

# RIETI

## Highlight

2011  
Special  
Edition  
**37**



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Introduction of Research Programs

## What is RIETI Highlight?

RIETI's public relations magazine "Highlight" is published quarterly, featuring RIETI's most recent activities with the objective of disseminating research outcomes to a wider audience. This special edition has been edited in English in order to reach our international readers.

In this issue, we focus on our special feature, "Quake Revival," in which RIETI has invested much time and effort as part of its contribution to the early rehabilitation and reconstruction of the disaster-affected area, and introduce to you our major research findings.

# About RIETI

## What is RIETI?

The Research Institute of Economy, Trade and Industry (RIETI), an incorporated administrative agency, was founded in April 2001 as a government-affiliated policy research institute with a certain degree of independence from the administrative authorities. RIETI endeavors to analyze and research various policy issues from a medium- to long-term perspective, thereby accumulating the necessary knowledge to formulate and recommend policy options.

## Research framework for the third medium-term plan (fiscal 2011-2015)

Under the third five-year medium-term plan commencing April 2011, RIETI's mission is to undertake theoretical and empirical research to create a grand design for aligning the Japanese economy on a growth path and solidifying sustainable growth in the future. To this end, we will proceed with research activity by always keeping in mind the following three "Priority Viewpoints" on economic and industrial policies.

- 1) Incorporating growth of the world economy;
- 2) Developing new growth areas; and
- 3) Responding to changes in society and creating new economic and social systems for sustainable growth.

Based on the three Priority Viewpoints, nine "Research Programs" have been established. Each program represents a set of interrelated policies, which will collectively cover a broad range of policy areas. Several research projects are to be conducted under this framework, and furthermore, there will also be Special Projects. Our current Research Programs will either be modified or supplemented on an as-needed basis. For more information, please visit Introduction of Research Programs on page 44.

### Three Priority Viewpoints on economic and industrial policies to be kept in mind when carrying out research activities

- 1) Incorporating growth of the world economy.
- 2) Developing new growth areas.
- 3) Responding to changes in society and creating new economic and social systems for sustainable growth.



# Message from the Chairman

The year 2011 turned out to be very challenging for both the Japanese and global economies. The Great East Japan Earthquake that struck on March 11 was not only a major humanitarian disaster but also dealt a tremendous blow to the companies in the affected areas. Moreover, businesses across a large area had to deal with further difficulties imposed by the restrictions on the use of electricity in the wake of the nuclear power plant accident. The resulting breakdown in supply chains had repercussions for the production of automobiles in Japan and in the United States. Although the impact of the nuclear power plant accident is gradually being alleviated, the number of overseas visitors to Japan has yet to recover fully. Fortunately, given the impact of up to three economic stimulus packages for restoration and reconstruction taken by the government, the real economic growth rate for the third quarter of the current year rose 1.4% from the previous quarter (or 5.4% year-on-year), representing a sharp recovery from the previous contractions. Still, there are many issues to address, including a grand theme of how to achieve reconstruction of the afflicted areas while ensuring local growth and employment.

Meanwhile, the global economy in 2011 witnessed ever increasing concerns over sovereign debt in the developed countries. In particular, debt problems in certain European countries have posed serious concerns for the global financial markets, even undermining the stability of the entire eurozone. Although European nations have been trying to improve their financial situations and eliminate market anxieties, it is indeed a difficult task to control expenditures while increasing public contribution in the face of the severe economic environment. Moreover, regaining fiscal strength will not guarantee economic revitalization. It is imperative to bolster corporate activities to support wages and employment in the future, while acting to restore fiscal soundness. In fact, the most recent period of sustained growth in the major developed countries was often attributed to a growing economic imbalance. These countries need to develop an innovation-driven economy in which economic growth is achieved through vigorous corporate activities, and not by the expansion of economic imbalances.

With both the Japanese and global economies facing many critical issues, research institutions have a responsibility to identify urgently these issues and propose improvements. These responsibilities are even clearer for an institution like RIETI, which was established as a policy think tank for the economy and industries. In April 2011, the 11th anniversary of its founding, RIETI launched a third five-year medium-term plan, establishing a number of research programs covering nine fields. It has also committed to seeking actively ways to address significant short-term economic issues.

For example, through its research and symposiums, RIETI analyzed the Great East Japan Earthquake through the experience of the Great Hanshin-Awaji Earthquake that occurred in 1995, and identified a number of facts, for instance: 1) the rate of bankruptcies of companies in the affected areas that had business relationships with financial institutions in the affected areas increased; and 2) the rate of relocation was higher among companies that were located in high corporate agglomeration areas before the disaster. RIETI has also proposed theories to support post-disaster revival, finding that while long-term economic growth is often accelerated after major wars or disasters, it is essential to reform comprehensively the frameworks of regulations and industry to truly revitalize the economy. Meanwhile, RIETI has also been analyzing corporate vitality and other issues. It is now developing a Japan Industrial Productivity (JIP) database related to corporate productivity and a Japanese Study of Aging and Retirement (JSTAR) database that stores panel data related to the lifestyles and health of elderly people. It is important to measure accurately corporate productivity and seek to raise it, mainly by improving exports and urban density. This will be a key factor that will determine economic growth in many countries going forward. We must also seek to understand better the health and lifestyles of people and their economic relationships, and compare the situation in Japan with that of other major countries so that Japan can take appropriate and effective measures amid severe fiscal restraints.

The latest RIETI Highlight will introduce research and symposiums related to the Great East Japan Earthquake and the databases developed by RIETI. I hope that this special edition will provide useful viewpoints to our readers in addressing the critical short-term economic issues.

## NAKAJIMA Atsushi was appointed Chairman of RIETI in April 2011.

### Profile

2011-Present	Chairman, RIETI
2004-2011	Senior Managing Executive Officer & Chief Economist, Mizuho Research Institute, Ltd.
2001-2011	Regular Commentator of World Business Satellite (TV Tokyo)
2000	Chief Economist & General Manager, Research Department, Head Office, IBJ
1999	President, Banque IBI (France) S.A.
1975	Joined Industrial Bank of Japan, Ltd. (IBJ)

### Selected Publications

*Nihon no Toppako (Japan's Breakthrough)*, Toyo Keizai Inc., 2011  
*Sekaikeizai: Rensasuru Kiki (Global Economy: Chain-reaction Crisis)*, Toyo Keizai Inc., 2009  
*Chugoku Jinmingen no Chosen (Challenge of China's Yuan)*, Toyo Keizai Inc., 2004  
*Nihon Keizai no Risuku Sinaro (Risk Scenarios for the Japanese Economy)*, Nihon Keizai Shimbun, Inc., 2004





# Quake Revival

The Great East Japan Earthquake that struck on March 11, 2011 caused significant damage not only in the Tohoku region, the area most immediately affected, but also to the Japanese economy, notably the auto industry, through a breakdown in supply chains. Moreover, in the wake of the accidents at the Fukushima Daiichi Nuclear Power Plant, a number of nuclear power plants suspended their operations, resulting in a serious shortage of electricity. Consequently, last summer, the government decided to impose energy restrictions on major users of industrial electricity. It also called on smaller electricity users and individual households to cut voluntarily their power consumption by 15%.

Work on restoration and reconstruction has been underway since the disaster, but the economic reconstruction of the affected areas still has a long way to go. Moreover, issues related to the Japanese overall economy remain unaddressed, such as how to develop systems of production that can take advantage of industrial agglomeration, yet remain resilient against disasters, or how to overcome restrictions on electricity supply, which are expected to be in place for some years. To develop appropriate policies to address these issues, it is important to understand accurately the realities of the disaster-stricken areas and the Japanese economy, and conduct extensive theoretical and empirical analyses.

RIETI was researching the economic impact of natural disasters even before the March earthquake, and immediately following the disaster, it has been actively proposing a range of policies. It has also been undertaking research contributing to reconstruction efforts, taking the perspectives of industrial concentration, regional productivity, and energy supply and demand, among a range of other viewpoints. In this latest special feature, we will introduce some of the initiatives that RIETI has been pursuing.

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# Japan's Recovery by Removing Borders and Decentralization: From a spatial economics perspective

August 2011

**FUJITA Masahisa**

President and Chief Research Officer, RIETI / Professor, Konan University



## Profile

FUJITA Masahisa is RIETI's president & chief research officer and concurrent professor at Konan University. His expertise includes urban and regional economics, regional development, spatial economics and international economics. He obtained his Ph.D. in regional science from the University of Pennsylvania in 1972. Prior to his current position, he was a professor at the Regional Science Department, University of Pennsylvania (1986-94) and a professor at the Department of Economics, University of Pennsylvania (1994-95). He is a member of the American Economic Association, the Japanese Economic Association, the Econometric Society, and the International Regional Science Association. Selected publications include *Economics of Agglomeration* (written with J. F. Thisse, Cambridge University Press, 2002), *The Spatial Economy* (written with P. Krugman and A. Venables, MIT Press, 1999), *Urban Economic Theory* (Cambridge University Press, 1989), and others.

On July 29, the Japanese government established the Basic Policy on Reconstruction from the Great East Japan Earthquake. Although the reconstruction project is on the order of 23 trillion yen over 10 years, the vital issue of how this project is to be funded remains a subject for future discussion. The new Cabinet led by NODA Yoshihiko, who was named prime minister on August 30, is required to create and implement quickly a specific plan for reconstruction. This column aims to give an outlook for the future course of Japan through the reconstruction from the perspective of spatial economics.

Spatial economics is a new field of economics that analyzes dynamic changes in intercity, interregional, and international spatial economic systems by focusing on agglomeration forces (improvement in productivity and creativity) arising from the proximity of diverse human activities and the complementary relationships among them. Its fundamental task is to analyze the process in which diverse activities of production and consumption form a variety of agglomeration at municipal, regional, and national levels in close interactions on the one hand and decentralization on the other through a tradeoff between economies of scale in individual production activities and transport costs in a broad sense (see Figure).

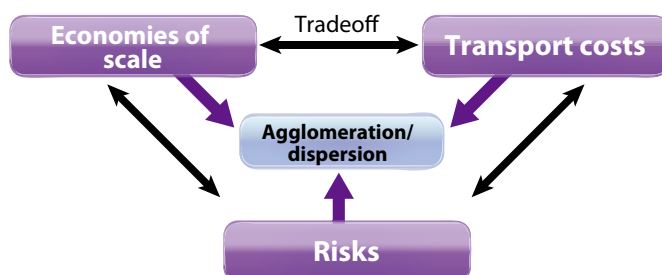


Figure: Fundamental task of spatial economics

The Great East Japan Earthquake was the first massive and complex disaster in history that included an earthquake, a tsunami, a nuclear power plant accident, power supply failure, and large-scale disruptions of supply chains. It became clear that the tradeoff between economies of scale and the risks resulting from diverse natural and man-made disasters is an essential issue to be addressed when thinking of the desirable spatial structure for Japan.

Japan was at an impasse even before the earthquake, faced with many fundamental problems. Japan should aim not just at a recovery to the state before the earthquake but also at a creative recovery that leads to a new future for Japan.

The experience of the Great Hanshin-Awaji Earthquake could be a useful reference for thinking about a creative recovery from the earthquake. Although the Port of Kobe achieved full recovery from a devastating disaster in the short period of two years and two months, its function as the international hub port in East Asia had already been overtaken by Busan and Shanghai. This fact demonstrates that the lock-in effects of a hub of the international maritime transport network cannot be recaptured once it is lost. It is also a telling reminder of the difficulty of a creative recovery.

Transforming the disaster into a creative destruction leading to new growth is a task that requires exceptional resolution, energy, and time. As it appears, however, Japan has been forced, rather than by choice, to change itself drastically. This is indeed the greatest crisis since World War II. But Japan must turn it into an opportunity to bring about fundamental changes by making united efforts and taking decisive steps. Otherwise, Japan's decline will continue.

Let us consider the direction to be taken in reconstructing the Japanese socio-economic system by focusing on the preferred path for recovery in the Tohoku region. The principal thrust should come from borderlessness and decentralization.

First, let us consider the target direction for development of the Japanese manufacturing industry in relation to the problem of supply chains. Although the areas directly struck by the earthquake were mainly four prefectures in the Tohoku and Kanto regions (Iwate, Miyagi, Fukushima, and Ibaraki), the entire manufacturing industry in Japan and part of the manufacturing industry abroad were forced to suspend production.

A single automobile is manufactured by assembling 20,000-30,000 parts and materials. Economies of scale work for the production of each part. With an established transportation infrastructure and low transport costs, there is a strong

incentive in Japan for a single company to mass-produce each part in a single location and transport such parts to places all over Japan and some to other countries. A dense network of supply chains is established all over Japan, and each manufacturer has been engaged in highly efficient production while reducing inventory to a minimum. Such efficiency-oriented management of supply networks backfired in the wake of the earthquake.

Japanese companies showed remarkable responsiveness on the frontline of production and restored supply chains at a rate greater than initially expected with production almost normalized in the manufacturing industry at the time of writing. Nevertheless, production at present has merely been rehabilitated to its original state. Placing the highest priority to the speed of restoration, rather than taking a "building back better" approach, was an inevitable choice, given the need to avoid the hollowing-out of Japan's advanced manufacturing industry. This, however, leaves Japan with the challenge of creating more resilient supply chains both within and across its national boundaries. We need to address this issue without delay in order to avoid the risk of Japan being excluded from global procurement networks, as there is strong pressure on components and materials manufacturers from both the domestic market and overseas markets to disperse production. The point is how to disperse risk while taking advantage of economies of scale, and we can take three basic policies to achieve that end: 1) virtual dispersion of plants through a business continuity plan (BCP) or a similar plan, 2) physical dispersion of plants inside Japan (for instance, to western and eastern Japan) or across national borders, and 3) thorough differentiation of core components and materials—those constituting the source of competitiveness—through continual (technological) innovation and by making clear distinction between two strategies for parts and components, i.e., commonalization and differentiation. We must find the best mix of these three policies to reconstruct more resilient supply chains in Japan and abroad.

In doing so, it is necessary to be capable of responding to a change in the major trend of the world economy, taking the lessons learned from the failure of the complete restoration of the Port of Kobe. Conventional global supply chains of Japanese corporations have been constructed for consumer markets in advanced Western countries. In this century, however, it is in emerging countries where a large expansion in the demand for industrial products is expected. In order to participate in global growth, current global supply chains and

corporate strategies must be fundamentally reviewed, and Japanese companies must depart from their management practices centered on Japanese personnel.

To ensure progress in the global economy, each company should boldly promote overseas operations. On the other hand, the Japanese government should prevent the hollowing-out of the manufacturing industry by retaining in Japan those core components, materials and manufacturing machinery industries, that are the source of competitiveness for Japanese advanced manufacturing industries, and make efforts for attracting foreign investment. Specifically, the government should make all-out efforts to bring the nuclear power plant accident under control and ensure the stable supply of power, promote free trade agreements (FTA) and economic partnership agreements (EPA), reduce the corporate tax rate to the international level, prevent a rise in the value of the yen, and resolutely implement a mid-to-long-term growth strategy.

A number of experts and business leaders, including MITARAI Fujio, chairman emeritus of Keidanren (Japan Business Federation), have proposed the establishment of a headquarters with comprehensive supervisory powers in the Tohoku region, in view of a possible transition to a new regional administrative system referred to as *doshusei* provincial system in the future, for leading the rapid implementation of recovery measures. I also support this proposal.

Specifically, the Reconstruction Agency, whose establishment is specified in the Basic Act on Reconstruction from the Great East Japan Earthquake, or its de facto executive organ should be established in the Tohoku region as a basis for the prospective "Province of Tohoku." I would like to propose realizing *doshusei* by gradually extending this prototypical system to other parts of Japan. This is necessary also for reducing the impact of the paralysis of urban functions in Tokyo, which could result from the direct impact of a near-field earthquake.

The centralized nation state with Tokyo as its capital, which emerged via the abolition of feudal domains and the establishment of prefectures in the Meiji Restoration, functioned well in the phase during which Japan tried to catch up with Western industrialized societies. Japan's stagnation after the collapse of the Japanese bubble economy, however, indicates that the entire Japanese socio-economic system has a major structural problem.

In the days when growth was possible by modifying and

improving advanced knowledge absorbed from Western countries, the traditional Japanese socio-economic system focusing on common knowledge functioned well. However, if Japan is to develop as a knowledge-creating society in the current age of globalization, it must cultivate the frontiers of knowledge not only in the area of science and technology but also in broader areas including society and economy. For this purpose, it is indispensable to reconstruct a socio-economic system which emphasizes the specific knowledge of each individual and is much more diverse and autonomous than before.

The realization of *doshusei* is preferable in order to develop highly autonomous and diverse regions. This is exemplified by the fact that, in recent years, the majority of the top 10 Organisation for Economic Co-operation and Development (OECD) countries on a per capita GDP basis have been small countries in northern Europe. The average population of these countries is about 6.3 million, which is smaller than the total population of the six prefectures in the Tohoku region (about 9.3 million). The aforementioned countries have their own language and culture as well as unique industrial concentration and economic, social, and educational policies and have developed knowledge-creating societies rich in diversity.

We can therefore see that a large-scale population is not very essential for a country to develop as a member of the knowledge-creating societies. Japan can be revitalized as a knowledge-creating society if a decentralized system of government based on *doshusei*—rich in autonomy and diversity—is constructed by drastically reexamining the division of roles between the national and local governments with a view to promoting regional competition and collaboration.

It is necessary to develop the whole Tohoku region as a place rich in diversity for innovation that enables participation by all stakeholders. For instance, the region can be expected to play a major role in the comprehensive technological development of renewable energy and the construction of a relevant social model. The Japanese government needs to improve support for university research centers in the Tohoku area and boldly promote industry-academia collaboration by utilizing a system of special reconstruction zones and other means.

Hardware-related scientific technology alone cannot make the Tohoku region an attractive area, however. It is presumably important to proceed with post-disaster reconstruction by involving experts in economics, business management, culture, and art.





Research Digest is a clear and concise summary of main points and issues with policy implications that have been raised in RIETI discussion papers.

# The Economic Impacts of Natural and Man-made Disasters and the Effectiveness of Insurance Mechanisms

Natural disasters, such as earthquakes, tsunamis, typhoons, and floods, and man-made disasters, such as wars and economic crises, significantly affect the lives of every individual and society in general. The limited resources used for dealing with these disasters must be distributed appropriately based on scientific evidence. To help achieve this, Faculty Fellow SAWADA Yasuyuki undertook a comparative study of the economic effects of a broad range of disasters, using data available for comparing results from countries around the world over a long time frame starting from 1960. Professor Sawada also examined the effectiveness of risk sharing mechanisms against disasters in developing nations, where natural disasters produce more serious effects, using data from Vietnam. Through these studies, Professor Sawada found that although all disasters produce short-term negative effects on the economy, with natural disasters and wars having particularly adverse effects, in the long run, natural disasters and wars produce positive economic effects, while economic crises have continuous negative effects. Professor Sawada argues that comprehensive short-term policy interventions are needed for dealing with natural disasters, while long-term measures are essential for addressing economic crises. A policy should take into account the effective allocation of limited resources across different disasters.

## Has the Number of Disasters Risen Sharply in Recent Years?

—Professor Sawada, you published two papers on disasters in succession. Tell us first about the motive for your research titled, "Aggregate Impacts of Natural and Man-made Disasters: A quantitative comparison."

(<http://www.rieti.go.jp/jp/publications/dp/11e023.pdf>)

I began this study about two years ago. It started with my impression that the occurrences of natural disasters might

be increasing. The great earthquake in Sichuan Province, China (2008), the great tsunami in the Indian Ocean (2004), Hurricane Katrina (2005), and the Great Hanshin-Awaji Earthquake (1995) are still fresh in our memories. And, of course, the Great East Japan Earthquake, the





devastating earthquake in Haiti, and volcanic eruptions in Iceland have taken place in more recent years. These natural disasters, which have significant adverse effects on people's lives, have been occurring around the globe at a rapidly rising frequency in the last 20 years or so. Data suggests that floods and other hydro-meteorological disasters, such as typhoons and hurricanes, have strikingly increased. Besides those natural catastrophes, there are other disasters—the Lehman Brothers collapse, the Asian currency crises, the economic crises in Mexico and Argentina, wars, civil wars, terrorist attacks, other violent disasters, the nuclear power plant accidents that accompanied the Great East Japan Earthquake, the Japan Railway Company (JR) Takarazuka Line derailment,

## SAWADA Yasuyuki

**Faculty Fellow, RIETI**  
**Professor, Graduate School of Economics,**  
**The University of Tokyo**

### Profile

SAWADA Yasuyuki has been a professor of Economics at the University of Tokyo since 2012. He was previously an associate professor in Faculty of Arts and Sciences and Faculty of Economics at the University of Tokyo since 1999. His fields of research are Development Economics, International Economics, and Applied Micro-econometrics. He holds a Ph.D. in Economics from Stanford University, an M.A. in International Development Policy from Stanford University, and an M.A. in International Relations from the University of Tokyo.

