

RIETI Special Discussion

Japan's New Capitalism and New Industrial Policy

RIETI Open BBL Webinar:
Global Intelligence Series

**Economic Security Policy as
Growth Strategy and
Recent Developments in Trade Rules**

What is RIETI Highlight?

RIETI's public relations magazine *RIETI Highlight* is published in Japanese on a quarterly basis, featuring RIETI's most recent activities with the objective of disseminating our research outcomes to a wider audience. This *RIETI Highlight Special Edition* is written in English and published annually as an overview of RIETI's undertakings for our international readers. We hope this Special Edition will be helpful not only in spreading information on our activities and research findings but also in deepening international readers' understanding of our mission as a leading Japanese policy think tank.

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- All titles and affiliations are as of the day of the event.
- Events and interviews are held online unless otherwise noted.
- Views expressed in this issue are solely those of the individual authors, and do not necessarily represent the views of RIETI.

RIETI Chairman Makoto Yano Elected as a New Member of the Japan Academy

RIETI Chairman Makoto Yano was elected as a new member of the Japan Academy at the 1154th General Meeting of the Japan Academy held on December 13, 2021. In selecting Dr. Yano, the Japan Academy described his major academic achievements as follows: “Dr. Yano has accumulated original and sophisticated theoretical research in the fields of international economics and dynamic general equilibrium theory. In particular, his ‘turnpike theorem’ on long-term equilibrium channels in the framework of the dynamic general equilibrium model, the most well-known neoclassical model, and his proof of global stability have been highly evaluated as a link between optimal growth theory and equilibrium dynamic theory. Furthermore, he developed the conventional neoclassical dynamic general equilibrium theory into a nonlinear dynamic theory in collaboration with Dr. Kazuo Nishimura and has greatly expanded the scope of endogenous business cycle theory. In addition, in the field of international economics, his original research on various policy issues of practical importance, such as the transfer paradox and the effects of voluntary export restrictions, has been widely recognized.”



Makoto Yano

Chairman, RIETI / Project Professor, Institute of Economic Research, Kyoto University / Professor by Special Appointment, Sophia University

RIETI Inaugurates New EBPM Center on April 1

Amid growing uncertainties caused by the climate crisis, geopolitical risks, and the pandemic, there is a need to re-design economic policy to include public-private partnerships for “Moon Shot” type large-scale advanced R&D initiatives, new institutional designs to create new markets and promote innovation, and measures to strengthen supply chain resilience.

In furtherance of effective change to meet these pressing needs, RIETI will inaugurate a new RIETI EBPM Center on April 1, 2022. In collaboration with domestic and overseas researchers and policymakers, the Center will strengthen retrospective policy assessments and develop new analytical tools to facilitate the prospective assessment of the economic effects of large-scale projects considered for implementation through public-private partnership, including, for example, decarbonization, and to propose the data design necessary to evaluate each potential project. Through these efforts, RIETI aims to evolve evidence-based policy making (EBPM) and to play a core role as a policy research institute that supports the advancement of economic and industrial policies through effective analysis and recommendations.

RIETI Faculty Fellow Takashi Unayama received 2021 NTJ Richard Musgrave Prize

David Cashin and Takashi Unayama’s paper “The Spending and Consumption Response to a VAT Rate Increase” (*National Tax Journal*, Vol. 74, No 2) won the 2021 NTJ Richard Musgrave Prize. The prize was established in 1999 and is presented each year to the author(s) of the best article published in the *National Tax Journal*.

<https://ntanet.org/awards/richard-musgrave-prize/>

The paper was written based on the following RIETI Discussion Paper:

“The Impact of Permanent Income Shock on Consumption: Evidence from Japan’s 2014 VAT Increase” (16-E-052)

<https://www.rieti.go.jp/en/publications/summary/16030069.html>



Takashi Unayama

Faculty Fellow, RIETI / Professor, Institute of Economic Research, Kyoto University

Japan's New Capitalism and New Industrial Policy

Speakers:



Richard Baldwin
Professor of International
Economics, Graduate
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Makoto Yano
Chairman, RIETI



Tetsuya Watanabe
Vice President,
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Japan's new capitalism and mission-oriented industrial policy has been formulated to cope with changing global supply chains and to drive economic growth. The policy places emphasis on economic growth and income distribution but needs to address risks from China's market transformation and climate change to succeed. Clear industrial targets for innovation must be based in high quality markets and on industrial inputs that are difficult to substitute. However, questions remain on how to interface with China in global trade and the degree to which government intervention may be necessary to combat climate change in sectors without current demand. Professor Richard Baldwin of Graduate Institute, Geneva, Makoto Yano, Chairman of RIETI, and Tetsuya Watanabe, Vice President of RIETI, met online to discuss the current issues.

Introduction

Tetsuya Watanabe: The supply chain disruption caused by the COVID-19 pandemic reminded us how integrated our supply chains are. It highlighted the supply chain risks for automakers in particular as the necessary procurement of automotive parts and components was disrupted. Furthermore, the disruption to supply chains revealed how little we know about our own global supply chains and their hidden risks, which have been impacted by the pandemic and geopolitical tensions. Decarbonization of the global supply chain is also a priority for decision making of business leaders. Products and services are in the end being selected by consumers and citizens around the globe who have become very sensitive about the carbon footprint throughout the supply chain. Geopolitical tensions and the increased importance of addressing economic security concerns required us to take a coordinated approach among like-minded countries, but at the same time we need to strengthen the rule-based global and regional economic order and upgrade the free trade system to avoid fragmentation of supply chains. Digital technologies change the supply chain dramatically, and how governments and private sectors can transform themselves in the data age is a huge challenge in every country.

The NBER (National Bureau of Economic Research) working paper, "Risks and Global Supply Chains: What We Know and What We Need to Know," authored by one of our speakers, Professor Richard Baldwin, and Dr. Rebecca Freeman of the Bank of England, identifies the risks to and from global supply chains, how global supply chains have recovered from past shocks, and

proposes a risk-versus-reward framework to evaluate whether risk policies are justified. Professor Baldwin and Dr. Freeman also discussed how exposures to foreign shocks are measured and considered the future of global supply chains in light of the current policy environment.

Heightened supply chain risk requires individual companies to respond to new risks by balancing the costs and risks of relying on global supply chains. But at the same time, the increasing uncertainty of global supply chains necessitates that governments also react to new risks and challenges.

In this new environment, new thinking on capitalism emerged in Europe, the U.S., and elsewhere. And in Japan, too, Prime Minister Fumio Kishida announced new capitalism as the main pillar of his economic policy. I first invite Chairman Yano to share his perspective on the new capitalism and mission-oriented industrial policy, then Professor Baldwin will share his perspective, followed by a discussion.

The need for a new capitalism

Makoto Yano: Recently, Prime Minister Kishida has proposed what he calls new capitalism as the basis of his policy agenda. By doing so, he emphasizes the importance of income distribution.

His initiative advocates the creation of a "good loop" of economic growth and income distribution. That is, he aims to end wage stagnation and, by doing so, to revitalize the Japanese economy. Mr. Kishida advocates controlling large corporations' dominant market power over smaller companies, from which they purchase intermediate goods and services at low prices, as is the

traditional Japanese business style. I agree with the premise of this policy. The policy aims to expand middle-income families and to increase population.

To realize this, the government is to subsidize education and housing and assist in childcare, for example, by increasing the number of nursery schools. This in particular has been noted as a problem because the small number of nursery schools is preventing women from both entering the workforce and remaining at work. Moreover, Prime Minister Kishida advocates increasing wages for essential workers, particularly those in nursing, elderly care, and childcare. This is partly because of the issues revealed during the current COVID-19 situation, but, of course, the need for wage increases in nursing services and elderly care was evident even before the pandemic.

Compared to the U.S., Japan's wages in nursing and elderly care are low. Recently, the BBC has reported that the Japanese average wage has been stagnant for over three decades, whereas wage rates have generally increased in many countries such as Germany, France, the UK, the U.S., and South Korea. However, this is partly a reflection of Japan's GDP as a whole, which has also not seen much growth.

I think that the administration perceives that by raising wages, it will create additional economic progress and economic growth.

Past industrial policy and new targets

METI is now advocating a “moonshot.” This is a part of the new industrial policy, which aims to make policy more target-orientated, or, you might say, mission-oriented. It differs from the old Japanese-style industrial policy, which set targets that had already been tested in more advanced economies at that time. Examples are electric appliances, cars and so on, the importance of which were obvious. This is in a sense similar to the current Chinese economic policies, although some of them are already more advanced than Japanese counterparts at this moment.

In the late 1980s, Japan switched from the old industrial policy to structural reform and is now thinking of adopting a new style of industrial policy, which aims at targets that are untested and unknown. When a country is trying to catch up to more advanced economies, it is not difficult to decide what sort of technologies it should adopt. Once an economy achieves the top technological level, however, it is very difficult to determine what technologies to focus on; at that point, the economy falls into a state of confusion. Falling into such a state of confusion is unfortunately nearly inevitable for any country that stands at the front line of technological development. For about three decades since the 1960s, the U.S. was in that state. For the last three decades, Japan has been in a similar state of confusion. For Japan to get out of this state, it is very important to seek a new approach to industrial policy, promoting the development of brand new technologies in the world; this is how the U.S. managed to get out of its technological stagnation, by developing new technologies that now

lead the world's industries, including spaceships, computers, and the internet. I believe that it is a very good time for METI to create new industrial policy seeking the development of new technologies in this drastically changing world.

METI identified three stages of industrial policy since the 1950s. METI states that the goal of the first stage industrial policy was to develop specific industries, and the underlying economic theory was to deal with market failure or infant industry protection. The innovation policy was more focused on application and catching up to the developed countries' models and manufacturing in the past, and the promotion of manufacturing was a very important part. And during the second-stage structural reform period, Japan wanted to reform the market infrastructure. METI wanted to make a market-oriented economic policy and to deal with the government failings with an innovation policy focused on attaining more basic scientific knowledge.

Japan shifted away from manufacturing during the second stage, and I have thought that this was the correct approach. During this stage, unfortunately, Japan has weakened its technological edge. I believe that this has prompted METI's current initiative.

Figure: New Industrial Policy: Contents

	Stage 1 Conventional Industrial Policy	Stage 2 Structural Reform	Stage 3 New Industrial Policy
Goal	Development of Specific Industries	Reform of Market Infrastructure	Mission-Oriented Problem Solving
Underlying Theory	Market Failure Infant Industry Protection	Market-Oriented Government Failure	Coping with Uncertainty Market Creation Government's Failure to Act
Innovation Policy	Application Catching-up	Basic Policy-Oriented	Moonshot-type Innovation
Manufacturing	Promotion of Manufacturing Industry	Shifting Away from Manufacturing	Digital Transformation Creation/Maintenance of Supply Chain/Value Chain

METI now wants to lead moonshot-type innovations. It wants to digitalize the industry as a whole and create or maintain new supply chains for the new digitalized economy. This new industrial policy is very similar to what Professor Richard Baldwin has emphasized during his past presentations at RIETI, discussing uncertainties of market creation, targeted innovation, digital transformation, and supply chain creation and maintenance. I agree with Professor Baldwin on the importance of pushing these issues. At the same time, however, there is a huge difference between where Japan is and where Europe and the U.S. are. The idea of this new industrial policy remains a broad concept in Japan, but its success is not guaranteed if Japan simply follows the U.S. or European models from the past or present.

The current targets being emphasized by the Japanese government are green technology, resiliency and sustainability, digital transformation, and income distribution. Currently, Japan wants to bring Taiwan Semiconductor Manufacturing Company (TSMC) to Japan and further their technology to develop logic chip production capabilities.

I believe that it is important to set up a grand design and

philosophy that supports these initiatives. For instance, John F. Kennedy's moonshot encompassed not just scientific knowledge but also commercial policy and targets, as well as military and national prestige. Clearly, market-oriented goal-setting was pursued during that period. It is also clear from the development of the internet and computer technology that a clearly-defined, market-oriented vision of the unfolding of these networks was evident from the beginning stages of the development of these technologies. Before launching the new industrial policy, we need to develop this type of clear vision on how the policy will use technology and what should be developed to enable such a vision of the future.

Quality markets and industrial transfer

Society has seen great changes in technologies, such as with the adoption of personal computers, spaceships, smartphones, and e-commerce. The recent commercialization of space travel came as a real surprise to me. Behind such transformations, there are high quality markets, which are prerequisites for such developments. It is these well-organized, high-quality markets that laid the foundation for personal computers, spaceships, smartphones, and e-commerce, and that is what Japan lacks. This is in part due to the fact that what Japan is trying to develop is totally unknown, and it's unlike past transformations in industry. To develop such unknown technologies requires good markets. A market connects technologies to people's lives. A market is a kind of dual-directional pipe where products go from technologies and resources to everyday life. Information or people's needs are connected through this pipe to technological development. Market quality can be seen as the quality of said pipe and the transfer of information through the pipe, given available technologies and consumer preferences. If the pipe is well developed, you can create a good loop between the production side and the consumption side of the economy. Currently, I believe that Japan does not have a good pipe connecting these two factors.

I think that the target of such a policy should be something that is difficult to achieve, like the moonshot or similar goals. It will take about 30 years from when the ideas for the technology are being developed until actual commercial use of such technologies. Space rockets, for example, took about 60 or 70 years to reach commercialization. To make commercial use of those advanced technologies, it is important to develop high-quality markets.

To make new technologies compatible to the market, I think that innovation must be needs-driven. Income distribution is particularly difficult to pinpoint as many and various opinions exist on the subject. Therefore, a good market is essential to achieving such targets. Japanese industrial policy is still a borrowed concept from Europe and the U.S. European economies went through reforms successfully in the 1980s and 1990s. They created very strong infrastructure, which seeded new technologies that allowed them to become commercial leaders three decades later.

Macro goals and micro goals

Richard Baldwin: I would like to begin by differentiating between macro goals and micro goals. The idea of inequality leading to stimulation of demand, which leads to stimulation and growth could be a macro goal. Nevertheless, on the micro side of new industrial policy, education, housing, and childcare all seem to be very clear in that they may boost productive capacity of an economy. For example, there is value for the country in having an educated society which is greater than the value for the individual. Therefore, education subsidies are a very good thing. Housing is another area where policy can have an impact because housing stock moves more slowly than demand for housing. Moreover, childcare is another area where policy can be effectual because if the capacity for childcare were larger, or there was easier access to it, more women would utilize it and plan for that possibility.

There are, however, distinctions between the new economic policy and the former ones. I agree that the old industrial policy was, indeed, based on the need to 'catch up,' so to speak, and it was easier to visualize that Japan needed industry development in steel, automotive, electronics, cement, chemicals, pharmaceuticals, etc. In the 1980s, Europe and the U.S. were moving toward price-oriented policies and limited government. Japan followed suit with excellent growth. However, it became evident that catch-up growth and steady growth are not the same, eventually reducing the attractiveness of that policy option.

Responding to the rise of China

For the new industrial policy, areas where there are targets that industry cannot cope with by themselves would be key. Another factor that affects the situation is the rise of China. Its industrialization progressed at a rapid rate in the span of about two decades. During this industrialization, it imported from industrial intermediaries such as Japan, Germany, and the U.S. However, since around 2006, its trade-GDP ratio began declining as it imported less. It began substituting domestic production from its domestic industrial base in place of previously imported high-tech intermediates. Those previous exports to China are now fading, and it will not revert course because China's trade-GDP ratio is converging to that of a large economy, like the U.S. or the EU. The implication of this is that the policy that worked for the last 20 years will no longer be effectual. Moreover, there are U.S.-China geostrategic tensions leading to industrial disruptions, which have been driven by political factors. One example of this is the disruption in semiconductors. The sitting administrations in the U.S. and China will dictate how aggressive these tensions will become, but in the U.S., neither major political party is interested in a cooperative approach with China. In China, President Xi is focusing on internal markets and developing their industrial base. These changes have fundamentally ended the status quo that has existed for the last 20 years.

It is clear that there is a need to assess these trends, especially

keeping an eye on what demand patterns for exports will evolve into in the face of diminishing demand from China. Companies surely have talented people working on what those targets should be, but it may require reorientation of production or concentration that would be better directed at the government policy level, so relevant targets necessarily incorporate this perspective. Policy targets must address areas where collective action is more effective than individual action in reorienting the economy as a whole.

