

**International Conference on Economic Structures 2022**

# **ICES 2022**

**PAPAIOS**



**Pan Pacific Association of Input-Output Studies  
(PAPAIOS)**



**19-20 March 2022**

**Hotel Plumm Yokohama**

(Address: 2-9-1 Kita-saiwai, Nishi-ku, Yokohama, Kanagawa, 220-0004, JAPAN)

The 6th International Conference on Economic Structures at Hotel Plumm Yokohama

**19 March, 2022**

	Venue A (Etincelle)	Venue B (Verre)	Venue C (Reine)
9:30-9:50	Opening Session		
10:00-12:00	Regional IO Analysis	Other Topics	Macroeconomic Modeling and CGE
13:00-13:40	Special Lecture		
14:00-16:40	Regional IO Analysis and Other Topics (14:00-16:00)	Environment, Resource and Energy	Int'l Economy and Int'l Development and Productivity

**20 March, 2022**

	Venue A (Etincelle)	Venue B (Verre)	Venue C (Reine)
10:00-12:00	Regional IO Analysis	Int'l Economy and Int'l Development	Theory of IO Techniques
13:00-14:20	Regional IO Analysis	Environment, Resource and Energy	
14:20-15:40	Int'l Economy and Int'l Development	Environment, Resource and Energy	

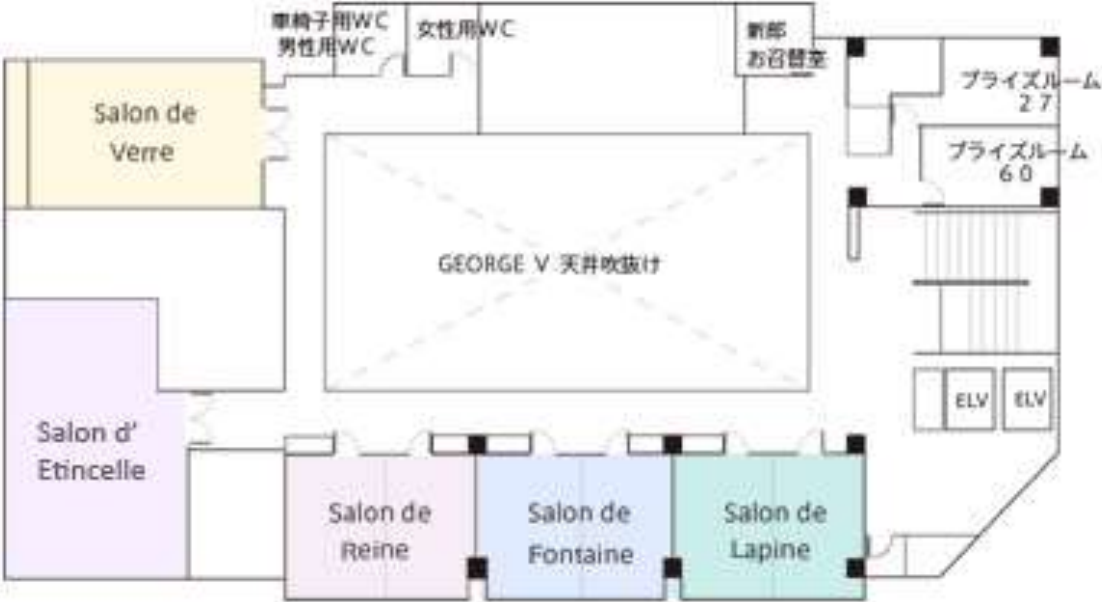


Supported by Yokohama Convention & Visitors Bureau.

Also supported by YOKOHAMA National University.

# Floor Map

Hotel Plumn 4th Floor



## Day 1 Events

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**Saturday, 19 March 9:30-9:50**

**Venue A  
(Etincelle)**

### Opening Session

Chair:	Mikio Suga	( Hosei University )
Speaker	Takashi Yagi (President of PAPAIOS)	( Meiji University )
Speaker	Yuichi Hasebe  (Head of ICES 2022 Local Committee)	Yokohama ( National University )

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**Saturday, 19 March 10:00-12:00**

**Venue A  
(Etincelle)**

### Regional Input-Output Analysis

Chair:	Nobuhiro Okamoto	( Daito Bunka University )
Title	Household Carbon Inequality in Vietnam: An Input-Output Analysis	
Author	Duy Dang	( Graduate School of Economics, Waseda University )
Co-author1	Yasushi Kondo	( Waseda University )
Title	Greenhouse gas emissions and value added in Kenyan industry induced by foreign final demand: An input-output approach	
Author	Benson Senelwa Igesa	( Waseda university )
Co-author1	Yasushi Kondo	( Waseda University )

## Day 1 Events

Title	Myanmar's Economic Structure during the Transition Period		*
Author	Ei Ei Thein	( Graduate School, Ritsumeikan University )	
Co-author1	Kazuo Inaba	( Ritsumeikan University )	

**Saturday, 19 March 10:00-12:00**

**Venue B  
(Verre)**

### Other Topics

Chair:	Mikio Suga	( Hosei University )	
Title	A Consideration on Analyzing the Economic Damage of Cyber Attacks Based on the Input-Output Model		*
Author	Akiyoshi Kokaji	( Institute of Information Security )	
Co-author1	Atsuhiko Goto	( Institute of Information security )	
Title	International Financial Input-output Tables for Trans-Pacific Area as well as Japan, US and Euro-area		*
Author	Jiyoung Kim	( Okayama University Statistics Bureau, Ministry of Internal Affairs and Communications )	
Co-author1	Satoru Hagino		

## Day 1 Events

Title	Distributional Structure of Japanese Economy: A Multiplier Analysis Using Social Accounting Matrix	
Author	Tsutomu Yoshioka	Former visiting scholar at ( SOAS, University of London )

**Saturday, 19 March 10:00-12:00**

**Venue C  
(Reine)**

### Macroeconomic Modeling and CGE

Chair:	Takashi Yagi	( Meiji University )
Title	Effects of Public Spending on the Agricultural Sector of Burkina Faso	*
Author	Christian Otchia	( Nagoya University )
Title	A Study on the Structure of International Financial Markets-From the perspective of the International Portfolio Investment Network	
Author	Katsushi Tabata	( Aichi University )
Co-author1	Tatsuya Torikoshi	( Kurume university )
Title	Developing Long-Term Baselines for a Global CGE Model with 47 Prefectures in Japan	
Author	Ken Itakura	( Nagoya City University )

## Day 1 Events

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Saturday, 19 March 13:00-13:40

Venue A  
(Etincelle)

### Special Lecture

Chair:	Yoshifumi Ishikawa	( Nanzan University )
Title	Economic spillover effect due to changes in household consumption expenditure during the declaration of a state of emergency	
Author	Mikio Suga	( Hosei University )

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Saturday, 19 March 14:00-16:00

Venue A  
(Etincelle)

### Regional Input-Output Analysis and Other Topics

Chair:	Yoshifumi Ishikawa	( Nanzan University )
Title	Carbon footprints of household consumption under the background of low marriage rate in 47 prefectures of Japan by income level	
Author	Yuzhuo Huang	( Graduate School, Nagasaki University )
Co-author1	Kenichi Matsumoto	( Toyo University )
Co-author2	Yosuke Shigetomi	( Nagasaki University )
Title	Disparities and Determinants of Reproductive Health Services: Evidence from the Districts (118) of Pakistan	
Author	Aiza Sarwar	( Nagoya University )

## Day 1 Events

Title	Identification of leading industries in the growth of Bangladesh & other South Asian LIDCs: A novel Structural Decomposition approach using Input-Output tables.	
Author	Muhammad Tashfiq Huq	( Hiroshima University )
Co-author1	Masaru Ichihashi	( Hiroshima University )

**Saturday, 19 March 14:00-16:40**

**Venue B  
(Verre)**

### Environment, Resource and Energy

Chair:	Kiyoshi Fujikawa	( Aichi Gakuin University )
Title	Carbon footprint of cities based on micro-consumption data	
Author	Keiichiro Kanemoto	( Research Institute for Humanity and Nature )
Co-author1	Jemyung Lee	( Research Institute for Humanity and Nature )
Co-author2	Shigetomi Yosuke	( Nagasaki University )
Title	Input-Output Analysis Extended in Virtual Power Plant Business	
Author	Yiyi Ju	( Waseda University )
Co-author1	Ayu Washizu	( Waseda University )
Co-author2	Akira Yoshida	( Waseda University )
Title	Trade impact on sustainable decarbonization: the global value chain analysis of Asian developing economies	



## Day 1 Events

Author	Shuning Chen	( Kyushu University )
Co-author1	Masaru Kagatsume	( Kyoto University )
Title	Integrated Assessment of Environmental, Economic, and Social Impacts of Waste Plastic Recycling in Japan	
Author	Baixin Li	( Waseda University )
Co-author1	Yasushi Kondo	( Waseda University )