Recent works include: "Did the Financial Crisis in Japan Affect Household Welfare Seriously?" *Journal of Money, Credit, and Banking* 43 (2-3), 297-324, 2011 (co-authored with NAWATA Kazumitsu, II Masako, and Mark J. LEE); "How do People Cope with Natural Disasters? Evidence from the Great Hanshin-Awaji (Kobe) Earthquake," *Journal of Money, Credit, and Banking* 40 (2-3), 463-488, 2008 (co-authored with SHIMIZUTANI Satoshi)



and airplane crashes—which could be called "technological disasters." We can lump economic crises, violent disasters, and technological disasters together and call them "man-made disasters." Disasters tremendously affect the lives of all individuals and society as a whole. For that reason, people intensely focus their attention on major disasters as they occur. However, interest in the disasters weakens rapidly, the media scales down its coverage, and relief donations shrink over time. These are the so-called "cognitive biases." As for policy response to disasters, while correcting the bias that results from "cognitive biases" and distinguishing a short-term axis from medium- and long-term axes, distributing limited resources appropriately will be a critical issue. Building upon this, as a premise for developing responses, I came up with the idea of comparatively analyzing the effects caused by various disasters from an empirical standpoint.

### —What kind of data did you use for your analysis?

I chose data that would allow me to compare results over a long time frame starting from 1960, based on macro data obtained from more than 100 countries. I made sure to show clear scientific evidence of disasters that have had large impacts on people's lives, using gross domestic product (GDP) and consumption levels as indicators.

## Natural Disasters and Wars Produce Positive Effects in the Long Run

### —What did your analysis reveal?

The analysis showed that the effects of disasters on a given country's economy differ depending on factors such as the

length of time post-disaster, disaster type, and the size of the country's GDP. Let me first talk about the differences caused by time. When we look at global averages in short-term periods of one to three years, natural disasters produce the largest downward effects on per capita GDP. A single natural disaster can lower per capita GDP by an annual rate of about 1%. Conflicts and wars cause the second largest effect on per capita GDP. Both lower the figure by an annual rate of 0.4 to 0.5%. Economic crises follow conflicts and wars, but their downward effect on per capita GDP is limited possibly to 0.2% per year.

**Table: Effects of Disasters on Per Capita GDP (Annual Rate)**

	Short term (1 year)	Long term (20 years)
Natural disasters	−1 to −0.7%	+0.6 to +1.2%
Conflicts and wars	−0.5 to −0.4%	+0.4 to +0.9%
Economic crises	−0.7 to −0.2%	−0.5 to 0%

In contrast, I found that natural disasters, conflicts, and wars work in the opposite direction over the long term and can push up per capita GDP. Based on my analysis of their effects over 20 years, natural disasters increase per capita GDP by 0.6 to 1.2% per year, while conflicts and wars produce upward effects of 0.4 to 0.9%. However, the effects of economic crises remain negative at minus 0.5 to 0% even over the long term (as shown in the table).

Next, let me explain the differences attributable to the size of GDP. Natural disasters cause extremely large short-



term adverse effects on countries with low per capita GDP. In contrast, wars create a significant negative impact on countries with large per capita GDP. Previous studies proved similar results that the effects of natural disasters and wars switch from negative to positive over the long term. To give an example, there is a research paper showing that Japan recovered surprisingly quickly from its serious loss of domestic capital stock, a negative repercussion of World War II.

As a cause of the positive long-term effects that the given disasters produce, previous studies suggested the amplification of economic activities caused by accelerated moves toward shakeout of firms, in other words, as a result of the forced withdrawal of relatively unproductive companies and the survival and growth of highly productive companies under the effects of the disasters. This is the process Joseph A. Schumpeter called "creative destruction," although when attributable to disasters, "creative destruction" may not be an appropriate expression from the standpoint of companies and households that have suffered unexpected, severe property and human damages.

In the meantime, concerning the negative effects that economic crises have on both short- and long-term bases, we can assume the following possibility. Natural disasters cause visible physical damage. The processes of recovery and reconstruction also become visible. Political agreements on recovery and reconstruction investments are assumed to be straightforward for that reason. On the other hand, as economic crises are largely intangible, decision making may take extra time, and sometimes effective prescriptions may not be known. As for the differences attributable to economic scale, because natural disasters generally cover geographically-limited areas, they greatly affect small nations but have limited effects on large nations.

## Economic Crises Require Long-Term Involvement

### —What kinds of policy implications can you draw from your study?

We must take comprehensive measures in the immediate wake of natural disasters because they produce extremely large adverse effects within short periods of time. In the meantime, we must involve governments in initiatives against economic crises for extended periods because their adverse effects continue over the long term.

### —What future research are you planning?

Many catastrophes occur concurrently. An economic crisis occurred immediately after the Great Kanto Earthquake. In Africa, there were cases in which natural disasters caused economic crises, which further led to conflict. In the latest Great East Japan Earthquake, natural disasters also caused technological disasters, such as the nuclear power plant accident, which led to a major catastrophe. I must study the "mechanisms" behind these "combined" disasters more closely.

## Insurance Markets in Developing Countries are Undeveloped

### —Please tell us about your second paper, "Self-production, Friction, and Risk Sharing against Disasters: Evidence from a developing country." What were your motives for studying the relationship between disasters and the economy of a developing country in the paper?

(👉 <http://www.rieti.go.jp/jp/publications/dp/11e017.pdf>)



A number of problems associated with risks have emerged in developing countries because of their undeveloped markets. These problems include the weak functioning of valid market mechanisms against "weather risks," or the risks of weather affecting the harvest of agricultural products that comprise a key industry in developing countries; "health risks," or the higher risks of infectious diseases and other health problems in tropical regions; and "contractual risks" attributable to weak legal foundations for contract enforcement in various economic transactions. Among these risks, natural disasters are particularly serious. Data for natural disasters by country show that the probability of an occurrence is the same for advanced and developing countries. Compared to developed countries, developing countries have insufficient central government policies and market functions, and these cause disasters to produce greater human and economic damage. To approach this problem, I wanted to study how disasters are related to economic welfare in developing countries on a micro level, in other words, from the perspectives of citizens and households.



## —Why did you focus on risk sharing in self-production and consumption?

A significant number of studies had been conducted on whether consumption risk sharing is achieved by exchanging daily necessities such as food in a community; in other words, whether people living in a village actually help each other. Many papers on this subject have been published in leading

economic journals. However, these studies did not set apart self-consumption that is essential in the farming regions of developing countries from total consumption. I thought that an explicit analysis of self-consumption through this research would significantly contribute to the prior studies because it is assumed to be a key factor for addressing risks independently in the farming regions of developing countries. In addition, very little prior research had analyzed risk sharing against natural disasters. I picked Vietnam for this study for several reasons. First, an outbreak of avian influenza, a serious natural disaster, caused enormous damage to the country. Second, Vietnam suffers from floods almost every year. The risks of natural disasters in general are high as indicated by its classification as Level 4, the second-highest risk group among the five natural disaster risk categories established by the United Nations International Strategy for Disaster Reduction (UNISDR), the UN agency responsible for disaster prevention programs.

## —What are the characteristics of the data you used for analysis?

In selecting data, I felt that it must be representative of Vietnamese households. As such, I tried to expand on multi-purpose household survey data from the Vietnam Household Living Standard Survey 2006 (VHLSS 2006), which the General Statistics Office of Vietnam (GSO) conducted as a nationwide survey that year. For this study, we selected about 2,000 households, or all subject households in four representative regions of Vietnam, from those studied in the VHLSS 2006, surveyed them on items related to our study objectives at the beginning of 2008, and constructed panel data by matching the results with the VHLSS data. As our four survey regions, we chose one area that sustained serious damage from both avian influenza and flooding, one area each which sustained serious damage from avian influenza or flooding, and one



area which was lightly damaged by both. The ratio of self-consumption to total consumption averaged 40% in these regions, which are dominated by farming villages. We also distinguished self-consumption from consumer expenditure in both the VHLSS panel data and our self-procured data. With these steps, we prepared household panel data that showed how disasters affected consumption and income from 2006 to 2007. In preparing questions for the follow-up survey, we devised a way to show people's subjective probabilities of avian influenza outbreaks and floods, the amount they are willing to pay for buying and staying in a hypothetical disaster insurance program, and their risk tolerances, aiming to develop an understanding of contentions such as "people think natural disasters will not befall them before they occur," which are often discussed in behavioral economics.

## Sharing Does Not Function in Geographically Extensive Disasters

### —What did you find through your analysis?

We found that no mechanism of pooling risks for consumption risk sharing was present within the broad framework of a province, which comprised a subject area of our research. In other words, we can say that mutual assistance mechanisms are unlikely to form in response to geographically extensive disasters. However, risk sharing mechanisms appear to function well in units called communes, which are groups of smaller territories such as villages. Many of the earlier studies in India and Pakistan showed that sharing mechanisms do not function completely even within villages in developing countries. Through this study, we found the possibility that sharing may function within villages in a way that is supplemented by self-help, when a self-help approach to dealing with risks

by adjusting self-consumption is taken into consideration. Our research also showed that the analysis results from the earlier studies arose from omitted variable biases of self-consumption variables. The second point is the substance of sharing mechanisms. We can think of various modes of sharing, including direct exchanges of actual goods, such as money and rice, and labor exchanges, in which another person performs agricultural work in place of a person unable to work. Through our analysis, we learned that the mechanism of risk diversification by means of money lending and borrowing is particularly important in Vietnam. The third point is a "commitment" to sharing. There is the theoretical possibility that spontaneous sharing mechanisms will not function when personal conditions are favorable, because under those conditions, a latent incentive for leaving mutual assistance mechanisms and offering no help to other people arises. However, our study found no support for this hypothesis in communes in Vietnam. I believe a strong relationship of trust that exists among people is one of the factors behind the effective operation of sharing mechanisms there.

### —What kind of policy implications can you draw from the results of your second study?

Through this research, we found that sharing mechanisms worked well at the commune level, but they did not function over a broader space. Thinking about it, this is quite natural. We must support formal insurance market transactions to ensure that risk sharing functions properly across broader areas. A scheme called crop insurance, in which compensation is paid for crop failures, is one possible approach. However, traditional indemnity-based crop insurance is known to work poorly in developing countries because damage verification is difficult and costly. To deal with this problem, new "index-based" insurance programs have been designed with schemes such as insurance payment for total rainfall below a pre-fixed

threshold, using indicators outside human control, such as rainfall, as "indices." The World Bank and other international agencies are using these "index-type insurance programs" in pilot experimental programs around the world. The programs are also used in commercial insurance contracts in places like India. This kind of fresh thinking will be required going forward. Natural disasters cause incomes to shift dramatically. Yet it is difficult for people to build an informal pooling and sharing scheme against very significant risks that negatively affect large areas, such as avian influenza outbreaks and floods. For that reason, in the future, we must design schemes against natural disasters, such as index insurance. For some time now, a number of international organizations have been experimenting in collaboration with partners such as global reinsurance companies in an attempt to develop these schemes.

## —What future research are you planning?

I would like to pursue projects designing actual insurance contracts with non-life insurance companies. I also hope to undertake carefully-designed experiments and econometric investigations to verify the effectiveness of insurance mechanisms.

## Recovery and Reconstruction from the Great East Japan Earthquake Will Take a Long Time

### —What policy implications can you draw on the economic effects of the Great East Japan Earthquake and reconstruction of quake-stricken areas in the future, based on the findings of your two studies?

I can say three things. First, natural disasters produce negative effects in the short term, but the effects prove positive in the long run. This is what we found through our first study. However, a closer investigation of the results caused by the type of natural disaster reveals that quake and tsunami damages make no contribution to economic growth over the long term. In the Great East Japan Earthquake, a tsunami destroyed entire towns. The adverse effects of this major quake will remain for an extended period because the physical damage will be so persistent. For that reason, recovery and reconstruction will require patient efforts over a very long time, in addition to short-term assistance.

Second, we must distribute our limited funds and resources to implement various policies in a level-headed way in order to keep the negative effects of this disaster to a minimum. We should always bear in mind the "biases" that may arise in the course of recovery and reconstruction, such as resource distribution limited to the political limelight and policy issues easily tackled. We need policy debate based on scientific evidence to achieve a "efficient and well-balanced distribution" of limited state resources. Gathering data that can serve as a basis for this debate is indispensable. Studies should prevent the debate from being too heavily influenced by political dynamics, playing the role of a "compass" for designing and executing policies.

Third, actively articulating the knowledge we created, sharing it within Japan and overseas, and turning it into an "global public good" are all extremely important. The damage to Japan from the recent earthquake was enormous. If too many people fall into a condition known in psychiatry as "disorientation," calm judgment becomes difficult, panic occurs, and society is thrown into turmoil. We must accumulate and share quality evidence to prepare ourselves for these situations and to draft better policies in the future.

# Securing a Future Energy Supply in a Sustainable Manner

July 2011

## TANAKA Nobuo

Executive Director, International Energy Agency (IEA)

On 23 June, for the third time in its history, the IEA announced that its member countries would release emergency stocks of oil. The release of 60 million barrels of oil for a period of one month was in response to the ongoing disruption of oil supplies from Libya, a problem whose effect has become more pronounced



as it has continued. The normal seasonal increase in refiner demand expected over the summer will exacerbate the shortfall further. Greater tightness in the oil market threatens to undermine the fragile global economic recovery. The collective action by the 28 member countries is intended to help bridge the gap until sufficient additional oil from producing countries reaches global markets.

This action surprised the oil market, as the Libyan disruption was already going on for four months without IEA action. But we have expressed our concern several times during those months and with additional demand in the third quarter on the radar, for which we saw insufficient additional supply, we could no longer wait. So, we moved in a pre-emptive manner to ensure a soft landing for the global energy markets ahead. Of course, the IEA is ready to release more oil onto the market if necessary, and this release represents only a tiny fraction of overall strategic stock levels.

While mitigating the effects of short-term disruptions by taking emergency measures remains our central focus, the IEA continues to provide benchmark analysis on future energy outlooks and policy recommendations over the

### Profile

TANAKA Nobuo took over as Executive Director of the IEA on September 1, 2007. Prior to that, he had been Director for Science, Technology and Industry at the Paris-based Organisation for Economic Co-operation and Development (OECD).

He began his career in 1973 in the Ministry of Economy, Trade and Industry (METI) in Tokyo. He has extensive national government and international experience within METI, the Embassy of Japan in Washington D.C. and OECD.

In the energy field, he was responsible for Japan's involvement with the IEA and the G7 Energy Ministers' Meeting during the second oil crisis. In the late 1980s, he participated in establishing the comprehensive energy policy of Japan and he also oversaw the implementation of Japan's international nuclear energy policy and led negotiations of bilateral nuclear agreements. He worked on formulating international strategy as well as co-ordinating domestic environment policy and energy policy in the Kyoto COP3 negotiation.

longer term. Our reports and analyses discuss the future energy landscape in terms of affordability, security and environmental sustainability. This task is complicated by uncertainties today such as a still-shaky economic recovery, a veritable revolution in unconventional gas production which has upended previous projections, the direction of climate change negotiations, policy choices in those emerging countries that account for the bulk of energy demand growth, political events in the Middle East and North Africa, and policy implications of the Fukushima nuclear incident. I would like to focus in this article on our latest findings on the implications of Fukushima, on whether we are entering a "golden age of gas," and on Japanese energy policy.

In the wake of Fukushima, we have been developing a lower-nuclear case, in which nuclear power's share of the total electricity mix drops from 14% to 10% by 2035. Initial findings show that a slowdown in nuclear power, coupled with disappointing climate-change negotiations at Copenhagen and Cancun, would make it practically impossible to limit emissions to a level concurrent with the long-term stabilization of the



atmospheric concentration of greenhouse gases at 450 ppm. This is the level that, according to the Intergovernmental Panel on Climate Change (IPCC), gives the world a 50% chance of limiting the global average temperature increase to 2 degrees Celsius.

To make up the slowdown of nuclear power, coal demand in 2035 would increase by 130 million tonnes of coal, which is roughly equivalent to the current level of Australian steam coal exports. Gas demand would rise by 80 billion cubic metres, roughly equivalent to the current gas production of Qatar. And additional generation from renewable sources would reach 460 terawatt-hours, or about five times the current generation from renewables in Germany. Prices of electricity will generally rise, energy security will suffer from less diversity in the energy mix and higher import dependence, and CO<sub>2</sub> emissions will rise with increased use of fossil fuels. We could see an increase in the growth in emissions from power generation of about 30% by 2035 compared with our base-line New Policies Scenario. We already see countries, particularly in Europe, moving away from nuclear power and making up for the future shortfall with a substantial expansion of renewable energy technology deployment. However, in order to still meet climate-change targets, investments will be required in the fossil fuels sector as well. Germany will need to import an additional 16 billion cubic metres of gas to replace much of its coal-fired generation by the government's 2022 nuclear phase-out date.

This is only one contributor to an increasing role for gas and, as such, we have recently released the Golden Age of Gas Scenario. This one assumes a rapid increase in gas consumption due largely to low prices from the expansion of unconventional gas exploitation. In this context, global primary natural gas demand rises by around 600 billion cubic metres to 2035 compared to the reference case, increasing from 3.3 trillion cubic metres in 2010 to 5.1 trillion cubic metres in 2035, or over 50%. The combined effect of a strong increase in natural gas demand throughout the Outlook period, and a decline in global coal demand from around 2020 onwards, results in global demand for natural gas overtaking coal before 2030 to become the second-largest fuel in the primary energy mix, after oil. However, even if this scenario represents a "golden age" for gas, it may not be a "golden age" for sustainability. An increased share of gas in the global energy mix is far from enough on its own to put the world on a carbon emissions path consistent with a global temperature rise of no more than 2 degrees Celsius. Our analysis shows that emissions are only negligibly

lower in the high-gas scenario, due to higher energy demand and the displacement of some renewables. Under low-nuclear power, high-gas, and indeed all our scenarios, electricity from renewable energy is vital. Neither of these recently developed scenarios changes the need for massive investments in low-carbon fuels and efficiency measures to achieve lower CO<sub>2</sub> emissions.

How do we see Japan in the global energy scene, especially after the Fukushima event? The priority today is to bring the damaged Fukushima Dai-ichi plants to cold shut-down. Also, it is imperative that power shortages be avoided over the summer by engaging every power source available while shaving peak electricity demand. Once this critical stage is over, the government intends to conduct a drastic review of its energy policy, namely the Basic Energy Plan, in which nuclear power is highlighted as a key power source, supplying 50% of electricity by 2030. I truly hope that serious discussions take place before jumping to conclusions, duly taking into account the various elements of energy security, cost and environmental issues. Especially given Japan's limited energy resource endowments, moving away from nuclear power would result in an even heavier import dependency on fossil fuel. Promoting renewable energy is important, of course. Former Prime Minister Kan's commitment to increase the share of renewable energy in the generation mix to at least 20% by the 2020s at the earliest is an ambitious one, and exceeds the measures of the IEA's 450 ppm scenario. In terms of energy security, such decisions should be carefully implemented based on a strategic energy design. Crucial elements of that design must include stable and safe nuclear power supply and further grid interconnection at the national level, and perhaps even across East Asia. Moreover, we expect Japan to continue to provide global leadership in the areas of energy efficiency and low-carbon economy by developing the most innovative and cutting-edge technology in the energy and environmental fields. The IEA has consistently called for an "energy technology revolution" that would encompass energy efficiency, renewables, nuclear power, carbon capture and storage, as well as smart grid and electric vehicles to realize a secure and sustainable energy future. There is no silver bullet. While we see encouraging developments, we must further accelerate and lock in the revolution in all areas by designing a better and more innovative energy market in Japan. Certainly Japan should take advantage of its low-carbon technologies and cultivate business opportunities ahead.

# The First Asia KLEMS Conference: Productivity Growth in Asia

July 27, 2011

## "World KLEMS and Asia KLEMS"

**Dale W. JORGENSON**

Samuel W. Morris University Professor, Harvard University



The focus of economic growth has shifted to Asia. In *The Rise of Developing Asia and the New Economic Order*, a paper I have written with Professor K. M. VU from the National University of Singapore, the relative ranking of different countries around the world shows that the rise of Asia is upon us. This is a very auspicious time to consider these issues on the occasion of the first Asia KLEMS conference.