Industrial response to climate change

The challenges of climate change, or as I like to call it, the climate rescue, are great. There will be a few decades in which to rescue ourselves from the damage that has been done and continues to be created. Actions for the mitigation of emissions and adaptation to changes that are already happening will have serious implications for demand for manufacturing goods worldwide. This is a point that has already been made by many commentators. It is a very large transformation that many companies are undertaking. However, in some technologies, there are bottlenecks or coordination failures or externalities that can impact such transformation. One example of such a bottleneck is the adoption of electric vehicles. While policy makers can help prompt demand, companies like Tesla have solved the issue of adoption of electric vehicle technology by organizing the whole supply chain. However, electronic vehicles are a relatively simple technology even compared to diesel or gasoline cars, and the supply chains are simple. Even for gasoline vehicles a moonshot was not necessary. However, it seems to me that hydrogen technology, carbon capture and other mitigating technologies require a more systematic push for development. The demand does not exist yet and so, here, government may be impactful. If such climate mitigating technologies do come to fruition, it seems that only a small number of companies and countries will develop the technology, but it will need to be deployed everywhere in the world. This is a massive reorientation of demand for high-tech manufacturing, which is where the G7 countries are still global leaders. That being said, such technologies will have demand for decades into this century, even if only for domestic use.

Other areas of change will be adaptation to extreme weather, including creation of sea walls, irrigation systems, moving cities, heat resistant agriculture, and so on. Precision irrigation and industrial agricultural equipment for planting that requires less water, less fertilizer, and less pesticide are other examples of super-high technology that will be in demand around the world during this period of rapid climate change. However, incentives for industry such as in agriculture may be required in Japan. Another area of adaptation of markets will be in water treatment and water production. Fresh water is already a critical issue for many regions, and desalination, water recycling, and rain capture are examples of high-tech or medium-tech engineering and scientific solutions—the demand for which will also increase with climate change. It is clear that there is room for a micro-level industrial policy that might help

avoid coordination problems and overcome certain externalities.

Potential targets

Determining appropriate targets for the new industrial policy is particularly difficult because industrial policy tends to be captured by industry. Industry has more knowledge about the technology in question than the government will ever be able to inform themselves about in a policy-relevant timeframe, but it may have differing incentives compared to other stakeholders, and so targets should be general but clear. Therefore, targets that address adapting to climate change and the changing manufacturing patterns in China are high-level enough that they should find significant public support and be implementable.

In terms of an intermediate timeframe, the rapid deterioration of the U.S.-China relationship and trade disruptive policies do justify industrial policies that safeguard key components. The idea of certain sectors that are critical to many surrounding sectors is something that policy should embrace again. The first criterion for this determination is the question of how complementary these inputs are to other industrial inputs. In the 1950s, Europe focused on coal and steel, forming trade communities for better coordination. Later, atomic energy was added, and these sectors became linchpins for other sectors. Semiconductors are similar in that regard, and this has been made clear during recent supply chain disruptions. For instance, it was not common knowledge that the automotive industry would be so heavily impacted by supply chain disruption in semiconductors. The inability to substitute such an input is another key criterion in determining an appropriate target, which, in turn, is also related to how difficult or time-consuming it may be to establish a similar infrastructure if the supply is lost. Here again, semiconductors are a good example. Taiwan has facilities at an advanced technical level that others may find challenging to replicate. In the medium term, as Japan, Europe, and the U.S. pivot to semiconductors, there may be a surplus of supply, leading some to characterize the current shift as a mistake. However, the degree to which they are necessary seems to outweigh any such criticism. The importance of securing domestic supply is now clear. Another industry that may face overcorrection, due to COVID-19, is the production of medical equipment and vaccine production. This may lead to waste but likewise it may be important to secure domestic infrastructures and supply.

Discussion

The role of government in target industries

Yano: You mentioned that industrial experts are more knowledgeable than the government in technology. However, you also mentioned the large role that government could have in an industry such as semiconductors. What is your take on these two

positions?

Baldwin: In my understanding, there is a part of the production in industry that is very cyclical where a new product, such as a memory chip, is designed: it starts as very expensive, but it becomes cheaper as production techniques are improved. Then more chips hit the market. This is an undersupply and oversupply situation. We are seeing a situation like this currently where the private industry is reluctant to invest due to this cyclical supply-demand structure, so government policy could be a kind of insurance to keep production going even when it may not be so profitable. Other industries such as education and healthcare also involve a government element because some parts of these industries are not profitable enough for private industry to maintain interest, despite societal demand for them.

So, such a target industry would have a lack of substitutable inputs, very long lead times, and a cyclical nature. These elements would make it difficult for the industry to cover all costs. It is in situations like this that I think that if there are very clear reasons for public investment, there could be public and private return from such investment.

In Europe, Airbus was one such case. Airbus could not enter the market as a private company because Boeing and McDonnell Douglas were already producing jets: a private company could not justify the risks involved in such a massive investment. I think that this public-private wedge that was used for Airbus can similarly be a justification for investment in semiconductors.

Yano: Currently, in the semiconductor industry, Intel is completely private, however, the Taiwan authority is involved in TSMC and this involvement has led to a different form of industry. TSMC has accumulated technologies and development over time that are more diverse than other players. What is it particularly about semiconductors that means that the private sector cannot catch up by themselves?

Baldwin: Here we are talking about getting a new production site or a new company producing the good. In some cases, this may require continued support but in other cases it may not. Airbus is now a profitable company and does not require support. Intel is also a profitable company, but it grew during the personal computer boom and was entangled with the growth of the Windows operating system. There are many products that were designed around—and in cooperation with—these chips, so the technology is self-sustaining at this point. It seems the Korean and Taiwanese semiconductor industries were influenced by government policy at one point but perhaps do not need it now. However, as I understand it, Japan is interested in manufacturing chips that do not currently exist, and for this, massive support from the government will be needed over many years. There is more of a need to establish the industry domestically, specifically due to U.S.-China tension, which has made trade between these states no longer free or guaranteed.

I understand and agree with your suggestion that permanent

subsidization should only be used in extraordinary cases.

Healthcare, education, roads, judiciary, police, fire brigades are all examples of areas that require permanent subsidies because of the gap between public and private. In other cases, there should be termination clauses if subsidization of an industry is going to work, that are based upon the evaluation of costs and benefits for society. So, it is also important to distinguish between startup help and permanent help.

There was also a case in the U.S. where massive government support was given to a semiconductor company to establish a cutting-edge manufacturing base, but eventually only a warehouse was built in Wisconsin. So private companies must also be forced to uphold agreements that they make. It is not just a case of injecting funds.

Watanabe: You mentioned that coordination in some cases may justify government industrial policy intervention regarding the rise of China and climate change issues. You also mentioned the need for the coordination among like-minded countries. Could you explain what you mean by increased coordination that may be necessary, due to the changes in demand resulting from China's new trade balance?

Baldwin: The argument is for requiring the least amount of government intervention. One example is evident in trains, heavy earth moving equipment, or big, advanced cranes, and construction equipment etc. that were being imported from Japan, Germany, or the U.S. when China was in its fast industrialization phase, say from the 1990s to 2010. The demand for all this equipment coming in was large enough to distort the world market. However, now, for example, China has their own construction equipment produced locally, so the demand for high-tech capital goods and high-tech intermediate inputs is moving. Maybe industry can adapt fast enough to this change, but there is a real possibility that this change is large and systemic. So, there may be a need for coordination among G7 manufacturers to realize that the Chinese market is not coming back and is orienting itself toward other areas. It may well be that the private sector has sufficient incentives to do that. However, the manufacturing of this equipment takes many companies—and perhaps the government could help in coordination of the supply chain between nations, and so on. However, the changing patterns for sophisticated and manufactured goods are nowhere near as strong as the shifting patterns for semiconductors.

Use of nuclear energy in achieving decarbonization goals

Yano: Regarding the considerations on nuclear energy, France and the European Union announced that nuclear is one way of coping with global warming and that nuclear will remain in the picture. What is your opinion on this technology?

Baldwin: In the German case, the then Chancellor, Angela Merkel, decided to phase out all nuclear energy after the Great East Japan

Earthquake and tsunami. I understand the concern for nuclear waste in the long term. However, there does not seem to be enough time to change to other sustainable technology. Nuclear energy is very low carbon and although it brings other problems and vulnerabilities, there may not be enough time before 2030 or 2050 to control carbon emissions without it. It may be the lesser of two evils right now. Japan, however, is a different case because it is geologically active, so the seismic activity might make it less attractive as an option. France, on the other hand, has been using nuclear power for a long time which has helped them adjust to climate goals. I think, in terms of combating climate change, we should use all of the tools that we have. Nuclear (energy) is a tool that has a long-run costs but short-run benefits.

Ensuring the interface with state capitalism

Yano: Some say that China is no longer a viable trading partner for the U.S., Europe, and Japan. Is that your view as well?

Baldwin: I would not take that view. That being said, I think that China's trading pattern is changing to that of a normal, mega-economy but that this change is not widely understood to be part of a permanent transition. The new equilibrium that we have arrived at will remain. The problem is the interface between China's type of capitalism and others, such as the capitalism in Europe, Japan, and the U.S. Over time, Europe, Japan, and the U.S. have come to terms with certain ways of interfacing with each other. Europe has a different capitalist system than the U.S. including the preventative principle, regulation, and social goals. Furthermore, Japan and the U.S. faced a great deal of conflict during the late 1980s and early 1990s until an interface was worked out. We must now find an appropriate interface for China. They will not change, and we will not change. I am optimistic that we will find an interface that works because there is so much money to be made in finding it; it could be so disruptive. China produces intermediate inputs that are used widely in manufactured goods, and these are pervasive throughout the world's value chains, to a degree that most people still do not comprehend. Therefore, if you buy a good from Canada, the EU, etc., many inputs are likely made in China. So, it will be very expensive and difficult to separate Chinese manufacturing especially for intermediate inputs, and there will be an imperative to find a way to cooperate. A main issue is with industrial subsidies.

One example of such cooperation is the U.S. and European aircraft industry, with military interest on the U.S. side and Airbus on the other. To clarify, China is undergoing permanent change led by one administration, and this is not a transitory action. China has become like Germany, a manufacturing powerhouse exporting and making industrial parts themselves. In the medium term, U.S.-China tensions make reliance on China risky, and this type of risk is difficult to plan for, due to the escalations that are possible in such a situation. An example of this risky nature is the reactions during the Trump administration leading to heightened tensions.

Yano: While the U.S.-Japan relationship had tensions during the 1980s, one factor that is different with China is the size of its economy. Japan is smaller than the U.S. in every way. China, on the other hand, is huge, both in terms of population, land, and market potential. It is entangling political and economic powers at the same time. This is a new model for U.S., Europe, and Japan to cope with. China's population is far larger than the U.S., Europe and Japan combined, and they may become even more powerful.

Baldwin: It is never possible to separate economics from politics at that level. China has been successful at industrializing and has driven some U.S. industries out of business. However, U.S. industry as a whole is not suffering in terms of production or exports. It is adapting. The domestic market effects are leading to popular backlash against China. There are also political exploitations of the tensions to get votes. However, it may not be possible to separate these elements. Solving the issue of the integration of China into the world system is a difficult problem that I cannot address. However, we should deal with elements such as forced technological transfers, subsidies, and the purchase of overseas companies. These elements are leading to changes in competitiveness at a product and firm level which are viewed as unfair. For instance, in commercial aircraft there was an agreement between the U.S. and Europe about how much financing could be given. This resulted in a series of industrial sector-level agreements and subsidy practices. Thus, there is a set of practical things that can be done on a commercial level that can solve some problems. It may be difficult to say if this will solve the larger problems, but they are not really for economists to solve.

These issues are bilateral or plurilateral issues and not within the purview of the WTO, so they will have to be addressed as such. So, my suggestion would be for METI and other economists to focus on allegations of unfair trade and commercial tensions. These kinds of discussions occur regularly between Europe, Japan, Korea, and the U.S., but the way those subsidies and policies work in China is different. The old tools like countervailing duties may not be sufficient, so that is where we should focus the dealings.

Watanabe: Richard touched upon a very important point by focusing on the need of interface with the state capitalism. Of course, we need to address economic security concerns and take a coordinated approach among like-minded countries, but at the same time our economies are so interdependent that we cannot decouple the global economy. In this regard, we have to bridge the different types of capitalisms and create an interface with their state capitalism. We have some tools in our toolbox already such as rules on industrial subsidies, government procurement, etc. By upgrading these toolkits, we can upgrade and strengthen the free trading system and rule-based global and regional economic order. That is the very important point we should not lose sight of, and that is where Japan and other middle-power countries caught in the middle of the superpower competition should play a role. Thank you.

RIETI COVID-19 Initiatives



Masayuki Morikawa

President and CRO, RIETI

Response of economic researchers to the COVID-19 pandemic

The COVID-19 pandemic has been a peculiar shock from a historical perspective. Despite the development and availability of vaccines and therapeutic drugs, a light at the end of the tunnel is still not visible. The year 2022 will likely also be one when we have to live with the virus.

This pandemic has been characterized by (1) a trade-off between health and economic activity, (2) heterogeneous impact by industry, and (3) the extremely heightened uncertainty. To mitigate the spread of infections, measures that restrict people's movements and requests to stay at home have suppressed economic activity, at least in the short run, and ordinary economic policies to stimulate the economy have ended up increasing the number of people infected. Global economic crises and other past shocks have had a considerable impact on manufacturing, but the COVID-19 pandemic has seriously affected the service industry where person-to-person contact is essential. Moreover, the COVID-19 pandemic has generated unparalleled uncertainty about the future.

Economists around the world are actively tackling these new issues. In the field of economics, there has been a cumulative increase in the number of research papers on the subject of COVID-19 and many academic journals have produced special issues. Japan is no exception to this trend. The Japanese Economic Association set up a special webpage for COVID-19 pandemic research. The Association's journal, *Japanese Economic Review*, has twice released special issues.

RIETI also has made a concerted effort to promote research relating to COVID-19 in its Fifth Medium-term Plan, which began in April 2020. At the time this article was penned, roughly 60 discussion papers have been published, and approximately 20 research papers have already been peer-reviewed and published or are scheduled to be published in academic journals.¹

Because real-time analysis and information unobtainable from government statistics are necessary, much research has been conducted using stock prices, POS data, mobile phone tracking data, and other types of high-frequency data as well as research based on original surveys of companies and individuals. The specific topics analyzed have ranged broadly. A provisional attempt at categorization of the topics might produce the following categories: (1) factors and countermeasures relating to infection spread, (2) impact on consumption and the macro-economy, (3) impact on industries and companies, and (4) impact on the labor market (see Figure 1).

RIETI COVID-19-related research

First, representative examples of research focusing on the pandemic have employed simulations incorporating economic models into epidemiological models (RIETI Discussion Paper 20-E-089, 21-E-004, 21-E-009).² The topics that have been analyzed have included the impact that social distancing measures, mobility restrictions, and vaccinations have had on infections and economic activity. In addition, research has also been conducted that is based upon original surveys of individuals, and which offers suggestions for effective methods of increasing vaccinations (21-J-007, 21-J-023, 21-J-026, 21-P-017). These have also been referenced by the government in the policymaking process.

Second, research relating to consumption and the macro-economy includes a survey of households on the effect that the pandemic and shelter-in-place measures have had in deterring people from engaging in consumption (20-P-020), analysis employing POS data indicating weekly changes in consumption behavior (20-J-037) and estimates of the effect of the Special Cash Payments provided to all households in 2020 on consumption (21-E-043). These papers have revealed empirically that, while consumption for cosmetics and eating out decreased

as COVID-19 spread, “nesting consumption” increased. The structure of composition significantly changed and the marginal propensity to consume was low for uniform cash payments provided to the public. Recently, analysis has also begun on the effect of vaccination on consumer behavior (21-E-079).