**Saturday, 19 March 14:00-16:40**

**Venue C  
(Reine)**

### **International Economy and International Development and Productivity**

Chair:	Nobuki Sugita	( Ritsumeikan University )
Title	Investment and Saving Behavior of the Migrant Household across the Distribution of Migration Duration	
Author	Md. Azad Uddin	( Graduate School, Hiroshima University )
Co-author1	Masaru Ichihashi	( Hiroshima University )
Title	Data disclosure as source of financial development in the long-run: Evidence from a panel of countries	
Author	Reynaldo Senra	( )
Title	Comparative advantage development strategy and labour productivity growth: Evidence from the Sub-Sahara African sector level	*

# Day 1 Events

Author Kouakou Jean Fidele SIE ( Nagoya University )

Title Technology Transfer and Productivity:  
Propensity Score Matching Analyses of Firms in Thailand \*

Author Utumporn Jitsutthiphakorn ( Bank of Thailand )



## Day2 Events

Sunday, 20 March 10:00-12:00		Venue A (Etincelle)
<b>Regional Input-Output Analysis</b>		
Chair:	Mitsuo Yamada	( Chukyo University )
Title	The Damage and Reconstruction of The Kumamoto Earthquake	*
Author	Kenta Takeda	The General Incorporated Association Institute for Policy and Sciences
Co-author1	Kazuo Inaba	( Ritsumeikan University )
Title	Effect of future consumption changes on the municipal economy in a depopulating society	*
Author	Mitsuo Yamada	( Chukyo University )
Title	Analysis of inter-regional industrial relations of major industries in Sejong City	*
Author	Seongha Lee	( Yokohama National University )
Co-author1	Taku Ishiro	( Yokohama National University )

Sunday, 20 March 10:00-12:00		Venue B (Verre)
<b>International Economy and International Development</b>		
Chair:	Masaaki Kuboniwa	( Hitotsubashi University )
Title	FDI and Economic Growth in Indonesia: A Provincial and Sectoral Analysis	*
Author	Al Muizzuddin Fazaalloh	( Graduate School, Nagoya University )

## Day2 Events

Title	A Comparative Analysis of Domestic and Foreign Value-Added with special reference to the case across the EU and Russia	
Author	Masaaki Kuboniwa	( Hitotsubashi University )
Title	Remittances and Formal Entrepreneurship Development: The Role of Local Financial Development	*
Author	Usman Alhassan	( Ritsumeikan University )
Co-author1	Jean-Claude Maswana	( Ritsumeikan University )
Co-author2	Kazuo Inaba	( Ritsumeikan University )

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**Sunday, 20 March 10:00-12:00**

**Venue C (Reine)**

### Theory of Input-Output Techniques

Chair:	Yasushi Kondo	( Waseda University )
Title	The Compilation and Analysis of the 2015 Input-output Table of Kyoto Prefecture for the Cultural Industry	
Author	Heming Zhang	( Graduate School, Yokohama National University, )
Co-author1	Taku Ishiro	( Yokohama National University )
Title	Improving the Uncertainty Analysis of Input-output Models by Considering the Correlation between Input Coefficients	
Author	Jian Jin	( Graduate School, Waseda University )
Co-author1	Yasushi Kondo	( Waseda University )

## Day2 Events

Title	Update of OECD TiVA Indicators and Usefulness of Extended Input-output Table incorporating firm heterogeneity	
Author	Satoru Hagino	( Statistics Bureau, Ministry of Internal Affairs and Communications )

**Sunday, 20 March 13:00-14:20**

**Venue A  
(Etincelle)**

### Regional Input-Output Analysis

Chair:	Mitsuo Yamada	( Chukyo University )
Title	The Creation of the Marine-Industry-detailed Input-Output Table: Shimizu-Ward, Shizuoka-Prefecture, Japan as case study.	
Author	Hajime Tanaka	( The University of Tokyo )
Co-author1	Shunsaku Konishi	( Promotion and Research Institute for Ocean Economics )
Title	Interregional Network Linkage Effects by the Liberalization of Agricultural and Food Product Import in Japan	*
Author	Kiyotaka Ishikawa	( The University of Tokyo )

**Sunday, 20 March 13:00-14:20**

**Venue B (Verre)**

### Environment, Resource and Energy

Chair:	Makiko Tsukui	( Tokyo International University )
Title	Material Footprint of Sector Groups based on Input-Output Analysis	
Author	Yasushi Kondo	( Waseda University )
Co-author1	Xu Han	( Waseda University )

## Day2 Events

Title Measuring the waste footprint of Chinese trading partners: a multi-regional waste input-output approach

Author Makiko Tsukui (Tokyo International University)

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**Sunday, 20 March 14:20-15:40**

**Venue A  
(Etincelle)**

### **International Economy and International Development**

Chair: Taku Ishiro (Yokohama National University)

Title Does learning by banking, fintech penetration, and financial inclusion explain financial development in emerging and developing economies? A cross country analysis \*

Author Joseph Aduba (Ritsumeikan University)

Title A Dynamic Theory of the Feldstein-Horioka Puzzle and Financial Frictions

Author Harutaka Takahashi (Graduate School, Kobe University)

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**Sunday, 20 March 14:20-15:40**

**Venue B (Verre)**

### **Environment, Resource and Energy**

Chair: Keiji Ujikawa (Yokohama National University)

Title Detecting air pollution clusters in Japan: A spatial analysis approach

Author Alvaro Dominguez (Asian Growth Research Institute)

Title Learning Curve on Solar PV: Policy Implications in Different Regions and Country Classes

Author Saiful Arefeen (Ritsumeikan University)

## Day2 Events

Co-  
author1 Koji Shimada

( Ritsumeikan  
University )

## **Abstract**

### **Abstract**

**Saturday, 19 March 10:00-12:00 (Venue A (Etincelle))**

**Regional Input-Output Analysis**

Chair: Nobuhiro Okamoto (Daito Bunka University)

**Duy Dang (Graduate School, Waseda University), Yasushi Kondo (Waseda University)**

#### **Household Carbon Inequality in Vietnam: An Input-Output Analysis**

Household consumption plays a significant role in the national carbon emission. Understanding carbon footprint (CF) distribution among household groups is vital in designing effective policies that tackle climate change. Although small developing economies, such as Vietnam are contributing more and more to global carbon emissions, very few studies on household CF are available for such countries. To the best of our knowledge, this is the first attempt to track down the CF of household groups at different income levels, locations and types (agricultural and non-agricultural) in Vietnam. We aim to answer the question of how much CF differs between household groups, and what factors can explain these differences. Applying an input-output model to the 2012 Vietnamese national input-output table (VN NIOT), we found a very high inequality in carbon distribution among household groups, with a more severe situation in urban areas than in rural areas. The richest 20% of the urban population generated as much carbon emissions as the remaining 80%. Further investigation, using Structural Decomposition Analysis, showed that the difference in CF among Vietnam's household groups was mainly due to the difference in consumption volume. Household size and consumption patterns had a relatively small impact on household CF. This study also proposes an approach that combine information from VN NIOT with information from EXIOBASE. This approach can take advantage of the most recent information from VN NIOT, and accounts for the carbon emission embodied in imported products, without building a new Multi-Regional Input-Output table (MRIOT).

**Benson Senelwa Igesa (Waseda university ), Yasushi Kondo (Waseda University )**

#### **Greenhouse gas emissions and value added in Kenyan industry induced by foreign final demand: An input-output approach**

Global multiregional input-output (MRIO) models have been ubiquitously applied to quantitatively analyze the relationships between consuming and producing countries. A typical such relationship is where developed countries' consumption causes environmental



## **Abstract**

burdens such as greenhouse gas (GHG) emissions and resource extraction in developing countries. Using the 2015 full Eora MRIO table, this paper assesses how GHG emissions and value added (VA) in the Kenyan industrial sector are induced by other countries' demands. The results show that over 80% of Kenyan total GHGs emissions and VA are induced by domestic final demand. The "Transport" and "Building and Construction" industries are the biggest contributors to GHG emissions in Kenya, whereas the highest VA-contributing industries are "Other services" and "Health". The top developed countries contributing to agriculture-related emissions and VA include the US, UK, and Germany. These three countries account for over 20% of GHG emissions and VA in Kenyan agriculture; the most affected industries include "Cut flowers" and "Vegetables" for the UK and Germany and the "Tea" industry for the US. Contrastingly, developing countries impact the secondary industries, especially "Metals and Machinery" and "Non-metallic manufacture" as well as tertiary industries including "Trade". The East Africa region, mainly Uganda and Tanzania, dominates GHG emissions at 25% and make a 20% VA contribution to Kenyan industries. High-income countries and the East African countries primarily drive Kenyan primary and secondary industries. Overall, the countries mentioned are substantially and comparably responsible for GHG emission and VA in Kenya.