The Asian Development Bank Institute (ADBI) has played a very important role in research on Asian economies and its sponsorship of the conference is a great step for KLEMS-type research around the world. Also, as a co-sponsor, the Research Institute of Economy, Trade and Industry (RIETI) has a long history of research in

### Profile

Dale W. JORGENSON is the Samuel W. Morris University Professor at Harvard University. He served as Chairman of the Department of Economics from 1994 to 1997. He is a member of the American Philosophical Society, the National Academy of Sciences, the American Academy of Arts and Sciences, and the American Association for the Advancement of Science. He was President of the American Economic Association in 2000, President of the Econometric Society in 1987, and recipient of the John Bates Clark Medal of the American Economic Association in 1971. He is the author of more than 246 articles and the author and editor of 32 books. His most recent book is *Information Technology and the American Growth Resurgence* (co-authoring with Mun S. HO and Kevin STIROH, The MIT Press, 2005). His collected papers have been published in 10 volumes by The MIT Press (1995 to 2001). He received his PhD degree in economics from Harvard in 1959 and his BA in economics from Reed College in Portland, Oregon, in 1955.

productivity in Asia going back to the beginning of the institute. Productivity and sources of growth are the central focus of RIETI.

RIETI is the most significant think tank in Asia dealing with economic issues. For example, it published *Productivity in Asia: Economic Growth and Competitiveness* in 2007. This involved productivity comparisons, mainly comparisons of sources of economic growth in major Asian countries. RIETI is also sponsoring the construction of the Japan Industrial Productivity Database (JIP).

The Hi-Stat Project at Hitotsubashi University similarly has a long history of research on economic growth, going back to the famous

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studies of the 1950s of the growth rate of the Japanese economy. At that time, Japan was the most rapidly growing economy in Asia. The period of income doubling created a template later followed by the Asian tigers (Korea, Taiwan, Singapore and Hong Kong).

For Developing Asia as well, beginning in India in 1991 and in China in 1978, economic development was patterned directly after the Japanese growth strategies of the 1950s, 1960s and early 1970s and the successful implementation of this strategy by the Asian tigers. Needless to say, growth in Singapore with 5 million people involves different issues than in India or China. Nonetheless, this history helps in understanding the emerging Asian model that informs all the research today.

The relationship between World KLEMS and Asia KLEMS also has a very long history. I think it is fair to say that the basic methodology was crystalized in *Information Technology and the American Growth Resurgence*, a book I co-authored with Mun S. HO and Kevin J. STIROH in 2005. This book was a result of work done on the impact of information technology (IT) on U.S. economic growth during the 1990s and early 2000s. Our book laid out a detailed methodology that has become a roadmap for subsequent research in this area.

## OECD report on standards for measuring productivity

The first of the challenges I will identify is to assemble the data on economic growth. Especially in Japan, but also in Korea and the other Asian tigers—there has been a long tradition of research on sources of growth in Asia. Around 2000 this work took a critical turn toward international comparability that is central to the focus of the World KLEMS Project.

In 2000 the Organisation for Economic Co-operation and Development (OECD), which involves amongst others the United States, Japan and Korea, convened a group of distinguished economists and statisticians to formulate a set of standards for productivity measurement around the world. This was an era of "many flowers bloom" and there were many different ways of measuring productivity and thus no basic standard approach that led to firm

conclusions about the sources of economic growth in any country.

International comparisons involving comparisons within Asia and similar comparisons in other regions were also impossible because everybody had their own way of doing things. The OECD proposed to meet this challenge by formulating a set of standards that could be used around the world. This set of standards resulted in the *OECD Manual—Measuring Productivity: Measurement of Aggregate and Industry-Level Productivity Growth*, which was a committee report.

In the OECD style the report was written by a single individual, namely Paul SCHREYER, now the Deputy Director of the Statistical Directorate of the OECD. Schreyer took upon himself in 2001 the task of writing up the consensus of the Statistical Committee. What emerged is a new set of standards for measuring productivity.

What do these standards involve? First and most important, they involved a view of capital that treated capital in terms of a service flow instead of a stock. In other words, they formulated standards for measuring capital that said that it is not enough to find out what the stocks of capital are—which was then the prevailing view up to that point—but that it is important to convert those stocks into a flow of services.

This is an important issue because the service flow from a given capital stock differs enormously among different types of assets, in particular between information technology (IT) assets and other types of assets. The elements that make up the service flow are 1) the rate of return, which is uniform across the different assets; 2) depreciation, which differs enormously from one type of asset to another; and finally 3) the decline in the price of assets, or the negative of the rate of increase of the price of assets. These three elements make up the components of the service flow. Although the idea had been present in economics going back into the 19th century history of capital theory, this concrete approach of capital services was featured in the publication by the OECD committee and Paul Schreyer's manual.

The year 2001 was already very late in the history of productivity measurement which had been very well developed much earlier in the 1950s and 1960s. However, the OECD report was a real watershed in defining the role of capital and made it possible to begin to focus sources of growth research on the impact of capital accumulation and how exactly that affects economic growth. This had been vague and imprecise until the OECD took a stand about how capital impacts economic growth.

So the history of the subject started anew in 2001 and that led to the challenge then to implement these ideas for many countries. This challenge was taken up in the United States, Japan, Korea and people in Europe involved later in the European Union's EU KLEMS Project, and the OECD then began to organize meetings to deliberate about these issues of capital measurement, but at a very fundamental level.

## Research on economic growth at industry level

What were the other elements in the OECD report? These included the importance of having consistency between measurement of productivity and the sources of growth at the industry level and at the aggregate level. Many of the consequences of research on economic growth are focused on issues at the aggregate level, for example the issue of the role of capital formation. That is something that starts from the top down, looking at the overall growth of the economy, the role of capital, the role of labor, the involvement of quality and so on, and all these things are then formulated at the aggregate level.

However, most of the detail about the sources of growth has a very specific industry dimension; for example, the dimension related to the production and use of information technology equipment and software. That is obviously something that is very specific to a group of industries. Thus, the OECD took upon itself the task of reconciling aggregate productivity measurements focused on broad policy issues with industry-level productivity measurement that would be consistent and could be integrated into an overall aggregate picture.

At the aggregate level, the sources of economic growth were capital and labor; but at the industry level, industries have inputs beyond the primary factors of production. In particular, they have inputs of energy, materials and services as examples. Furthermore, for most industries, these inputs of intermediate goods like sources of energy, materials and services are dominant at the level of particular industry groups.

The OECD said that the best way to proceed is to think of these intermediate inputs in addition to capital and labor as part of the system of inter-industry accounts. This made it possible to draw on decades of research around the world in Japan, Korea, Taiwan, Canada, the United States, Australia, and in many European countries going back to 1947 or even earlier. The results from this research work could be used by the OECD, provided that input-output data could be assembled in a form of consistent time series in both current and constant prices.

Why consistent time series? It is necessary in order to look at the growth of the intermediate inputs to have the same kind of consistent time series in current and constant prices that would be used at the aggregate level to measure capital and labor services. While it was a radical idea at the time, researchers had already devoted a good deal of attention to it and it became one of the central themes in the development of the JIP Database in Japan, and subsequently in Korea and work in Taiwan.

Fortunately, the OECD was able to agree that there should be a framework that incorporated the intermediate goods. This put extremely difficult demands on the government statisticians, because they were used to assembling input-output tables and liked to have as much detail as possible, but were not used to the idea of making these tables consistent over time. Therefore, the OECD posed a huge challenge to countries that were already developing input-output tables to translate those into a form that could be used in the sources of economic growth analysis at the industry level.

## Labor input quality measurement

The third accomplishment of the 2001 effort was the idea of incorporating quality dimensions into the



measurement of labor input. The great tradition of research in productivity analysis is based on the idea of measuring employment or hours worked, and this initiative of incorporating quality dimensions into a labor input played a very important role in labor economics where there was a whole human capital school that developed in understanding relative rewards in different kinds of labor.

However, the human capital school of research on labor input never got to the point of thinking about labor input along with capital and intermediate goods as input in the production. Thus, the OECD took the step of saying that labor had to be thought of as very heterogeneous and that therefore it is necessary to aggregate over different kinds of labor and to reflect in weights of the aggregation process the relative quality.

How should this quality be measured? This is where the human capital school had a great deal to contribute because in the famous Mincer equation, formulated by Jacob Mincer, the focus of the model was on the reward to human capital as measured by labor compensation, which includes the wages earned, supplements paid in the form of pension, health benefits, etc., and for many emerging economies, the rewards to labor that are earned as part of self-employment and informal activities. In the developments that followed where the technology began to be transferred toward emerging economies, the issue of essentially using these concepts of human capital for informal activities immediately came to the fore, and that was part of the OECD program.

Thus, capital, labor, energy, materials and services (KLEMS) were all formulated explicitly as part of an international consensus among economic statisticians in a committee convened by the OECD resulting in a report that established a handbook for carrying out productivity research. This handbook embodied ideas that were already present in earlier work and databases around the world, but by establishing a set of common standards, the OECD challenged each of the research groups that had already been active in this area to bring their own measurement standards into conformity with the international standards.

International standards for measurement are very well established in the international statistical community. For many years going back to the middle of the last century, the OECD and other international organizations like the International Monetary Fund (IMF), World Bank and the Statistical Office of the European Commission (Eurostat) have been working to develop a System of National Accounts (SNA) which is standard around the world. Although this has not focused on issues having to do with productivity measurement, it illustrates the idea that the international community of statisticians is familiar with the idea of standardization so as to adapt methods and concepts to the local situation.

Measurements are not identical in different countries, as I learned in research comparing Japan and the United States. It is necessary to drill down and deal with the peculiarities of each of these relatively advanced economies. This holds much more forcefully when thinking about moving from industrialized economies with well developed statistical systems to emerging economies. That is why the role of international standards comes to play a very significant role in this whole area.

## Revision of the SNA

After the OECD effort was completed, an effort was launched to revise the SNA. This was of great interest to the statistical community but did not receive any headlines in the *Wall Street Journal*, *Nikkei* or *Financial Times*. It was nonetheless a very important event because the SNA involving the United Nations, World Bank, IMF includes not only advanced industrialized economies like the OECD economies but all of the economies of the world, down to the smallest island nations. The UN assembled more than a hundred countries in an effort to work out a new set of standards that would be appropriate for the new environment in the new century. This effort lasted for perhaps a decade and a momentous development took place in a very unusual location. That location was Canberra, the capital of Australia.

What does Canberra have to do with this? A number of committees were appointed by the SNA to consider issues related to the revision of the SNA and these were named after the cities where they were convened. Hence,

a committee was convened in Canberra consisting of about 150 people and most of the meetings were held in Canberra with the purpose of deliberating about issues having to do with the measurement of capital.

Many days, weeks, months and years later, the Canberra Group emerged with its recommendations. These were to measure capital in a way that can be integrated with accounts for the sources of economic growth and to make this an integral part of the SNA. The OECD had already established standards, so if anybody wanted to find out how to measure productivity in an OECD country, they could refer to the OECD Manual published in 2001. By moving this to an agenda involving the standardization of methods and measurement practices around the world, the United Nations encompassed all of the issues that arose in dealing with the emerging economies. This was very ambitious.

How could this be accomplished? First, this had to be sold to the management. The way the SNA is organized is that there are various city groups that report to a central commission that passes (or fails to pass) particular recommendations. In March 2007, the United Nations Statistical Commission, the governing body for the revision of the SNA, endorsed the report of the Canberra Group, saying that it was possible to standardize for every country in the world the measurement of capital according to the OECD methodology as part of a world data system, the SNA.

This did not hit the headlines either. It escaped the attention of the financial press, but it was a momentous development, because it meant that the same standards could be applied to India, Myanmar, Japan and the United States as well as every country around the world. And these standards were precisely the ones that had been agreed upon earlier by the OECD which represented a completely different constituency. The people who were deliberating about this were not ignorant of the fact that for many countries this would be an extremely demanding undertaking, which is precisely why this is such a significant development.

As the process was finalized, the OECD and the other organizations that developed the SNA produced a two-volume document called the *2008 SNA*, the 2008 revision of the System of National Accounts. In chapter 20 of volume 2, there was a complete description of how to measure capital within the framework of the SNA. In 1993, only 15 years earlier, a similar UN panel had said that it was impossible to measure capital at all and therefore progress in understanding the sources of economic growth during the most dynamic period of economic growth in world history was halted for 15 years as a result of a set of decisions by a group of economic statisticians.

This illustrates the great power held by the statisticians in halting the flow of information that would have been essential to understanding world developments at such a critical time. The Asian crisis passed, the recovery occurred, and the economic and financial crisis went forward, all in total ignorance of the role of capital in a form that could be compared across countries. Fortunately, the authors of the *2008 SNA* took this as a challenge and resolved the issue in favor of the OECD methodology.

The OECD followed up by writing another handbook on the measurement of capital, spelling out exactly how this is to be done: how capital services are defined, how it is related to capital stock, the role of the deflators, the role of depreciation, the role of the rate of return, and so on. And all of this was summarized in chapter 20 of volume 2 of the SNA, an official document involving the endorsement of the UN Statistical Commission and literally more than a hundred nations around the world.

### World KLEMS Consortium

This sets the stage for World KLEMS. So what is World KLEMS about? What is the purpose of World KLEMS? The purpose is nothing more or less than to try to implement these ideas, not only in advanced countries in the OECD, but around the world including the emerging economies of Asia. On August 19-20, 2010, one year after the publication of the 2008 revision of the SNA, a meeting took place at Harvard University to form a World KLEMS Consortium to implement the OECD approach for countries around the world.

At the First World KLEMS Conference 40 countries were represented. In addition to the members of the OECD which had been involved in the earlier research, there were representatives from India, China, Latin America (including Chile, Brazil, Argentina and Mexico), Turkey, Taiwan and Indonesia, among altogether 40 countries making up more than 90% of world gross domestic product (GDP).

It should be noted that the representatives at this meeting included not only advanced economies with well developed statistical systems but emerging economies. The World KLEMS Consortium took on the challenge of developing methods for compiling and analyzing data in a form that could be used to understand the sources of economic growth in countries at every level around the world. The Consortium focused on those that are the most significant economically, but ultimately with the goal to encompass the world economy in as much detail as possible.

The World KLEMS Consortium was put forward as an approach to implementing the ideas that had been first developed in the OECD report, then endorsed by the UN SNA and finally incorporated in the 2008 revision of the SNA. The OECD capital measurement manual was a very important document as well. All of these efforts succeeded in establishing a common methodology and a common set of standards that could be applied in the same way as national accounting had been applied in a standard format around the world 40-50 years earlier.

This was the setting for the formation of the World KLEMS Consortium, which greatly broadens the community of people who are involved. It is no longer a matter of simply compiling or collecting the data. Data can be collected on the population, economic units or informal sector, but there may not be an accounting system in place. To find out what is needed is a matter of research in which economic statisticians must collaborate with people who specialize in economic measurement within the community of research economists.

## Application of the KLEMS-type methodology

The idea was to turn this into a practical reality—to take a set of abstract ideas with a set of methodological dicta and implement it at the operating level where an economic statistician has to produce a report every month, quarter or year. It would obviously require an enormous research effort to adapt these ideas to the conditions, for example, in China or India. Both of these countries are very promising alternatives because they are among the economies with the best developed statistical systems. Therefore, although they are not ideally adapted to the application of the KLEMS-type methodology, they contain all of the elements.

What are these elements? They are capital, labor and intermediate goods in the form of input-output tables. Input-output research is very well established in China. It is something that goes back to the era of a planned economy and has developed since then through the earnest efforts of many research scholars to be implemented within the framework of the Chinese system of national accounts. There are official input-output tables which can be compared over time and form the basis for a KLEMS-type dataset.

The situation is even better in India, which has a long tradition of empirical research in economics with one of the best developed systems of national accounts in the world, a very elaborate system of population statistics, as well as household and economic survey statistics. Although this effort is quite ambitious to begin with, it is in fact feasible. However, it takes talent and it takes the kind of people, for example, who have assembled to launch the Asia KLEMS Project.

## Role of statisticians

To take these ideas of the World KLEMS that have been endorsed by the international statistical community and turn them into reality and economic research that will push this down to the level of international comparable statistics around the world, it is going to take a mode of organization which is extremely well established. In the United States, Japan, and all of the countries that are participating in the Asia KLEMS Project, there are

established relationships between economic statisticians and research economists to integrate and use common standards to adapt these abstract ideas having their origins in economic measurement to the specific conditions that are confronted by countries at every level of development.

To meet this challenge of compiling data, it is necessary to involve academic researchers and researchers of think tanks along with economic statisticians. These are the people who collect, compile and report the data. The job will not be finished until the research community has completed the task of providing something that can be reported on a regular basis as part of the national accounts.

The setting is as follows: In 1993, the UN said that it was impossible to report measures of capital as part of the national accounts. In 2007, thanks to the work of the Canberra Group and the OECD, the UN changed completely and took the opposite point of view that it is possible in fact to do productivity measurement using the KLEMS model within the SNA. This is important because it is not mainly a story about research; it is mainly a story about measurement, and measurements must be reported on a regular basis.

And if data are reported on a regular basis, the standards must be the same. If the results are going to be understood by anybody outside the country making the report, they must conform to the international standards of the SNA. Never was there a better time to undertake a project like the World KLEMS Consortium as ambitious as it sounds, involving 40 countries around the world, than now.

Fortunately, at the World KLEMS meeting that took place in August 2010, the participants grasped the opportunity and took upon themselves the role of seeing to it that there would be a thoroughgoing implementation of these very basic ideas in economic measurement that would make it possible to begin to understand the momentous changes that are taking place as a result of growth in the world economy and growth in the Asian region, which is becoming central to growth in the world economy and

growth in the most important countries of Asia.

## Asia KLEMS conference

That sets the stage then for today's meeting, mainly beginning to think of how all this can be done in Asia. Why is that important? First, economic growth and the focus of growth in the world economy is shifting very rapidly to Asia where all the action is taking place and where the understanding is necessary for issues related to the world economy. Second, Asia is a marvelous laboratory for understanding the importance of these measurement issues and how to resolve them in different settings.

Japan is the country with the most sophisticated highly decentralized economic statistical system in the world; Korea has an extremely sophisticated system of economic measurement to which enormous resources have been devoted over decades. Paired with these countries and the other Four Tigers, the greatest challenges for economic measurement emerge. These include the challenge of understanding economic growth in China and in India. This is not going to be an easy challenge to meet.

Reading the literature on the sources of growth in China and India, two countries which are so central to the future of the world economy, the same enormous heterogeneity and differences in methodologies and approaches that have characterized productivity research around the world until the OECD manifesto of 2001 are seen. With that heterogeneity, of course, it is impossible to draw conclusions, either for an individual country, for the region or for specific groupings of countries.

Without standardization, it is impossible to do measurement. That is the situation that economics finds itself in today. The same applies to measurements in physics or engineering. With the opportunity created by the careful thought of the economic statisticians and being implemented in the World KLEMS Consortium, it really is an opportunity for transformation in economics in a very fundamental way.

The mode of organization is very clear. It is going to be necessary to have the statistical agencies collaborate



with the research community in each individual country; that is, the people who have been studying the measurement issues at the ground level where all the specifics and challenges emerge. Another challenge is to identify the informal sector which is essentially "the rest" or the economy that is not captured by conventional measurement methods. This does not mean that statisticians in China or India or other emerging economies have not attempted to deal with the issues, but it does mean that this involves a completely separate set of challenges that must be met as part of this overall undertaking. This is an additional reason why this meeting on Asia KLEMS is so significant.

## Role of the regional organizations

That essentially sets the stage for discussing future work and the role of the regional organizations that are now emerging as part of the World KLEMS Consortium, which itself is very recent, dating back only to 2010. It should be noted that the second World KLEMS conference will be held at Harvard University on August 9-10, 2012. Discussion will cover the regional organizations in Asia, the corresponding organization in Latin America, and most importantly the organization in Europe, which has led the way to implementation within Europe.

In terms of the role of the specific regional organizations, after my book with Ho and Stiroh on the U.S. growth resurgence was published in 2005, a group of European economists led by Bart van Ark and others decided that the next step was to try to implement these ideas for Europe. The European economy had been carefully scrutinized in an international conference of all the members of the European Union in Lisbon, Portugal, in 2000. In the Lisbon Agenda, the Europeans formulated the objective that Europe should by 2010 become the world's most dynamic knowledge-based economy.

This goal was originally set in 2000, at a time when the U.S. economy had grown at faster rates than ever before for about 10 years and the European economies flowed relative to their very dramatic growth of the postwar period. They were very specific about what that meant, i.e. the use of information technology and knowledge-based methods for developing technology such as scientific

and non-scientific research and development. All of these things were to be developed in Europe at a state that would make Europe comparable and surpass the United States.

At the World KLEMS Consortium meeting in 2010, it was possible to look backward and see what happened. By around 2005, five years after the famous Lisbon Agenda, Europeans began to develop doubts about things not having changed five years into it. The U.S. economy was growing faster than ever and Europe was languishing. What happened to the goal of becoming the world's most dynamic knowledge-based economy?