Third, most of RIETI’s COVID-19-related research papers have concerned the pandemic’s effect on industries and companies. Stock price data offer high utility enabling a quick understanding of the impact that the shock has had on industry and companies. Beginning early on, research has been conducted using such data (20-E-061, 20-E-068, 20-E-088). Based upon original survey data, research measuring the uncertainty firms face (20-E-081, 21-E-042) suggested an increase in uncertainty among firms maintaining trade relations with China during the initial stage of the pandemic, and that the COVID-19 pandemic has been strongly characterized as a greater uncertainty shock than the Global Financial Crisis. There has also been much research employing simulations and ex-post assessments of shock propagation (20-E-037, 21-E-001, 21-J-010, 21-E-014, 21-J-031) that has revealed how the impact extended across regions and countries via the supply chain. While the COVID-19 shock has had a severe negative impact on accommodations, dining services, and passenger transportation industries, there have also been industries that were positively affected as a result of “nesting consumption,” such as electrical and machine manufacturing, information services, and online retail. Research simulating the exit of firms during the COVID-19 pandemic (20-E-065) indicated sizable heterogeneity, varying by industry and region, and that enormous subsidies are needed to prevent firms from exiting. Research has also been conducted that used original surveys of companies to reveal the characteristics of companies which have taken advantage of the assistance provided by government relief measures (21-P-006, 21-J-029). Making use of market mechanisms is important in selection of companies to facilitate post-COVID-19 economic growth, and research on these mechanisms will provide suggestions for desirable government policies.

Fourth, there has also been much research looking at the pandemic’s effect on the labor market. Research analyzing the characteristics of workers who have been severely impacted (20-E-039, 20-E-064) has shown that the COVID-19 pandemic has dealt a heavy blow to non-standard workers, small-scale self-employed, and low-income earners, and that this has widened economic disparity. Also, a noticeable change in the labor market during the COVID-19 pandemic has been the rapid expansion in employees working from home, which much research has addressed (20-E-073, 21-E-002, 21-E-024, 21-E-063, 21-E-078). While the increase in working from home has mitigated the effects of the COVID-19 shock on employment and corporate

performance, the feasibility of working from home varies greatly depending upon industry and occupation. This research revealed a trend of this practice increasing the disparity in the labor market. It has also found that average productivity when working from home is lower than when working at the usual workplace.

Prospects and Challenges

Much research is also currently underway, including research integrating the social and natural sciences, such as a study on antibody testing, which is being jointly conducted with the Kyoto University Graduate School of Medicine and the Pasteur Institute in France. The results are expected to be promising. Ex-post evaluations of the variety of relief policies extended to individuals and companies, to which huge budgets have been committed during the COVID-19 pandemic, present future issues of high priority from the perspective of evidence-based policy making (EBPM). As mentioned earlier, analysis has already been conducted on the effect of the Special Cash Payments, but empirical analyses are still lagging on the effects and side-effects of government financial institutions’ cash flow assistance, benefits to small- and medium-sized enterprises, employment adjustment subsidies, tourism demand promotion measures (Go To Travel), and other policies. RIETI will continue to actively pursue research related to COVID-19 in 2022 in order to shed light on possible changes in the economic structure after COVID-19.

Footnotes

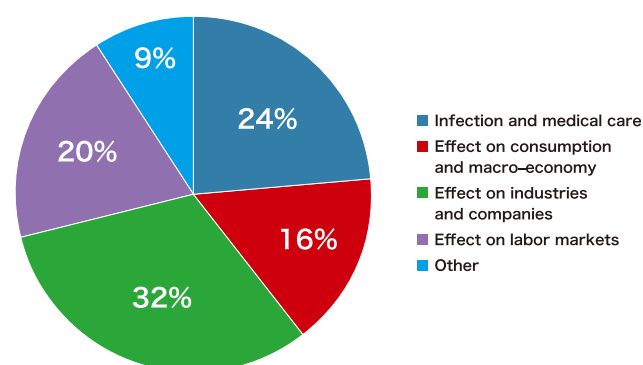
1 In addition to these, several books have also been published: Kobayashi, Keiichiro and Masayuki Morikawa (Eds.) (2020), *Economics of the COVID-19 Pandemic*, Nikkei Business Publications, and Miyagawa, Tsutomu (Ed.) (2021), *Economics of the COVID-19 Shock*, Chuokeizai-Sha.

2 These numbers are the numbers assigned to the RIETI Discussion Papers (the same applies hereinafter).

*The discussion papers referred to in the text are easily accessible from the online version of this column: https://www.rieti.go.jp/en/columns/s22_0005.html



Figure 1: Overview of RIETI COVID-19-related paper topics



Note: As of December 2021.

RIETI Open BBL Webinar: Global Intelligence Series

Economic Security Policy as Growth Strategy and Recent Developments in Trade Rules

Date: September 6, 2021

Speaker: **Jun Kazeki**

(Director-General, Trade Control Department, Trade and Economic Cooperation Bureau/ Director-General, Economic Security Policy, Minister's Secretariat, Ministry of Economy, Trade and Industry (METI))

Commentator: **Tsuyoshi Kawase**

(Faculty Fellow, RIETI / Professor, Faculty of Law, Sophia University)

Commentator: **Kazuto Suzuki**

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



The Government of Japan expands on its view of economic security policy as a growth strategy and its holistic approach to protect critical technology in response to rapid changes in technological innovation and shifting geopolitics. Japan's Ministry of Economy, Trade and Industry (METI) is engaged in a review of its export control policy and shares recent developments in trade rules and the use of anti-dumping and countervailing duties, and challenges and opportunities therein.

Economic security policy as a growth strategy

The basis of national security is rapidly expanding into the economic and technological fields due to technological innovation and geopolitical changes. Vulnerabilities in supply chains are becoming clear due to COVID-19 and other disruptive challenges. In this respect, the Japanese government recently states in its growth strategy that it will strengthen and promote economic security policy. Japan intends to secure autonomy and gain superiority, as well as deepen cooperation with like-minded countries and establish an international order based on fundamental values and rules. Japan will strengthen its effort to know, protect and promote critical technologies via a holistic, whole-of-government approach.

While the economic security policy is a new focus, free and fair trade remains an essential part of government policy. In fact, the most recent government-wide documents emphasize that the Japanese government will expand free and fair economic order and further strengthen the rules-based multilateral trading system to build a resilient supply chain and to actively develop the global economy in light of challenges such as climate change and the digital economy. In addition to rulemaking in such challenging areas, enforcement is important in tackling unfair trade practices, including those that may lead to overcapacity in certain sectors in the global economy.

“Know, protect and promote”

Japan has adopted a holistic approach to protecting critical technology, namely “know, protect and promote.” “Know” means to identify chokepoints in global supply chains with multiple suppliers. “Protect” means to prevent diversified technology

acquisition activities. “Promote” is research and development (R&D) promotion in critical technology fields, as highlighted in the Integrated Innovation Strategy of 2020, through which the government made intensive efforts to materialize and define government policy in more granular detail.

Foundation of economic security

Economic security is characterized as a key policy in three government-wide strategies, namely the Action Plan of the Growth Strategy, the Basic Policy on Economic and Fiscal Management and Reform of 2021, and the Integrated Innovation Strategy of 2021. These three documents stipulate the allocation of human and other resources in the Japanese government through which Japan will accelerate its economic security policy, including export controls.

Within the Japanese government's Action Plan of the Growth Strategy, I would like to highlight Chapter 6: Ensuring Economic Security and Concentrated Investment. It places critical importance on the assurance of technological supremacy. To achieve this, the strategy highlights the need to develop critical technologies in sectors such as aerospace, quantum, artificial intelligence, high performance computing, semiconductors, nuclear, advanced materials, biotechnology, and marine technologies.

Furthermore, it mentions protecting critical technologies, such as through a novel export control framework and export controls. It also focuses on investment screening enforcement, immigration screening policy for foreign students and researchers, research integrity, and a secret patent system. Thus, it promotes both a policy of protection and a policy of promotion. Moreover, the government strategy highlights building resilient supply chains for critical



technologies and materials in four critical sectors: semiconductors, pharmaceutical products, batteries, and critical minerals.

In addition, the Government of Japan intends to newly establish a funding mechanism for economic security, promote advanced semiconductor and battery technologies and attract manufacturing facilities of critical industries to Japan, in order to strengthen its supply chain resilience.

These factors are identical to those mentioned in the U.S.'s 100-Day Supply Chain Report, the European Union's Open Strategic Autonomy, and China's emphasis on the importance of supply chain resilience in order to reduce its dependency on other countries while simultaneously increasing the dependency on China by other countries in critical sectors. As such, it is evident that major economies are promoting these protection policies and promotion policies emphasizing supply chain resilience.

Export control regimes

There are two important areas of export control to consider. The first is the challenges of existing export control regimes and possible solutions. Japan's export controls are in accordance with international regimes, such as the Wassenaar Arrangement and the Nuclear Suppliers Group, but limitations exist. Under such frameworks as the Wassenaar Arrangement, the immediate needs to address emerging technologies are undermined by a deficiency in consensus process among the 42 member countries. Export control requires quick consensus, but that is often difficult.

Additionally, unilateral measures are problematic. During the recent trade conflict, the U.S. issued a number of unilateral measures, namely, the foreign direct product rules on semiconductors or some additions to the entity list, which had a number of impacts on industries. In response, China also introduced a number of measures including the newly entered into force Export Control Laws, anti-extraterritorial application law and the anti-sanction laws. This sort of escalation of unilateral measures by two major economies is detrimental to business predictability.

In addition, unilateral measures are not effective as they cannot deter the exports of equivalent items from other countries due to loopholes. Therefore, the Government of Japan seeks a solution through the promotion of the like-minded countries approach, seeking to form a novel export control group complementary to existing international regimes, in order to achieve more effective export control and also avoid any escalation of unilateral measures.

The second important area of export control is the review of deemed export controls. The approach firstly addresses appropriate controls on intangible technology transfer, which is foundational for both national security and innovation in companies, universities, and institutions. This includes such intangible technologies as design program software or algorithms.

The Government of Japan is also to review and expand the scope of control to include residents who are influenced by foreign countries. Under current rules, Japanese nationals and foreigners

staying in Japan for more than six months are exempted from the intangible technology transfer controls. As a response to this situation, the Government of Japan seeks to protect critical technologies at an early stage in these transactions, and a cabinet-backed proposal to do so is now under the public comment process. The new approach requires intangible technology transfer controls or an export license for critical technologies being transferred between residents within the country when the receiving party is under significant influence of a foreign power, either through certain contracts, economic benefits, direct government instructions, or similar.

Challenges and Opportunities

METI's policy includes global economic strategy, and it intends to integrate internal policy and external policy. It seeks to do this by building trustable value chains focusing on resilience, green, climate change, human rights protection and digital. Furthermore, METI's policy supports a free and open trading system built for sustainability and fairness, including its improvement, as well as creating norms that ensure a level playing field at the World Trade Organization (WTO), within Economic Partnership Agreements (EPAs), and other fora. Japan is currently at the center of a mega free trade agreement (FTA), and in response to market distorting measures, METI deems both rulemaking and enforcement to be important.

Since 1995, Japan has only imposed anti-dumping duties in nine cases, and only a single instance of countervailing duty, in 2006. Anti-dumping duties are widely used around the world with 113 cases in 2020. In particular, after COVID-19, instances are growing, notably in the metal and chemical sectors. In addition, between 1995 and 2020, there have been 344 countervailing duties implemented around the world, while Japanese cases are very limited.

But what are the challenges here? Trade structure has become more complex with the development of global supply chains. Thus, countervailing duties can be seen to be an option to lead to less market-distorting measures, including industrial subsidies.

METI has conducted studies through the Subcommittee on Trade Remedies of the Industrial Structure Council, and the key findings reveal that there is difficulty in gaining information on subsidies, or in particular, the benefits of a subsidy under the definitions of the WTO agreement and domestic regulation. The second issue concerns retaliation from other countries. Once a countervailing duty is issued, it may prompt a countermeasure from another party.

Third, there is a lack of awareness of countervailing duties in Japan considering that the only use of countervailing duties was in 2006. Given the current economic situation and importance of supply chains, it is curious that Japan has not considered the use of countervailing duties. The next step is for Japan to promote international cooperation and engage with the EU and the U.S. to compare best practices in the use of such trade remedies.

Comments and Q&A



Tsuyoshi Kawase: The use of trade remedy measures has been increasing for the past couple of years. This is explainable by the current economic downtrend all over the world caused by the COVID-19 pandemic. We experienced a similar increase in the use of trade remedies in the time of the 1997 Asian

Financial Crisis and the 2008 Global Financial Crisis, for example.

Trade remedies, in particular anti-dumping and countervailing duties, are often described as tools to tackle unfair trade practices. However, the explanation is one-sided. Countries with a great variety of economic systems have acceded to the WTO. Even among two similar Western-style market economies, there are many differences in regulatory conditions, government policies, and thus cost structures, even within the same industry.

According to Professor John Jackson, known as a founding father of the WTO, trade remedies play a buffering role, allowing the members in the various economic systems to coexist in the single WTO system. Regardless of their usefulness, so far Japan has seldom employed trade remedies. This is partly because of Japan's experiences under the General Agreement on Tariffs and Trade (GATT) of 1947, when Japan was a target of anti-dumping and countervailing duties imposed mainly by the U.S. and the European Economic Community (EEC) at that time. For that reason, in Japan, trade remedies have the stigma of a protectionist tool, and additionally, Japan's domestic competitiveness in manufacturing meant that there was little need for the measures. Therefore, Japan was eager to reinforce discipline on trade remedies during the Uruguay Round and the early stage of the Doha Round.

This sentiment changed due to the rise of China and as other emerging economies became more salient in the early 2000s. For Japan, the turning point was the imposition of the provisional safeguard measures on certain agricultural imports, mainly from China in 2001, followed by anti-dumping duties on Korean polyester staple fiber the following year.

As Mr. Kazeki showed, Japan has been invoking trade remedies constantly ever since then. Therefore, even though the total number is still small, there has been a remarkable increase in the past 20 years. Alongside this, there has also been a continuing improvement of the investigation procedures in Japan.

Japanese industries used to seldom initiate trade remedy investigations. That is due to not only the aforesaid guilty conscience associated with a protectionist action, but also the restrictiveness of the prerequisites for petition. For example, Japan's domestic regulation on anti-dumping and countervailing duties used to require more support from a domestic industry to initiate an investigation than those required under the WTO agreements. The 2011 and 2016 amendments to the anti-dumping and countervailing duties guidelines relaxed the excessively stringent requirements to

conform with the WTO agreement, with further amendments in 2017.

Another impediment for prospective petitioners is the Anti-monopoly Law. Sometimes the producers concerned inevitably need to discuss their collective application for an investigation, and because such talks sometimes touch upon information about pricing, it could be deemed as a violation of the Anti-monopoly Law. To remedy such legal uncertainties, METI published a hypothetical case of collective application, which gives the prospective petitioners a hint of the dos and don'ts in preparing the application.

Furthermore, METI has recently intensified outreach for domestic industries as only a limited number of Japanese manufacturers were aware of the usefulness of trade remedies in their business strategy at top management levels.

In addition to the domestic effort, Japan attempts to combat unfair trade practices through international cooperation. In 2017, it set up the Trilateral Trade Minister Meeting with the U.S. and the EU, which agreed to amendments to the current WTO Subsidy Agreement, including expansion of the list of prohibited subsidies, introduction of a list of situations where out-of-country benchmarks can be used regarding governmental provision of goods and services, and redefinition of a public body whose subsidies are subject to WTO rules.

While these elements, if successfully incorporated into the WTO Subsidy Agreement, contribute to better use of countervailing duties, the Trilateral Meeting should pay more attention to the procedural aspect of countervailing duties. Currently the Appellate Body is defunct and unfortunately this status quo will continue for the foreseeable future. Accordingly, in the absence of dispute settlement measures, countervailing duties imposed by individual WTO members are more effective to combat distortive industrial subsidies and ensure a level playing field. Therefore, I would urge the Trilateral Meeting to discuss the cooperation between their investigating authorities, including exchange of information regarding the third country subsidies and concerted action in the countervailing duties investigations.

In conclusion, the active use of trade remedies is necessary for levelling the playing field, especially among the WTO members with their great variety of economic systems. Having said that, my comments developed here by no means encourage protectionism. All measures and investigations must be WTO consistent as a matter of course. WTO agreements regarding the trade remedies have already been sufficiently clarified by a number of panel and appellate body reports. Therefore, finally, I recommended the Japanese investigating authorities observe the relevant WTO jurisprudence.

Kazuto Suzuki: The economic security of Japan is a very urgent issue in the context of the rivalry between the U.S. and China, and for many years Japan has taken a position, which separates economic activities and political influence, and that economic



activities should not be influenced by political motivations or political strategy. Nevertheless, in the recent geostrategic and geopolitical situation, the economy is now being used as leverage to impose the will of the state on others, and it is a certainty that more countries are actively using these economic measures to impose strategic positions. As such, Japan needs to take appropriate actions.