**Ei Ei Thein (Graduate School, Ritsumeikan University), Kazuo Inaba (Ritsumeikan University)**

### **Myanmar's Economic Structure during the Transition Period**

After starting the political and economic reform in 2011, Myanmar's economy turned to a developing status with over 7% sustainable GDP growth per year. The main objective of this study is to examine the basic economic structure of Myanmar in comparison to other ASEAN countries, and sectoral expansion during the economic reformation in Myanmar between 2010 and 2015. The data for the analyses are taken from the EORA global database and Asian Development Bank's database. The shares of imports and exports in gross production of Myanmar are very low (around 1% export and 4% import). Production expansion highly relies on the domestic market. Petroleum, chemical and non-metallic mineral products show high forward linkages. On the other hand, the backward linkages are high in transport equipment sector. Gross production expansion of Myanmar was 1.78 times, the highest growth record among the selected countries during 2010-2015. Analysis of sectoral deviations from proportional growth (DPGs) shows that public administration and construction mainly contribute to the production growth of Myanmar. Consumption, investment, imports and exports had a positive effect while technology change has a negative effect on the production growth. Investment has a major contributor to the economic growth of Myanmar. Despite high economic growth, the Myanmar's economic structure does

## Abstract

not show remarkable change within five years. Keywords: Economic structure, Sectoral expansion, Forward linkages, Backward linkages, Deviations from proportional growth

**Saturday, 19 March 10:00-12:00 (Venue B (Verre))**

### Other Topics

Chair: Mikio Suga (Hosei University)

**Akiyoshi Kokaji (Institute of Information Security), Atsuhiko Goto (Insutitute of Information security)**

### **A Consideration on Analyzing the Economic Damage of Cyber Attacks Based on the Input-Output Model**

According to the Center for Strategic and International Studies (CSIS) in the United States, global economic losses from cyber attacks in 2020 are estimated to be about 1% of global GDP, totaling over 1 trillion US dollars. On the other hand, the analysis of economic damage caused by cyber attacks in Japan mainly targets the damage of the attacked companies, and the damage that spreads to other companies, industries, and the whole country is not sufficiently analyzed. In this paper, we analyze the amount of economic damage to the entire country due to cyber attacks in Japan by using the input-output model. The purpose is to contribute to improving the accuracy of damage prediction and various national measures by devising a model for estimating the amount of damage to the entire country caused by cyber attacks using the input-output table. Specifically, we first estimate the annual damage amount by industry based on cyber incident data. Next, by using the input-output model, we devise a model that estimates the amount of damage to the entire country, taking into account the resistance to cyber attacks for each industry. And we estimate the damage amount of the whole country. In addition, we compare it with existing well-known overseas guesses, verify this model, and consider the estimating method.

**Jiyoung Kim (Okayama University), Satoru Hagino (Statistics Bureau, Ministry of Internal Affairs and Communications)**

### **International Financial Input-output Tables for Trans-Pacific Area as well as Japan, US and Euro-area**

We discuss the development of international flow of funds accounts; it compiles and

## **Abstract**

analyzes such accounts with a focus on the global financial crisis. Briefly reviewing the world economy of recent years reveals that a savings glut has caused public debt problems in developed economies. On the other hand, a lack of investment has undermined economic growth in underdeveloped countries. Discrepancies among the financial systems of developed and developing countries hinder the global redistribution of funds. Both financial and real sectors should be considered in analyzing the global economy. Financial transactions and trades are two sides of the same coin. Financial transactions among the entities of multiple countries make up the global financial market, whereas international trade reflects the real economy. As is well known, international input-output tables that measure the real sector have been developed. However, statistics for international financial relations remain undeveloped. This research considers the possibility and relevance of compiling global FFAs, particularly extending the compilation to international “from-whom-to-whom” financial stock tables for Japan, Korea, the United States, and China. We combined these tables to generate a four-country international from-whom-to-whom financial stock table. Input-output analyses reveal that nonfinancial corporations in the four countries have the largest liability power-of-dispersion and that the Japanese government’s liability power-of-dispersion is large. In contrast, the financial institution sector in Japan has the largest asset power-of-dispersion. In the future, the table could be expanded to include other major Asia-Pacific countries and linked to Euro-area from-whom-to-whom financial stock tables to provide a global from-whom-to-whom financial stock table.

**Tsutomu Yoshioka (Former visiting scholar at SOAS, University of London)**

### **Distributional Structure of Japanese Economy: A Multiplier Analysis Using Social Accounting Matrix**

The aim of this study is to analyse influences of redistribution of income on Japanese economy. For this purpose, we estimate social accounting matrix (SAM) of Japan and adopt a multiplier analysis that Roland-Holst and Sancho (1992) put forward. An analysis of redistributive effects requires analytical tools that can show distributional structure between sectors or economic agents. SAM satisfies this requirement. It shows the flow of intermediate goods between industries, the flow of value added between sectors, and the flow of demand. We can understand to which sectors the value added is distributed by using SAM. The SAM in this study is estimated by using input-output table and SNA data published by the Japanese government. The multiplier analysis put forward by Roland-Holst and Sancho (1992) enables us to analyse influences of changes in demand on distribution of income. An increase in the demand in a sector creates new value added. The new value added is distributed not only to the sector whose demand increases but also to other sectors through input-output relations between industries. The multiplier analysis can estimate how much

## **Abstract**

changes in the demand influence the distributional structure. This study applies the multiplier analysis to SAM of Japan and investigates the distributional structure of Japanese economy.

**Saturday, 19 March 10:00-12:00 (Venue C (Reine))**

### **Macroeconomic Modeling and CGE**

Chair: Takashi Yagi (Meiji University)

**Christian Otchia (Nagoya University)**

### **Effects of Public Spending on the Agricultural Sector of Burkina Faso**

Rural development has been viewed by many as a key for reducing poverty and achieving sustainable economic growth. In light of this, the government of Burkina Faso has implemented a number of agriculture development plans since 2000 alone. A Rural Development Strategy was adopted by the government of Burkina Faso in 2003 and implemented in two phases. In the 2003-2010 period, it was operationalized at project and sub-sectoral program levels, while it was executed through the development and implementation of the Rural Sector National Program (PNSR) during the period 2011-2015. The country developed a PNSR II that run through 2019/20. This program incorporated budget plans for a number of agriculture allied ministries, with corresponding sub-sectoral targets. This study evaluates whether the agricultural sector budget program under PNSR II will enable Burkina Faso achieve selected sectoral targets. While we observe that the planned budget figure will have positive impacts on the economy, this will be accompanied by mixed degrees of success vis-a-vis the targets set. It is likely that the agricultural value-added growth and average income from forestry and fauna activities targets are achievable. However, the country will miss out the cereal production growth, export from the livestock sector, and value-added income from fisheries targets unless the government scales-up its spending to the respective ministries, directed systematically to activities closely linked to the respective targets and/or the efficiency of public service provision improves. We also provide an estimate of budget gaps in achieving some of these targets.

**Katsushi Tabata (Aichi University), Tatsuya Torikoshi (Kurume university)**

**A Study on the Structure of International Financial Markets-From the perspective of the International Portfolio Investment Network Do the international financial center contributes to the economic growth?**

## **Abstract**

In recent years, the leading role of cross-border financial transactions in each country has shifted from "other investments" consisting of bank loans, etc., to "direct investments" and "portfolio investments". This paper focuses on the shift from other investment to portfolio investments and attempts to clarify the impact of this shift on international financial markets from both theoretical and empirical perspectives. Due to data limitations on other investments, we used data on cross-border bank claims as a substitute. On the empirical side, the network analysis revealed that the structure of the international financial market formed by portfolio investments differs significantly from that of the international financial market formed by "bank claims" in two respects. First, the international financial market formed by bank claims has a dual structure of core and periphery, or "duality of international finance", whereas the international financial market formed by portfolio investments has an unclear duality of international finance. Second, the international financial market formed by bank claims does not have a high degree of "U.S. centrality", while the international financial market formed by portfolio investments has a high degree of U.S. centrality. On the theoretical side, we attempted to clarify why the structure of the international financial market formed by portfolio investments and bank claims differs greatly in two aspects by numerical analysis using an economic theory model. The results suggest that the conditions for the existence of the duality of international finance may be related to the acceleration of capital formation, but the centrality of the United States has not been clarified. Our attempt to theorize networks using real data in economics is in its early stages. We hope to establish a scientific approach to understanding changes in the world economy through further verification.

**Ken Itakura (Nagoya City University)**

### **Developing Long-Term Baselines for a Global CGE Model with 47 Prefectures in Japan**

We develop a global computable general equilibrium (CGE) model which encompasses 47 prefectures in Japan and foreign economies. We extend the CGE model and database of Global Trade Analysis Project (GTAP) which does not provide the sub-national details of Japan. By breaking down the GTAP database for Japan into all 47 prefectures, the extended CGE model enables us to analyze domestic transactions among prefectures as well as international trade. To study policies affecting the nexus between domestic prefectures and foreign economies in our CGE model, we construct long-term baselines spanning for 2011-2100. A baseline simulation serves as the basis to measure potential economic impacts of the policies. Fundamental data inputs constructing the baselines are projections for demography and economic activities in addition to the CGE database. Long-term projections of demography and economy provide alternating scenarios. For example, the United

## Abstract

Nations' World Population Prospects offers different long-term demographic projections, depending on key parameters. Similarly, the International Institute for Applied Systems Analysis (IIASA) offers the Shared Socioeconomic Pathways (SSP) scenarios for demography and economy as well as climate change. In this study, we explore different long-term baseline scenarios and the resulting economic structures of all prefectures in Japan as well as foreign economies. We begin with description of our global CGE model and the database, and then explanation of long-term projections of demography and economy follows. Long-term simulation results obtained from alternating baselines are discussed.