A series of reports began to emerge from various sources and people in Brussels at the European Union began to realize that they did not know the reasons for the slowdown in Europe and the acceleration of economic growth in the United States. They received a quick lesson from colleagues at the OECD and the prescription was very simple: It is necessary to carry out a KLEMS-type project for Europe in order to understand the differences. It is necessary to understand where the growth comes from before you talk about a knowledge-based economy.

## EU KLEMS project

Thus, beginning in 2005, the Europeans began the implementation of KLEMS for as many European economies as possible. While one might think that this is easy when dealing with advanced economies such as United Kingdom, Germany, France and Italy and so on, there are a lot of economies in Europe that are not so advanced such as the new Central and Eastern European members, countries that had had no contact with the international statistical community until the fall of the Berlin Wall in 1989. These countries were in a very primitive state, statistically speaking.

Nonetheless, 25 EU economies were eventually included in this project which resulted in an initial release on 15 March 2007. This was the first and most successful project so far implementing the KLEMS approach designed by the OECD across a very heterogeneous group of countries in different stages of development, statistical sophistication and research sophistication. Still, this initial

release provoked not a storm of controversy but rather a welcoming on the part of statisticians and measurement economists, not only in Europe but around the world.

Even people who were skeptical about the KLEMS approach stated that this was a new era and something that will be the definitive treatment of the European economy for the decades to come. The European countries continued to cooperate and by the middle of 2008, just before the financial crisis, the EU KLEMS Project was completed. This project was reported in a book edited by Marcel Timmer and his colleagues, which was the first international comparison among such a broad range of economies involving 25 of the 27 EU members.

As Professor Pyo remarked, as part of the EU KLEMS Project, the community of people already involved in this type of research in the United States, Canada, Japan and Korea were invited to join as "adjunct members" of the EU KLEMS Project with an idea that if the EU KLEMS Project was successful, it could lead to a broader effort involving other countries. By the time the project was completed, this approach was well known among people in the measurement community not only in Europe, but in the United States, Canada, Japan and Korea and all of these separate efforts began to focus on the same basic methodological approach, mainly implementing the standards agreed upon by the OECD statisticians and finally implemented in the SNA. The book describing the EU KLEMS Project was published in 2010 and volume 2 has gone to press with contributions from members of the EU community who did individual country studies with a full report of a successful implementation of an international comparison project involving KLEMS-type research.

### PPP and World I-O database

Exactly what was accomplished with the EU KLEMS Project? It was not merely a comparison of growth of the 25 countries. The ambition was much greater. The people who designed the EU KLEMS Project had in mind not merely the idea to compare growth rates across countries, but also levels. It was necessary to have measures comparing, for example, the level of capital in Italy with the level of capital in France, etc. Therefore, an effort was made to integrate the measurements for the different

countries. This is the fundamental concept of purchasing power parity (PPP).

When one begins to compare sources of growth across countries, or outputs across countries, it is necessary to make use of the concept of PPP, a common set of prices that enable the translation of results from different countries into results from other countries. This is worked out in some detail for the United States and Japan and in a lot of detail for the EU economies and is an integral part of the design of Asia KLEMS. The conclusion then is that there are standards in place and an accumulated well of experience now in implementing an approach to KLEMS that makes it possible to standardize measurements across countries, and most importantly to do inter-country comparisons.

This leads to the third and final capstone of this research, namely the world input-output database. The idea is that in addition to making comparisons across countries, it is going to be possible to look at the way in which these countries are integrated through international trade. This will essentially unify the world statistical system and provide a unified picture of the world economy involving not only the individual countries and comparisons across countries, but the very important processes of international coordination that are involved in international trade. This is obviously a very ambitious undertaking and has implications for Asia KLEMS.

### Asia KLEMS and the challenge ahead

Asia KLEMS is a project that was launched at the initiative of Professor Pyo who was fortunate to enlist RIETI and ADBI in co-sponsoring this effort with support from Hitotsubashi University based on the basic idea that the EU KLEMS model involving integration of comparison of methods across countries adapted to specific situations could be extended to Asia. The motivation is easily understood. Asia is where the action is. Research in economic growth has to be done on Asia and it is an area which has already been carefully "prospected" by investigators in Japan, Korea and Taiwan in earlier work in productivity. What has been missing so far is the use of common standards. Fortunately, because of the work of the UN, the OECD and of the EU KLEMS Project, these

common standards are in place.

What remains to be done? It is necessary to understand how these standards can be applied to the conditions in Asia. This reveals problems of a totally different order and totally different set of challenges than have been seen before. How is it going to be possible to apply these ideas that have been mainly developed and implemented for advanced economies to a region like Asia where there are indeed advanced economies—as advanced as any in the world—along with very large and very important economies that are emerging, that have statistical systems still under development, but are the core of the emerging pattern of economic growth in the world. How is that going to be possible?

Professor Pyo has succeeded in enlisting an outstanding group of collaborators from Japan, India, China, Singapore, Malaysia and so on. This is something that is now beginning to take real form, where confidence is building that the approach that has already been tested so thoroughly over the last decade since the beginning of the new era of productivity measurement can be successfully applied in Asia. Difficult issues will certainly emerge, but groups are already forming that are going to solve these problems. Very well established groups already exist in China and in India, with additional projects being launched in Asia that are going to make it possible to meet these challenges.

Asia KLEMS will have an independent identity from World KLEMS. The problems that are going to emerge are not going to be solved by any kind of top-down dictation of standards and so on from any kind of international organization. Those are already in place and agreed upon, but the implementation is something that has to be done on the ground. That is the purpose of the Asia KLEMS conference.

This is an extremely challenging undertaking and is something that has an audience waiting for it. It is not the kind of audience that was waiting for the result of the EU KLEMS Project. In that case, it was a story about a failure; a failure of Europe to keep up with the development of technology which then looked so impressive in the United States. That was the challenge there.

The challenge here in Asia is completely different, namely precisely the reverse. As Asia is the center of gravity with world economic growth moving to Asia, the prospect is not only that China will overtake Japan, which happened last year in terms of exchange rates, but it will also overtake the United States by around 2018 as the world's largest economy. The United States has been the world's largest economy for a hundred years, so this is a historic development, but is not limited to China. India will overtake Japan. This should not be shocking. It is something that is going to happen and it will happen within the next decade.

Developing Asia, excluding Japan, will overtake the famous G-7, the industrialized countries that have led the world since the middle of the last century. This will also happen within the next decade. There will be a new world order emerging as this research for Asia KLEMS is undertaken. Therefore, rather than looking at a divergence in which deficiencies in the EU countries are now becoming increasingly apparent, the project will look at the emergence of the "Asian century," and it is something that economists around the world will be required to study.

There will be many voices that will be part of this debate over the rise of Asia. Goldman Sachs and all investment bankers have their own view on this topic. What role is there for statisticians and economists in this debate? The numbers that the people are going to be referring to as this debate unfolds are the numbers produced by this group. The same is going to be true around the world as part of the World KLEMS Consortium.

The first Asia KLEMS meeting has something to contribute that is unique. The researchers assembled have the knowledge, standards and the experience that will make it possible for people in the economic statistical community who are reporting the growth rates to extend their reach and build up a new model for measurement of economic growth. This will lead to an understanding of the sources of economic growth that will apply to Asia and around the world as this Asian century unfolds.

# What Have We Learned from the Panel Data of the Elderly? For better life and health

July 29, 2011

Solving issues related to the economics and health of the elderly is one of the top priorities facing Japan at present. Due to increasingly tight fiscal conditions, however, discussions tend to focus only the financial aspect. One of the reasons we do not see more fruitful discussions is the lack of statistical data reflecting actual conditions of the elderly in Japan from a multidimensional perspective. Industrialized countries have conducted large-scale panel data surveys and utilized the resulting data as a valuable input for real-world policymaking. In Japan, a comprehensive survey of elderly people based on an international standard—Japanese Study of Aging and Retirement (JSTAR)—was launched in 2007 by RIETI and co-working institutions. The symposium "What Have We Learned from the Panel Data of the Elderly? For better life and health" held on July 29, 2011 brought out the true picture of the elderly captured in these datasets and how they are utilized in actual policymaking by the world's leading researchers conducting these surveys. Also, the nature of JSTAR results as well as its policy implications were presented. The symposium proved us the importance of panel studies.

## Lecture

### "Longitudinal Aging Data for Behavioral and Social Research"

**John W.R. PHILLIPS**

Behavioral and Social Research Program, National Institute on Aging (NIA)

The mission of the National Institute on Aging (NIA) is to improve the health and well-being of older Americans by conducting high-quality research (aging processes, age-related disease, and special problems and needs of the aged) and disseminating information to interested groups so that the data can be useful for a wide array of key policy questions (social security, Medicare, etc.). The NIA Strategic Plan of 2007 also supports the development of longitudinal studies, data archiving and data sharing as well as the development of internationally harmonized social and behavioral data on aging to foster cross-national research.



The research model followed by the NIA is to gather considerable input from the research community, thus

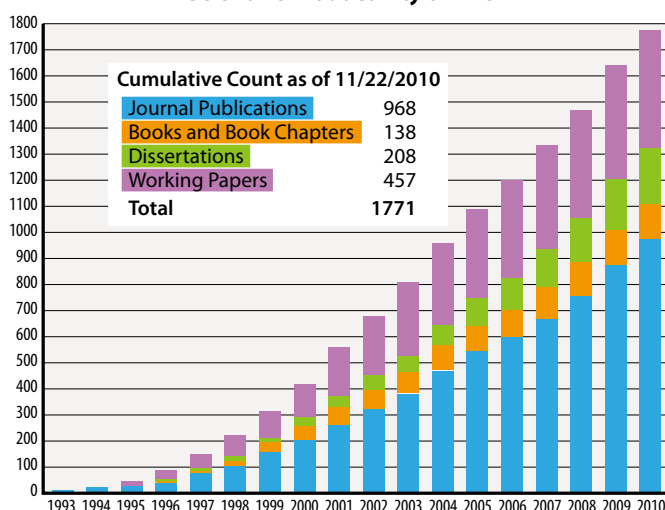
receiving expert advice on the direction of its scientific programs. The decision to go ahead with the Health and Retirement Study (HRS) was similarly made through recommendations at numerous workshops and expert panels, such as the 1987 Ad Hoc Advisory Panel on Data Collection Priorities, as well as regular reviews. The consistent themes that came out of all of the workshops were the importance of having longitudinal, multidisciplinary data and consideration for biomarkers and administrative linkages, among others.

The NIA promotes and develops data by making use of mechanisms that feature interaction between the federal government, the data collectors, and third-party experts, reaching across to other federal agencies for administrative data linkages as well as finances. It has also started initiatives to ensure that the data is well used and harmonized through research networks and distribution mechanisms. Throughout the grant process of the NIA, there is continuous review and monitoring by third-party experts for the development of the HRS. The partnerships made with other federal agencies, such as the U.S. Social Security Administration and the Center for Medicare and Medicaid Services, have provided opportunities for doing unique research with administrative data.

Based upon the successes in cross-national research (e.g. Gruber/Wise), greater comparability of the different aging surveys for the purpose of generating more cross-national research is encouraged. Planning grants are offered for international data collection and to help create more harmonized measures and develop the studies. RAND, through support from NIA, has two programs that work to effectively distribute the HRS data: the easy-to-use RAND HRS dataset and the RAND Survey Meta Data Repository as a resource for cross-national research. Both are free to the public online.

In sum, the HRS was a result of the NIA soliciting a longitudinal aging study with significant feedback from the research community. The distribution strategy has been successful in increasing the number of scholarly users. It has also been a significant contributor to science and policy, covering many topical areas across several disciplines. For example, the HRS informed studies on the expanded Medicare Program on prescription drug benefits, the impact of the financial crisis on stocks and retirement, and the impacts on cognitive functioning after severe sepsis. The HRS is used not only in academics but also extensively throughout the federal government for policymaking. In this sense, the HRS is a public good for conducting innovative multidisciplinary research.

**Scientific Productivity of HRS**



**Q&A** Dr. Phillips mentioned the Economics of Aging project which has looked at issues of late life work, retirement, and social security, as well as health care/insurance and intergenerational transfer. Regarding how the HRS data can contribute to local governments, he explained that there is

potential to break down samples by individual geography, although it has not been a major focus. Relating JSTAR to HRS, Dr. Phillips commended JSTAR and predicted that JSTAR would grow and develop even more rich data.

## Session 1

### Population Aging in the World Observed in Panel Data

#### "Outline and Purpose of the Japanese Study of Aging and Retirement (JSTAR) and the True Picture of Elderly People in Japan as Revealed by the Study"

##### ICHIMURA Hidehiko

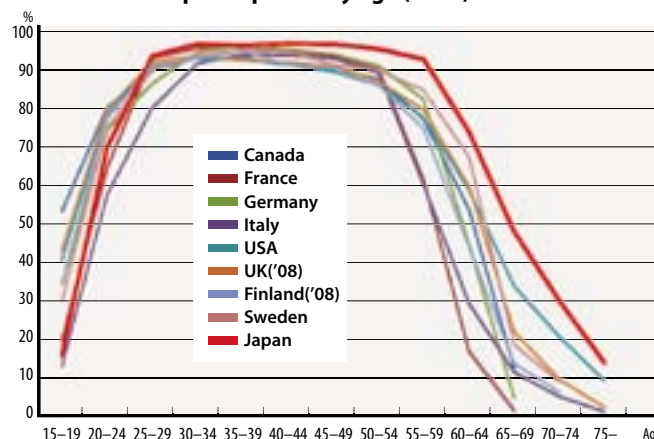
Faculty Fellow, RIETI / Professor of Economics at the Graduate School of Economics and the Graduate School of Public Policy, The University of Tokyo

For many developed and developing countries alike, the increasing aging population is a common issue. Japan is unfortunately the leader in this respect, with an old age dependency ratio of 35% and expected to rise steadily. The main concern of such a high dependency ratio is the shortage of labor supply and deterioration of the balance on the pay-as-you-go pension system. This has led to the elderly remaining in the labor market longer, and this experience in Japan may contribute some knowledge for other countries.

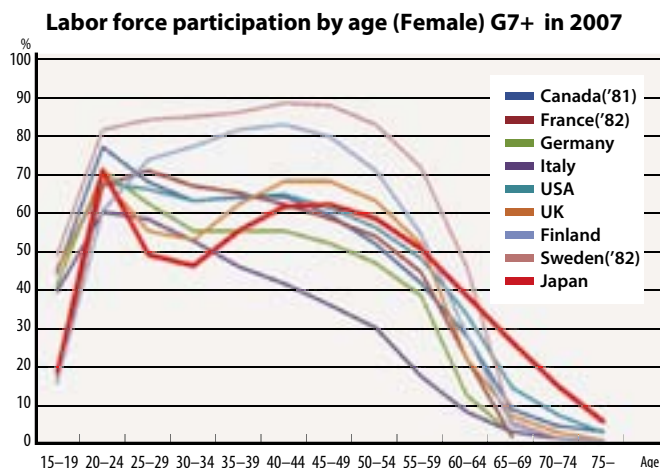


Concrete numbers show, for example, that for elderly men, while the proportion has decreased compared to 1980,

**Labor force participation by age (Male) G7+ in 2007**







Japan's numbers are still higher than other G7 countries. For Japanese women (over 60) also, many remain in the labor force longer than in the G7 countries, but not Sweden. There is a trend across cohorts that men's labor force participation is declining, but for women this is increasing, and it is driving the age issue. In order to consider pension, employment, health and nursing care policies, comprehensive data collection efforts that commenced in the U.S. were propagated across the world. JSTAR is a recent addition to this family and harmonization efforts are now being led by RAND for cross-country comparisons to be made. There are panel studies all around the world, including in the U.S., Indonesia, Mexico, Europe, Korea, Japan, China, Ireland, Thailand, India and Brazil.

As in the U.S. where the HRS informs policy debates on social security reform, JSTAR hopes to play that role in Japan. The first wave in 2007 was based on a stratified random sample of five municipalities; the second wave in 2009 added two new locations; and the third wave in 2011 plans to add three more locations. This sampling design based on municipalities has the advantage of having many individuals with a uniform socioeconomic environment, namely a city. Many of the questions relate to how individuals make decisions given the environment and how the environment affects individual decisions. The sampling allows for a more flexible separating of the effect of the environment and the differences across individuals such as income level, education, etc. On the other hand, a disadvantage is that a nationally representative sample cannot be constructed easily. The aim is to obtain representativeness by increasing the number of municipalities, currently at ten. Another constraint is the lack of human resources, for which further funding is necessary.

JSTAR is largely based on the Survey of Health, Ageing and Retirement in Europe (SHARE) as is common across HRS-related surveys and has eight sections (individual characteristics and family; cognitive ability; work; health; income and consumption; grip strength; housing and assets; and medical treatment and care service usage). It differs from other studies in that it is not a nationally representative stratified random sample. In addition, JSTAR measures food intake using a questionnaire validated in Japan. For those who gave permission, it is possible to link the data to administrative records of their health and nursing care usage, as well as their medical examinations. It would be of benefit if the government allowed links to social security data and tax records.

While some argue that people, if left on their own, would not save enough for old age, Scholz, Seshadri and Khitatrakun showed in 2006 based on the HRS that people are over-saving rather than under-saving. Following this, calculating expected net lifetime wealth by cohort using income/expenditure, consumption and health information collected through JSTAR reveals that the ratio of people with a below average expected net lifetime wealth decreases with age (50 and over). Without such insights, it is simply impossible to design a sensible pension system or more generally a sensible social security system. For this, HRS type panel data provide the key.

## "A Comparative Study of Well-being in the U.S., the UK, and Continental Europe"

**Arie KAPTEYN**

Director, RAND Labor and Population

The motivation behind this comparative study is the aim of government policy to improve the well-being of its citizens and the obvious positive correlation between well-being and health. The objective is to determine the differences across countries



and people. By using several items from the Center for Epidemiologic Studies Depression Scale (CES-D) asking respondents to report unpleasant feelings, a depression score is determined for individuals. The items chosen are those that would yield comparable data, for example demographics, major/minor health conditions, health behavior, limitations

in activities of daily living (ADLs), limitations in instrumental activities, age and birth year.

In the results from a multivariate analysis, i.e. keeping other things equal, depression scores from different studies were compared. The HRS shows that in the U.S. depression decreases with age. However, looking at birth year, those born earlier are more likely to be depressed. Results of the English Longitudinal Study of Ageing (ELSA) study in the UK show the same trend by age and cohort, as do the patterns from SHARE for Continental Europe though the correlations there are slighter. This exercise stresses the fact that effects of age cohorts have to be taken into account on top of age when studying depression. Even controlling for the selectivity effect, i.e. that optimistic people are more likely to live longer, essentially the effects of changes in depression by age are the same. Other demographics that influence the likelihood of depression include ethnic background, smoking, gender, work, ADLs and IADLs, marital status and income.

Controlling for these variables, one interesting finding from the HRS is that the effect on an individual's sense of depression is major for those without health insurance compared to those with health insurance. Looking at work as relating to retirement, the effects vary across the U.S., the UK and Europe. Since effects are controlled for income, wealth, etc., the differences in the importance of work on depression may be based on social factors.

In sum, the similar patterns across countries show that there is evidence for different roles played by age and cohorts. This speaks for the significance of having panel data. In addition, reduced functioning leads to more depression; money and being married are protective against depression; and females are more at risk of depression. Questions raised by differences such as work being a more important factor in the U.S. or the influence of insurance on dealing with major health shocks have to be considered when looking at policies in this field.

**Q&A** Professor Ichimura asked whether there were studies looking at the linkage between depression and suicidal behavior, to which Dr. Kapteyn replied that it could be added in the JSTAR but that complications could arise in measurement and number of observations. Responding to a question from the floor, Dr. Kapteyn also explained

that religion or other spiritual practices were not currently considered in the descriptive data.

Professor Ichimura added to his presentation that JSTAR does not include explicit questions on job status (non-regular, contingent), but does include non-paid, voluntary work. He also explained that the JSTAR sample covers about 0.05% of the population and that it includes Japanese/non-Japanese alike as long as the respondents are registered in the municipalities. Furthermore, JSTAR measures social capital by number of friends in different categories. To a question about gaining permission about respondents' health conditions, Professor Ichimura stated that building rapport is very important for the interviewer.

### "Health and Early Retirement: Policy lessons from international comparisons"

#### Axel BÖRSCH-SUPAN

Director, Munich Center for the Economics of Aging (MEA) at the Max-Planck-Institute for Social Law and Social Policy (MPISOC)

In order to compare differences in the effects of public and social policy on behavior, it is important to study cross-national variation through econometric analysis of survey and macro data. Some typical insights from cross-national correlations are the negative



incentive effects of pension provisions on early retirement, the fallacy of the relationship between early retirement and unemployment rate, the correlation between per capita expenditure devoted to the elderly versus the young, and the effect of health care spending on health status.