Mr. Kazeki discussed economic security, but the term “economic security” is relatively new, and its definition is not yet clear. Basically, in relation to technological innovation and geopolitical change, economic security means the re-establishment of supply chain resilience to reduce vulnerability in supply chain activities. Indeed, it is extremely difficult to separate the global market into smaller businesses based within national economies, and a global supply chain is unavoidable if we want to reap the benefits of productivity and just-in-time production. As such, all countries are vulnerable to political influence upon the supply chain. In order to increase the resilience in supply chains, METI’s policy is to highlight strategic autonomy and gain superiority in the supply chain. Then the question remains: To what extent should Japan be autonomous and at what cost? What type of items of trade are more or less important in terms of strategic autonomy? Here, the definition of the terms will be critical.

The concepts of “know, protect and promote” are, to some extent, understandable, but if you look carefully there are different categories or different contexts included in those activities. “Knowing” is understanding the vulnerability of the supply chain and the current structure of international trade. “Protecting” means methods of protecting Japanese industry and technology and preventing technology from transferring to other parties. “Promoting” relates to more basic, traditional industrial policy. These three have different contexts. What does economic security as national security mean, exactly? In the study of international relations, national security means preventing intentional harm by others. As it pertains to economic security, it, by extension, takes on the concept of trying to avoid intentional harm to the supply chain. And furthermore, “protecting” means the intentional harm that is done by stealing technology. Then the question remains: What does “promote” do for national security? Yes, building up the industrial base is important, but how does it contribute to national security? Whether the promotion of industrial policy relates to national security is another question that we need to explore in the future.

Regarding the proposed, a much smaller, agile export control group with like-minded countries with certain technological capabilities is very understandable, and I encourage METI to move forward with this idea. The question remains whether it is going to be a new export control regime or a group within a certain regime, particularly in the Wassenaar Arrangement. I think the international regime is basically the coalition of the willing. It’s not

legally binding, but it still needs to clarify how to relate to the other international regimes. This new export control group may have some conflict with the other existing but still influential members. So how do we justify the idea of this new framework of the export control group?

Jun Kazeki: First of all, to Professor Suzuki, the first question you raised on whether the Japanese government or industry should pursue the economic security policy at all costs is a relevant question because of the number of products and number of technologies in question: Some technologies are critical, and others are not. The question is how can we distinguish between the two? Which ones are strategically important?

During METI’s consultations with industry, we propose that compliance and transparency are important, but for company activities to shrink too much is not ideal. Therefore, we do our best to clarify the critical technologies in our list. And at the same time, companies need to make a comprehensive assessment regarding the risk, the nature of the technologies and the regulations present in the U.S., China, and EU. They need to look at the supply chains as a whole, not only for export control, but also regarding their R&D office, strategy office, and various other offices. Now we are recommending that companies establish a holistic strategy office to cope with such matters.

Regarding the second question on how economic security policy and national security are treated and what kind of definitions exist, there is no clear, concrete, legal text definition of economic security policy. It is a new subject, so we are attempting to define its scope. One approach is to focus on critical technologies, but as Professor Suzuki rightly said, there are several broader perspectives and definitions in use around the world. Therefore, I believe that government officials, industries, and academia need to contribute to this debate on the definition. The ultimate objective is to provide transparency or guidance to all stakeholders.

Regarding the third question on the novel export control regime, Wassenaar is still the basis for control of exports, and we are considering its future. The question is whether to create the security-related mechanism within Wassenaar or outside it. In short, there is a need for certain discussions with Japan’s trading partners, but we also need to rapidly protect or regulate critical technologies. Here, the point is that like-minded countries should be countries which actually possess such critical technologies in the supply chains.

Also, regarding Professor Kawase’s comment that the use of countervailing duties is effective in terms of the current WTO impasse, of course, METI’s basic view is that we need WTO reform, but in the meantime, countervailing duty use will be necessary, otherwise our industry or stakeholders will lose their level playing field around the world. We need to promote this idea right now and proceed with international cooperation with the U.S. and the EU, and we plan to have an international seminar in this regard.

RIETI Open BBL Webinar: Global Intelligence Series

Mongolia Long-term Vision 2050 and Expectations for Japan, Presented by Former Chairman of the National Development Agency of Mongolia

Date: April 7, 2021

Speaker: **Bayarsaikhan Banzragch, Ph.D.**

(Former Chairman of the National Development Agency of Mongolia / Counsellor, Head of Economy and Trade Division, Embassy of Mongolia in Japan)

Commentator: **Osamu Onodera**

(Consulting Fellow, RIETI / Deputy Director General for Trade Policy, Trade Policy Bureau, Ministry of Economy, Trade and Industry (METI))

Moderator: **Haruhiko Ando**

(Vice Chairman, RIETI)



Sandwiched between China and Russia, Mongolia has a national land area about four times that of Japan, yet a population of only 3.4 million. That is less than the populations of Hong Kong (7.5 million) and the Uyghur people (12.8 million), who are currently the focus of international discussions. Amid the harsh geographical circumstances of a landlocked country, Mongolia maintains independent peaceful diplomacy with an emphasis on ties to Japan. In October 2019, Mongolia revised its Constitution, indicating its intent to carry out “sustainable and stable development policy.” In May 2020, Mongolia formulated its Long-term Vision 2050, a plan that looks back on the country’s 30-year path following democratization while setting out policy for long-term development over the next 30 years. At this seminar, Bayarsaikhan Banzragch, a former Chairman of the National Development Agency of Mongolia who worked on formulation of the long-term vision, explained in fluent Japanese the future vision for Mongolia and the potential for cooperation with Japan.

The aims of Mongolia’s Long-term Vision 2050

The creation of Long-term Vision 2050, Mongolia’s roadmap for long-term development policy, was overseen by the country’s National Development Agency under the leadership of then-Chief of the Cabinet Secretariat and current Prime Minister Oyun-Erdene Luvsannamsrai and with the participation of over 1,500 bureaucrats, researchers, and other parties. The Constitution of Mongolia was amended to specify that “development policies and plans should be sustainable and stable.” To that end, development policy-related laws were also amended in May 2020. The maintenance of long-term development policy as top-level policy was guaranteed under law, regardless of elections and changes of administration.

Every program of Long-term Vision 2050 is associated with the SDGs. On that topic, the Mongolian Minister of Finance and I presented the country’s Voluntary National Review 2019 at a session of the United Nations in July 2019. Regarding air pollution, the topic of focus, Mongolia cut air pollution in the capital region by 40% in 2020.

While Mongolia has always ranked among the top 10 countries globally in intellectual abilities, this accomplishment has been underutilized and the country lags the world significantly in a number of development metrics. The poverty rate is high at 28.4% (2019), while GDP per capita is \$4,294. We aim to raise GDP per capita to \$38,000 and reduce the poverty rate to 5% by 2050.

The Long-term Vision declares the intent to maintain nomadic culture as a shared value of the country’s people. Mongolia seeks to

commercialize nomadic culture tourism and a sustainable livestock industry unlike any other in the world. It also seeks to make the capital region a hub for logistics in Northeast Asia by 2050, by developing a new international airport and satellite cities.

Mongolia’s population of 3.4 million is increasing by 100,000 yearly and is expected to reach 5.4 million by 2050. Given the importance of economic development that secures stable employment and income for the Mongolian people, the country hopes to maintain its current annual economic growth rate of 5% to 6%.

Expectations for Japan

This year marks the fifth anniversary of the Economic Partnership Agreement (EPA) between Mongolia and Japan that came into effect on June 7, 2016. There are many projects that offer potential for cooperation. In international supply chains, the two countries cooperate on the development and maintenance of logistics infrastructure. The installation of sprinkler irrigation systems carries the potential to secure huge areas of agricultural land. In the livestock industry, we envision the development of processed meat products, cashmere, wool, leather products, and lactic acid bacteria-related products. In the tourism industry, we envision Roadside Station development and space travel training centers, among other projects. In the information processing industry, the development of AI, ICT, and large-scale data centers is feasible. In the energy industry, including the renewable energy and battery industries, we will promote development, processing, and



manufacturing involving underground resources. The Japanese company Megatech Corporation is carrying out a silica mining and processing project in Mongolia, and high-quality coke manufacturing and limestone projects are also moving forward.

Mongolia is the world's second-largest producer of horse meat, and actively produces mutton and goat meat as well. Sumitomo Corporation is already conducting commercialization studies and is exploring the potential for exports to the Middle East under the Livestock Industry 2.0 initiative, which utilizes IoT for traceability. Transforming the livestock industry into an export industry is a major mission. Mongolia commands 40% of the world market for cashmere and wool, but 80% of its cashmere is exported as raw wool. If half of this can undergo secondary processing and productization within Mongolia, over 40,000 new jobs will be created.

The tourism industry is a peaceful industry that provides jobs, income, and joy to many people. We hope to develop a network of Roadside Stations modeled after those of Japan. Constructing distribution and logistics infrastructure in rural areas will also aid regional economic development. In short, we believe that bringing together what Japan and Mongolia each possesses will enable the promotion of joint projects in international supply chains. Regarding the just-completed New Ulaanbaatar International Airport, during my time as Chairman of the National Development Agency a concession agreement was signed by which Mitsubishi Corporation, Narita International Airport Corporation, Japan Airport Terminal Co., Ltd. (Haneda Airport), and JALUX Inc. will jointly participate in operation of the airport for 15 years. We hope to engage in joint development to make the airport a hub for Central Asia. There is also potential for all manner of peripheral projects around the new airport. These include economic and financial special zones, integrated resort (IR) tourism special zones, international logistics centers, and large-scale greenhouse projects making use of the vast land areas.

We aim to cooperate with Japan on achieving carbon neutrality 30 years from now. As a major coal producer, Mongolia is examining the introduction of clean coal technology from Japan. Mongolia faces further challenges in the reuse of resources. The country imports 94% of its automobiles (including used cars) from Japan, and improperly disposed-of used batteries have become a societal problem. I believe that recycling these will make a contribution to society.

Human resource development will be crucial in achieving Mongolia's long-term plans. The number of Mongolian international students in Japan has increased year by year to reach 3,170. There is a need for further cooperation with elementary schools, junior high schools, high schools, and universities. In the industrial field, technical colleges are attracting worldwide attention for the training of engineers. The Japan International Cooperation Agency (JICA) is currently implementing the Project to Develop 1,000 Engineers in Mongolia, with 1,000 Mongolians scheduled to engage in studies at Japanese technical colleges by March 2023.

Mongolia has concluded an EPA with Japan and participates in preferential tariff systems with the U.S. and the EU, which means that products made in Mongolia are able to target Western markets. When I was Chairman of the National Development Agency, I brought together

five related government bodies to launch the One Stop Service Center to attract investment. This center currently offers 62 types of services and plans to establish a Japanese-speaking contact desk.

I hope that Mongolian events will be held regularly online in the future. I invite you to take a look at the monthly information magazines distributed online by the Mongolian National Development Agency and the Embassy of Mongolia in Japan.

Comment and Q&A

Commentator: On the topic of future Japan–Mongolia relations, there are three major themes. One is New Ulaanbaatar International Airport, which was constructed through an ODA loan and will become a base for tourism. The second is the utilization of agricultural product and livestock processing. There are expectations for collaboration with the tourism industry in the Master Plan on the Agricultural Value Chain in Mongolia that JICA is implementing from 2020 to 2023. It is important to determine the best use of Mongolia's history, landscapes, and other rich materials to create a compelling story. The third theme is the development of IT and other new industries. The IT industry is able to overcome many of the disadvantages of being a landlocked country, and it is becoming clear that Mongolia possesses a large pool of Japanese-speaking human resources who have an affinity for Japan and who are highly skilled in science and mathematics.

Human resources are the key to these three pillars, and in fact, over 3,000 Mongolian international students returning to the country are now supporting each other through the JUGAMO association for returnees. There are also three Japanese-style technical colleges in Mongolia, with close ties to Japan's National Institute of Technology. JICA's Mongolia-Japan Center for Human Resources Development further contributes to human resources development in Mongolia. I have hopes that business collaboration between Japan and Mongolia will continue to deepen.

Q: I think Mongolia is an ideal location for satellite offices, but what is the state of the communication environment, such as 4G and 5G?

Speaker: Mongolia faces very few natural disasters such as earthquakes, which makes it an ideal location for data centers. Regarding the communication environment, optical fiber is being laid in all 21 provinces and in major towns and villages. Mobile 4G covers most residential areas, business areas including mines, tourist areas, and other areas nationwide, and continues to expand. The development and introduction of all manner of application services using 4G and smartphones by the government, public, and private sectors, and the use of these by the general public, are making considerable progress. Mongolia's largest mobile phone company, MobiCom, in which Japan's KDDI is an investor, has a Japanese president and leads the telecommunications industry in Mongolia. While studying the know-how of Japan, Mongolia is also preparing for the introduction of 5G in the near future. In addition, Mongolia is moving ahead with the scheduled opening of its new airport on July 1. I hope you will visit the new airport when it opens.



Column

COP26 Assessment and Challenges

Jun Arima

Consulting Fellow, RIETI

Did COP26 conclude “successfully”?

On November 13, COP26 concluded “successfully” with the adoption of the Glasgow Climate Pact. I enclosed the word “successfully” in quotation marks because there have been a variety of assessments as to what the convention actually achieved. For example, environmental activist Greta Thunberg denounced the summit: “It is not a secret that COP26 is a failure ... Two weeks of business as usual, blah, blah, blah!” Prime Minister Boris Johnson of Britain, the host country, enumerated what he aimed at achieving at COP26: (1) securing global net zero by mid-century and keep warming to 1.5°C within reach; (2) adapting to protect communities and natural habitats; (3) mobilizing finance; and (4) completing negotiations on the Paris Agreement’s rule book. Although incomplete, it may at least be said that these results have been achieved. It is with mixed feelings that I believe COP26 was a success, surpassing previous expectations.

Of the above expected outcomes, Britain placed the greatest emphasis on its aim of holding the global average temperature to an increase of 1.5°C. The Paris Agreement states: “This Agreement ... aims to strengthen the global response to the threat of climate change ... including by: Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels” and “In order to achieve the long-term temperature goal ... Parties aim to reach global peaking of GHG emissions as soon as possible ... and to undertake rapid reduction thereafter ... so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century.” Consolidating the most demanding target of 1.5°C from the range of temperature targets provides a basis for aiming to achieve global net zero by 2050, a 45% reduction in global emissions by 2030, phasing out coal power, ending the sale of internal combustion automobiles, and other goals.

That is why, at the G7 Cornwall Summit which Britain hosted, it first incorporated into the Summit Communiqué the 1.5°C target, net zero by 2050, transitioning away from unabated coal capacity, halting public financing for coal power abroad, and other initiatives. Britain’s next strategy was to align with Italy, the G20 host, to have the similar messages reflected in the G20 Leaders’ Declaration, but China, India, Saudi Arabia, Russia, and other countries strongly opposed such a move. They argued that attaching particular emphasis on the

1.5°C and 2050 net zero goals was almost equal to the renegotiation of the Paris Agreement. China and India, both of which are highly dependent upon coal, pushed back strongly against eliminating coal from their domestic energy mixes, and Saudi Arabia and Russia also followed suit over concerns that elimination of coal might be extended to all fossil fuels including oil and natural gas. The result was that the G20 summit only reconfirmed the temperature targets instituted under the Paris Agreement. Phasing out of domestic coal capacity was not included as a G20 commitment. That is why President Biden and Prime Minister Johnson were disappointed with the G20 outcome on climate.

Based on this series of events, I forecasted that COP26 would probably not reach an agreement beyond what was agreed to at the G20 summit. However, the Glasgow Climate Pact adopted at COP26 includes, among other commitments: (1) a resolution to pursue efforts to limit the temperature increase to 1.5°C; (2) recognition that limiting the rise in temperature to 1.5 °C requires reducing global emissions by 45% by 2030 relative to the 2010 level and to net zero around mid-century; (3) consequently, the 2020 decade is regarded as the “critical decade” and calls on COP27 to adopt a work plan to scale up the level of ambitions during this period of time; and (4) a request for the parties to revisit and strengthen their nationally determined contributions (NDC) as necessary to align with the Paris Agreement temperature goal by the end of 2022. This clearly surpasses what was achieved at the G20 Summit. Predictably, China, India, Saudi Arabia, and other nations reacted negatively to broaching the 1.5°C target. G20 is a forum where clashes arise between G7 nations and emerging countries. However, COP offers a strong voice not only to major economies but also to vulnerable, less-developed nations and small island nations that are susceptible to the damage wreaked by climate change, as well as the influence of environmental NGOs inside and outside of the chambers. China, India, and other emerging nations are concerned about the effect that the 1.5°C target will have on their economic growth. Resource-rich nations are worried about the effect on their fossil fuel exports. On the other hand, small island nations and less-developed nations anticipate that raising the temperature target hurdle will increase the need for assistance for climate change adaptation as well as loss and damage due to its effects. During the informal stocktaking plenary by the COP26 President, massive pressure to conform emerged. The plenary erupted into great applause whenever strong support for the 1.5°C goal was expressed. Britain



succeeded in leveraging that conference sentiment to push the 1.5°C goal to the forefront.