**Saturday, 19 March 13:00-13:40 (Venue A (Etincelle))**

### Special Lecture

Chair: Yoshifumi Ishikawa (Nanzan University)

**Mikio Suga (Hosei University)**

#### **Economic spillover effect due to changes in household consumption expenditure during the declaration of a state of emergency**

The impact of the implementation of emergency measures on household consumption caused by the epidemic of the COVID-19 might be that transportation expenses have decreased due to the request of residents to refrain from going out, and education and entertainment expenses due to refraining from events. There are factors such as a decrease in tourism-related spending, a decrease in dining expenses due to a leave request, an increase in personal computer-related spending for teleworking, and a shortage of masks. What kind of economic spillover effect does this bring? It seems that the general public, not just economic experts, is highly interested in what the impact was on the macroeconomics. The economic spillover effect of changes in household consumption expenditure due to the implementation of emergency measures (April-May 2020, January-March 2021, April-September 2021) is estimated by using 2015 Japanese input output table. Specifically, the household consumption expenditure per household by item from the Ministry of Internal Affairs and Communications Statistics Bureau ""Household Survey"" was rearranged into the input-output table sector, and deflated by the consumer price index, and then converted from the purchaser price to the producer price, The consumption vector was applied to the Leontief inverse to calculate the economic spillover effect. This was converted to the unit of per household member, and the effect on the macro was estimated by multiplying this by the estimated population.

## **Abstract**

**Saturday, 19 March 14:00-16:00 (Venue A (Etincelle))**

### **Regional Input-Output Analysis and Other Topics**

Chair: Yoshifumi Ishikawa (Nanzan University)

**Yuzhuo Huang (Graduate School, Nagasaki University), Kenichi Matsumoto (Toyo University), Yosuke Shigetomi (Nagasaki University)**

### **Carbon footprints of household consumption under the background of low marriage rate in 47 prefectures of Japan by income level**

With the continuous increase of household income, household consumption has eventually become one of the important growth points of Japan's indirect carbon dioxide emissions. However, the household consumption in each prefecture is based on the consumption structure under different income groups. Therefore, the carbon footprints of household consumption and carbon footprint distribution of different income groups in each prefecture have substantial differences. Under the background of low marriage rate in Japanese society, quantifying carbon inequality in each prefecture through the carbon footprint of single person and multi person household consumption in different income groups of Japan's 47 prefectures has become the main research problem. Based on the multi region input output table of Japan in 2005, this study used environmentally extended input-output approach to quantified household carbon footprints for different income groups of single person and multi person household of Japan's 47 prefectures. Moreover, carbon footprint Gini coefficients (CF Gini coefficients) of single person and multi person household were calculated to measure carbon inequality for households across prefectures. We found that in economically developed prefecture, carbon footprint of multi person household is higher, while the single person household is lower. Meantime, the more developed the economy, the greater the gap between the carbon footprints of single person and multi person household. On the whole, CF Gini coefficients decrease from economically underdeveloped areas to economically developed areas, and the CF Gini coefficients of multi person household are lower than that of single person. Moreover, the CF Gini coefficients in economically developed prefectures are higher in service and non-durable goods expenditure, while the CF Gini coefficients in economically underdeveloped prefecture are higher in basic expenditure.

**Aiza Sarwar (Nagoya University )**

**Disparities and Determinants of Reproductive Health Services: Evidence from the Districts (118) of Pakistan**

## **Abstract**

Although maternal healthcare is provided free of charge in Pakistan via the primary health care sector, a significant section of the population does not make appropriate use of accessible health services. For example, prenatal care are used by 92 percent of women aged 15-49 years in Punjab, but just 55.5 percent in Baluchistan. Similarly, the proportion of Skilled Birth Attendants (SBAs) split by the total number of live births in Punjab is 71 percent, whereas in Baluchistan it is 38.2 percent. Although a series of efforts began in 1990, provide universal health coverage and the provision of high- quality healthcare services at the district level. Despite these efforts, maternity healthcare access remained limited and inequalities can be found across the country. Therefore, this study will provide light on several socioeconomic factors that may contribute to regional inequalities in access to maternal healthcare services in Pakistan. Therefore, exploratory data analysis used to examine the regional pattern of Reproductive Health Care Services (RHCS) and developmental factors. To begin, this study examines the relationship between the RHCS index and development by comparing it to five development indicators. Second, it employs spatial regression to ascertain the factors that contribute to the reduction of the access gap to the RHCS. The findings indicated that geographic pattern of inequality was spatially connected to all development metrics. Pakistan's western and southern districts were identified as cold spots, indicating that these areas lacked adequate transportation, healthcare, better housing, improved toilet facilities, and education. These patterns may assist policymakers and planners in comprehending the cluster's geographical dimension, which lacked adequate coverage and resources. The findings are specific to target the most vulnerable portion of society. To conclude, poverty reduction, female empowerment, and public infrastructure are critical components of reducing inequality in access to the RHCS.

**Muhammad Tashfiq Huq (Hiroshima University), Masaru Ichihashi (Hiroshima University)**

### **Identification of leading industries in the growth of Bangladesh & other South Asian LIDCs: A novel Structural Decomposition approach using Input-Output tables.**

Using sectoral level data from input-output tables this study is focused on the structural decomposition of the total output change in Bangladesh & 5 other South Asian Lower Income Developing Countries (LIDCs) to identify leading sectors contributing to economic growth. Our study aims to find most deserving growth sectors for policy support as the resources are scarce in the developing countries like Bangladesh. To capture long term growth, instead of measuring conventional structural change between two time periods we introduced a novel decomposition approach which we named Difference in Difference (DID) decomposition. The acceleration/deceleration part of DID decomposition could indicate which sectors are growing in the long run. Further decomposing final demand effects of the



## Abstract

acceleration part in DID decomposition of countries into Consumption, Investment & Export shows the main contributing factor behind the growth of these countries. The decomposition result shows except Vietnam which mainly depends on export expansion, economic growth in all other countries including Bangladesh are mainly due to change in consumption. Vietnam is the only country which has diversified manufacturing sectors as its leading sectors. Leading sectors in other countries than Vietnam are mainly service sectors with exception of few manufacturing ones. Food & Construction sectors have been found as commonly growing sectors in all the countries.

**Saturday, 19 March 14:00-16:40 (Venue B (Verre))**

### **Environment, Resource and Energy**

Chair: Kiyoshi Fujikawa (Aichi Gakuin University)

**Keiichiro Kanemoto (Research Institute for Humanity and Nature), Jemyung Lee (Research Institute for Humanity and Nature), Shigetomi Yosuke (Nagasaki University)**

### **Carbon footprint of cities based on micro-consumption data**

Given that national pledges are likely insufficient to meet Paris greenhouse gas (GHG) reduction targets, increasingly actors at the city and state level are looking for options on how local government can contribute to reducing GHG emissions. For a typical city only one third to half of their carbon footprint (CF) is emitted within the jurisdiction, while the majority is embodied in goods and services flowing into the city. To support well-informed mitigation efforts, administrators need robust inventories of both direct emissions as well as the supply chain emissions. Here we construct household CF inventories for cities in Japan, India, the European Union (EU), and Indonesia using detailed consumer expenditure data from hundreds of thousands of households and a multi-regional input-output (MRIO) model. Our city-level CF database includes 1172 cities in Japan, 623 cities in India, 76 cities in the EU, and 514 cities in Indonesia (see <https://city.spatialfootprint.com/>). We identify the consumption activities (food, electricity, gas, other energy, medical care, public transport, education, consumable goods, durables goods, other services) which city policymakers can target to reduce CF. Understanding a city's consumption-based CF of households in addition to its direct emissions exposes additional policy options for each citizen to contribute to achieving national goals.

## **Abstract**

**Yiyi Ju (Waseda University), Ayu Washizu (Waseda University), Akira Yoshida (Waseda University)**

### **Input-Output Analysis Extended in Virtual Power Plant Business**

The more efficient utilization of distributed power resources on the demand side, together with the improvement in output curtailment of solar power generation, calls for the commercialization of the Virtual Power Plant (VPP) business. In this study, based on the result from the latest "Virtual Power Plant Construction Demonstration Project" report, together with the 2015 IONGES table (Input-Output table for the analysis of a Next-generation Energy System), we developed an Input-Output table containing the VPP business sector, in order to investigate the impacts when VPP commercialization becomes full-scale. The sector is simplified as a sector supplying advisory services regarding smart energy management, where thermal power generation can be replaced by solar power generation according to demand responses. Based on the table we developed, we further investigated the impacts of VPP business on CO<sub>2</sub> emission reduction (caused by the replacement of thermal with solar power), on the cost reduction in all sectors (caused by the cashback from VPP business), as well as on the overall economic activities (induced by the increase in final consumption due to the cashback from VPP business). Different scenarios are also designed to investigate the uncertainties on load following, trading amount, and unit prices along with the full-scale of VPP commercialization.