To solve the causality issue, panel data and detailed micro-data are necessary because it is not easy to draw conclusions from broad macro aggregates which are very often simultaneously determined. Exogenous forces of policy effects can only be explored through micro-data and panel data as they include data over time and policy events. For example, historical experiments in Germany demonstrate the importance of using panel data to make effects, such as drop in retirement age and effect on unemployment, visible.

In Europe, SHARE has collected data from 20 European countries with a sample size of 60,000 households. It is the closest correspondence to a laboratory setting, measuring all the effects of pension systems and health care systems. SHARE has been built up to use cross-national variation among health, labor market and institutional data. The challenges in collecting data in different countries include variations in language, institutions, interpretation and methods. These are solved by using computer-assisted technologies, objective measures and common reporting styles.

An example of a similar comparative study was done on the side effects of disability insurance, for which there are huge variations in enrollment across Europe. Looking at the causes of these variations and relating them to health and other variables, it is found more probable that those who are in bad health receive disability benefits within each country. However, there seems to be a very strong effect of policy between countries in terms of lowering the number of recipients receiving disability benefits in countries where generosity is low. Thus, there is a clear distinction of health as a driver of disability benefits within each country, but it is the policy across countries that makes a difference.

In conclusion, international comparisons are powerful in detecting policy effects, but they only work when data is harmonized so as to avoid spurious effects. Obtaining panel data thus requires resources, funding, foresight, and patience.

## "Cognitive Health of Older Indians: Individual and geographic determinants of female disadvantage"

**Jinkook LEE**

Senior Economist, RAND Corporation

The motivation behind studying India is its size, large population and huge geographic variation with each local government having different policies. As for cognitive function, it has been found to be a risk factor of physical chronic disease and vice versa. India is experiencing an epidemiological transition with non-communicable diseases increasing rapidly. However, not



much is known about the cognition of older Indians.

Research has shown that in developed countries, the cognitive functioning of women is generally better than that of men. The evidence from developing countries, though much more limited, shows that women perform worse than men, due possibly to educational differences. However, the literature on India focuses only on single-city populations with the female disadvantages more pronounced in the Northern states. This North-South difference may be due to female discrimination and gender inequity.

The pilot survey of the Longitudinal Aging Study in India (LASI) was completed in 2010 covering four states and 1,546 randomly selected households. Indian census data show real gender imbalances in the North and a difference in life expectancy with the regular pattern of women living longer than men in Southern states, but not in Northern states. Based on results of cognitive tests, the LASI revealed gender differences in episodic memory as well as global cognition with women performing worse and a greater gap especially in Northern states.

The cognitive gender disparities could be explained by gender inequality (under-nutrition, education and health care), restricted social engagement and increased psychological distress. These possible risk factors of cognition were analyzed to see whether the female disadvantage persists after controlling for them. For example, there is no female disadvantage in terms of nutrition and food insecurity, but a big disadvantage in terms of education and literacy with a much higher proportion of women with no schooling in Northern states. A female disadvantage is also observed in self-reported chronic diseases (but not infectious diseases); men are found to be more socially engaged; and women in Northern India are more depressed than men. Controlling for the risk factors, education and psychological distress were found to be able to explain the female disadvantage, but not others. Analyzing the covariants, the main effect of female differences observed in the Northern states is found not to be statistically significant.

In conclusion, women aged 45 and older in India do worse in cognitive tests, and more so in Northern states, and education accounts for 40-50% of the gender disparity in cognition. This

implies that greater access to education among women has a great potential to reduce gender disparities in cognition.

**Q&A** Dr. Lee explained that one variable to look at in the future is the extent of experiencing discrimination in early childhood, which may explain the regional differences. She also stated that marital status did not have a protective effect for cognition and depression in India. Professor Ichimura added that looking at age and societal change over time may also be of interest. A participant further suggested adding predictive probabilities to compare North-South differences.

## Session 2

### Considering Medical and Health Care Policy Based on Panel Data

#### "Should Medicare Reform Target Incentives for Providers or Patients?"

**David WEIR**

Research Professor, Survey Research Center, University of Michigan / Director, Health and Retirement Study (HRS)

The HRS and its international network have particular relevance to policy and are beneficial for studying fundamental questions about health and processes of aging given their coverage of economics and policy participation. Aging is the policy challenge of the 21st century everywhere as aging populations create fiscal pressures with commitments to retirees exceeding current taxes from workers. Although comparatively the U.S. is not aging as rapidly, the current impasse over raising the debt limit is essentially about aging and a complete lack of what it means for public policy.



Policies for older Americans include Social Security and Medicare with the effects on the latter more unpredictable and uncontrollable. Medicare's unfunded liability, estimated at about US\$41 trillion, is larger than that for Social Security. This is why Medicare is the biggest and most difficult aging-related policy in the U.S. To contain spending on Medicare, the best policies would be to limit spending on treatments that provide less benefit, since the U.S. spends more on

health care but has a lower life expectancy. In addition, the Dartmouth atlas shows regional variation in spending within the U.S. However, high-cost medicine in areas does not seem to lead to better outcomes than low-cost medicine in other areas. Therefore, the policy prescription being pushed is to have expensive regions practice medicine more like the less expensive areas to save money without harm to health.

Looking at the distribution of expenditure for Medicare, while there are differences, the effects seem exaggerated, and what needs to be established is whether people persistently spend more than others in the same health condition. With the HRS linkages to administrative records, it is thus valuable for policy research. On the question of whether to target interventions on regional provider or individual spending variation, i.e. which has greater potential for savings, the answer would have to come from observing Medicare spending in claims data for time periods between HRS interviews and regressing over various variables. The findings show that the patient effect explains more of the residual variance than looking at the regional provider effect. Thus, targeting policies at individuals would be at least as effective as targeting providers.

#### "Using International Country Data to Learn about Health—The case of England and the USA"

**James P. SMITH**

Distinguished Chair in Labor Markets and Demographic Studies, RAND Corporation

In the background to this comparison was the motivation to determine the reasons why in terms of prevalence of various diseases the U.S. leads even the UK among those 55-64 years of age. Differences in reporting as well as conventional risk factors were considered as explanations, but they did not explain why Americans had the highest disease prevalence. Neither did less standard risk factors, such as social integration and support (behavioral/psychosocial risk factors). However, one significant explanatory risk factor were body shape indicators such as waist circumference, as opposed to body mass index (BMI) which is regarded as a poor measure of risk of disease.



Another hypothesis was to study childhood disease history. Across all age groups, Americans were more prone to childhood diseases than the English. For all kinds of adult illnesses as well, Americans fared worse than the English. Controlling for age, gender and country differences, measuring the interaction of adult and childhood diseases, existence of diseases at very early ages seems to be a significant contributing factor for adult illnesses in the U.S. Another explanatory factor may be differential screening effects for cancer in the U.S.

Other uses of data are in mortality and disease incidence. Comparing the HRS and ELSA in these terms, it can be concluded that the U.S. has a higher prevalence and incidence of disease, but Americans outlive the English. Therefore, despite the inefficiencies in the U.S. health care system, the idea that it is not productive is incorrect since it has a lower mortality rate. However, if control measures, such as standard health behavior, marital status and work, are included, the differences in mortality between the two countries diminish greatly. Furthermore, if health status is controlled for, the mortality gradients by financial status between the two countries actually disappear. Also, comparisons over longer periods of time generate little evidence of significant wealth effects.

## "Health and Health Care in Japanese Elderly"

**HASHIMOTO Hideki**

Professor, School of Public Health, The University of Tokyo

Following the end of the Second World War, Japanese life expectancy has grown to exceed that in all countries of the Organisation for Economic Co-operation and Development (OECD), although the longevity of Japanese men seems to be decelerating nowadays. Data to be published in The Lancet on the Japanese health care system show that primary care and lifestyle modification still matter and may be the keys to strong population health in Japan.

Looking at historical changes, the demographic and epidemiological analysis has detected that prolonged life expectancy of elderly men and women in Japan is mainly



due to reduced mortality of stroke and heart diseases, and especially since the 1980s among those 75 years of age and older. Furthermore, the top contributors to mortality (hypertension, tobacco, inactivity and other lifestyle factors) can be treated in a primary care setting. However, these findings do not inform policy reform as they lack social or psychological backgrounds to individual behaviors.

OECD health data show that Japan spends only about 8.5% of its gross domestic product (GDP) for health, but coverage of public expenditure for health is very high. Also, using JSTAR data, it is possible to see that equity in access is high for outpatient services, but there is a poor-rich gap for dental services. Analyzing out-of-pocket payments proportionate to household income, those in their 60s are found to spend the largest amounts and even in the lowest income quartiles, this figure is about 8% of income.

With the government discussing reform plans to increase the co-payment rate for the elderly, a precautionary assessment on how this affects their access and health care outcomes is necessary. In this respect, JSTAR could be a powerful contributor. For example, studying access to preventive services, such as annual checkups, one can see considerable variation depending on education and work status as well as across cities. Linked with claims data over time, expenditures for most illnesses have consistently stayed high in Japan. JSTAR additionally first introduced a food frequency questionnaire to study dietary patterns, which show, for example, that age, marital status and region make quite a difference on the intake of different types of food.

In conclusion, while the longevity trend has so far been good, there are problems in primary care, and lifestyle modification (quitting smoking and healthy diet) should be enhanced. In addition, panel comparisons with HRS and SHARE are important to find out what makes longevity in Japan so unique.

**Q&A** In response to a question on individual and provider effects, Dr. Weir explained that the extent to which individual providers vary even within regions in persistent ways is not captured in HRS since the focus has been on regional clusters of provider behavior. He also added that regional variations within the U.S. are very localized and may be widening.



Dr. Smith stated that the degree of inequality in the U.S. is not the driving force of the difference compared to the UK. He speculated that one possibility is that preventive treatment of childhood illnesses is better in the UK, calling for an analysis of the medical system as a whole.

On the issue of burdens of an aging population on society or on individuals, Dr. Smith drew the conclusion that the extended period of life was also one of extended quality of life, to which Dr. Weir agreed since most of the burden has so far been physical disability. Dr. Weir added that it would be important to continue watching if there is earlier onset of cognitive decline and measuring burden of care among generations and how this is managed between state and family. With regard to taking into account environmental exposures in regions, Dr. Weir believed that this would be of interest in the future.

### Session 3

## Work Participation of the Elderly as Suggested by Evidence from Panel Data

### "Mental Retirement: National-level policy variations and pooled cross-sectional data from HRS, ELSA, and SHARE to identify a causal effect of early retirement on cognition"

**Robert WILLIS**

Professor, University of Michigan

Despite popular belief that mental exercise can stave off cognitive decline, empirical evidence for this idea is weak since the causal direction is unclear. This study uses HRS, ELSA and SHARE to investigate the idea that people could avoid cognitive decline at older ages by being in a more mentally stimulating home or work environment. A previous study using these data found remarkably strong negative correlation across countries between cognitive ability and retirement illustrated plot of cognitive performance versus labor force participation. This study finds support for the hypothesis that this is a casual effect using country-level retirement policies as instrumental variables. The rationale for this approach is that most of the



cross-country variation in retirement has been shown to be a consequence of the incentive effects created by public pension, disability and tax policies, and it is unlikely that these policies have been set in response to observed age patterns of cognition in a country's population. Thus, policies provide valid instruments to remove reverse causation of cognition on retirement behavior in micro-data.

Based on such a research base, that retirement is influenced by policies, the Mental Retirement Hypothesis investigates the causal effect of retirement on cognitive status of older persons. This involves identification issues which could be misleading since retirement is a self-selected status and could lead to reverse causation. Theoretical cognitive psychology states that fluid intelligence, or the "thinking" part of ability, decreases with age, while crystallized intelligence, the "knowing" part of ability, increases. The Flynn Effect of large cohort growth in fluid abilities may be explained by aspects of human capital theory.

Thus, the two arguments to be made for the Mental Retirement Effect could be the Disengagement Lifestyle Hypothesis, i.e. increased stimulation in the workplace, or the On-the-Job Hypothesis, i.e. different incentives to invest human capital. Regressing labor force participation on cognition, the negative correlation can be illustrated clearly. From results of models using different variables, it can be concluded that early retirement has a significant negative impact on the cognitive ability of people in their early 60s which is both quantitatively important and causal. These findings are consistent with research showing that fluid intelligence is affected by human capital and show that not working at an older age reduces cognition. For Americans, there has been a reversal of the century-long trend toward early retirement, which could be good news for the cognitive capacity of the aging nation.

### "Retirement Process of Elderly People and Social Security in Japan"

**SHIMIZUTANI Satoshi**

Consulting Fellow, RIETI / Senior Research Fellow, Institute for International Policy Studies (IIPS)

As already stated, Japan is showing an unprecedented speed of population aging, longer life expectancies, later

retirement and higher labor force participation in old age. In addition to these macro observations, it is also necessary to consider micro observations, in particular on the issue of individual decision making in retirement focusing on policy/institutional effects. In such an analysis, diversity among people and incentive mechanisms need to be kept in mind. While the relationship between social security and labor supply has been intensively studied abroad, data had been scarce in Japan until the emergence of JSTAR.



In studying retirement, three features have to be considered: 1) retirement depends on definition; 2) it may be a gradual process; and 3) it may be a joint decision. JSTAR data illustrates that there is a jump in the 60s in the non-working status, with a higher female non-working population. Furthermore, while the retirement age is concentrated on age 60, the dominant expected age of retirement is at 65. The age at which people start receiving public pension benefit (National Pension Insurance (NPI) or Employees' Pension Insurance (EPI)) is also concentrated on ages 60 or 65. It should be noted that JSTAR is the only data source to examine a forward-looking claiming decision, which has important policy implications for designing public pension policies.



Preliminary analysis using JSTAR data shows that survival probability and liquidity constraint is significantly related to claiming behavior. There are also huge discrepancies between changes using cross-section or panel data. It is also possible

to track the transitions in employment status (employed to self-employed and full-time to part-time) and declining hours worked before retirement with the JSTAR data. Regression analyses reveal factors affecting probability of working for men and women, such as numbers of hours worked, spousal separation, and lifetime assets, and for men, cognitive decline.

In conclusion, JSTAR is a nice opportunity to explore the retirement "process" by longitudinal, interdisciplinary and international features. Further examination of the "process" by JSTAR is indispensable to policy evaluation and new scientific knowledge.

## "Were They Prepared for Retirement? Financial status at advanced ages in the HRS and AHEAD cohorts"

**David WISE**

John F. Stambaugh Professor of Political Economy, Harvard Kennedy School

The level of assets that households hold can be used as an ex post measure of retirement preparation (assets in the last year before death) as opposed to an ex ante measure (assets at the beginning of retirement). The study also emphasizes the importance of health and family pathways to end of life.



Balance sheets including the three asset categories of financial assets: home equity, social security, and defined benefit pensions, suggest that a lot of older single people are living essentially on annuities. Three different pathways to end of life were followed in the AHEAD survey: one-person households; persons who started out in 1993 in two-person households, but their spouse died in the last observed year; and persons in two-person households. In terms of evolution of assets, people who survived the longest after 1993 had the largest assets in all three family groups. Health status related highly to the drawdown of assets as well as mortality and future health events, among others.

The conclusions that can be drawn from looking at annuity income, non-annuity assets, and health before death are

that a large fraction of retirees rely almost entirely on Social Security benefits (annuity wealth) for support in retirement, with no financial or housing wealth (non-annuity wealth), and those with the least wealth are in the poorest health. Taking into account that 60% of respondents say that their retirement is "very satisfying," the proportion of those "very satisfied" increases considerably in the highest percentiles in terms of health and annuity and non-annuity wealth.

In sum, wealth at death is greatest for people who remain in two-person households the longest. There is a very strong correlation between the level of assets in 1993 and the number of years a person survives after 1993. Furthermore, there is a very strong relationship between health status and wealth at death. Finally, a large percentage of people die with annuity income only, with no financial assets, and with zero housing wealth. Thus, greater financial assets (and housing

wealth) would increase life satisfaction in retirement.

**Q&A** Responding to a question on the policy implication of his research, Professor Willis explained that the policy thrust to have people work longer, in addition to improving fiscal balance, would be to raise their life satisfaction by keeping their minds more active.

In response to a question on the effect of education on life satisfaction, Professor Wise stated that education is strongly related to health. He further explained that support from family was not included in the analysis, but that living arrangements in retirement would be an important consideration. On the similarity of the slopes of reduction of total wealth for all three family pathways, Professor Wise added that the decline is estimated based on the beginning of retirement and, controlling for health status, in the previous period.

## What is JSTAR?

### 1. What is JSTAR?

JSTAR (Japanese Study of Aging and Retirement) is a comprehensive survey of elderly people aged 50 or older started in 2007 by RIETI, Hitotsubashi University, and, more recently, the University of Tokyo. It is a panel survey, in which the same participants were asked to answer a different set of questionnaires at each visit.

The panel data include diversified information on the economic, social, and health aspects of elderly people. The questionnaires are designed to maximize comparability with surveys that have been conducted in advanced countries, including the Health and Retirement Study (HRS) in the U.S., the Survey of Health, Aging and Retirement in Europe (SHARE) in continental Europe, and the English Longitudinal Study of Aging (ELSA) in the UK. Therefore, by analyzing JSTAR data, researchers can track down the characteristics of the Japanese elderly population in terms of their specificity and universality in the world. In this sense, JSTAR is Japan's first-ever globally comparable panel data survey of elderly people.

### 2. Outline of the JSTAR survey and the questionnaire

#### 1) Outline of the first wave of the JSTAR survey:

"JSTAR First Results 2009 Report"

Visit <http://www.rieti.go.jp/en/publications/summary/09090002.html> to download the entire text, which includes detailed information on the sample design and the response rate.

#### 2) First wave codebook of the JSTAR survey

Visit [http://www.rieti.go.jp/en/projects/jstar/data/jstar\\_1st\\_codebook.pdf](http://www.rieti.go.jp/en/projects/jstar/data/jstar_1st_codebook.pdf) to download the entire text, which includes the questionnaire and major statistics.

### 3. Use of JSTAR datasets

The JSTAR survey was conducted for the purpose of contributing to academic research and policymaking. The resulting data are made available free of charge, but only to qualified researchers, higher education institutions, and administrative agencies that have agreed to follow the stringent conditions of use set by RIETI and only in the case that such data are used for academic and statistical research purposes (For detailed information about how to apply, please visit <http://www.rieti.go.jp/en/projects/jstar/index.html#caption03>).

# Scale Startups: Meeting the growth challenge in developed economies after the recession

June 2011

**Robert E. LITAN**

Vice President for Research and Policy, Ewing Marion Kauffman Foundation



## Profile

Robert E. LITAN is the Vice President for Research and Policy at the Ewing Marion Kauffman Foundation in Kansas City, where he oversees the Foundation's extensive program for funding data collection and research relating to entrepreneurship and economic growth. He also writes frequently with the Foundation's president, Carl Schramm. Their book, *Good Capitalism, Bad Capitalism, and the Economics of Growth and Prosperity*, co-authored with William Baumol, (Yale University Press, 2007) has been translated into ten languages and is used as a college text around the world.

**T**he 2008 economic crisis began in and struck developed economies most heavily, and virtually all of them (Australia and Canada being notable exceptions) are finding it very difficult to recover. Compounding the challenge is the wave of retirees, and the accompanying social security and medical obligations that governments have promised to pay them. As these "entitlement programs" are cut back, or taxes increased to finance them, in order to keep structural government deficits from exploding out of control, these measures will add a "fiscal drag" that will slow consumer spending and thus growth in all of the affected countries.

**U**nless it is reversed, slow growth could bring with it all sorts of maladies. Most important, slower output

growth will mean slower growth in hiring, which will keep unemployment rates abnormally high for years, if not decades. If workers in rich economies can't find jobs, some will migrate, if they can, to medium-income countries, while others will retire early or not even work at all, if they can sustain themselves on shrinking welfare state payments. The downsizing of expectations will be bitter pills to swallow for many, and could easily contribute to rising social frictions and political tensions.

**T**here is only one way, in principle, to avoid these bleak outcomes, and that is for rich countries to host or take advantage of new and continuous waves of innovation that make their citizens more productive and earn them greater incomes. Rising incomes, in turn, can fuel the growth in consumption and investment that are required to turn a potential vicious cycle of despair into a virtuous cycle of hope.

**P**olicy makers are too often immediately tempted to meet any innovation challenge by increasing government expenditures on basic research and development, in the hope

that the discovery of new ideas eventually will be translated into new products, services, or methods of production or service delivery. Even if it were the right answer, which it is not clear that it is, this apparently easy fix is no longer available to rich country economies mired in debt and seeking ways to cut rather than to add to government spending. A far more cost effective strategy is to keep open, and ideally remove, remaining barriers to trade and direct investment. Technological advances move most quickly from one country to another if they are carried by the movement of goods and services, and perhaps even more important, of patient capital across borders.