In addition, the Agreement includes the wording "... to accelerate the ... phasedown of unabated coal power and phase-out of inefficient fossil fuel subsidies..." At the United Nations General Assembly in September 2021, President Xi announced that China would not build any new coal-fired power projects abroad. That is why the G20 included in its message, just as the G7 had, a halt to public financing for new coal capacity abroad. Despite that, the COP26 agreement extends to domestic coal capacity. The original proposal was worded "phase-out coal," which was much broader in scope than the electricity sector alone. Encountering strong opposition from China, India, Saudi Arabia, South Africa, and other nations, just as with the 1.5°C target, the wording was modified to "phase-out of unabated coal power." However, even at the final stage of the convention, India, China, South Africa, and other nations were still not satisfied. India argued that "inexpensive and stable electric power for poor people is the top priority for countries." Considerations were added that revised "phase-out" to "phasedown" and included the wording "while providing targeted support to the poorest and most vulnerable in line with national circumstances and recognizing the need for support toward a just transition." Even though the EU, small island nations, and other countries rallied in unison against this, they accepted it reluctantly from the standpoint of passing a package that would achieve an overall consensus. Nevertheless, it deserves attention that wording targeting specific energy sources was included for the first time in the Paris Agreement and related decisions.

In this way, the 1.5°C target was strongly highlighted and the formulation of a very ambitious work plan in line with that was incorporated. Together with the coal phasedown, while toned down from the original proposal, the Glasgow Climate Pact is lauded by environmentalists as a historic agreement.

Heavy consequences of the 1.5°C goal

While Britain's diplomatic skill in working out an agreement beyond the line agreed at the G20 deserves accolades, the author cannot simply be jubilant because Britain's strong push of the 1.5°C target and net zero in 2050 has significantly altered the nature of the Paris Agreement, which was established while striking a delicate balance between the top-down approach of setting temperature targets for the entire world and the bottom-up approach where each country sets targets according to its specific national circumstances. Aiming for global net zero by 2050 will likely create a fierce battle between developed and developing nations over limited carbon budgets through the year 2050. Already India has argued that if developed nations strongly push global net zero by 2050, they should achieve net zero much earlier than 2050, go into negative emissions thereafter and give carbon space to developing nations. It has also contended that if developed nations are demanding that developing nations raise their NDCs in order to ultimately achieve net zero emissions, they should substantially increase financial flows to developing countries to \$1 trillion annually. While the world is significantly off track from

the 2°C pathway, Europe and the U.S. pushed through a further ambitious target related to 1.5°C. This will likely come back to haunt developed nations over the coming decade in the form of incessant pressure from developing nations calling on them to achieve carbon neutrality much more rapidly and to significantly increase assistance to developing countries.

Will the COP standard make the world happy?

The Agreement calls for NDCs to be strengthened in line with the Paris Agreement temperature goal and be submitted by the end of 2022, but it is very unlikely that China and India will revise their targets. Both nations, which have embraced the 2060 and 2070 net zero targets, will no doubt argue they are respecting the Paris Agreement provision of "net zero in the second half of this century" Rather, as the host country of the 2022 G7 Summit, Germany, which has the Green Party in the coalition, could propose that G7 nations move forward the 2050 net zero target and further raise 2030 NDCs with a view to urging China and India to follow suit. The result would be further expansion of the market for Chinese made solar panels, windmills, and storage batteries, creating a windfall for China.

The argument over coal phaseout is likely to resurface with a certain target year. This could further extend to the phaseout of all fossil fuels. Such a discussion is completely divorced from the reality of the energy landscape. A major cause of the energy crisis, which is overwhelming Europe and spreading to Japan, is that supply has not kept up with the increase in energy demand generated by the economic recovery. A significant cause of that imbalance is the stagnation in upstream investment in petroleum and gas. Meanwhile, in the COP world, the U.S. and EU nations have put their names on the joint declaration to end public financing for the fossil fuel sector. This could further stagnate upstream investment, resulting in tightening of energy supply in the future as well. The environmental fundamentalism originating in Europe has been demonizing coal and resulted in the global rise in gas demand. While the Biden administration is prohibiting domestic oil production on federal lands, it has called on OPEC and Russia to ramp up production. While Britain is at the forefront of coal bashing, power shortfalls due to very weak wind and skyrocketing gas prices obliged it to mobilize old power plants in order to maintain power supply. These are contrary to the climate narrative, which is calling for the phaseout of fossil fuels. This shows that when secure and affordable energy supply, as the most fundamental policy requirement, is at risk, the climate agenda could easily be set aside.

Will global dissemination of the standard created at COP, which has excluded this realistic discussion, really be a positive step for the world? I believe that we need to think long and hard about that.

Footnote

1. "COP26: Greta Thunberg tells protest that COP26 has been a 'failure'," BBC News, November 5, 2021 <https://www.bbc.com/news/uk-scotland-glasgow-west-59165781>

Column

Collapse of the CDM Scheme under the Kyoto Protocol and Its Spillover: Consequences of “carbon panic”

Kazunari Kainou

Fellow, RIETI

Collapse of the first international carbon finance scheme

The Clean Development Mechanism (CDM) under the Kyoto Protocol represents the world's first international carbon finance scheme that was prescribed under Article 12 of the Kyoto Protocol, which was adopted in Kyoto in 1997. This is a scheme whereby investing companies acquire CER (certified emission reduction) credits when it has been confirmed that they have made investments in energy conservation and new energy projects in developing countries in accordance with the rules and methodologies determined by the Conference of the Parties and the CDM Executive Board, and that the investments have contributed to reductions in carbon emissions. The initial objective of the CDM scheme was to make it easier for the EU and Japan, which were obligated to reduce carbon emissions under the Kyoto Protocol, to achieve emission reduction targets by enabling the acquisition of credits through investments in developing countries.

CERs issued under the CDM scheme have been traded and priced in major commodities exchanges around the world. In 2008, the first year of the first commitment period, the CER price hit a record high of 25 euros per ton of CO₂. At first, the operation of the CDM scheme was successful. For example, between the launch of the CDM scheme and 2012, the final year of the first commitment period, a total of around 6,600 projects were registered under the scheme, while CERs totaling around 1.2 billion tons of CO₂ were issued. In line with an increase in CER issuance, the CER price gradually fell, down to 10 euros per ton of CO₂, but the price decline is considered to have been appropriately reflecting the CER supply-demand balance at the time.

However, in 2012, at the end of the first commitment period, the CER price crashed, falling to a meager 0.5 euro per ton of CO₂ or so. Eventually, the CER market tumbled into a situation of “carbon panic,” with its pricing mechanism breaking down completely. This was how the world's first international carbon finance scheme collapsed just five years after its launch. In this article, I would like to offer my personal opinions on the background to the collapse of the CDM and its spillover as

viewed from my perspective as a member of the CDM Executive Board who experienced the scheme's collapse from the beginning to the end and who is still dedicated to the scheme's operation.

Background to the “carbon panic” of 2012

The primary background factors of the carbon panic that struck the CDM scheme in 2012 are problems created mainly by emission credit buyers, namely 1) the EU's isolationist carbon policy that prohibited the use of CERs in the EU area, and 2) Japan's retreat from the commitment to its numerical targets. These problems led to the loss of the market's confidence in the CDM scheme.

The European Commission was operating the EU-Emissions Trading System (EU-ETS) alongside the CDM scheme, but the slumping price of the EUR intra-regional emission permits became a cause for concern for the Commission against the backdrop of economic stagnation in the former Soviet bloc countries in Eastern Europe. The EU was aiming to implement a “European Green Economy” initiative under which generous quotas of emission permits granted to the former Soviet bloc countries would induce capital investment and help to promote economic revitalization and mitigate unemployment. However, what actually occurred in those countries was a nightmare situation: Coal-fired power plants and coal mines eligible for generous quotas of emission permits were closed one after another, with coal replaced by cheap natural gas from Russia, resulting in massive surpluses of emissions permits and swarms of jobless people on the streets across the region. Therefore, although the European Commission initially allowed CERs to be used in place of EURs, it announced an isolationist policy reminiscent of the bloc economy era, under which the use of CERs was banned, starting in 2012, for existing and future projects other than those in least developed countries (LDCs) as part of efforts to raise the EUR price¹ through a supply reduction.

In the case of Japan, as all nuclear power stations were shut down due to the accident at Fukushima Daiichi Nuclear Power Station following the Great East Japan Earthquake in 2011, a political decision was made to set no numerical target for



the second commitment period from 2012 under the Kyoto Protocol. Naturally, it was also decided that the Japanese government would not purchase CERs.

Consequently, those actions of the European Commission and the Japanese government, which happened to counter the CER trading apparatus, triggered the carbon panic, resulting in the CER price crash and the collapse of the CDM scheme.

The beginning of the liquidation of the world's first international carbon finance scheme

The atmosphere of the first meeting of the CDM Executive Board in 2013 was combative, as if this was a gathering of distressed creditors of a failed company. Executives representing developing countries directed harsh criticism at the attitudes of the EU and Japan. As I felt compelled to speak up, I presented the following proposal in reference to the U.S. trading system for sulfur emission credits.²

1) Establishment of a voluntary cancellation system: At that time, only the EU and Japan were intended to purchase CERs under the CDM scheme. My proposal called for the establishment of a voluntary cancellation system under which restrictions on the scope of purchasers would be fully abolished, allowing any country or individual around the world to directly purchase and cancel CERs. Of course, this would not restore liquidity for the whole 1.2 billion tons of CO₂ of emission credits that had remained unsold. But the idea that the Executive Board should at least do what little it could do appeared to have gained sympathy from other board members.

The atmosphere of the Executive Board's meeting changed immediately, perhaps because my proposal had a disarming effect. One after the other, executives and secretariat officials started to present proposals of their own for facilitating the liquidation of the CDM scheme, including 2) recommending the use of CERs by developing countries and international organizations, and 3) selling CERs for use in carbon offsetting of soccer and other international events. Even though the use of the term liquidation was avoided as requested strongly by executives representing developing countries, the board decided to go ahead with the de facto liquidation of the CDM scheme, which started in 2013.

Therefore, at least in 2013, nobody imagined that the CDM scheme would ever achieve a revival, as it has actually done thanks to support from unexpected quarters. Fed up with talk about dismal prospects for the CDM scheme, many executives left the Executive Board. However, I remained on the Board, despite the fact that doing so felt like sitting on a bed of thorns, because I was somewhat interested in the unusual situation of a U.N. scheme being liquidated.

Relief coming from unexpected quarters and revival of the CDM scheme

Fortunately, the liquidation of the CDM scheme, which centered on the abovementioned cancellation system, was almost completed by 2020. The greatest factor of the completion of the liquidation was the fact that many investing companies begrudgingly accepted loss-cutting cancellation of CER upon expiry of the project period (10 years, or 7 years with two possible renewals). However, it was quite unexpected that the CDM scheme would be revived thanks to unexpected support coming from the U.S. and developing countries as explained below.

1) The volume of CERs cancelled under the voluntary cancellation system has amounted to 77 million tons of CO₂, larger than expected. Surprisingly, U.S. companies and citizens account for most of the users of this system. In terms of purchase volume, companies eligible for the emission credit trading systems of California and 13 East Coast states account for most of the total, while in terms of the number of purchases, U.S. citizens are by far the largest user group. It is a unique case where citizens are willing to purchase CERs at their own discretion despite the government having avoided engagement with both the Kyoto Protocol and the Paris Agreement.

2) As a result of the recommendation of the use of CERs by developing countries and international organizations, many developing countries, including China, South Africa, and Mexico, decided to allow the use of CERs under domestic environmental tax systems and emission credit trading systems. A typical example is South Africa's carbon tax system, which came into force in 2019. Under this system, major carbon emitters, such as electric power and mining companies, are taxed according to their emission volume at a nominal tax rate of around 8 U.S. dollars/ton of CO₂ but are exempted from tax payment for the portion of their emissions that is covered by voluntarily canceled CERs.

As a result, in recent years, the CDM scheme has been on the path of recovery. Since 2013, 1,200 projects have been newly registered with a cumulative total CER issuance amount at 2 billion tons of CO₂. Most of those new projects and newly issued CERs represent investments made by companies in China, South Africa, and Mexico in order to accumulate CERs for future use as the use of CERs is allowed under those countries' systems. For example, a financially struggling South African electric power utility is snapping up CERs, which are available at a "very affordable price," and building up holdings of CERs as intangible assets, as it is necessary to make some preparations for unforeseen emergencies, including extreme weather events and abrupt tax hikes, according to an account given by an official of the utility.

However, assuming that prospects for the CDM scheme are bright is misguided. From my point of view, the current favorable outcomes for the CDM scheme are nothing more than accidental. Given that the CER price has remained stuck in the range of 1 to 2 euros/ton of CO₂, the present situation should be regarded as a temporary phenomenon.

At a more fundamental level, there has been no change in the fact that the world of carbon finance, including the CDM scheme, is structurally prone to panic because supply is potentially much greater than demand. Moreover, as the world is full of investing companies that were forced to swallow huge losses and financial institutions that had a frightening experience with carbon finance, it is overly optimistic to assume that the situation has taken a turn for the better overnight following the arrival of the Paris Agreement in place of the Kyoto Protocol.

Spillover of the CDM collapse—Why do negotiations over the Paris Agreement remain deadlocked?

Under the Framework Convention on Climate Change, negotiations over the Paris Agreement, which came into force in 2016, are ongoing. One reason why the negotiations have remained deadlocked is the EU's proposal for restricting the carryover of CERs to the Paris Agreement regime.

As I already explained, companies in developing countries such as China, South Africa, and Mexico have been major investors in CDM projects since 2013. They have assiduously amassed holdings of CERs for future use in preparation for developing countries' upcoming participation in the Paris Agreement. Naturally, the EU's proposal for invalidating CERs all at once in the name of "environmental integrity" has invited a firestorm of opposition. After all, the EU is one of the culprits of the carbon panic of 2012. Moreover, developing countries have now become major players in the CER market on both the buying and selling sides. Therefore, in the eyes of developing countries, the EU is simply a bully trying to ruin a system that they are no longer party to.

On the other hand, from the viewpoint of people involved in international carbon finance, it is doubtful whether emission credits will be able to find buyers in the period beyond 2030 under the Paris Agreement because the compliance system through which the achievement of targets is assessed is much more lenient than under the Kyoto Protocol. In particular, concerns have been raised that if the massive holdings of cheap CERs are not to be carried over to the Paris Agreement regime, credit prices may become volatile under the agreement, prompting developing countries to refuse to purchase credits as a means of compliance and triggering a new carbon panic.

Under the Kyoto Protocol regime, the EU's argument that only developed countries, including the U.S., should be committed

to emission reduction targets, was accepted widely among developing countries, allowing the EU to exercise leadership in negotiations. However, the U.S. has already withdrawn from the Paris Agreement, and it has become clear that the EU's true objective under the agreement is realizing and protecting its own "green economy." In this situation, it is entirely misguided to assume the EU can again exercise leadership within negotiations. As long as the EU tries to bind the hands of developing countries under the pretext of environmental integrity, the negotiations over the Paris Agreement will continue to become more complicated and the conclusion of negotiations will remain out of reach.

Footnotes

1. The EU's isolationist carbon policy still continues to have negative effects. I have heard that as a series of policy measures taken by the European Commission to limit the supply of quotas of emission permits worked too well, the EUR price rose to 30 euros per ton of CO₂ in 2020 and that this is burdening low-income earners through general price inflation. The European situation is an indication of how difficult it is for governments to control prices and the market, and Japan should learn from the EU's problem.
2. Under California's sulfur emission credit trading system, as anyone can purchase or cancel sulfur emission credits, environmental conservation groups purchase credits using donations collected from individuals when the price falls. Unfortunately, environmental conservation groups in the EU area or Japan do not seem to be engaging in similar activities at any significant level.