**Shuning Chen (Kyushu University), Masaru Kagatsume (Kyoto University)**

### **Trade impact on sustainable decarbonization: the global value chain analysis of Asian developing economies**

Developing countries meet challenges to meet the decarbonization target when they promote industry modernization. Especially since these countries are the global value chain participant in the processing process, trade impact on their national decarbonization outcomes should be noted. Taking the Asian developing economies as a case study, we developed a relative intersectoral linkage analysis based on the global value chain (GVC) framework. We investigated CO<sub>2</sub> emissions changes during economic structural changes. The indices of intersectoral linkages and Revealed Comparative Advantage (RCA) have been employed to analyze the trade impacts on emissions changes from composition, scale, and technology channels. Although research on pollution heaven evidence in developing countries has been proved, the discussion of decarbonization in developing countries has just begun. The results show that emission-intensive sectors as suppliers tended to be influenced in their forwarding linkage to the local and the global economy under stringent

## Abstract

local emission reduction policies. Meanwhile, emission intensity depends on downstream sectors through comprehensive backward linkage. We found that emission concentration in the local market for avoiding emission leakage leads to increased domestic emission intensity. The findings suggest that reconstruction of the value chain is necessary for sustainable decarbonization from local to global economies. Keywords: Embodied carbon emissions; Global value chain; Trade in Value-added; Inter-industry linkage; Revealed comparative advantage

**Baixin Li (Waseda University ), Yasushi Kondo (Waseda University )**

### **Integrated Assessment of Environmental, Economic, and Social Impacts of Waste Plastic Recycling in Japan**

Since China's ban on waste plastic imports in 2017, there has been a growing need for promotion of domestic treatment and recycling worldwide, particularly in Japan. Export of waste plastic or plastic scrap from Japan was halved during the period 2015-2020, from 1.61 Tg to 0.821 Tg. Considering this background, in this study, we apply input-output analysis for integrated assessment of Japanese waste plastic recycling scenarios, wherein 1.61 Tg of waste plastic is not exported but treated or recycled in Japan. The base-case scenario describes incineration without energy recovery and landfill. The other scenarios include recycling in the 'Pig iron' sector via coke oven chemical feedstock conversion, 'Petroleum products' sector via liquefaction, 'Chemical fiber' sector via mechanical recycling, 'Plastic products' sector via mechanical recycling, and 'In-house power generation' sector with energy recovery via RPF (refuse paper and plastic fuel) conversion. When the recycling sector cannot accept a portion of waste plastic due to capacity limitations, that portion is incinerated without energy recovery or landfilled. For each scenario, we quantified the environmental, economic, and social indicators (carbon dioxide emissions, income, employment, and total import). These indicators are used for integrated assessments of the scenarios. The assessment results show that neither the 'Petroleum products' nor 'Chemical fiber' sectors can accept all the waste plastic due to capacity limitations. The 'Plastic products' sector performs well considering economic (increasing income) and social perspectives (increasing employment and decreasing the dependence on foreign resources), while the 'Pig iron' sector achieves the least carbon dioxide emissions among the recycling sectors fulfilling certain economic and social conditions. The results of this study exemplify the usefulness of input-output analysis for integrated assessment of recycling scenarios without calculating single aggregated indicators.

## **Abstract**

**Saturday, 19 March 14:00-16:40 (Venue C (Reine))**

**International Economy and International Development, and Productivity**

Chair: Nobuki Sugita (Ritsumeikan University)

**Md. Azad Uddin (Graduate School, Hiroshima University), Masaru Ichihashi (Hiroshima University)**

**Investment and Saving Behavior of the Migrant Household across the Distribution of Migration Duration**

The life-cycle of a migrant can play an important role in the pattern of remittance based investment and savings decisions of a migrant household. In order to formulate effective policy for improving the utilization of remittances, it is important to understand the investment behavior of the remittance receiving households across the distribution of duration of migration. However, how the pattern of investment and savings behavior varies across the distribution of migration duration is not yet explored in the literature. Using a nationally representative household level survey data namely "Survey on Investment from Remittances 2016" and logistic regression method, the study investigates the pattern of investment and savings behavior varies across the distribution of migration duration. The pattern of investment may differ across different types of investment. To capture the types of investment, we categorized the investment expenditure of a migrant household into main five categories: investment in farm, non-farm, housing, land, and loan repayment. We found that there is a considerable variation in the pattern of investment across the migration duration. The estimation results show that as the duration increases, the probability of loan repayment significantly decreases. The probability of investing in housing is higher at the beginning of the distribution of migration duration, followed by the land purchase and farm investment. The results for savings pattern show that the probability of saving at formal financial institutions (Bank/FI) increases with the duration and the probability of saving at semi-formal institutions (NGO, Co-operative) decreases with the duration. We further investigate the investment behavior of the migrant with his entrepreneurship behavior. using the migrant's business ownership at destination as the proxy for entrepreneurship, we found that the probability for investment in different category is more likely to higher for the migrants who have long migration duration with business ownership.

**Reynaldo Senra**

**Data disclosure as source of financial development in the long-run: Evidence from a panel of countries**

## **Abstract**

There are numerous theoretical growth models indicating that information is critical for the well functioning of the financial markets. However, just few empirical studies investigate this nexus. Considering this, we investigate the role of data disclosure on financial development. This topic is important because many governments in the world are releasing statistics as a “goodwill” or a duty. Indeed, some few hide statistics that may reflect their poor performance. In addition, many other policies that have been considered beneficial for the financial markets tend to require long time to yield results, may require significant economic resources and may be risky. In this case we can mention the reform of the financial system and the strengthen of the institutions. Compared with these policies, data disclosure requires less resources and may be less complex. We investigate the linkage between statistics diffusion and economic development at aggregated level using methodologies for non-stationary panel data. We found cointegration and statistics availability was mostly causing financial development in the long-run. Indeed, a short-run positive causal nexus was identified. Interestingly, when we used sub-periods to analyze the robustness of our results, we find that the nexus have had intensified in the recent period. This suggests that statistics have turned more important for the well functioning of the financial markets. Therefore, governments attempting to develop the financial markets are better off including the release of statistics among the policies and strategies to achieve that goal.

**Kouakou Jean Fidele SIE (Nagoya University)**

### **Comparative advantage development strategy and labour productivity growth: Evidence from the Sub-Sahara African sector level**

In the current development era, structural transformation and labour productivity growth have revived interests across developing countries and Africa in particular. Labour productivity growth has remained stagnant while structural transformation is yet to be dynamic (mainly driven by the static gains). While there is an advocacy to explore alternative sources of growth as conventional variables are becoming less relevant in explaining growth, and mainly due to the changing structure of developing economies, the comparative advantage development strategy remains unexploited as a strong determinant and particularly in the case of Africa. The comparative advantage development strategy emerges from the New Structural Economics which argues that economic outcome is endogenously determined by the country’s long-term economic development strategy and suggested a development based on comparative advantage following (CAF) instead of the comparative advantage defying (CAD). However, some critics argue that low-income and resource rich countries will have a slow upgrading process of their economies if they strictly follow their comparative advantage and, argue that defiance of the comparative advantage would yield negative effects beyond a certain threshold. Therefore, to shed light on whether Sub-Saharan Africa countries should comply or defy their comparative advantage when designing their industries,

## **Abstract**

this paper will, first of all, analyse the different sources of growth by using the decomposition method of shift-share analysis with a recent dataset of 9 sectors from 1960 till 2017 and then investigate the impact of comparative advantage development strategy on sectoral growth as well as the component of growth (within effects and structural effects).

**Utumporn Jitsutthiphakorn (Bank of Thailand)**

### **Technology Transfer and Productivity: Propensity Score Matching Analyses of Firms in Thailand**

In the macro-view, many previous studies have established that exporting can increase productivity through knowledge and technology transfer from foreign buyers. However, the micro-analysis still lacks an impact analysis of technology transfer's effect on firm productivity in Thailand. This firm-level study first used the 2016 World Bank Enterprise cross-sector survey of Thailand to explore the effect of technology transfer on firm productivity. The export channel was studied to assess the benefits of exporting on firm productivity in Thailand. This research has related two hypotheses, the first of which concerns the self-selection hypothesis, exploring the determinants of an exporter's decision to join the export market. The second hypothesis, learning by exporting and I investigate whether the firm has learned from exporting by adopting the propensity score matching model (PSM) to address heterogeneous firm bias between exporters and non-exporters. The study found that exporters in Thailand with high productivity, a larger size, extensive experience, and a high share of foreign ownership were more likely to export. Moreover, after addressing firm heterogeneity with the propensity score matching model. This study shows that firms already have high productivity before entering the export market and the effect of technology transfer through exporting on firm productivity (both in terms of TFP and labor productivity) is weak, not significantly different from the non-exporter. Therefore, as a policy implication, I highlight the need for policymakers to design a new export promotion policy to promote productivity.