**Y**et even open borders do not guarantee that innovations developed elsewhere will be absorbed most effectively into the commercial activity of a given country. Some progress in this direction will be made, of course, simply by accepting and ideally giving national treatment, to foreign-owned firms that want to make investments in other countries. But the best way to make use of and even improve upon technological advances, developed at home or abroad, is to make it easy—and ideally to encourage—the formation of new companies that can grow or scale quickly.

**T**hat is certainly the U.S. experience. The truly disruptive technologies that have made modern life what it is today in the U.S. and elsewhere—the car, the airplane, air conditioning, virtually all aspects of computing, and many Internet businesses, including eBay, Google, and Facebook—were introduced to the market and successfully commercialized by entrepreneurs starting new firms rather than by established businesses. There are exceptions to this rule, mainly from Japanese companies, notably Toyota and Honda, which both introduced the hybrid car.

**N**onetheless, there is a reason that the exceptions prove the rule. Established companies have a vested interest in the status quo, especially if they helped create it and are profiting handsomely from it. Moreover, because of their bureaucratic structures with layers of managers in the decision chain, large firms typically cannot move nimbly to take advantage of new opportunities in the marketplace. In contrast, entrepreneurs don't care about the status quo and indeed exist precisely to disrupt it. And they don't have layers of management and can change directions quickly if

their initial ideas are not accepted by consumers. For all these reasons, we tend to see disruptive innovations emerging from newer firms while large firms, with their large R&D staffs and big budgets, concentrate on incremental innovations.

**A**lso in the U.S., until the Great Recession, various papers published or funded by the Kauffman Foundation have established that new firms have been the engines of job creation, accounting for virtually all net new jobs created in the U.S. economy since 1980. Recent research published by the RIETI has found new firms to be important sources of jobs in the Japanese economy as well.<sup>1)</sup> I have not seen similar analyses for other developed economies, but I know that in some of them (Israel and Taiwan, for example), entrepreneurship has been and continues to be an important source of economy-wide growth.

**I**f new, scale firms are vital to both innovation and job creation in developed economies—as I believe they are—then the key to a sustained recovery from the recession, as well as to faster growth thereafter must be the creation and growth of new, innovative firms. Truly innovative firms create wealth not only for their founder-owners, but for society as a whole. By one account, inventor-entrepreneurs only reap 1/25 of the social value of their innovations for themselves, the rest leaking out to benefit others who use their technologies to create other companies.<sup>2)</sup> Think, for example, of the economic ecosystems built around the automobile, or all of the application software tools built to work with the platform technologies of Microsoft's Windows or Apple's iPhone, and you get the idea.

**A**rmed with this analysis, I recently conducted a hypothetical calculation for the U.S., asking how many "scale firms," which I arbitrarily defined to be firms whose annual sales would eventually grow to \$1 billion or more, would the U.S. economy need to create *each year* to *permanently* raise the growth rate by one full percentage point? The answer is about 30-60, depending on certain assumptions that went into the calculation. This is a small number compared to the roughly 500,000 new firms that are created in the U.S. economy each year, but it is a large number compared to U.S. historical experience since the 1850s, which has seen only about 10-15 such "billion dollar firms" launched on average per year.<sup>3)</sup>



Fortunately, the task of incubating true "home run" firms is less daunting once one assumes that future growth also will be driven by smaller, but still successful firms. You don't need as many home runs to run up a high growth score if the economy can produce plenty of singles, doubles and triples.

Recent U.S. economic performance has been disappointing, however. Data reported by the Kauffman Foundation show that while the number of new firms being created each year has increased somewhat since the recession, the number of new firms *with employees* has dropped, and has been dropping for some time. I hope soon to document more about this disturbing trend in new research with my Kauffman colleague, E. J. Reedy. I have not seen data on employer-based new firms in Japan or Europe, but I would not be surprised if these countries follow the U.S. pattern.

How, then, can policymakers, who tend to be most comfortable dealing with the challenges of larger businesses, best foster the creation of new scale firms, or those most likely to hire other employees? I believe the quickest and least costly answer to this question—for all economies, including Japan—is to permit and ideally encourage the entry of all of the skilled immigrants who want to come, not just for temporary work (which is essentially the case in the U.S. now), but permanently.

In the U.S., an obvious place to start would be to give all of the roughly 65,000 foreign graduates of U.S. universities with degrees in science, technology, engineering or math ("STEM") a green card with their diplomas. The U.S. workforce not only would benefit from this human capital, but over time we would get the formation and growth of a lot more scale businesses, given the greater propensity of immigrants to establish such companies.

A fallback solution is to permit entry of just those immigrants who actually start businesses, with low thresholds for outside capital or initial revenue in the U.S., as legislation proposed by Senators John Kerry and Richard Lugar would do (although I do not believe we should keep the current cap on the total number of entrepreneur-immigrants). Giving new visas to immigrant entrepreneurs avoids the greatest political impediment to more immigration—the threat that immigrants will "take"

jobs away from Americans—because, by definition, the visa only would be made permanent if the immigrants actually hired other (non-family) workers. Despite this, the politics of immigration in the U.S. is so complicated and divisive that even this sensible idea so far has gotten nowhere.

Not in Chile. That country has seen the light by just launching a program that *pays* the 300 most enterprising entrepreneurs who apply each year the equivalent of \$40,000 to come to its country. Other developed economies, like the U.S. and *even Japan* might not even have to pay, if only they were more welcoming to such individuals.

Japan historically has not welcomed immigrants, despite its aging and shrinking work force. I can understand the hesitancy to change course given the close cultural and ethnic ties among Japanese people. But just as all countries have found that opening their borders to trade and capital improved their economies, they eventually will discover that in a global economy where companies increasingly are doing business globally and attracting and needing workers from many countries, it is good business to accept and ideally recruit individuals from other nations. Since immigrants to any country tend naturally to be risk-takers—it takes immense fortitude to pick up and leave your home country and move to another, after all—why not eagerly accept and seek out especially those individuals who want to start businesses?

It may be said that foreigners will find it difficult without already spending a lot of time in Japan to launch scale companies. While this is surely true, this too can change if Japan sought out more foreign students to attend their universities. There remains a fascination with Japan in the U.S. among students that Japan could tap into, especially if it made clear that university students who came to the country could stay if they launched businesses within a certain period of time. Such a policy would help make Japan a more attractive destination for younger people, and specifically would help it compete with China, one of the world's favorite destinations right now for people with entrepreneurial ambition, which still does not have the political freedoms found in developed country democracies.

Of course, there are more steps that Japan will need to consider if it wants to put itself back on a higher growth path, which this essay has argued will require a much larger rate of formation of scale companies. In particular, another significant barrier to entrepreneurship in Japan is that many larger companies provide housing or housing subsidies to their employees. While this fringe benefit is important and highly valued by Japanese workers in light of the high housing costs in the country, especially in or close to major cities, it also discourages those Japanese workers who are most likely to build new successful companies—individuals whose work experience has given them the insights into new markets and opportunities that all entrepreneurs require—to leave the comfort of their large companies to strike out on their own. I am hesitant as an outsider to know how best to change Japanese practices in this regard, but perhaps one place to start is with tax incentives or penalties for Japanese companies to abandon this practice and pay workers higher wages to compensate for the loss or cutback in employee housing benefits.

Another important impediment to entrepreneurship in Japan, as it is elsewhere, is the stigma or shame that individuals suffer if their businesses fail. The ability to fail without shame, and indeed even with honor, has contributed importantly to the success of entrepreneurs in California's famed Silicon Valley. Indeed, many venture capitalists and angel investors in the U.S. will not invest in a new company unless its founder already has failed before and thus learned what mistakes not to make in his or her next ventures.

Here, too, I am reluctant to offer concrete suggestions how to change Japanese attitudes toward business failure, which are clearly cultural and not easily altered through one or more policy changes. Perhaps one place to begin is in schools, even as early as elementary school, but certainly in universities, to teach students that some of the best learning comes through failure. Even the most successful Japanese companies (let alone many companies elsewhere) have had to learn, through a process of trial and error, before coming out with a solution that is widely accepted by consumers. This process of failing as a predicate for later success is something that should be acknowledged and welcomed by Japanese business and thought leaders.

Finally, while I earlier expressed some skepticism about the need, and certainly the affordability, of more government spending to promote innovation, there is more that governments in all countries can do to ensure that the R&D money they do spend is diffused more efficiently and quickly in usable form through successful commercialization. The U.S. government has channeled much of its R&D spending into universities, which have had some success in translating their discoveries into commercial products and services. But I believe the U.S. can do better. One place to start would be for the U.S. government to require that university recipients of government R&D funding give their faculty inventors the right at least to license their technologies without being forced to use the licensing services of their own universities. Introducing competition into the licensing of faculty innovations would only speed more of them to commercial success.

My understanding is that in Japan, much government R&D money is channeled to government labs and to industry directly, and compared to the U.S., much less to universities. I do not have sufficient knowledge of how this system might be reformed to generate more commercially successful products at a faster pace, but perhaps the government could experiment with ways of either giving the individual inventors some property rights in their inventions or some other monetary awards once those inventions are commercialized.

In summary, the developed world faces extraordinary challenges in the years ahead, not only mounting a recovery from the deepest recession of the post-war era but in finding ways to boost growth on a sustained basis without spending money that governments do not have. The futures of their citizens and of much of the world hang in the balance.

- 1) See FUKAO Kyoji and KWON Hyeog Ug, "Sources of Future Economic Growth in Japan: An empirical analysis based on micro-data," RIETI Discussion Paper Series, 11-J-045, English abstract available at: <http://www.rieti.go.jp/en/publications/summary/11040008.html>
- 2) William D. NORDHAUS, "Schumpeterian Profits and the Alchemist Fallacy," Yale Working Papers on Economic Applications and Policy, Discussion Paper No. 6, 2005, available at: <http://www.econ.yale.edu/ddp/ddp00/ddp0006.pdf>
- 3) Robert E. LITAN, "Inventive Billion Dollar Firms: A Faster Way To Grow," Kauffman Foundation, December, 2010, available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1721608](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1721608)

# Global Imbalances are Back!

July 2011

## Pier Carlo PADOAN

Deputy Secretary-General and Chief Economist, OECD



### Profile

Pier Carlo PADOAN took up his functions as Deputy Secretary-General of the OECD on June 1, 2007. As of December 1, 2009, he was also appointed Chief Economist while retaining his role as Deputy Secretary-General. In addition to heading the Economics Department, he is the G20 Finance Deputy for the OECD and also leads the Strategic Response, the Green Growth, and Innovation initiatives of the Organisation and helps build the necessary synergies between the Economics Department and that of other Directorates.

Prior to joining the OECD, he was a Professor of Economics at the University La Sapienza of Rome, a Director of the Fondazione Italianeuropei, a policy think-tank focusing on economic and social issues, and the Italian Executive Director at the IMF from 2001 to 2005. He served as an Economic Adviser to Italian Prime Ministers Massimo D'Alema and Giuliano Amato, in charge of international economic policies from 1998 to 2001.

He has a degree in Economics from the University of Rome and has held various academic positions in Italian and foreign universities. He has published widely in international academic journals and is the author and editor of several books.

**T**he debate about global imbalances usually refers to the large current account deficits and surpluses that co-exist around the globe. As such, they are not a new phenomenon. Already in the 1980s the United States was running a massive current account deficit, financed to a large extent by surpluses in Germany and Japan. This imbalance pointed to an overvalued U.S. dollar exchange rate—in part due to the mix of fiscal expansion and tight monetary policy of the Reagan administration—and was feeding into disquieting protectionist measures. This eventually led to a revival of international cooperation after it had fallen out of grace in the late 1970s, important manifestations being the Plaza (September 1985) and Louvre (February 1987) Accords to realign exchange rates through intervention in exchange markets and the coordination of monetary policies.

**T**he adjustment burden of global imbalances in those days initially tended to be borne by deficit countries alone. The view that surplus countries should adjust was heavily contested, typically by those countries identified as "best placed" to do so, notably West Germany and Japan. However, after monetary policy was eased in response to the 1987 stock market crash, a financial and real estate bubble began to develop in Japan, while a boom in real estate markets in Germany was prompted by positive money supply and confidence shocks associated with its reunification. Both popped in the early 1990s. Similar developments were seen in the Nordic countries, as well as in the United States, culminating in the Savings and Loans and LTCM crises.

**G**lobal imbalances largely disappeared from the radar screen in the 1990s, but this dramatically changed when emerging market economies entered

the picture. Since the mid-1990s the world economy has become increasingly integrated, owing to the removal of trade barriers, the liberalisation of capital flows, the spread of new technologies and—last but not least—the fall of the Iron Curtain. World trade soared and cross-border flows grew from around 5% of world GDP in the mid-1990s to about 20% in 2007—the year preceding the global financial and economic crisis. External assets and liabilities as a share of world GDP more than doubled over this period, from 150% to 350%.

**T**he case of China, now the second-largest economy in the world, deserves a separate mention. China's accession to the World Trade Organization (WTO) in 2001 represented a milestone in its engagement with the world economy. China has been running large current account surpluses while also attracting large inflows of foreign direct investment from the OECD area. Coupled with an exchange-rate policy of pegging the currency to the U.S. dollar and strict capital controls on capital outflows, this led to the build-up of over \$3 trillion worth of foreign exchange reserves—almost 50% of GDP and one third of the global total. The bulk of China's official reserves have been invested in U.S. Treasury bonds, allowing the United States to finance its large current account deficit at favourable terms and to keep its bond yields low.

**I**n addition, globalisation meant a massive increase in the global supply of low-skilled labour in the world economy, and this had substantial real-economy effects. Not only were emerging market economies now a major driver of global growth, they also kept inflation in the developed economies low via growth in cheap export products, economies of scale associated with integrated supply chains, and competition. Gradually this development was offset by the effect of buoyant demand on oil and commodity prices, but this was largely discounted as not being part of "core" inflation. In addition, in some OECD countries policy interest rates were systematically lower relative to the guidance offered by simple normative policy rules, such as the Taylor rule. In the context of malfunctioning and poorly supervised financial markets, this contributed to

excessive risk taking and leveraging and, ultimately, the financial crisis.

**T**he phenomenon of historically large current-account imbalances across the world is partly a reflection of high and rising commodity prices, in particular the oil price, leading to massive current account surpluses among the major oil exporters. But it can also be seen as a consequence of the globalisation of financial markets, with the home bias in financial investment largely removed. In principle, such a development is welcome to the extent it results in better international allocation of capital. This is based on the premise that normally capital "flows downhill," i.e. from high-income to low-income regions in the world where the marginal return on capital is highest. It would thus contribute to the convergence of per capita GDP across the world.

**H**owever, rather than flowing downhill, capital has been flowing uphill to a large extent, with emerging market economies massively investing in financial instruments issued by the advanced economies, notably the United States, attracted by its (supposedly) better quality of financial markets. Presently, downhill capital flows are gaining importance, as excess liquidity in the advanced economies is looking for yields in the emerging market economies. But paradoxically this may be too much of a good thing. Emerging market economies find it hard to absorb this capital properly. They face risks of Dutch disease (export squeeze due to appreciating real exchange rates), overheating, and instability.

**G**lobal imbalances eased in the aftermath of the crisis. Deleveraging prompted smaller current account deficits among many advanced economies. Policy stimulus to ward off recession along with a decline in primary commodity prices led to smaller current account surpluses among emerging market economies and commodity exporters, respectively. Even so, global imbalances are set to resurface. Commodity prices are recovering and emerging market economies are cutting back demand stimulus in the face of high inflation. The underlying propensity to save remains

high among many emerging market economies, and in some advanced surplus economies such as Germany and Japan as well, while growing public indebtedness is boosting the demand for capital among advanced deficit countries—including in parts of Europe.

**A** risk associated with continued global imbalances in current account positions is that their unwinding could be disorderly—perhaps even more so now in the aftermath of the crisis than prior to the crisis. If biased towards deficit countries, the adjustment would slow the global recovery at a still delicate time. Fiscal stress in advanced deficit countries could prompt exchange rate and interest rate volatility. Protectionism could roar its ugly head. To prevent such damaging scenarios, surplus countries should allow a gradual but sustained real exchange rate adjustment and deficit countries should restore private and public balance sheets. International coordination could help to speed up this process.

**T**he G-20 Framework for Strong, Sustainable and Balanced Growth has a useful role to play here, by seeking complementarities between macroeconomic and structural policies in the pursuit of global rebalancing. Possible avenues for structural policy contributions are: i) the development of welfare systems and financial systems in the emerging market economies to stem the need for precautionary savings and relax borrowing constraints, respectively; ii) pension reforms in advanced economies (increased retirement age to reduce savings propensities in surplus countries, lower replacement rates to increase saving propensities in deficit countries); iii) product market reforms to encourage domestic investment in advanced surplus countries; and iv) the removal of tax incentives for debt financing to encourage savings in advanced deficit countries.

**W**hile the crisis raged, the gross capital flows from and among advanced economies collapsed. Gross capital flows have shown an incipient rebound in 2010, but the bulk is now directed towards emerging market economies. Past experience has shown that such capital flows can be a source of instability if they suddenly

reverse. Banking crisis or currency crisis can easily ensue and cause longer term damage. This has been, by the way, the main motivation for many emerging market economies to "self-insure" against instability through the build-up of foreign exchange reserves. This, in turn, prevents exchange rate adjustment, complicates monetary policy, and is relatively costly.

**T**herefore, it would be much better to develop structural solutions to stem the risk of instability associated with capital inflows. Specific reform options are multiple. The advanced economies should continue to deal with systemic risk such as the adoption of Basel III and tighter capital requirements for global systemically important financial institutions. They should also design and implement cross-border banking resolution schemes and monitor shadow banking and non-banks. Emerging market economies should promote more market based financial systems and develop local financial markets and open their capital account. They should also increase the quality of product market regulation and adopt less stringent job protection while boosting the quality of human capital. This is expected to increase long-term capital flows to emerging market economies along with a shift from debt to more stable foreign direct investment.

**B**ut such structural policies—useful as they may be—are unlikely to stem or change the composition of the ongoing short-run capital flows to emerging market economies. Soaring short-run capital flows to emerging market economies can be explained by the easy monetary conditions in the advanced economies—indispensable in view of their current fragility. Liquidity is hunting for yield, and where else would they be expected to do so than in the emerging market economies, given their—equally indispensable—tighter monetary conditions.

**R**ecent work has suggested that apart from letting the exchange rate bear some of the brunt of the adjustment, macroeconomic policies constitute a first line of defence. Emerging market economies could pursue a counter-cyclical fiscal policy so as to take off some of the pressure. Macro-prudential measures



may be a second line of defence insofar as they may prevent capital inflows from generating a domestic credit bubble with associated financial fragilities. Only as a third line of defence should one consider capital controls. The acceptance of capital controls as the last line of defence comes, however, with certain risks. To be specific, capital controls are politically more convenient to use than the first lines of defence—they can in effect become a cover for inappropriate macroeconomic policies. Capital controls can also entail distortions. And capital controls keeping out capital flows in one country may spill over elsewhere.

To prevent such adverse effects of a proliferation of capital controls it might be good to have some international surveillance process that establishes procedures and creates transparency about countries' policies. The OECD has a set of Codes concerning capital account policies. While the end-goal is free capital movements, the codes allow countries to set reservations on specific items and also allow them to become more restrictive if needed. But they will have to come and explain to other countries what they are doing, and having such a transparent process may help to establish some discipline. The OECD Codes may be useful as a source of inspiration, but have in any case recently been opened to adherence by non-OECD countries.

More fundamentally, mechanisms need to be found to allow different policy settings to co-exist across the globe in a way that promotes economic stability and growth. This will require international co-operation, surveillance and communication in setting priorities and in minimising any potential adverse side-effects that can arise from the resulting geographical constellation of policies. One aspect of this is the international effort under way to strengthen prudential frameworks around the world. Beyond this, the role of the G20 Framework for Strong Sustainable and Balanced Growth is to identify a combination of macroeconomic, structural and exchange-rate policies that strengthens growth prospects and helps to achieve more sustainable fiscal positions, whilst minimising the risks of a renewed widening in global imbalances.

Co-operation is also necessary if the international monetary system is to be strengthened. Eventually, real exchange rates will move in line with policy differences as well as different growth rates, inflation, and fiscal positions. Specifically, over time it would be expected that emerging market economies would experience a real appreciation. If the nominal exchange rate is fixed, the required changes have to come through adjustments to wages and prices, which can be costly as it would risk de-anchoring inflation expectations. Persistent currency misalignments in the interim can generate unsustainable external imbalances. Hence reforms are needed to facilitate the movement of exchange rates in line with economic fundamentals so as to ensure that nominal exchange-rate adjustment acts as a safety valve. On the other hand, excessive exchange-rate volatility can also have its costs.