SPECIAL INTERVIEW

EBPM Also for Climate Change Countermeasures

Toshi H. Arimura

(Faculty Fellow, RIETI / Professor, Faculty of Political Science and Economics, Waseda University)

Interviewed by RIETI Highlight Editorial Team



The process of trial and error for new policies as well as validation of any improvements, or what might also be called the perspective of evidence-based policy making (EBPM), is essential for making use of never-before-attempted climate change countermeasures and green innovation to restructure industry. The question of whether different environmental measures are really effective is one that we posed to Toshi H. Arimura, Professor in the Faculty of Political Science and Economics at Waseda University. Professor Arimura has conducted groundbreaking EBPM research in the field of environmental economics and we talked with him about results produced in research and policy implementation.

Professor Arimura, you are a leading authority in the field of environmental economics and the recipient of many awards. Could you please tell us about your research?

I wrote my Ph.D. dissertation on trading of sulfur dioxide (SO₂) emission allowances as it relates to acid rain countermeasures and have always pursued research in which I attempt to use markets to solve environmental problems. In 2000, I returned to Japan. Japan does not have any mechanisms where markets are used for environmental measures, so I conducted research to verify whether the ISO14001 certification, which was popular at the time and a system whereby companies voluntarily adopted environmental measures, was really effective. My research papers on this subject have also been cited by highly reputable academic journals.

Also, during a sabbatical leave that I took from 2006 to 2008, I went to Resources for the Future (RFF), a research institution in Washington DC, where I did research on carbon pricing (CP), emissions trading, carbon border adjustment mechanisms, and other devices that may serve as measures to address climate change. Around that time in Japan as well, the Ministry of Finance's Customs and Tariff Bureau started considering such measures together with the Ministry of Economy, Trade and Industry, Ministry of Foreign Affairs, Ministry of the Environment, and competent experts, taking into account that carbon tariffs could be introduced with border measures. So, with my collaborators, I conducted an input-output analysis to determine which industries would be burdened if CP was introduced and to what extent. Further, we used an applied general equilibrium analysis to research the effects of border carbon adjustment. We found that, because Japan exports steel and is competitive overseas, placing tariffs on imported products to protect the industry would have no effect at all. If export rebates were applied, then the measures would be somewhat useful for

industry protection, but export rebates pose quite a problem in the eyes of the WTO. They are not a part of the EU proposal, either. From an economic perspective, the best thing was actually output-based allocation. It's an idea that says that when the amount produced is increased, a more generous emissions allowance is allocated. In fact, this is also the most effective measure for energy-intensive industries. Japanese industry at the time was opposed to CP in the first place and their straightforward reaction was that carbon border adjustment mechanisms, in particular, would likely block trade, so they did not support the idea of carbon tariffs.

The EU is already starting to institute carbon border adjustment mechanisms. A RIETI project which began in 2021 has been verifying what sort of impact that will have on Japan.

Specifically, what sort of things have you learned?

If we want to introduce CP while continuing to protect Japan's industrial competitiveness, instead of carbon border adjustments, it would be better to have an output-based allocation that takes into account how to allocate emissions quotas. I proposed this about 10 years ago, but the official in charge at the time said, "The system is too complex, and it won't get through the Diet." Incidentally, this system was adopted in Australia, but abolished when a new political administration came to power.

In Japan, Tokyo and Saitama Prefecture have already introduced emissions trading schemes. Saitama Prefecture's system was launched right when the Great East Japan Earthquake struck, so it did not get much media coverage.

What is interesting about Tokyo's emissions trading scheme is that Tokyo doesn't have many factories, so it is the first system in the world that focuses on office buildings. The interesting thing about Saitama's system is that it also focuses on factories, of which the prefecture has quite a heavy concentration, but the



system levies no penalties. So, it is merely a scheme in which companies voluntarily participate in tacit agreement between the Saitama Prefecture business community and the prefectural office.

You have also served as a member of the Tokyo committee on emissions trading, haven't you?

What I found interesting about that was evidence-based policymaking (EBPM), which was used by the committee, and which RIETI is also promoting now. EBPM determines whether a policy is effective or not. For example, it has been said that emissions have decreased in Tokyo, but we make use of data to analyze what factors have contributed to that decrease. The Great East Japan Earthquake hit, after which the local government requested that people use less electricity. Also, because Tokyo is within the TEPCO service area, there was a sharp rise in electricity charges during the first few years. Was less power consumed because of the rise in electricity charges or was it an effect of emissions trading? We sought to shed light on that question.

There was a certain effect on office buildings with a little more than half due to emissions trading and a little less than half due to the higher electricity charges during the first four years (2010–2013). Mitsutsugu Hamamoto, Professor at Dokkyo University, conducted an analysis of Saitama Prefecture, which revealed a reduction in emissions due to the emissions trading scheme. These research results received recognition upon receiving the Commentary Award from the Society for Environmental Economics and Policy Studies (Arimura, Toshi H. and Shigeru Matsumoto (Eds.)(2020), *Carbon Pricing in Japan*, Springer). This publication is available through open access and has been downloaded some 39,000 times.

As we also proposed in the book, we believe economic growth is possible while reducing emissions if tax revenue from carbon taxes is used wisely. When a carbon tax is introduced in the future, it will probably be a tax on petroleum and coal and used for research and development or something related. However, it is important to also use it to reduce corporate or consumption taxes. This is referred to as the “double dividend of the carbon tax,” which I have also presented at RIETI workshops and seminars. The economic analysis concluded that, if this is done, both the environmental countermeasures and economic growth will likely do well. Because the Japanese government has been faced with a budget deficit for decades, the carbon tax should also be wisely used.

I feel that we are beginning to see what sort of system we should have.

Environmental economics in Japan previously was not very quantitative in nature. It was more about discussing how systems should be constructed and function. Instead, I am attempting to generate quantitative results about costs and benefits. The book in which I compiled that research is *An Evaluation of Japanese*

Environmental Regulations (Sophia University Press (SUP), 2011).

My hope is that EBPM will also be used for environmental measures and that academic knowledge will be reflected in policy. I think there have been times during the pandemic when scientific knowledge has not been reflected well in policy.

I also think it is necessary for us to take an overall comprehensive view of policies. It is important that we do this not just for environmental measures but also look comprehensively at the economy and public finance.

One more thing that I would like to talk about is related to the Global Intelligence Project (GIP: research on transformation of the international order and Japan's medium-to-long-term competitiveness) that RIETI is now engaged in. Southeast Asian nations have started to consider adopting emissions trading. The EU system stipulates that a border carbon tax be paid in the EU on products that the EU imports or countries are asked to create their own carbon pricing system. If the border carbon tax is paid in their own country, then it does not have to be paid in the EU. Since Japanese companies have created global supply chains, they have to be mindful of developments occurring overseas. Such initiatives will probably need to be put in place across the entire supply chain.

I am currently conducting research for a Ministry of the Environment project on what kind of an impact the Tokyo and Saitama Prefecture schemes have had. I think that the Tokyo and Saitama models could be role models for Asia. However, we are losing the international debate to China and Korea. China has launched emissions trading and Korea also introduced an emissions trading scheme for the country. These are influencing ASEAN nations, and we are losing ground in the competition among countries. Tokyo and Saitama have been properly conducting their schemes, so I hope that they will draw a little more attention internationally. Nevertheless, Korea has brought in EU officials as advisors and is creating a system that copies EU-ETS. China is conducting trials in seven or eight provinces. It appears that these are going well in some areas and not so well in others.

There is one more thing that we should pay attention to. On the very same day when the detailed design of the border carbon adjustment mechanism was announced in July 2021 by the EU, the Chinese government announced that it rolled out emissions trading of the electric power sector nationwide. Not surprisingly, China is closely watching what the EU is doing. When President Obama and President Xi Jinping met in 2015, China declared that it would engage in emissions trading. Even so, it has taken about six years. That's how difficult it is to implement such a scheme.

In the book I mentioned earlier, research results are presented showing that the Energy Conservation Act has had a certain positive effect. When I talk to different people around the country, they are surprised that this sort of intangible system without penalties, where industry does the best that it can, works.



RIETI Special Seminar for the Media

Will Raising the Minimum Wage Take Away Jobs? – Considering a desirable minimum wage policy –

Date: May 18, 2021

Speaker: **Daiji Kawaguchi**

(Program Director and Faculty Fellow, RIETI / Professor, Graduate School of Economics and Graduate School of Public Policy, The University of Tokyo)

With the goal of accelerating evidence-based policy making (EBPM) RIETI launched the “Policy Assessment” program in the Fifth Medium-term Plan to simultaneously promote two research subjects: the optimal configuration of EBPM and the assessment of individual policies. On May 18, 2021, RIETI invited Professor Daiji Kawaguchi of Graduate School of Economics and Graduate School of Public Policy at the University of Tokyo, who is also the Program Director of the program, to speak at RIETI’s Special Seminar for the Media. As a leading expert in policy evaluation research, Professor Kawaguchi shared his insights on a desirable minimum wage policy in Japan.

As wages have stagnated and the criticism that the fruits of economic growth have not been passed on to workers has heightened in countries all over the world, a broad debate is taking place about raising the minimum wage. Japan is no exception. All major political parties, from the ruling party to opposition parties, support a minimum wage hike. Japan’s minimum wage is essentially decided once a year by the central government, which determines the levels for each of the 47 prefectures. However, concern has also been voiced about the degree to which a wage hike will reduce employment of low-skilled workers. This presentation provides an overview of the policy debate on the minimum wage in Japan.

The hike in the minimum wage for 2020 was limited due to considerations about the effect of the pandemic. For small and medium-sized enterprises, in addition to a loss of employment, raising the minimum wage puts pressure on management and leads companies to close their doors, so strong arguments have always been made that minimum wage increases should be considered very carefully before they are enacted. On the other hand, of course, the main argument for increasing the minimum wage is to improve the livelihoods of minimum-wage workers. Recently, there have also been strong arguments that raising the minimum wage encourages the exit of inefficient companies and enhances productivity. Does increasing the minimum wage take away jobs? Or can a wage increase be realized without a decrease in employment? Moreover, can a minimum wage hike improve corporate productivity? Evidence is necessary to tackle these questions. Moreover, we need to determine what happened when Japan previously raised the minimum wage in the past.

Raising the national average minimum wage to ¥1,000¹

On May 14, 2021, at a meeting of the Council on Economic and Fiscal Policy, Prime Minister Suga expressed his resolve to soon realize a national average minimum wage of ¥1,000. The current weighted average of the minimum wage is ¥902. With an across-the-board raise of ¥100, the ¥1,000 level is achievable.

There are two types of minimum wages. The first is the regional minimum wage set for each prefecture and the other is the minimum wage set for specific industries. However, the role of the industry-specific minimum wage seems to be coming to an end and greater attention has been given to the regional minimum wage. The highest regional minimum wage is ¥1,013 in Tokyo and the lowest is ¥792 in Akita, Tottori, Kochi, Saga, Oita and Okinawa prefectures. The minimum wage is high in large cities, and lower in more rural prefectures. In today’s presentation, I would like to consider what needs to be done to realize a national average of ¥1,000.

How minimum wages are set

Similar to many labor policies, the minimum wage is determined by a council. Members representing public interests, workers, and employers meet to determine incremental increases in the minimum wage. First, the Central Minimum Wage Council meets and divides the 47 prefectures into four ranks ranging from A to D. It then recommends a proposed incremental raise for each rank by around the end of July. Following this, the regional minimum wage councils hold meetings where members take into account the actual circumstances of their own prefectures and make minor adjustments to the minimum wage, after which a new minimum wage comes into effect for each prefecture

sometime between early and mid-October of each year. Of the steps in this process, the proposed incremental raise set by the Central Minimum Wage Council is the primary factor taken into account when increasing the minimum wage. The pattern is pretty much the same each year. Worker representatives demand an increase in the minimum wage and employer representatives reject that. The opinion of the public-interest members is respected and serves as a middle ground. Then, the guideline amount is determined.

It has been commented that Japan's minimum wage is not determined based on evidence. Yet, no guideline wage could be set without there being some sort of basis from which to proceed. This basis is the Ministry of Health, Labour and Welfare's wage revision status survey. The guideline wage has been decided for many years based upon the results of this survey. The survey focuses on business establishments with less than 30 workers. Enterprises are sampled at random from locations around local prefectural offices as well as two other areas in each prefecture, and questionnaires sent out to these companies. What is unique about the questionnaire is that it asks about the wage status of the same workers during June of the previous year and June of the current year. On that basis, the questionnaire is able to look at what the average wage is of the same workers and how much wages have increased. The table, which classifies the rate at which the average wage increases into rank A through D and reports these, is known as Table 4. Traditionally, the minimum wage has been determined in a way that very closely aligns with the figures in Table 4.

Professor Keiko Tamada of Fukuoka University wrote a research paper about this in which she essentially found that it would be no understatement to say that the policy has been determined in a non-discretionary manner with a rule being followed that actual wage increases at small companies be taken into consideration in raising the minimum wage. On the other hand, in response to the inclination of government administrations in recent years to raise the minimum wage, the Central Minimum Wage Council has gradually issued guideline wages that are slightly higher, even though an increase in the minimum wage according to the wage revision status survey would be within a range of 1 to 2%. Particularly since 2016, a recommended increase of 3% or more has been made each year.

It has recently been pointed out that even though labor policy is set by a council comprised of members representing public interests, workers, and employers, the way in which the minimum wage is determined has changed. One example is the work-style reform bills. Even though working hour restrictions, fixed- and part-time labor legislation, and other provisions have been addressed, the policy framework has been determined at the nexus of political power, then sent back to the Labour Policy

Council. That same trend has also been observed with regard to minimum wages.

Are regional minimum wages really that low?

When decisions are made in a discretionary and political manner, a responsibility is incurred to explain the reasoning behind such decisions. Evidence-based policy making fulfills this responsibility. But, recognizing that the regional minimum wage must soon be increased in order to achieve a national average minimum wage of ¥1,000, we need to ask whether regional minimum wages are really that low, which means that we need to consider this question while also taking into account wage levels in rural regions of the country. Every year a very large survey is conducted of more than one million people known as the Basic Survey on Wage Structure. This survey samples short-term workers and people working at business establishments with between 10 and 99 workers. The reason for this is basically that people working for minimum wage are mostly part-time workers and employees at small companies.

In 2020, for example, the average hourly wage in Aomori Prefecture was ¥924 and the minimum wage was ¥793. The Kaitz Index divides the minimum wage by the average wage, and the index is 0.86 for Aomori Prefecture and 0.71 for Tokyo. In effect, the comparison with market wage shows that Aomori Prefecture has a higher minimum wage. The closer the Kaitz Index is to 1, the more people there are working at a wage close to the minimum wage. This suggests that a hike in the minimum wage in Aomori Prefecture would affect a larger percentage of the prefectural population compared to a hike in Tokyo. Accordingly, there naturally is concern that jobs might be lost if the minimum wage is raised.

Relationship between minimum wage and employment

It has been said that policies are not really formulated based upon evidence in Japan, but that is not true. According to a literature survey of 18 research papers conducted by Shuichi Matsuta of the Cabinet Office, of the 11 papers that studied the effects of minimum wage on employment, seven reported finding a negative effect, three the absence of any effect, and one reported finding both positive and negative effects.

If we ask why these results vary, it is because the effect cannot be appropriately estimated with small studies. Another important point is that the timing when the minimum wage is raised has traditionally been when the local economy experiences a boom. On account of that, even supposing that an increase in the minimum wage might decrease employment, economic expansion offsets that impact. That being the case, one might think that it is okay to raise the minimum wage when the economy is expanding. However, despite the offset, the impact

of economic expansion should expand employment when the minimum wage is not increased. Therefore, there is no change either way in the finding that minimum wage has a negative effect on employment.

It is necessary to focus on situations where the minimum wage increases regardless of the employment situation and to look at the impact of minimum wage on employment. An analytical method used recently references the 2007 revision of the Minimum Wage Act. When revision of the act was being considered, it was noted that even if someone worked full-time at minimum wage, that person's monthly income would be below the ceiling for public assistance. The public assistance ceiling is determined by living expenses, so the amount of public assistance benefits provided is high in urban areas where living expenses are high.