## **Abstract**

**Sunday, 20 March 10:00-12:00 (Venue A (Etincelle))**

### **Regional Input-Output Analysis**

Chair: Mitsuo Yamada (Chukyo University)

**Kenta Takeda (The General Incorporated Association Institute for Policy and Sciences), Kazuo Inaba (Ritsumeikan University)**

### **The Damage and Reconstruction of The Kumamoto Earthquake**

The Kumamoto earthquake which occurred in April 2016, measured twice a maximum seismic intensity of 7, causing serious damage to center on Kumamoto prefecture. The amount of stock damage in the prefecture reached approximately 3.8 trillion yen, and the accompanied flow loss (production decline) due to damage to agriculture, forestry, and fisheries products and the shutdown of factories was estimated to be around 100 billion yen. Furthermore, decline in demand was caused by the decrease in consumer sentiment among the affected population on account of evacuation and anxiety about the future, as well as a decline tourist owing to harmful rumor. These supply and demand constraints are expected to have an indirect impact on both inside and outside the prefecture through the supply chain. This study mainly focuses on the demand side and analyzes the ripple effects of changes in expenditures due to the Kumamoto earthquake. We use the multi-regional Input-Output Table for Kumamoto Prefecture in 2015, which is estimated by a non-survey method based on existing statistics. The table consists of Kumamoto Prefecture, which is divided into three regions, and the other parts of Japan, and we reveal the direct and indirect effects of the changes in demand before and after the earthquake on both in and out of the prefecture.

### **Mitsuo Yamada (Chukyo University)**

### **Effect of future consumption changes on the municipal economy in a depopulating society**

In a depopulating society, household consumption expenditure will decrease, so production and added value will decline. In 2021ICES, in order to capture this decrease on a municipal basis, we estimated the amount of change in consumption by municipality in Aichi prefecture. Then, using the 2011 Aichi Prefecture's inter-municipal input-output table, the ripple effect on the value-added by municipality was measured. The population of many municipalities in Aichi Prefecture will decrease, but in the Nishi-Mikawa area, the population will increase for some time. In such regions, the demand for consumption will increase, and the regional total of the induced amount of production and value-added will increase. On the other hand, even

## **Abstract**

in such cities, the reduction effect is greater when considering the induced production and value-added due to the decrease in the population in other cities. By sector, medical expenses increase due to the aging population, education expenses decrease due to the declining birthrate, and spending in many service sectors and automobile-related sectors decreased. In that analysis, there were several remaining issues, one of which is related to the range of consumer expenditure. We estimated the amount of change in household final consumption expenditure due to population-fluctuating factors by municipality, however some parts of government consumption expenditure, such as insurance benefits in medical care and long-term care, might also change accordingly. This issue relates to the concept of consumption defined dually; “final consumption expenditure” and “actual final consumption.” The former grasps it from the viewpoints of “share of burden,” and the latter of “enjoyment of benefits.” Here, we will investigate what difference will appear on the induced production and induced value-added in each municipality when the consumption change is calculated by these different concepts.

**Seongha Lee (Graduate School, Yokohama National University), Taku Ishiro (Yokohama National University)**

### **Analysis of inter-regional industrial relations of major industries in Sejong City**

The phenomenon of centralization in the metropolitan area is experienced by many countries, but South Korea is one of the most severe cases. South Korea's metropolitan area accounts for more than half of its total population and GDP. To overcome this, the Korean government implemented various policies for the balanced development of the country, and a representative of them was the construction of Sejong City in Chungcheong Province. Sejong City was established in July 2012 and by 2021, 44 government organizations and 15 state-run research institutes have migrated from the metropolitan area. In addition, it is actively interacting with various cities in Daejeon, Chungcheongbuk-do, and Chungcheongnam-do, increasing its influence on the size of the economy and surrounding cities. Despite the importance of Sejong City, economic analysis after the establishment of Sejong City is still insufficient. Sejong City is expected to have clear regional characteristics in the public administration sector and R&D for the purpose of construction, and since it is a new city, the proportion of the construction industry can be expected to be larger than other cities. Therefore, by using 2015 Korean Multiregional Input-Output table, this paper analyzes the industrial structure of Sejong City and Sejong's industrial characteristics and economic relations with other regions by measuring the industrial linkage between Sejong City and Chungcheong area, metropolitan area, and other regions by major industry.

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## **Abstract**

**Sunday, 20 March 10:00-12:00 (Venue B (Verre))**

**International Economy and International Development**

Chair: Masaaki Kuboniwa (Hitotsubashi University)

**Al Muizzuddin Fazaalloh (Graduate School, Nagoya University)**

**FDI and Economic Growth in Indonesia: A Provincial and Sectoral Analysis**

Foreign direct investment (FDI) plays an essential role in growing the economy, where this role runs through two things, namely capital accumulation and technology transfer. However, in the literature, previous research findings are still inconclusive to show positive contributions of FDI on economic growth. To evaluate the impact of FDI on economic growth more accurately, the researchers attempt to investigate using disaggregate FDI data at the sectoral level. Although the analysis of the effect of FDI on economic growth has been tested employing sectoral data, it is less research explored with data at the provincial and sectoral levels. This study aims to analyze the impact of foreign direct investment (FDI) on economic growth employing sectoral data at the provincial level (33 provinces) in Indonesia over 2010-2019. We apply the regressions with many levels of fixed effects estimator (reghdfe) to this research. Our estimation results prove that, in general, FDI significantly positively impacts economic growth in the Indonesian provinces. We also find that FDI in the mining, manufacturing, water, gas and electricity, hotels and restaurants, and real estate sectors has a significant positive effect on economic growth. Meanwhile, only FDI in the agricultural sector has a significant negative impact. Our estimation results confirm that FDI in the manufacturing sector contributes positively and has a considerable impact. The results are robust to the GMM System estimator, which considers the endogeneity problem. Keywords: FDI, economic growth, sector, province, Indonesia

**Masaaki Kuboniwa (Hitotsubashi University)**

**A Comparative Analysis of Domestic and Foreign Value-Added with special reference to the case across the EU and Russia**

**Abstract** Exports of a country brings about domestic value-added of the country. Usually they also need imports, which induce foreign value-added generated in partner countries. This results in the global value chains (GVCs). This paper provides a comparative analysis on value-added induced by foreign trade with special reference to the GVCs generated across three countries/areas, that's to say, the EU, Russia, and the rest of the world (ROW). The quantitative approaches are armed with Leontief's input-output techniques using inter-

## **Abstract**

country input-output tables (ICIO) released by the OECD in 2021. First, outlines of vertical specialization (VS) developed by Hummels-Ishii-Yi and Koopman et al. are presented in a comparative view. Also, shown are essential relationships between Russia's GDP, exports and imports from/to the EU, and the international oil prices. Second, demonstrated are complicated value chains across the three countries/areas in cases with 1-sector and 30-sector, respectively, in a concise manner using Johnson-Noguera's value-added exports, and Treffer-Zhu-Kuboniwa's decomposition of gross exports. Third, shown here is that further considerations or modifications on data of Russia's oil and gas GDP, and exports and imports to/from the EU, which are largely exposed to changes in international oil prices, would bring about clearer understandings of inter-dependence between the EU and Russia. Keywords: GVC (global value chain), vertical specialization, value-added exports, EU, Russia

**Usman Alhassan (Ritsumeikan University), Jean-Claude Maswana (Ritsumeikan University), Kazuo Inaba (Ritsumeikan University)**

## **Remittances and Formal Entrepreneurship Development: The Role of Local Financial Development**

Low savings rates in developing countries often hinder the effectiveness of their local financial sectors from providing funding for entrepreneurship development. However, the sheer size and the relative stability of migrants' remittances to developing countries could play an important role in filling this savings gap and in fostering formal entrepreneurship development given certain conditions in developing countries. This paper studies how local financial sector development serves as a mechanism for positioning a country to increase remittances inflow and channel them towards formal entrepreneurship development. The paper deviates from previous studies that assess the combined impact of remittances and financial development on the general economic growth by focusing on formal entrepreneurship development while excluding the informal sector that accounts for large portions of GDP in developing countries. We use a new dataset on new business density in 81 remittance-receiving countries that capture formal enterprises development from 2006 to 2018 and the panel Feasible Generalized Least Square (FGLS) and a two-step system Generalized Method of Moments (GMM) techniques for our analysis. The preliminary findings from both estimation techniques show that remittances and financial development, proxied by domestic credit to the private sector play a complementary role in facilitating formal entrepreneurship development. This is evident from a positive and significant impact of remittances-financial development interaction on formal entrepreneurship. The implication is that remittances adequately fill up the savings gap in developing countries thereby allowing local financial institutions to channel credits towards entrepreneurship development.