To sum up, global imbalances remain at the forefront of our preoccupations. There are essentially three major challenges: two structural, one cyclical. The first structural challenge is to increase the net savings of several major advanced economies and to reduce that of the surplus economies, including (but not exclusively) in emerging market economies. To achieve this, emerging market economies need to develop their social welfare systems and deepen their financial markets while incentives for leveraging in some major advanced economies should be eased.

The second structural challenge is to secure a stable gross flow of capital from advanced economies to emerging market economies. This remains essential for global convergence, though it must be financed to a greater extent by domestic savings in advanced economies now running current account deficits. This requires inter alia a further opening of capital accounts and better quality product market regulation in emerging market economies. The short-run challenge is that abundant liquidity in advanced economies is hunting for yield in emerging market economies, where it can generate Dutch disease, overheating, instability, and protectionism. This should be tackled by a combination of exchange rate adjustment, counter-cyclical fiscal policy, and micro- and macro-prudential tools. Capital controls should be seen as a last resort.

# International Trade and Investment Program

**WAKASUGI Ryuhei**

**Faculty Fellow / Program Director**

(Professor, Institute of Economic Research, Kyoto University)

**U**nder the third medium-term plan that started this fiscal year, the International Trade and Investment Program will continue the international economic research undertaken in the Formulating Japan's Strategy in Response to Globalization and Deepening Economic Interdependence in Asia Program during the second medium-term plan, and will further deepen policy research. In the program, researchers from the fields of economics, management, law, and political science will study international trade, direct investment, technological innovation, and economic growth, as well as trade policies and international economic rules related to these issues. The scope of the research is quite broad; in

particular, how the Japanese economy, which is recovering from the Great East Japan Earthquake, should cope with the international economy is an extremely important issue. The objectives of the four projects comprising this program are described below.

**T**he Study of the Creation of the Japanese Economy and Trade and Direct Investment project (project leaders: WAKASUGI Ryuhei, FF & PD and TODO Yasuyuki, FF) will further develop the research based on the results of the Study on International Trade and Firms project undertaken in the second medium-term plan period. Thus far, both theoretical and empirical analysis have been conducted and policy proposals made that incorporate firm heterogeneity, taking firms' internationalization (i.e., export and foreign direct investment (FDI)) as the key to Japan's economic growth. The project will be developed to cover the effects of exports and FDI by Japanese firms on employment, the impact of the protection of international property rights on corporate R&D and innovation, and the impact of internationalization of firms on international technology transfer. It will also take note of the developing Chinese market and will analyze the agglomeration and internationalization of firms (i.e., exports and FDI) and the growth of the Chinese economy. Of particular note is the fact that the Great East Japan Earthquake has caused a massive shock to Japan's society and economy. How to overcome this serious damage will be the key to future development of the Japanese economy. In this project, to



achieve the creation of a new Japanese economy after the damage from the Great East Japan Earthquake, research will be undertaken to examine the issues on the international transactions (trade and foreign investment) of firms, particularly the new production networks in global markets, industry agglomeration, and the response to the electric power supply restrictions. The project will be conducted by 10 researchers.

**T**he population decrease, low birthrate, and aging society are exacerbating the problems of domestic market contraction and labor force supply restrictions, and the growth of emerging economies is causing a relative sagging of the Japanese economy. Meanwhile, the future of the World Trade Organization (WTO) round of negotiations remains unclear while free trade agreement (FTA) networking is advancing. What trade policy should be adopted is becoming increasingly important for the Japanese economy. Regarding the choice of such an important trade policy, free trade is supported by many economists; however, it is a fact that there are many who have a sense of resistance to the realization of free trade. There is a possibility that individual characteristics that are not assumed by standard economic theories have an impact on the approval or disapproval of trade policies. The Empirical Analysis of Trade Policy Preferences at the Individual Level in Japan project (project leader: TOMIURA Eiichi, FF) will conduct surveys and empirical research based on such surveys regarding public support on the choice of trade policy and will provide foundational knowledge for forming Japan's trade policy.

**C**orporate production technology is directly connected to competitiveness, so firms are engaged daily in a competition for technology development and acquisition, and corporate activities aimed at improving productivity and technological capabilities are a source of economic growth. In the past, Japanese firms have enhanced their productivity and technological capabilities through globalization, particularly through exports and FDI. Recently, they have been making acquisitions with the aim of incorporating technology as well as technology transfer and outflow in connection with offshoring. The various issues regarding corporate technology are closely tied to the advancement of economic globalization. The Economic Analysis of Technology in the Global Economy project (project leader: ISHIKAWA Jota, FF) will theoretically and empirically analyze various technology-related issues including technology development, imitation, protection, transfer, diffusion, and standardization from an international economics perspective, and draw policy implications that will help make the improvements in productivity and technological capabilities that are vital for Japan to achieve global economic growth.

**I**nternational economic transactions are based on various treaties and agreements, and one cannot disregard the impact that the contents of such treaties and agreements have on the Japanese economy. The Comprehensive Research on WTO project (project leader: KAWASE Tsuyoshi, FF) will further develop the results of the second medium-term plan and analyze the WTO and other international trade orders for trade and investment from legal and political viewpoints and make policy proposals.

Research Projects under International Trade and Investment Program	Project Leader
Study of the Creation of the Japanese Economy and Trade and Direct Investment	WAKASUGI Ryuhei
Comprehensive Research on WTO	KAWASE Tsuyoshi
Empirical Analysis of Trade Policy Preferences at the Individual Level in Japan	TOMIURA Eiichi
Economic Analysis of Technology in the Global Economy	ISHIKAWA Jota

# International Macroeconomics Program

**ITO Takatoshi**

**Faculty Fellow / Program Director**

(Professor, Faculty of Economics and Graduate School of Public Policy, The University of Tokyo)

**A**mid rapidly advancing globalization, it is far from certain if the growth engine of the Japanese economy, its superiority in *monozukuri* (manufacturing) and exports, will remain as it did in the past. There is a need to consider how the growth in emerging markets can be internalized by the Japanese economy and what is needed for Japan, which is surrounded by the rapidly growing neighboring countries of Asia, to realize balanced sustainable growth. Now that Japan is faced with its biggest post-war challenge, the economic recovery from the Great East Japan Earthquake, the macroeconomic management of Japan is fraught with difficulty. In future macroeconomic policies, it is important to develop new systems by being conscious not only of domestic factors but also of international aspects.



This International Macroeconomics Program will advance research projects spanning fields such as macro finance, international trade and macroeconomics, international finance, corporate foreign exchange risk management, and corporate finance. The relationship among individual projects can be set out as seen in the chart below.

**F**irst of all, two research projects will focus on the domestic factors of the Japanese economy that are striving to recover from the earthquake disaster. In the 3) Research on Macroeconomic Policies Focused on Fiscal Reconstruction and Similar Measures project, the sustainability of Japan's public finances is deemed an essential condition for the steady advancement of economic recovery. Theoretical analysis will be conducted on the relationship between fiscal reconstruction and the financial system as the holder of government bonds. In the 4) Long-term Deflation in Japan: Its causes and policy implications project, instead of treating long-term deflation as a simple monetary phenomenon, it is treated as a phenomenon deeply related to the real aspects of the economy (i.e., long-term stagnation of the real economy). The objective will be to elucidate the correlation between abnormalities occurring in the real and monetary parts of the economy.

**O**n the international front, two research projects will specifically focus on the relationship between Japan and Asia, namely, the 1) Research on a Currency Basket project and the 2) Research on Exchange Rate Pass-through project.

The currency basket project will continue to propose the use of the Asian Monetary Unit (AMU), which has been made

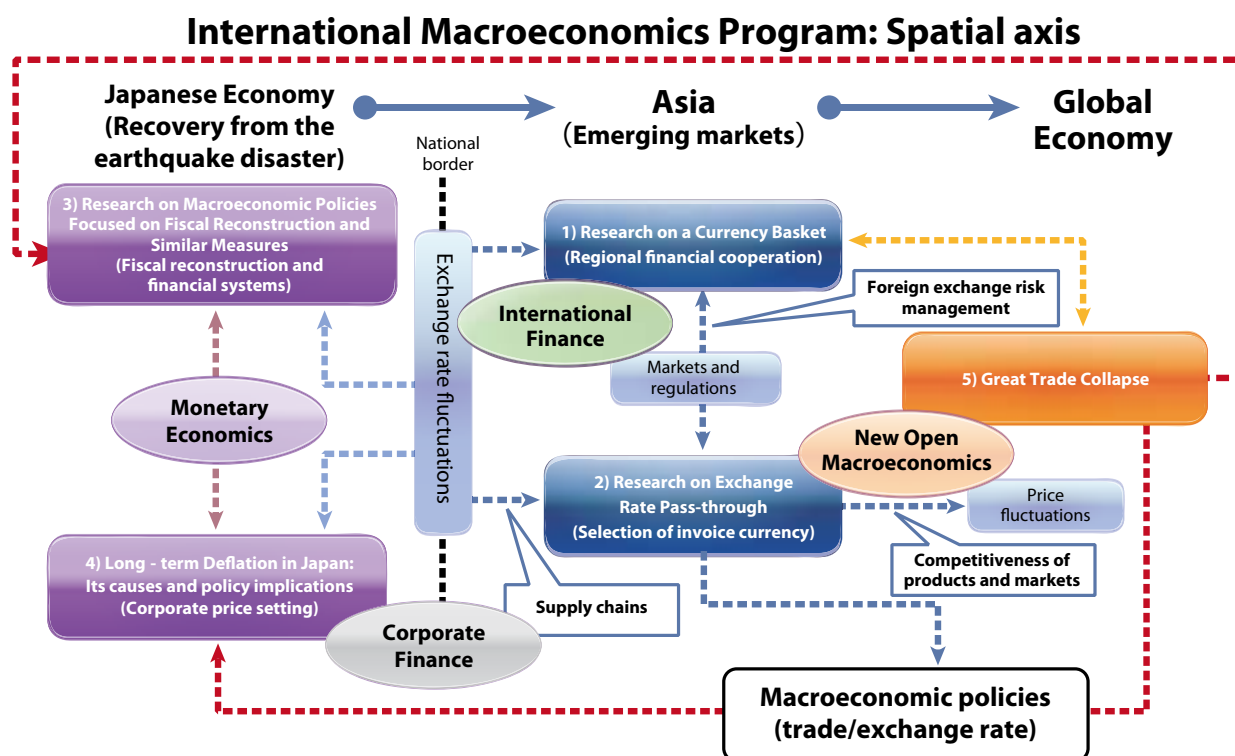
public on RIETI's website since 2005, and the AMU Deviation Indicator in order to stabilize exchange rates within the region. Additionally, research on a new international currency system and an appropriate new currency system in Asia will be undertaken. In the exchange rate pass-through project, various issues related to pass-through and a closely linked subject, trade invoice currency selection, will be analyzed from both macroeconomic and corporate-level perspectives. Factors such as pricing, foreign exchange risk management, production/sales networks, and corporate competitiveness will be the keywords in this research.

In the 5) Great Trade Collapse project, which will start after September, the macroeconomic effects of the drop in trade that the world economy experienced during the recessionary period of 2008-2009 (the "Great Trade Collapse") on the Japanese economy will be analyzed. Structural changes in supply chains will be one of the areas to be focused on.

As mentioned above, in this program, issues on international macroeconomics are analyzed by using various approaches. But, as shown in the chart, each project theme is closely related to the others. Research will be conducted along a spatial axis involving the Japanese, Asian, and world economies. As for the Japanese economy, studies will be performed on

macroeconomic policies to achieve fiscal reconstruction and breakaway from long-term deflation in view of their effects on foreign exchange rates. As for Asia, studies on institutional infrastructure such as the role of a common basket currency and analysis of various issues related to the exchange rate pass-through and invoice currency selection, with their effect on the supply chains of Japanese firms, will be undertaken. As for the world economy, new policies on trade and foreign exchange will be proposed in the 5) Great Trade Collapse project. Therefore, where necessary, collaboration between projects will become important. The program director will be responsible for monitoring the progress and performing this function. Collaboration with other RIETI programs will also be pursued to improve research results.

Japanese firms are pricing their products and services based on the trends in the foreign exchange rates and supply and demand in domestic and overseas markets. But their practices vary depending on the competitiveness of their products, the countries to which they export, and differences in their foreign exchange risk management. By adding the collection of such corporate-level micro-data and related analysis to the projects, the program will grasp the Japanese economy from a wide range of perspectives, thereby leading to research that directly contributes to macroeconomic policy.





# Regional Economies Program

**HAMAGUCHI Nobuaki**

**Faculty Fellow / Program Director**

(Professor, Research Institute for Economics and Business Administration, Kobe University)

In the past, Japan conducted a regional policy which promoted the shift of large companies' factories to rural areas while improving the infrastructure of specific regional locations. By decentralizing production, economies of scale were sacrificed. However, by spreading growing employment opportunities to these areas, the overcrowding of the urban areas and regional disparities was mitigated, and the sustained growth of the Japanese economy was supported. For the present Japanese economy, which is seeing a hollowing-out of industries under the strong yen, knowledge-intensive activities such as manufactured products involving advanced technology and services are thought to be growth industries. But industries that benefit from the spillover of knowledge are destined to agglomerate around large urban areas, posing a

dilemma to the concept of balanced regional development.

In the Regional Economies Program, we would like to present the perspective that planning for the balanced development of the regions will lead to maintaining the growth of the whole Japanese economy.

Each region has diverse resources that can be used for production. Highly mobile resources such as capital goods and knowledge-intensive workforces have a high tendency to concentrate geographically. On the other hand, the locations of general workforces are dispersed, and there are immobile resources such as land. There are also resources that have a high adherence to a region but disappear with the collapse of the regional community, such as jointly-owned knowledge in traditional industries. To develop knowledge-intensive industries in the large urban areas and redistribute their income to the regional areas are not the relevant issues here. Rather, it is that each region finds its own growth strategy, one that is consistent with the market mechanism and utilizes its distinctive features. Such strategy should make globalization and the economic integration of East Asia a precondition, and should strive to incorporate the dynamism of the growth of the outside world. In other words, the market is global even at the regional level, resources that are scarce should be brought in from outside, and, while achieving economies of scale, making utmost use of the resources that are abundant in the region.

As an illustration, the population of Finland, which is known for its success with the cluster policy, is a little over five million,



about half that of Japan's Tohoku region. However, its per capita income in nominal terms translated into U.S. dollars is about 1.5 times that of Japan. Accordingly, the size of the economy is not that important for maintaining a high standard of living. The Tohoku region exports only 2% of its total production and is highly dependent on domestic demand. In contrast, Finland exports more than 20% of its GDP, not counting exports to the EU market (which occupies a position similar to that of domestic demand for Tohoku). (Total exports, including those to the EU, are at 45% of GDP.) This shows that the country turns more of its attention to foreign markets than do the Japanese regions.

**I**t is probably unavoidable that the production activities of Japanese firms will move overseas due to globalization. Nevertheless, those that remain and expand in Japan and the resulting economic balance between domestic regions should differ depending on the strength of linkages among domestic regions and between each region and the world economy. This research program will address such understanding of the issues from the perspective of spatial economics, which expressly considers the movement of production factors. We will produce theoretical forecasts, empirically analyze statistical information, and meticulously gather and dissect qualitative information for that purpose.

For example, it has been recognized anew that the area spanning from Ibaraki prefecture to the Tohoku region, heavily affected by the Great East Japan Earthquake, is

home to firms that comprise links in the supply chains of the automobile and electronics industries and are producing parts for which substitutes are difficult to find. One of the factors that led to the development of such production capability at these locations was the existence at appropriate costs of 1) the quality of the technology required by firms that sell their products globally as well as 2) personnel and factory sites that make such large-scale production possible. If mass-production type of manufacturing can be firmly established in the regional areas in the future, it will provide the basis for the development of highly creative research and development activities in the large urban areas and will answer the need for balanced regional development. In this program, research on regional policy, urban policy, and appropriate regional administration will be further developed from such policy perspectives.

**H**owever, owing to an enhanced awareness of business continuity plans after the earthquake, the risk of geographic concentration of specific parts production has become more explicitly assessed. This has forced on us a new issue, namely, in order for Japan to maintain international competitiveness without being excluded, it is important for industrial agglomeration to seek economies of scale to balance the control of such risk. In this program, we will not only research the strengthening of links among regions and between a given region and the world but also the appropriate industrial location policies and regional policies to solidify the resilience of supply chains.

Research Projects under Regional Economies Program	Project Leader
Studies on the Structure of Japanese Economic Space and Japanese Supply Chains Sustaining Growth Under Globalization and Disaster Risks	HAMAGUCHI Nobuaki
Theory and Empirics of Urban Growth and Spatial Structure	TABUCHI Takatoshi
Formation of Economic Agglomerations and the Emergence of Order in their Spatial Patterns: Theory, evidence, and policy implications	MORI Tomoya
Research of a Mechanism for Regional Revitalization	NAKANISHI Hodaka
Development Policies for Robust Regional Economies, Learned from the Great East Japan Earthquake of 2011	OKUMURA Makoto
Sustainable Regional Development: New industrial clusters and division of functions	NAKAMURA Ryohei

# Technology and Innovation Program

**NAGAOKA Sadao**

**Faculty Fellow / Program Director**

(Professor, Institute of Innovation Research, Hitotsubashi University)

**T**he most fundamental solutions to the constraints on economic growth, such as the increasing scarcity of energy resources and global environment constraints, are the development of new technologies directly addressing these constraints and the innovations based on them. Furthermore, the development of new pharmaceuticals and diagnostic technologies is also the key for improving longevity and quality of life for humankind. The objectives of the Technology and Innovation program are to create an original database that is useful for identifying the process of the development of such new technologies as well as innovation, and to analyze

the direction of policies and institutional developments in order to accelerate them.

**T**here are three features of this program. The first is the development of an original database that can identify the process of technology development and of innovation. In cases of technology development, as an example, it is relatively easy to grasp statistically the gross expenditure for corporate research and development (R&D), but this only measures personnel expenses for researchers employed and other monetary expenditures such as purchasing research equipment. What is extremely important in technology development, however, is the knowledge itself, such as information from users and suppliers and the technology seeds obtained from scientific and technical literature and from university collaborations. The quality of the stock of such knowledge and the ability of a firm to absorb it as well as to integrate and combine acquired knowledge are what determine R&D performance. This program aims to develop, through a survey of inventors and other means, a micro database that is capable of systemically identifying the flow and the new combination of knowledge for innovation. The same applies to the process of development and dissemination of standards as well as to establishing business startups.



**S**econd, this program intends to conduct original analysis and make proposals on improving the institutions that support technology development and innovation, such as the systems for patents, standards setting, start-ups, R&D assistance, and industry-academia collaboration. Historically, the continuous development of new technologies as seen today started only after the onset of the Industrial Revolution. The fact that only industrialized nations are undertaking full-fledged R&D also suggests the importance of institutions in technology development and innovation. The patent system, for instance, serves diverse functions such as increasing appropriability for knowledge production, promoting commercialization investments that exploit inventions, providing a mechanism of reputation establishment for inventors and firms, and expanding the stock of public knowledge through disclosure. Most research in the past targeted the effects of the patent system on appropriability. In this program, we will extend research to other functions, particularly the expansion of the stock of public knowledge through disclosure. According to the results of the survey of inventors conducted by RIETI under the program director, the importance of the information disclosed through the patent system differs greatly by technology field. Our research will thus aim at identifying the causes of such differences and the issues faced in improving them, among others.

**T**he third feature of this program is the promotion of international collaboration in research on database development and analysis. When assessing Japanese innovation performance, the comparisons with the United States and Europe are crucial. In a project during the second medium-term plan in which the program director served as a leader, we undertook a large-scale survey of inventors in Japan and the United States, in collaboration with Professor John WALSH of the Georgia Institute of Technology. This was the first such survey in both countries, and we were able to provide interesting findings on the differences between the two countries in the invention and innovation process. Based on these experiences, in cooperation with Professor Dietmar HARHOFF of the University of Munich and Professor Alfonso GAMBARDELLA of Bocconi University, we have been conducting a new survey on inventors in Japan, Europe, and the United States. With regard to the analysis of entrepreneurial activities, we plan to clarify the characteristics of start-up activities in Japan, using the Global Entrepreneurship Monitoring Database, an international database on this subject. Furthermore, in the area of standard policy, we plan to proceed in collaboration with Professor Nancy GALLINI of the University of British Columbia and the other internationally renowned experts in the areas of theoretical analysis of standard and intellectual property.