To resolve this inversion, the Minimum Wage Act was revised in 2007. It stipulates that a balance between the minimum wage and the amount of public assistance be taken into consideration. The inversion phenomenon was substantially resolved over roughly five years. Two academic papers have used this point to analyze the impact on employment. The first is a paper recently co-authored by Yuko Mori, Associate Professor at Tsuda University and this author. When she conducted her analysis using a monthly labor force survey of 50,000 households, she found a decrease in employment among junior high school and high school male graduates aged 19 to 24. A 10% increase in the minimum wage had quite a substantial impact, lowering their employment by 12%. On the other hand, no effect was seen on junior high school and high school female graduates or other male besides junior high school and high school graduates.

The other is a paper authored by Hiroko Okudaira, Associate Professor at Doshisha University, Miho Takizawa, then associate professor and currently Professor at Gakushuin University, and Kenta Yamanouchi, then lecturer at Keio University and currently Associate Professor at Kagawa University. They used the Census of Manufacturers to focus their analysis on the manufacturing industry. Their analysis showed that a 10% increase in the minimum wage would have the effect of reducing employment by 5%.

What is very interesting about their research is the calculation of a gap between worker productivity and wages. Because they used industrial statistics, they were also aware of shipments and labor inputs. They used this information to analyze the extent that labor contributed to production. Additionally, information about costs was also included, so the labor share was expressed as the percentage that total labor costs account for out of total expenditures, to find both labor's contribution to production and the amount paid for that contribution. This margin was large for business establishments where productivity exceeded wages, but

even if wages increased for such businesses, employment would not necessarily decline. Because there is a disparity between productivity and wages, even if the minimum wage is increased and wages have to be raised, that increase is able to be absorbed by reducing profit.

Identifying areas where productivity is higher than wages

When we consider regions in which to raise the minimum wage in the future, the research results produced by Okudaira et al. offer a wealth of suggestions, hinting that it is important to identify areas where productivity exceeds wages (monopsony). A situation where productivity exceeds wages is realized when the labor market is not competitive. When the labor market is competitive, employee poaching frequently occurs. When that happens, businesses whose productivity is higher than wages gradually expand employment. This pushes wages up so that they are on par with productivity. That does not happen, conversely, in situations where an employer has the power to decide wages in a labor market.

Countries' competition authorities have always measured the extent of competition in the market. When reviewing corporate mergers, Japan's Fair Trade Commission and other competition authorities have always calculated the Herfindahl–Hirschman index, which indicates the extent of industrial concentration, and they do not permit mergers if this concentration intensifies. Research is now underway to measure the extent of competition in the market in this way and might show that employment is not reduced even if the minimum wage is raised in areas where this index is low. We will probably need to watch this to determine which areas will not lose jobs if the minimum wage is increased.

I believe that another important unresolved issue is the great importance of using employment insurance data to analyze which businesses are absorbing workers who have lost jobs. In Germany, such research is already being conducted.

Footnote

1. ¥1,000 is about U.S. \$8.70 at the current rate as of March 1, 2022.

Establishing EBPM in Japan – The benefits of using nudges –

Fumio Ohtake

(Faculty Fellow, RIETI / Specially Appointed Professor, Center for Infectious Disease Education and Research (CiDER), Osaka University)

Interviewed by Masataka Saburi (Director, International Coordination and PR Strategy, RIETI)



Making policy proposals based on objective data is a crucial mission for RIETI. Four years ago, we launched an evidence-based policy making (EBPM) research project. Has the EBPM approach become established in Japan during the past four years? How should EBPM be used to respond to life-threatening crisis situations such as torrential rain disasters and COVID-19? We asked Fumio Ohtake, Specially Appointed Professor at Osaka University and member of the Japanese government's Advisory Council on Countermeasures against Novel Influenza and Other Diseases, who has played a leading role in RIETI's EBPM research from the start.

Please tell us about the EBPM research you have undertaken at RIETI so far.

At RIETI, we have held research meetings on evidence-based policy making (EBPM) for the past four years. We also hold annual symposiums. The primary purpose of the research meetings has been to establish the EBPM approach to policy in Japan. Before that, however, we had to begin by defining what EBPM means. The Japanese government had previously carried out policy assessments, but these were focused on assessing whether budgets were allocated and used in accordance with the original plans. Yet the essential purpose of policy assessment should be to ascertain whether or not the established policy goals have been achieved. In other words, policy assessment should include outcomes, which measure the results of policy goals, and outputs, which measure the effectiveness of the projects themselves. However, we found that in many cases it was not outcomes or outputs that were being assessed, but rather inputs; that is, whether the project had been implemented according to plan. We therefore started by establishing a common understanding of goal setting for outcomes and outputs. To begin with, in many cases we found insufficient explanation, based on scientific knowledge and evidence, of the logical mechanisms that would cause a policy input, say Project A, to lead to the desired outputs and outcomes. This was the first step toward establishing EBPM as a general approach.

Next, we were faced with the problem of how to measure the effectiveness of a policy. This was often measured by comparing the situation before and after the policy was implemented, but this does not constitute an accurate policy assessment in terms of the causal inference approach used in fields such as statistics and economics. When testing the effectiveness of a particular policy, it is crucial to compare the results after policy implementation

with counterfactual assumptions regarding what the situation would have been like if the policy had not been implemented. During the initial research meetings and symposiums, we therefore aimed to define the goals of EBPM, and to establish general methods for evaluating policy effectiveness. I feel that this approach is now beginning to sink in.

We also considered that it would be beneficial for those entrusted with policy implementation if we provided specific, practical examples in addition to evaluation methods. Through RIETI research meetings, symposiums and other forums, we have provided EBPM case studies across a range of fields such as education and disaster prevention, as well as COVID-19 countermeasures, which we presented at the symposium in December 2021.

Moreover, through discussions at RIETI research meetings, we have endeavored to emphasize our ideal vision for EBPM: conventional policy assessment focused on the *a posteriori* evaluation of implemented policies. However, as our mission is “evidence-based policy making,” we consider it vital to establish a number of policy candidates to achieve a specific goal, and ascertain *a priori* which policy will be most effective, before moving on to full-scale implementation. We have repeatedly discussed the idea that EBPM should be carried out as a preparatory step during the policy formulation or budgeting stage and linked to full-scale policy implementation.

After four years of work, I now feel that the EBPM approach is gradually taking root in Japan.

What kind of research are you engaged in at the moment? Can you tell us a little about the results of this research?

I am currently engaged in two types of research related to

EBPM. The first is the validation of policy effectiveness. This includes, among other work, the analysis of education policy effectiveness in collaboration with Amagasaki City in Hyogo Prefecture and Nara City in Nara Prefecture. For example, we have examined the impact of factors such as small class sizes, special abacus zones, temporary school closures due to COVID-19, and poverty on academic ability and soft skills. The preparatory work before beginning the actual research was quite demanding, as we needed to start by constructing datasets. The second type of research I am engaged in is closer to the original EBPM approach. It involves *a priori* analysis of what kind of policies will be effective, finding evidence, and linking it to policy decisions. Here, I would like to mention my research in Hiroshima Prefecture, where many lives were lost in torrential rain disasters. Hiroshima Prefecture has introduced a system of disaster prevention education, and a very large proportion of residents are aware of shelters and evacuation routes. However, not many residents actually evacuated when torrential rain struck the prefecture in 2018, leading to significant casualties. We therefore examined the effectiveness of policies using the behavioral economics concept of “nudges.” We used a method known as a randomized controlled trial (RCT), based on the results of questionnaire surveys by 10,000 respondents. We sent respondents one of six types of messages, selected at random, and examined how much their evacuation awareness had changed. We also conducted a follow-up survey of the same respondents eight months later, to determine whether or not they were continuing to engage in disaster prevention behavior.

The main issue we encountered with the surveys was what kind of messages to send. From interviews and surveys of people who had evacuated during the torrential rain disaster, we found that the vast majority had evacuated only after seeing those around them evacuating or being warned to evacuate by those close to them. Phenomena such as this, where people determine their own actions with reference to the behavior of those around them, are referred to in behavioral economics as “social norms.” It was therefore clear that expressions like “those around you are evacuating” would effectively promote evacuation, but such expressions could not be used in situations where many people have yet to evacuate. Such expressions were also unsuitable for community education activities, so we had to use a little ingenuity. We came up with the following message: “If you evacuate, you can save the lives of people close to you” (Table 1-A). Using this message in community education activities promotes the awareness that evacuating is an altruistic act that can save the lives of others. We also developed a negative message—“If you do not evacuate, you are putting people’s lives at risk” (Table 1-B)—and messages indicating the benefit of being able to obtain supplies by evacuating to a shelter—

“Evacuating to a shelter will help you secure food and blankets”; and “If you do not evacuate, then you may not be able to secure food or blankets” (Table 1-D and E).

Table 1: Nudge messages used in the intervention

A. Influence gain nudge	In the past, most people who evacuated in response to evacuation orders during heavy rains did so because others around them were evacuating. If you evacuate, you can save the lives of people close to you.
B. Influence loss nudge	In the past, most people who evacuated in response to evacuation orders during heavy rains did so because others around them were evacuating. If you do not evacuate, you are putting people’s lives at risk.
C. Reference point	When evacuation advisories are issued, due to heavy rains, it is necessary to evacuate as soon as possible. If you must remain at home, just in case, please wear something that can help identify you, as your life may be in danger.
D. Gain-framed relief goods	When evacuation advisories are issued, due to heavy rains, evacuating to a shelter will help you secure food and blankets.
E. Loss-framed relief goods	If you do not evacuate to an evacuation site when an evacuation order is issued, due to heavy rain, you may not be able to secure food or blankets.
F. Control	Every year, most rain falls between the beginning of the rainy season, around the start of June, and autumn, due to the influence of rainy season fronts and typhoons. In Hiroshima Prefecture, there have been many disasters, such as landslides, where mountains and steep slopes collapse. We should learn about the damage caused by heavy rainfall and protect our lives from disasters by developing the ability to make good decisions and taking action when danger is imminent.

The results of the questionnaire survey showed that those who received messages A or B had a strong intention to evacuate. Moreover, the follow-up survey indicated that those who received message A still maintained disaster prevention behavior even eight months after the message was sent. The effect of the negative message, on the other hand, had disappeared after eight months. From a policy perspective, we found that positive messages that emphasize societal impact (e.g., “your evacuation will save lives”) were extremely effective. As a result, Hiroshima Prefecture began extensive use of the “your evacuation will save lives” style of messaging.

I am confident that this research represents a good example of EBPM using nudges. We developed a number of message candidates that we anticipated would be effective in realizing policy goals from a behavioral economics point of view, examined the effects of these messages, and implemented those that we ascertained were effective and deployable from an administrative standpoint.

Another example I would like to talk about is the messaging used for COVID-19 countermeasures. A state of emergency was declared in Japan from April 2020, and a policy goal was established of reducing interpersonal contact by 80% during the Golden Week holiday from the end of April to early May. The message most utilized at the time was “Stay home.” We developed other candidate messages and evaluated which was the most effective (Table 2). Was it best to simply provide information? Or was it better to have an altruistic message like “By refraining from going out, avoiding the ‘3 Cs (closed spaces, crowded spaces, and close contact),’ washing your hands,

and wearing a mask, you can protect the lives of people close to you” instead? Or was a selfish message—“By refraining from going out, avoiding the ‘3 Cs,’ washing your hands, and wearing a mask, you can protect your own life”—better? We also developed a range of other messages based on behavioral economics, including a loss-framed altruistic message, and a combination of altruistic and selfish messages. Throughout the 2020 Golden Week, we implemented an RCT using online surveys. As a result, we found that a gain-framed altruistic message (Table 2-B) was the most effective.

Table 2: Nudge messages used in the intervention

A. Control	To prevent infection, reducing contact with others, avoiding the “3 Cs” (closed spaces, crowded spaces, and close contact), practicing proper hand washing, and wearing a mask are effective.
B. Gain-framed altruistic message	By refraining from going out, avoiding the “3 Cs,” washing your hands, and wearing a mask, you can protect the lives of people close to you.
C. Loss-framed altruistic message	By going out, not avoiding the “3 Cs,” and not washing your hands or wearing a mask, you will put the lives of people close to you at risk.
D. Selfish message	By refraining from going out, avoiding the “3 Cs,” washing your hands, and wearing a mask, you can protect your own life.
E. Altruistic and selfish message	By refraining from going out, avoiding the “3 Cs,” washing your hands, and wearing a mask, you can protect your life and the lives of people close to you.
F. Simple message	Stay home. You can protect the lives of people close to you.

In 2021, we went on to examine measures to promote vaccination. In Japan, vaccinations for the elderly began in earnest from May 2021. We began research into effective messaging from around January 2021, so that our research results could be utilized in the actual vaccination drive. Through our research, it became increasingly clear that people are significantly influenced by social norms. There is not a strong desire for vaccination while the number of vaccinated people is still low, but as that number increases, so does the desire to get vaccinated. Of course, just like in the case of evacuations, vaccination programs are always going to start with only a few people. We developed and tested three candidate messages to send at this early stage (Table 3). As a result, we found that a gain-framed social impact message (message B) was the most effective in increasing motivation to get vaccinated, with a significant effect observed among the elderly in particular. On the other hand, we found that a loss-framed message (message C), while effective among some people, also represented a psychological burden.

Table 3: Nudge messages used in the intervention

A. Comparison nudge	Seven to eight out of 10 people in your age group answered that they would receive this vaccine.
B. Influence-gain nudge	The more people receive this vaccine, the more people have the intention to do so. Your vaccination behavior can encourage the vaccination behaviors of those around you.
C. Influence-loss nudge	The more people receive this vaccine, the more people have the intention to do so. If you do not receive the vaccine, the people around you may also not do so.

In this way, even before a policy is implemented, it is possible to test its effectiveness to some extent by using online surveys such as those where messages are distributed to respondents at random. I am also involved in research into messages to promote antibody testing for rubella. In this case, we not only carried out surveys but also tracked participants’ actual behavior, finding a significant correlation between their intentions and behavior. I believe that if we establish a framework for constant implementation of surveys using this simple method, then we will be able to test the effectiveness of messages in real time as we deploy them in policy, even when faced with policy issues where the situation is rapidly changing, such as during the COVID-19 pandemic.

How should EBPM be developed in Japan in the future?

The EBPM method I have described enables a relatively simple and logical way to test for the best approach. For example, in practice, the composition of notices such as posters and notifications written by those responsible for policy implementation is left largely to the discretion of the person writing the notice. When providing information, it is easy for the person writing the notice to alter the design and composition of these notices slightly, without changing their actual content. It is relatively simple to obtain a comparison of outcomes, such as which notification elicited the greatest number of applications, and the effectiveness of different approaches can be rapidly verified. There are various other sophisticated methods used to verify causal inference, but in this way, nudges can be used first of all to provide an extremely accessible, low-budget method of testing effectiveness on the level of those responsible on the front line of policy implementation. I think it’s best to learn the basics of EBPM from this approach to begin with, also in terms of human resources formation and development. In this way, it’s possible to gain a first-hand understanding of the entire process, from the reasoning behind policy proposals and methods of verifying their effectiveness, to actual implementation based on these results. Of course, many government undertakings are very large in scale, and it is not possible to test their effectiveness so easily. However, even at the policy design stage, personnel with experience in the kind of approach described above should have an understanding of what sort of policy design will facilitate the verification of effectiveness later in the process and provide useful hints for policy improvement.

I think that empirical verification using nudges from behavioral economics is a highly effective method of gaining expertise in EBPM. It does not require large-scale surveys or sophisticated statistical techniques, and I sincerely hope that it is practiced by as many people as possible.

RIETI has been partnering with the Centre for Economic Policy Research (CEPR) since 2014, and articles written by RIETI fellows have also been published on VoxEU.org, the policy portal site operated by CEPR. Many columns by RIETI fellows are listed as “Most Read” articles, and we would like to share some examples.



Teams Become More Productive When Their Hours Are Shorter



Ruo Shangguan
Waseda University



Jed DeVaro
California State University, East Bay



Hideo Owan
Faculty Fellow, RIETI

It has been argued that when workers are already working long weeks, adding more hours can reduce productivity. This column tests this argument using evidence from Japan. The authors find that long working hours of key team members harm team productivity. In contrast, shorter hours cause the opposite effect, perhaps because workers recover from fatigue and arrive for work with increased energy and focus.