## **Abstract**

Keywords: Remittances; Entrepreneurship; Financial Development; New Business Creation  
JEL Classification: F24; L26; O16; M13

**Sunday, 20 March 10:00-12:00 (Venue C (Reine))**

### **Theory of Input-Output Techniques**

Chair: Yasushi Kondo (Waseda University)

**Heming Zhang (Graduate School, Yokohama National University, ), Taku Ishiro (Yokohama National University)**

### **The Compilation and Analysis of the 2015 Input-output Table of Kyoto Prefecture for the Cultural Industry**

The rise of cultural industry is in the part facilitated by the rise of leisure and entertainment in the advanced industrialized economies. Recently western countries have been attaching importance to cultural industry and developing it as one of the growth strategies. Japan has also made numerous efforts to its cultural industry. Kyoto Prefecture, as the ancient capital of Japan, is famous for its traditional culture, promoting the development of its cultural industry positively in these years. This article is to analyze the impact and development status of cultural industry of Kyoto Prefecture, based on the compilation of the 2015 Input-output Table of Kyoto Prefecture with 110 sectors. First, the writer compiled a new 2015 Input-output Table of Kyoto Prefecture with cultural industry sectors, based on the 2015 Input-output Table of Kyoto Prefecture with 105 sectors. Second, some important indexes derived from the matrixes such as specialization coefficient, sensitivity coefficient and the index of power of dispersion, are computed and analyzed to show the impact of cultural industry of Kyoto Prefecture. Third, the writer summarized the results of the analysis with the recent development status of Kyoto's cultural industry and gave some suggestions to the future activation strategy of Kyoto's cultural industry.

**Jian Jin (Waseda University Graduate School), Yasushi Kondo (Waseda University)**

### **Improving the Uncertainty Analysis of Input-output Models by Considering the Correlation between Input Coefficients**

Input-output (IO) analysis rarely reports uncertainty indicators such as standard deviation, despite their importance. The literature on the uncertainty analysis of IO models identifies Monte Carlo simulation as the norm in quantifying uncertainty indicators, where the input

## **Abstract**

coefficients are assumed to be mutually independent. However, studies such as Nakajima et al. (2013, Environ. Sci. Technol.) and Ali and Santos (2014, IIOA Conference) are exceptions. These studies applied the Dirichlet distribution to consider the correlation between the input coefficients of each production sector. This study quantitatively evaluates the performance of the Dirichlet distribution in comparison to the corresponding independent distribution. We used the 2014 Japanese national IO table of the World Input-Output Database. By defining the economic impact (EI) of a sector as “the increase in the sum of outputs of all sectors when the final demand for the respective sector increases by one unit,” we found that the 95% coverage interval of an EI is 23% narrower on the average when the correlation between input coefficients is considered than when it is excluded. This substantial improvement indicates that the proposed method is more likely to produce conclusive or significant results. This study also outlines an approach for determining the parameters of the Dirichlet distribution by utilizing the variance of transactions in the IO table.

**Satoru Hagino (Statistics Bureau, Ministry of Internal Affairs and Communications)**

### **Update of OECD TiVA Indicators and Usefulness of Extended Input-output Table incorporating firm heterogeneity**

This paper examines the updates of OECD TiVA indicators and the usefulness of an extended input-output table (EIOT) incorporating firm heterogeneity of Japanese firms in terms of differences in their ratio of imported intermediate goods to total output. Using such an EIOT, we calculated the vertical specialization indicator of Japan, which corresponds to the foreign value added included in exports. In this process, we measured the differences in intermediate input ratios between different types of firms using firm-level microdata from the Basic Survey of Japanese Business Structure and Activities. Our analysis shows that distinguishing between exporting and non-exporting firms is relevant for assembly industries such as the electronic and automobile industries, as widely discussed in the literature. In contrast, for primary materials industries such as paper, chemical and metal industries, other distinctions appear more important. More specifically, for the chemical industry, where firms tend to have large, integrated manufacturing plants, the differences in intermediate import ratios are largest when distinguishing large firms from small and medium firms. For the paper and metal industries, which rely on foreign raw materials, the difference is largest when distinguishing between firms with and without foreign affiliates. By incorporating such heterogeneity, the vertical specification indicator increases by 70 percent, and thus, the EIOT could the foreign value added more comprehensively.

## **Abstract**

**Sunday, 20 March 13:00-14:20 (Venue A (Etincelle))**

### **Regional Input-Output Analysis**

Chair: Mitsuo Yamada (Chukyo University)

**Hajime Tanaka (The University of Tokyo), Shunsaku Konishi (Promotion and Research Institute for Ocean Economics)**

#### **The Creation of the Marine-Industry-detailed Input-Output Table: Shimizu-Ward, Shizuoka-Prefecture, Japan as case study.**

Shimizu-Ward, Shizuoka-City, Shizuoka-Prefecture in Japan is blessed with marine conditions facing Suruga Bay, the deepest bay in Japan with a diverse ecosystem, and has achieved economic development centered on the marine industry. For example, Sakura-Shrimp caught only in Suruga-Bay has sustained fisheries and fish processing in Shimizu. In particular, the marine transport industry has developed as a logistics hub at Shimizu Port, which is designated as an international hub port, a core international port, and a specified port under the Port Regulations Law. In order to further develop the economy, Shizuoka City has made various port plans to further expand the use of Shimizu Port. Although the promotion of the marine industry is an important policy goal for Shizuoka-City, there is no detailed input-output table for the marine industry that can be used as a basis for analyzing the economic effects of achieving this goal. In this study, we used the non-survey method to create an input-output table that categorized the marine industries (fisheries, fish processing, ship building and repairing, and marine transport) in Shimizu-Ward. The input-output table revealed that the ripple magnification of the ship building and repairing is 1.75, that of the marine transport industry is 1.68, that of the fish processing 1.56, and that of the fisheries is 1.16. In addition, we estimated one of the policy promoting use of the Shimizu-Port as an example of using the Input-Output Table.

**Kiyotaka Ishikawa (The University of Tokyo)**

#### **Interregional Network Linkage Effects by the Liberalization of Agricultural and Food Product Import in Japan**

Input-output structure in Japan's agri-food sectors is intra-regional in its intermediate input supply, which suggests that productivity changes in those sectors are intensive in intra-regional spillover to the regional output (Network Linkage effect), as studied in Ishikawa (2021). This study, based on the same Network Linkage model by Baqaee and Farhi (2019), empirically studies the propagation toward regional macroeconomy by two historical shocks

## Abstract

in the agri-food sectors; a) TFP changes and b) import dependency changes (import value divided by final demand). a) For TFP shocks in food processing sector, some regions have suffered from negative Network Linkage effect. Since the sectoral TFP are stagnant or falling, its downstream reduce the input from the sector and meanwhile increase the substitutes in intermediate input cost-share, and eventually the latter effect prevails in the Network. This can be attributed to the food commodities differentiated with its origins or transportation costs of perishables between remote regions. b) As import extends in agricultural sector, urban regions have suffered from negative effect more significantly than rural regions have while there is no such urban-rural gap for shocks in food processing sector. This means that rural agricultural products are less vulnerable to import shocks since they require inputs or production factors only locally reproducible such as specific land or climate and maintain the supply chain to urban area's food consumption. On the other hand, location is relatively less important among food processing industries, considering that most of them locate near consumption. Ishikawa, K. (2021). Networks in Japanese Regional Agro-food Supply Chain: An Application of Interregional Input-Output Table to Network Linkage Model, PAPIOS-ICES 2021, C-1 Regional Input-Output Analysis 1, Kobe JAPAN, March 20. Baqaee, D. R., & Farhi, E. (2019). The macroeconomic impact of microeconomic shocks: beyond Hulten's Theorem. *Econometrica*, 87(4), 1155-1203.

**Sunday, 20 March 13:00-14:20 (Venue B (Verre))**

### **Environment, Resource and Energy**

Chair: Makiko Tsukui (Tokyo International University)

**Yasushi Kondo (Waseda University), Xu Han (Waseda University )**

### **Material Footprint of Sector Groups based on Input-Output Analysis**

There is an increasing interest in material footprint and resource productivity. According to the United Nations Sustainable Development Goals (SDGs), material footprint is an SDG indicator related not just to the improvement of global resource efficiency in consumption and production but also the decoupling of economic growth from environmental degradation. In industrial ecology, input-output (IO) analysis is widely used to quantify material footprint alongside other environmental footprints. The standard IO model, that is, the Leontief quantity model, in which final demand drives production at sectors, is suitable to quantifying the material footprint of final products such as machinery and buildings. However, when analyzing the material footprint of intermediate products such as machine parts and construction materials, the application of the standard IO model is not straightforward. While the Szyrmer total flow approach can be used to quantify the material footprint of a single

## **Abstract**

sector, to the best of our knowledge, methods suitable for simultaneously analyzing multiple sectors are not known. There is a great need for filling this research gap, and, therefore, this study proposes a method to analyze the material footprint of sector groups by using a time series of Japanese IO tables and material flow data. We found that this proposed method provided reasonable results, whereas a naive application of the standard IO model led to an under-estimation. Moreover, the Szyrmer approach led to an over-estimation when the results of individual sectors are aggregated into sector groups. Our findings can effectively improve the quantification of resource efficiency in large enterprises and industry associations, which typically span multiple sectors in a detailed IO table as well as groups closely related to these sectors.