Research Projects under Technology and Innovation Program	Project Leader
Research on Innovation Process and its Institutional Infrastructure based on Micro Data	NAGAOKA Sadao
Standard Policy for Innovation	AOKI Reiko
Empirical Study on the International Comparison of Open Innovation	MOTOHASHI Kazuyuki
International Comparison of Business Start-up Activities and Research of Entrepreneurial Activities Resulting in Job Growth	TAKAHASHI Noriyuki
Research on the Interactions Between the Business Strategies of Excellent Small and Medium Enterprises (SMEs) and their External Environment	INOUE Tatsuhiko

# Raising Industrial and Firm Productivity Program

**FUKAO Kyoji**

**Faculty Fellow / Program Director**

(Professor, Institute of Economic Research, Hitotsubashi University)

**F**or a country with a shrinking population like Japan to maintain its economic vitality and affluence, raising productivity is an urgent issue. The status quo based on international comparison by the UN and the OECD for 2009 has Japan in 19th place (71% of the value of the U.S.) among the 34 OECD countries in per capita GDP, when calculated using purchasing power parity, which reflects differences in price levels. Even if the market exchange rate is used, in which the yen has been very strong, Japanese per capita GDP still stands at 88% of that of the U.S. and 83% of that of the Netherlands. This indicates that by catching up on productivity, there is still ample room for increasing our income. In this program, industry- and firm-level productivity and their determinants



for Japan and various East Asian countries are measured, and analysis is performed on the kind of policies required to raise productivity. This program comprises seven projects as shown in the table below, and the character of the whole program can be summarized as follows:

**T**he first characteristic of the program is that it will construct and update industrial and regional databases, including the Japan Industrial Productivity (JIP) Database, and, in principle, make all data available to the general public as public property. These databases will be used as basic materials for analyzing the industrial structures, industrial productivity, and regional economic structures of Japan and East Asia. More specifically, in collaboration with Hitotsubashi University, the program will update and expand the JIP Database and concurrently construct the new China Industrial Productivity (CIP) Database. It will also build an industrial productivity database by prefecture for Japan and examine the impact of the recent earthquake on regional economies and subsequent reconstruction policies.

**T**he second characteristic is that the program recognizes and analyzes the productivity trends at macroeconomic and industrial levels as the aggregation of productivity trends of firms and plants that comprise the industry and the whole economy. By utilizing micro-data from government statistics and corporate financial data, this approach opens up a new research area on the determinants of productivity and will enable the provision of definite knowledge on policy



effects. In particular, Japanese and Chinese micro-data from government statistics and corporate financial data will be used to study issues such as the determinants of productivity differentials between firms, the effects of globalization and changes in demand on corporate performance, policies for raising productivity in the service sector, and the comparison of productivity dynamics from an international perspective, including productivity differentials between Japanese, Chinese, and Korean firms. A firm-level database that measures and internationally compares total factor productivity of all listed firms of Japan, China, and Korea is planned to be constructed and made public. Additionally, at the industry and firm levels, the program will measure investment in intangible assets such as research and development, software, in-house training, and organizational change—all of which are important sources of innovation and growing productivity—and will examine the economic effects of such investments.

**T**he third characteristic of this program is that it will cooperate with overseas research projects and a range of both domestic and overseas research institutions and statistics organizations. Such cooperation will help make it possible to compare productivity and its determinants in Japan with those in other countries. At the same time, it will contribute to improvements in government statistics, the statistics of international institutions, and to domestic and overseas research on productivity. More specifically, the global collaborations that are planned are as follows: First, by cooperating with the Asian Development Bank Institute

(ADBI), National University of Singapore, Harvard University, and University of Groningen, the program aims to push ahead with the construction of the Asia KLEMS Network, which measures the industrial structure and productivity of various Asian countries and compares them with other regions of the world. Second, the program will continue to provide data on Japan's industrial structure and productivity to the EU's World Input-Output Database (WIOD) project, World KLEMS project, the OECD, etc. Third, the program will cooperate with researchers of the Economic and Social Research Institute (ESRI) of the Cabinet Office of Japan on the construction of a productivity database directly linked with System of National Accounts (SNA) statistics and the development of methods for measuring the output of non-market services such as health care and education. Fourth, together with researchers of the National Institute of Science and Technology Policy (NISTEP) of the Ministry of Education, Culture, Sports, Science and Technology (MEXT), the program will conduct studies on the sources and effects of innovation. Finally, the program will conduct research in collaboration with researchers from the OECD, Imperial College London, Seoul National University, and other institutions on the international comparison on investment in intangible assets, and with researchers from Peking University, Sogang University, and other institutions on the international comparison of productivity levels of firms. Additionally, for the international comparison of productivity levels, we have won the cooperation of the International Comparison Program (ICP), led by the World Bank, for purchasing power parity data.

<b>Research Projects under Raising Industrial and Firm Productivity Program</b>	<b>Project Leader</b>
<b>East Asian Industrial Productivity Project</b>	<b>FUKAO Kyoji</b>
<b>Study on Intangible Assets in Japan</b>	<b>MIYAGAWA Tsutomu</b>
<b>Economic Impact of the Tohoku Earthquake: An analysis based on the Japan Regional Industrial Production Database</b>	<b>TOKUI Joji</b>
<b>East Asian Firm-level Productivity Project</b>	<b>ITO Keiko</b>
<b>Research on Measuring Productivity in the Service Industries and Identifying the Driving Factors for Productivity Growth</b>	<b>KWON Hyeog Ug</b>
<b>Determinants of the Productivity Gap among Firms in Japan</b>	<b>KIYOTA Kozo</b>
<b>Decomposition of Economic Fluctuations for Supply and Demand Shocks</b>	<b>KONISHI Yoko</b>

# New Industrial Policy Program

**OHASHI Hiroshi**

**Faculty Fellow / Program Director**

(Associate Professor, Graduate School of Economics, The University of Tokyo)

The Great East Japan Earthquake served as an opportunity to illuminate the problems that had long existed in Japan. The overvalued yen and the high effective corporate tax rate had been cited as factors putting Japanese companies at disadvantage in competing with their overseas rivals. Forthcoming changes in the nation's energy policy and other challenges brought on by the earthquake spell a harsher business environment going forward. Against this backdrop, concerns have been raised over the acceleration in the offshoring of operations from Japan to lower cost economies, particularly among manufacturers. As the Japanese economy undergoes structural changes, shifting weight from the

manufacturing sector to the service sector, it is necessary to create new industrial sectors to generate jobs.

Along with the need for a "new industry" policy, industrial policies attract intense attention worldwide given the economic crisis after the collapse of Lehman Brothers. With interests in such policy drawing attention—especially in competing with emerging nations such as China, Korea, and Brazil which appear to be growing rapidly under the leadership of their governments—we need to deepen our understanding about the new "industrial policy" by taking into account past criticism of industrial policies.

This program has the two aforementioned aspects as its background—the "new industry" policy and the new "industrial policy"—and it plans to conduct projects with diverse approaches (Please refer to the table below).

Through the economic crisis following the collapse of Lehman Brothers, the industrial policy that had not received much attention for over a decade is now again receiving increasing attention. Japan, too, needs to formulate and implement policies that aim to achieve sustainable economic growth by promptly shifting its allocation of resources from old industries to new ones, thereby improving the metabolism on the supply side leading to new goods and services.



**B**roadly speaking, the two major agenda for improving the metabolism of the Japanese economy are: 1) the creation and development of new industries and new companies; and 2) the turnaround and revitalization of existing companies. The recent economic crisis and the earthquake have made it clear that these agenda cannot be completely left to the market functions alone and need substantial policy intervention.

While empirical studies are demonstrating that the factors mentioned in Agenda 1)—creation and development of new industries and companies—drive economic growth and innovation, long-term efforts are required before these industries/companies can stand on their own feet. While expectations are high for innovation in the areas of energy and medical and elderly care, we would like to include in our analyses Japan's entrepreneurial activities, which have been lackluster by international comparison.

**K**nowing the time-consuming process of entrepreneurial endeavors and development of new industries, turnaround and reconstruction of existing companies and industries are more effective as approaches with more immediate payoffs. Through the earthquake disaster, the importance of using policy to prevent external diseconomies

arising from the disconnection of the supply network has been recognized anew. On the other hand, there is concern about an increasing sense of unfairness if the policy decision process regarding government support of particular companies lacks transparency. We plan to conduct research also from the perspective of competition policy that would minimize government failure by making assessments before and after the fact to prevent any distortion of the competitive environment of the domestic market through government support. Also, how to rebuild Japan's agricultural industry amidst the decreasing population and globalization is an important perspective in considering the direction to take on the Trans-Pacific Partnership (TPP) and is an important theme of this program.

**T**here are no versatile prescriptions for revitalizing economic activities. For both entrepreneurship and reconstruction of companies, subtle policies that take into consideration the market situation and the industry structure of each case are desirable. New perspectives that traditional research has not covered—how to provide government support while utilizing the discipline of market competition and how to assess such policies—are needed today. In this program, we will zero in on such new topics while collaborating with other programs.

Research Projects under New Industrial Policy Program	Project Leaders
Issues Faced by Japan's Economy and Economic Policy: Demand, productivity, and sustained growth	YOSHIKAWA Hiroshi, UNAYAMA Takashi
Basic Research for New Industrial Policy	OHASHI Hiroshi
Dynamics, Energy and Environment, and Growth of Small- and Medium-sized Enterprises	AOYAMA Hideaki
Agricultural Policy Reform Aimed at Competitive Agriculture in the Age of Globalization and Decreasing Population	YAMASHITA Kazuhito
Globalization, Innovation, and Competition Policy	KAWAHAMA Noboru, OHASHI Hiroshi
Economic Analysis of Environmental, Energy, and Resource Strategies Following the Great East Japan Earthquake	MANAGI Shunsuke

# Human Capital Program

**TSURU Kotaro**

Senior Fellow / Program Director

**H**aving reached the 10th year of its establishment, RIETI, in its third medium-term plan, has decided to newly create a program for each major research area. Under this plan, research on employment, labor, and education will be conducted in the Human Capital Program. As the program director, I will briefly explain the research themes and other matters of the Human Capital Program, focusing on matters in which I will be closely involved.

For RIETI to categorize themes including employment,



labor, and education as "human capital," there should be a significant reason. This is because—amid the rapid aging of its society, intensifying global competition, and recovery from the Great East Japan Earthquake—utilizing its human resources will be critical for Japan, a nation relatively lacking in natural resources, to maintain and strengthen its economic dynamism and increase its growth potential. In other words, even when conducting research on employment, labor, and education, how these factors can eventually be linked to the growth of the Japanese economy will be important.



*Non-regular Employment System Reform in Japan: Changing the way people work*  
Nippon Hyoronsha Co., Ltd.

**T**he Human Capital Program will be broadly structured around two perspectives. The first perspective is on the design of labor market institutions that increase worker incentives and ability. In its second medium-term research program, RIETI set up the Reform of Labor Market

Institutions project, in which diverse research activities were undertaken including a book published in June 2011, *Non-regular Employment System Reform in Japan: Changing the way people work* (written and edited by TSURU Kotaro, HIGUCHI Yoshio, and MIZUMACHI Yuichiro, Nippon Hyoronsha Co., Ltd., in Japanese). Related to this project, which will continue in the third medium term, a symposium will be held in December 2011 and focus particularly on wages and other employment conditions, factors that strongly affect worker performance. There are also plans to discuss the effects of the Great East Japan Earthquake and the appropriate employment and labor policies, both of which are themes of high urgency. Furthermore, we plan to focus on minimum wages and conduct research that will lead to the publishing of a comprehensive book on its effect on the labor market and appropriate policies.

**A**dditionally, recent empirical research in labor economics has shown the importance of constructing original panel data. RIETI has conducted a number of surveys in the labor/employment field in the past. In the third medium-term program, the objective will be to enhance these surveys and also to develop another one that will enable the construction of comprehensive panel data on both the supply and demand sides of labor (i.e., firms and employees).

The second perspective is on measures for strengthening human capital and human resources capabilities from a full life-cycle perspective. When we refer to human resources, importance is often attached to human

resources development in the employment age years such as vocational training and ability development. Recent studies, however, show the significance of early childhood education. There are also issues as to the appropriate form of higher education that effectively bridges to the working age. Additionally, as we are rapidly moving to a super aging society, there are roles the elderly are expected to play in matters such as passing on skills to the young and educating children. Discussions are underway to set up a new project to conduct multifaceted, comprehensive research on measures for strengthening human capital and human resources capabilities from a full life-cycle perspective.

**I**n conducting research for the Human Capital Program, we will aim to achieve synergy and coherence collectively by encouraging the different projects to share information and collaborate among each other.

#### Research Projects under Human Capital Program (Example)

##### Reform of Labor Market Institutions

- Minimum wage group
- Labor law study group
- Regular/non-regular employees panel data analysis group
- Firm/employee panel data analysis group

##### Human Capital/Human Resources Reform

##### Vibrant Japanese Economy and Society, etc.

##### Education Finances and Governance

##### Developing Human Resources/Management Strategy for Globalization



# Social Security, Taxation, and Public Finance Program

**FUKAO Mitsuhiro**

**Faculty Fellow / Program Director**

(Professor, Faculty of Business and Commerce, Keio University; Senior Research Fellow, Japan Center for Economic Research)

**T**he public debt-to-GDP ratio of Japan is at a very high level, rarely seen in other parts of the world, which is gradually increasing the risk of a rise in interest rates due to higher risk premiums demanded in the financial markets. The Great East Japan Earthquake and the serious accident at the Fukushima Daiichi Nuclear Power Plant are negative factors for Japan's already tough fiscal condition. The shrinking economy will decrease tax revenue, while the increased fiscal spending for the reconstruction of the social capital damaged by the earthquake and tsunami, the implementation of programs to support the disaster victims, and compensation for the losses associated with the radiation contamination, etc. will significantly increase the fiscal deficit. According

to the estimate announced by the Cabinet Office on March 23, 2011, total losses in social capital, housing, and private-sector companies' facilities from the earthquake disaster are expected to be between 16-25 trillion yen. Thus, a huge additional fiscal burden, as a result of increased spending and decreased tax revenue, is expected to be inevitable in the coming reconstruction period. Furthermore, in addition to the appreciation of the yen, the sovereign debt crises of Greece and others with the resulting significant rise in government bond interest rates in the eurozone will affect Japan in two ways. First, the European economy might enter into a serious recession with the worsening crisis, which would negatively and significantly affect Japan's exports, both directly and indirectly. Second, the sovereign crisis of the European nations with lower public debt-to-GDP ratios than Japan might make the market participants recognize anew the seriousness of Japan's fiscal problem, possibly triggering the rise in Japanese government bond interest rates.

Hence, Japan will also be required to increase government revenue through tax increases, etc. and to restrain government spending by reviewing the overall social security system. It is, however, facing a difficult issue in that if the fiscal tightening leads to a recession, it would make fiscal restoration itself difficult. Greece, in fact, is facing the dilemma that severe fiscal tightening and its unstable financial system have led to a significantly negative GDP growth rate, making fiscal restoration difficult. While it is very challenging to realize the three goals of resurgence from the earthquake disaster,



economic recovery, and fiscal restoration, this program will examine and consider policy to manage realization of fiscal restoration while minimizing its negative effects on economic recovery.

**T**he overall program will be designed around the following research projects:

- ❖ To map out fiscal crisis scenarios and their possible negative impacts that may occur in Japan by comparing Japan with nations that have faced fiscal crises;
- ❖ To estimate Japan's potential growth rate based on demographic estimates and expected capital stock and prepare a realistic forecast of government revenues;
- ❖ To analyze empirically the relationship between Japan's deflation rate and labor and capital utilization rates and clarify why deflation is continuing. Also to explain what would be the problems if deflation is left unsolved;
- ❖ To study and propose policy measures that would recover sustainable fiscal balance in the long term, while avoiding economic slowdown;
- ❖ To review the problems of the current taxation and social security systems and propose fundamental reform of these systems, going beyond the conventional tax reform to address both social insurance premium and social security entitlement issues.

**W**hile we will make specific policy proposals as we make progress in our research, feasible policy measures include the following:

- 1) Phased raising of the consumption tax, combined with the abolition of the flat-sum premium of the National Pension System and the decrease in the premium rates

of the Welfare Pension Insurance withheld at source from employment income; and

- 2) Phased introduction of a carbon tax combined with efficiency-focused investment subsidies for measures against global warming.

The above policy proposals assume a phased increase of indirect taxes which, by artificially raising prices, would encourage accelerated spending through inter-temporal consumption substitution. They also take into consideration the effect that the improvement in financial backing for social security will have on stimulating consumption, namely, by recovering people's trust in the public pension system. On the other hand, the abolishment of the highly regressive, flat-sum social security premium would offset the increased burden on low-income earners due to the consumption tax raise. Also, the decrease in the rates of pension and other social security insurance premiums withheld at the income source is expected to encourage employment of full-time workers by decreasing taxation associated with employment.

**I**n the project which I will be directly involved as a faculty fellow, we will estimate a macro production function in order to estimate the total factor productivity (TFP) growth rate. With this function, we can estimate the potential growth rate of Japan. By breaking down the growth rate into contributions from labor, capital, and TFP, we can better understand the causes that led to the long-term stagnation of the Japanese economy. We will also estimate the positive effects of increased employment brought about by a lower social security tax rate and increased investment resulting from investment subsidies generated by carbon-tax revenues.

#### Research Projects under Social Security, Taxation, and Public Finance Program

#### Project Leader

<b>Policy Mix for Fiscal Consolidation Without Harming Japan's Economic Recovery</b>	<b>FUKAO Mitsuhiro</b>
<b>Toward a Comprehensive Resolution of the Social Security Problem: A new economics of aging</b>	<b>ICHIMURA Hidehiko</b>
<b>Evaluation of Corporate Tax</b>	<b>NIREI Makoto</b>

# Policy History and Policy Assessment Program

**TAKEDA Haruhito**

**Faculty Fellow / Program Director**

(Professor, Faculty of Economics and Graduate School of Economics, The University of Tokyo)

**T**his research program aims to study the history of trade and industrial policy and the methodology policy assessment that we expect can be derived from the process by summarizing the research on trade and industry policy history (1980-2000) conducted during the second medium-term plan period which ended in fiscal 2010.

**I**n the second medium-term plan of RIETI (fiscal 2006-2010), surveys and research were conducted on major policies implemented during the final two decades of the



20th century—the subject period of that research—in the following 11 domains, in line with the organizational structure of the then Ministry of International Trade and Industry (MITI), namely: international trade policy; industrial policy; commerce and distribution policy; industrial location, environment and security policy; basic industries policy; machinery and information industries policy; consumer goods industries policy; industrial technology policy; natural resources and energy policy; intellectual properties policy; and small and medium enterprises policy. For these policies, the process of such policy formulation, the industrial and economic conditions that made such policy formulation necessary, the process of policy implementation, the state of realization of the intents of policy, and industrial and economic conditions following policy implementation were examined. The research results do not only record historical facts but also include the assessment of policies to the extent possible, and are now being published as they are completed.

**L**ooking back after going through such activities, we strongly recognize that the final two decades of the 20th century were not only a period of significant changes in Japan's economy and society but also a time of very major real and organizational changes in trade and industry policy. This

research will attempt to make clear how changes in trade and industrial policy at the turn of the century were brought about, based on activities including assessment of the recognition of policy issues over the preceding quarter-century, choice of policy means in response, and their results. Examining this major transition period, first of all, we wish to clarify generally the historical significance of the large shifts in the trade and industry policy in the 1990s as one of the consequences of the four major changes that occurred in the last quarter-century, namely: changes in domestic macroeconomic conditions, economic globalization on a worldwide scale, new emphasis on deregulations and fiscal reconstruction, and increasing international awareness for environmental preservation. Secondly, in exploring policy areas, we will examine continuities and discontinuities between the period before and after 2000, and make efforts to link past research results to the history of economic and industry policy. In compiling the trade and industry policy history in the second medium-term plan, we also faced unique difficulties in clearly understanding and assessing the policy formulation process, the effects of the implemented policy intents, etc., and often could not produce sufficient descriptions, contrary to our original intentions.

**A**lthough these are times that require everything to be assessed, it is not easy to determine the causal association between policies and results. There may be cases where judgment on such association might be needed and cases where arguments as to whether specific policies achieved their set goals on its own could be made. On the other hand, however, there may be cases where policy involvement leads to the identification of new issues that require measures in response. This case of policy involvement

leading to the identification of new issues could be assessed as a creative innovation related to policy formation. In this sense, diverse assessment criteria need to be made available for the assessment process.

**U**nique difficulties include a "specific culture" of MITI and its successor, the Ministry of Economy, Trade and Industry where their archives are insufficiently developed. With the development of a legal framework for public documents, this situation might improve in the future. Improvement of such foundation of materials is regarded to be of primary importance. When we consider the fact that the research results of *Tsusho Sangyo Seisakushi Kenkyu* (Studies of the History of International Trade and Industrial Policy)—one of the projects completed by the Research Institute of International Trade and Industry in the mid-1990s—were highly useful as secondary source materials (created with the help of MITI using the most recent materials at that time) in compiling the policy history in the second medium-term plan, we believe it is also necessary to prompt the development of archives through specific research activities on important policy issues.





<http://www.rieti.go.jp/en/>

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