**Makiko Tsukui (Tokyo International University)**

### **Measuring the waste footprint of Chinese trading partners: a multi-regional waste input-output approach**

The serious waste problem in China is strongly related to the development of infrastructure and production activities for exports. Many trading partners import Chinese goods, which stimulates the manufacturing industries in China and causes large amounts of waste. We used a multi-regional waste input-output approach to investigate which industries in China are primarily responsible for waste generation, and which exports induce the industries responsible for generating these wastes. We extended the WIOD, one of the major multi-regional input-output tables for 2007 and 2014, to investigate waste generation, recycling, and waste treatment activities in China, and to assess how these are affected by China's trading partners. We also investigated the differences in the economic structure and waste generation in China between 2007 and 2014. In China, production activities in the "Mining and quarrying", "Electricity, gas, steam and air conditioning supply", "Manufacture of basic metals", "Manufacture of chemicals and chemical products", and "Manufacture of other non-metallic mineral products" sectors induced most of the waste generation in both 2007 and 2014. Compared with 2007 and 2014, China's waste generation per production value improved dramatically after China implemented the 11th Five-Year Plan. The contribution of the rest of the world (ROW), which the WIOD does not cover as a country, to waste generation in China through trade, also increased from 2007 to 2014. The results showed the need for more detailed and reliable estimates for Asian and African regions in multi-regional input-output tables.

## **Abstract**

**Sunday, 20 March 14:20-15:40 (Venue A (Etincelle))**

### **International Economy and International Development**

Chair: Taku Ishiro (Yokohama National University)

**Joseph Aduba (Ritsumeikan University)**

#### **Does learning by banking, fintech penetration, and financial inclusion explain financial development in emerging and developing economies? A cross country analysis**

For developing and emerging economies, financial development (FD) means the basic business of building sounder and more efficient financial institutions, equity, and bond markets that could efficiently intermediate economies' savings into various productive uses. However, the drivers of FD are multi-dimensional. This study investigates the connection between the performance of depository financial institutions (DFIs), fintech penetration, financial inclusion, and financial development in developing and emerging economies. Using the learning curve theory and stochastic frontier analysis approach, the study estimates the efficiency gains from the information-intensive processes of asset transformation in more than 60 emerging and developing countries and thereafter investigate the relationship between these performance measures, fintech penetration, financial inclusion and financial development as computed by IMF. Preliminary results show significantly positive relationships between financial deepening and some financial performance measures analyzed, especially the efficiency of credit and value creation. In addition, the preliminary results also show that fintech penetration and financial inclusion have significantly positive effects on financial development. The implication is that the efficiency of credit and value creation, fintech penetration and financial inclusion are important drivers of financial deepening in emerging and developing countries. Keywords: Credit/value creation, Financial inclusion, Fintech, Financial development, Investment, Learning curve. JEL: G21, G32, MI

**Harutaka Takahashi (Graduate School, Kobe University)**

#### **A Dynamic Theory of the Feldstein? Horioka Puzzle and Financial Frictions**

Many empirical studies of the Feldstein-Horioka Puzzle (FHP) conducted so far had common drawbacks; among others, those estimates were free from economic models, and their specification errors were not avoidable. In other words, statistically significant estimates of the saving retention coefficient are not known yet. Taking a completely different approach



## **Abstract**

from earlier studies to elucidate FHP, I re-estimated the savings retention coefficient (called “beta”) indirectly based on the saddle-path dynamics of investment under convex adjustment cost based on Tobin’s q-theory. In order to avoid complications, I assumed that the domestic saving was exogenously given and that the error term of the regression model represented various shocks and effect of financial frictions. If domestic investment determined by the above investment theory were not equal to a given domestic savings, then international money flows through international financial market would work to partially offset this gap. In other words, estimated betas indicate the measurer of smoothness of this adjustment process. My main empirical results are: (1) Replication of the FHP in the 16 OECD countries during 1964-1974 yielded 0.52 as the estimate of the beta, which was much smaller than the estimate of Feldstein and Horioka (1980). (2) Estimates using samples for every 10 years during 1960-1999 exhibited that the beta decreased gradually. (3) During 2000-2008, the FHP temporarily disappeared and then the higher beta returned after 2008. The results clearly illustrate the degree of complete capital mobility in international financial markets over the past four decades.

**Sunday, 20 March 14:20-15:40 (Venue B (Verre))**

### **Environment, Resource and Energy**

Chair: Keiji Ujikawa (Yokohama National University)

#### **Alvaro Dominguez (Asian Growth Research Institute)**

##### **Detecting air pollution clusters in Japan: A spatial analysis approach**

We rely on satellite data to study the spatial distribution of air pollutants and economic activity for 1644 municipalities of all four main islands of Japan: Honshu, Kyushu, Hokkaido and Shikoku. Specifically, we analyze atmospheric particulate matter and ozone concentrations, as well as population density, accessibility to cities, and night lights for the above islands. We then make use of principal component analysis, spatial dependence analysis, and methods of regionalization to endogenously classify the municipalities based on their similarity in attributes and geographic location. The spatial dependence analysis provides results which show us the specific sites where the high-value clusters (hot spots) and low-value clusters (cold spots) are located. These show a high positive correlation between economic activity and air pollution. Additionally, we perform a regionalization analysis of the variables under consideration, which specifies how the four main islands can be regionalized into eight or nine geographical regions or structures, each. The regionalization takes into consideration both pollution levels and economic activity. We then conclude by discussing how these different analyses can complement each other, and how they contribute in finding the

## **Abstract**

locations where policies related to air quality can help in improving the quality of life of the population.

**Saiful Arefeen (Ritsumeikan University), Koji Shimada (Ritsumeikan University)**

### **Learning Curve on Solar PV: Policy Implications in Different Regions and Country Classes**

For more than a decade, solar photovoltaic (PV) has been regarded as the fastest-growing, ecologically and economically feasible energy source. It was discovered that capital expenditure is one of the most significant financial barriers to solar photovoltaic uptake. The capital cost of solar photovoltaic may be broken down into two parts: the 'module,' which converts sunshine to energy, and the 'other costs,' which include installation, inverter, labour, mount, cable, permitting, and grid connection. The cost-share in capital investment of solar photovoltaic installation has been observed a dramatic change recently. The module price has declined faster than the 'other cost'. While module costs are internationally priced and well-documented, 'other costs' is little known. Moreover, solar photovoltaics power's adoption can be determined by policy learning. Furthermore, each location or nation has unique cost elements as a result of industry, legislation, energy objectives, and the environment. Therefore, it is crucial for policymakers to know the rate of cost reduction in 'other cost (other than module pricing)' components of solar photovoltaic power by renewable policy (such as feed-in tariff vs without feed-in tariff), country class (developed vs developing), and geographical regions. To examine the learning curve coefficient, we used the Trappey et al.' (2016)'s learning curve approach and applied multiple econometric models such as fixed-effect and random-effect. The data will collect from various sources such as IEA, IRENA, and country reports. This study will aid the policymakers to focus on the appropriate policy interventions on cost structures, especially in developing and emerging countries, to penetrate solar photovoltaic power and promote clean energy worldwide.

Keywords: solar photovoltaic, learning curve, cost, energy policy, emerging country

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## Access

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# ACCESS

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"YOKOHAMA Station."

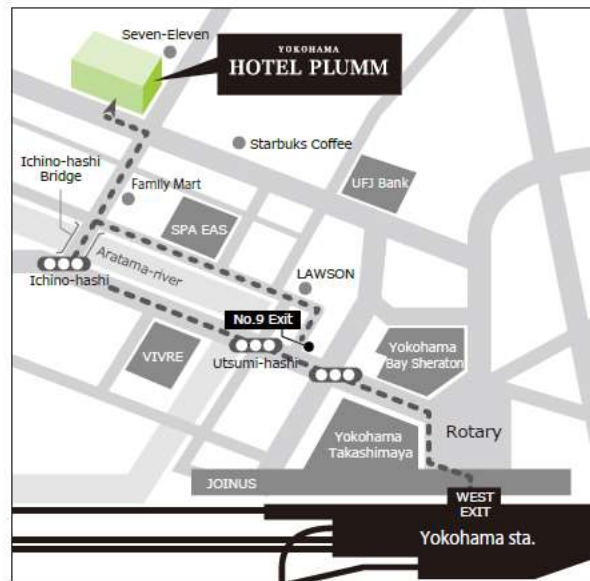
JR Line, Tokyu Line, Sotetsu Line, Keikyu Line, municipal subway

### Directions from the Yokohama Station

Leave Yokohama Station West Exit and turn left. Make a left turn at a corner of Takashimaya, and go straight on big street, and cross a right turn, the bridge with the third signal "Ichinohashi bright" and is HOTEL PLUMM at going straight, the second corner.

### Public transport

10 minutes by subway from JR shin-yokohama Station / 30 minutes by bus from Haneda Airport.  
1 hour 30 minutes by taxi from Narita Airport / 1 minute by car from the Yokohama West Exit lamp of the Metropolitan Expressway.  
30 minutes by car from Tomei Expressway Yokohama Machida Interchange.



PAPAIOS



**International Conference on Economic Structures 2022  
Hotel Plumm Yokohama, Japan, March 19-20, 2022**

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