Is it true that less really is more? Can companies, by asking less of their workers, actually get more out of them? The answer, at least in some cases, is yes. A historical example happened in Britain during WWI. Workers, most of them women paid on piece rates and working long weekly hours, were engaged with the task of manufacturing artillery shells for the British military. Although investing more hours allowed these women to increase their production, that was true only up to a point. When the workweek was already quite long, assigning additional hours reduced productivity, perhaps due to workers' fatigue and exhaustion. In short, the relationship between a worker's output and her working hours exhibited an inverted U shape.

This intriguing phenomenon from a century ago—discovered by Pencavel (2015)—raises important questions for today. Does this pattern of hours and productivity exist in the modern workplace? Can it be found outside of the simple, individualistic production process of military manufacturing? Is it observed in the more complex, team-oriented production settings that increasingly describe the modern workplace? If so, does the way in which working hours are allocated across a team's members matter for productivity and, if so, how? Does productivity actually increase if companies impose shorter work schedules to cut back on labor during a recession?

In a new paper (Shangguan et al. 2021), we tackle these

questions using project management and personnel data from a Japanese architectural design and consultancy firm. Specifically, we examine how the firm responded to the Global Crisis of 2008-2009 in terms of the working hours it assigned to the firm's project design teams, and we assess how those hours assignments affected team productivity. We find evidence of the 'less is more' result documented in Pencavel (2015) but with some interesting new twists due to the team setting. One of those twists concerns how working hours are allocated across team members. After the crisis, hours become more concentrated within the team as work schedules become shorter. That is, the number of team members shrinks, and a higher fraction of the team's total hours is contributed by the team member who invests the longest hours as demand declines.

Japan, a country long known for its long working hours and high levels of job security, offers an ideal setting in which to study these questions. Our findings should be of interest from a policy perspective because the country's tradition of long hours is recently being called into question, as many companies strive to reduce overtime hours under the banner of 'work style reform.' The impetus for this shift is a pledge made by Shinzo Abe's administration in 2016, resulting in the revision of various labor-related laws (such as setting the upper limit on working hours) that came into effect in 2019. While there was a shared understanding in society that reducing long working hours was

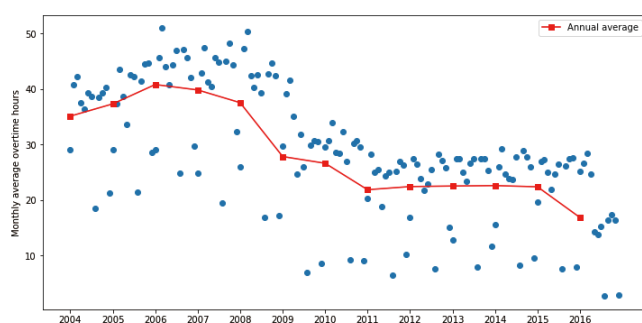
necessary for the physical and mental health of workers, there was persistent concern that reducing long working hours would further undermine the competitiveness of Japanese companies. But would it? The lesson from the case of British munitions workers from a century ago suggests otherwise.

It is well known that when a recession hits, and demand for products and services drops, companies typically respond with measures to reduce labor costs. This can be done in two ways: by laying off workers or by reducing working hours.

If layoffs are used, labor productivity may increase as workers try to improve their performance by exerting effort to avoid being laid off in a situation where it is difficult to change jobs (Lazear et al. 2016).

In many Japanese companies, because of the high levels of job security that workers traditionally enjoy, the tendency is to respond to a drop in demand by reducing hours rather than workers. Particularly if working hours were excessively long before being cut, labor productivity may increase as workers who were previously exhausted recover from fatigue and arrive for work more rested and with greater energy and concentration. In the firm we study, the turnover rate remained consistently low during the 2008–2009 recession. The worker attrition that occurred over time happened mainly through reduced hiring. On the other hand, as Figure 1 shows, the average monthly overtime hours decreased significantly during the crisis period.

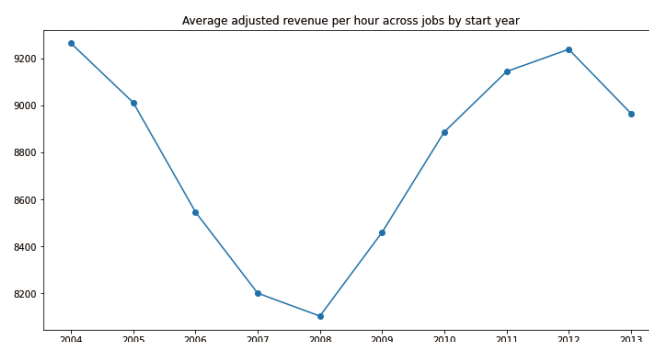
Figure 1: Average Monthly Overtime Hours, 2004–2016



In the firm that we study, design projects are divided into phases called jobs, and work is executed by teams. Team productivity is measured by dividing the income (which is set in a contract in advance) by the total working hours of the team's members. Figure 2 shows that the team-level productivity index increased after the Global Crisis. The regression analysis estimates that there was a 7.6% increase in team productivity. Team productivity is not necessarily an average of individual productivity because two new factors are added. First, team

members' individual outputs are interdependent. Namely, one member's high-quality output executed at the right timing also helps another member to do a good job in a timely manner. This is the complementarity between the work of individual team members. Second, the assignment of tasks to workers with different abilities will be adjusted if more capable workers can focus more on a smaller number of jobs in response to a weak demand. This allows the more capable workers to take more tasks in each of the remaining jobs.

Figure 2: Team-level Average Productivity, 2004–2013



In the study, we propose and calibrate a theoretical model to analyze within-team labor allocation and show empirically that complementarity and labor reallocation within the team are important determinants of team labor productivity. In the model, as the project workload increases, less capable workers are increasingly assigned to the team as the more capable team members become unable to handle the workload themselves. This leads to a decrease in the team's average productivity. This mechanism, operating in reverse as demand fell, was a driver of productivity growth during the Global Crisis.

Specifically, concerning the firm's response to the decrease in hours resulting from the crisis:

- (1) Total productivity improved by more than the increase in individual productivity, the labor share became more concentrated, and team size decreased.
- (2) The productivity improvement was greater for larger teams and less productive teams.
- (3) Larger teams exhibited lower average productivity because weaker workers joined teams when more hours were needed than the top performers could handle.

Our analysis shows that overtime caused the productivity decline, rather than vice versa. In particular, the more overtime that is supplied by the team member who invests the most time on a project, the more damaging is the effect on team productivity. We also find that the long working hours of key team members not only reduce productivity but also contribute

to an increased frequency of design defects.

These results suggest that when long working hours are reduced, individual productivity increases, and fewer mistakes are made at work. This might happen because workers recover from fatigue and arrive for work with increased energy and focus. The increased productivity of these rejuvenated workers in turn leads to increased productivity of their teammates in complementary relationships. Since fewer team members are then needed to finish the job, there is no need to add less capable workers to help with the workload. This reduces team size and increases team productivity. Prior empirical studies suggest this series of mechanisms, and, along with our work, support the likely effectiveness of work style reforms aimed at shifting toward shorter work schedules.

Editor's note

The main research on which this column is based first appeared as *RIETI Discussion Paper 21-E-040*.

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The Impact of COVID-19 on Global Production



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COVID-19 has had large impacts on global production and international trade. The column uses quarterly aggregate-level data on foreign affiliates of Japanese multinational corporations to show that multinational production and supply chains were negatively affected by the COVID-19 pandemic, especially in the 2nd quarter of 2020. The sales of Japanese manufacturing affiliates almost recovered in the 4th quarter of 2020, indicating the resilience of global production and multinationals' supply chains. But there are large variations in recovery across countries.

The COVID-19 pandemic has had substantial impacts on the world economy. In 2020, world real GDP fell by 3.6%, the volume of world merchandise trade declined by 5.3%, and foreign direct investment (FDI) flows dropped by 42%.¹ Supply chains have been disrupted and both supply and demand shocks transmitted through supply chains and propagated across borders. As Baldwin and Tomiura (2020) point out, COVID-19 is as contagious economically as it is medically. To slow down the spread of the coronavirus, many countries imposed some form of restrictions on people and businesses. Previous studies have shown that COVID-19 had large negative impacts on global supply chains (Baldwin and Freeman 2020, Bonadio et al. 2020), international trade (Hayakawa and Mukunoki 2021), and the

subjective uncertainty of global firms (Chen et al. 2021).

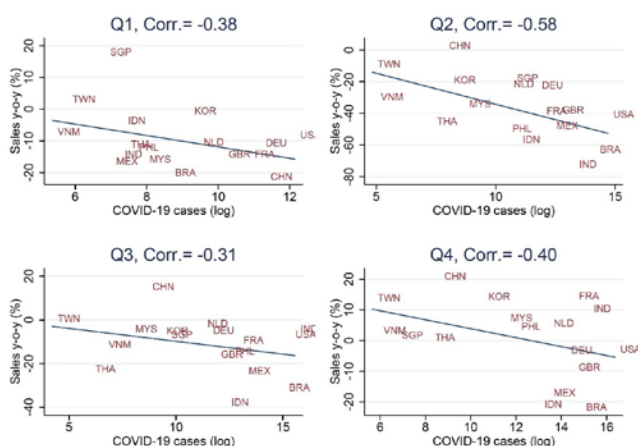
Since Japanese multinational corporations (MNCs) are important drivers and players in FDI and global value chains (GVCs), their overseas production and supply chains were hit hard by the COVID-19 pandemic. In a recent paper (Zhang 2021), I assess the impact of COVID-19 on global production by analysing quarterly data on the foreign manufacturing affiliates of Japanese MNCs.

Impact on sales of foreign affiliates of Japanese MNCs

In what follows, I document the impact of COVID-19 on the

performance of Japanese manufacturing affiliates in major host countries. Figure 1 shows the relationship between the number of COVID-19 cases (in logarithms) and year-on-year (y-o-y) changes of total sales in 2020. The plots of y-o-y changes in sales against COVID-19 cases across countries show that sales decline significantly with increases in COVID-19 cases in each quarter. In other words, COVID-19 cases are significantly negatively associated with sales of Japanese affiliates in major countries, especially in the 2nd quarter of 2020. In Q1 2020, affiliates' sales in China (including Hong Kong) and Brazil sharply decreased by about 20% y-o-y, whilst sales in Taiwan and Singapore only increased. In Q2, whilst China had almost recovered from COVID-19, the sales of Japanese affiliates dropped substantially in all other countries. India, Brazil, and Indonesia were the worst amongst them. Importantly, the fitted lines for Q1 and Q2 show that the negative correlations between COVID-19 cases and sales growth rates became significantly stronger from Q1 2020 to Q2 2020. This suggests that the pandemic and the performance of Japanese affiliates were getting worse in major countries, except China. In Q3, affiliates' sales in China continued to increase. The situation in other countries was improving relative to Q2, but most of them still had large decreases in sales. In Q4, the sales of Japanese affiliates in most countries recovered but there are still large variations across countries, implying the differences in recovery from the pandemic.

Figure 1: COVID-19 and Global Production



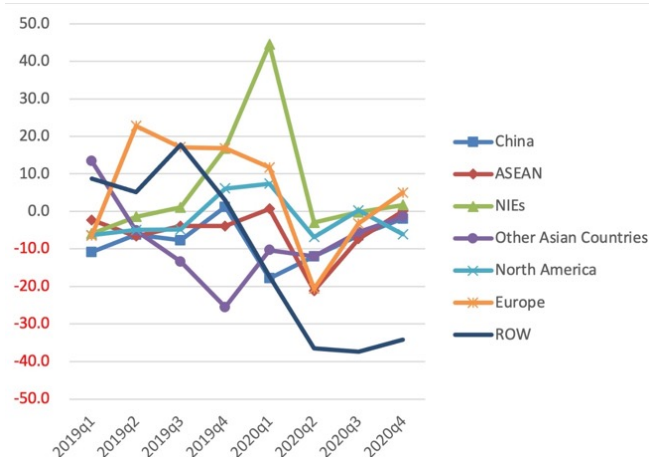
Source: Author's own compilation based on the Quarterly Survey of Overseas Subsidiaries (QSOS), Ministry of Economy, Trade and Industry (METI), and Johns Hopkins Coronavirus Resource Center.

Supply chain disruption and recovery

COVID-19 disrupted supply chains regionally and globally. Figure 2 shows the y-o-y changes of overseas affiliates' exports to Japan by region from Q1 2019 to Q4 2020. In Q1 2020, due to the rapid spread of COVID-19 in China, Japanese affiliates'

exports from China to Japan had a substantial decrease of 17.8% y-o-y. COVID-19 shocks hit China–Japan trade hard as the supply chains of Japanese firms rely heavily on China. In contrast, in ASEAN, newly industrialized economies (NIEs), North America, and Europe, exports to Japan increased by 0.7%, 44.5%, 7.4%, and 11.7% y-o-y, respectively. The sudden increase in NIEs, especially the Republic of Korea and Taiwan, may reflect the substitution effect as imports from China were disrupted in Q1. However, in Q2 2020, although Japanese affiliates' local sales in China almost recovered and increased by 6.7% y-o-y, their exports to Japan continued to see a y-o-y decrease of 12%. The situation in non-China regions such as ASEAN and Europe was even worse (about -20% y-o-y). ASEAN, which is expected to be an important alternative sourcing origin, also experienced significant decreases. The supply chains between ASEAN and Japan were in crisis as well. In Q4 2020, exports to Japan were recovering in all regions except the rest of the world (ROW).

Figure 2: Exports to Japan (% y-o-y)



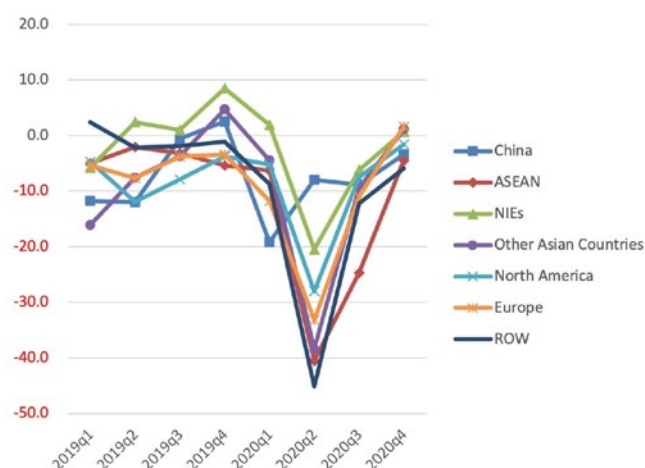
Note: Hong Kong is included in China. NIEs include the Republic of Korea, Singapore, and Taiwan. ROW includes countries in Africa, Oceania, and South America.

Source: Author's own compilation based on the QSOS, METI.

Similarly, Figure 3 shows that Japanese manufacturing affiliates' exports to third countries fell sharply during Q1–Q2 2020. Importantly, the impact was much larger relative to exports to Japan. On average, the y-o-y changes of exports to third countries were -9.5% and -33.4% in Q1 and Q2, whilst the y-o-y changes of exports to Japan were -5.5% and -16.5% during the same period. Foreign affiliates' exports to third countries were recovering in Q3 2020 but did not return to pre-COVID-19 levels. It is also worth noting that ASEAN-based affiliates had the lowest recovery in Q3. Whilst their exports to Japan were -7.2% y-o-y in Q3, their exports to third countries were much

lower, at -24.7% y-o-y. This suggests that the negative demand shock was much larger in the third countries, relative to Japan. In Q4 2020, exports to third countries almost recovered in all regions.

Figure 3: Exports to Third Countries (% , y-o-y)



Note: Hong Kong is included in China. NIEs include the Republic of Korea, Singapore, and Taiwan. ROW include countries in Africa, Oceania, and South America.

Source: Author's own compilation based on the QSOS, METI.

Policy implications

The ongoing COVID-19 pandemic will likely transform global production. UNCTAD (2020) argues that reshoring, diversification, and regionalization will drive the restructuring of GVCs in the coming years. This column provides some policy implications for global production and the re-evaluation of supply chain strategy in the post-COVID-19 era. To reduce the reliance on supply chains in China, in April 2020, the Japanese government approved a fiscal stimulus package including ¥220 billion (U.S.\$2 billion) for manufacturing firms to move production home and ¥23.5 billion (\$0.2 billion) to move production to ASEAN countries. However, China has brought the spread of COVID-19 under control, and the supply chains and economic activities have recovered since Q2 2020. On the other hand, Japan, ASEAN, and the ROW were hit hard by the pandemic at the same time. As shown in Bonadio et al. (2020), the renationalization of global supply chains does not make countries more resilient to pandemic-induced contractions in the labor supply. Therefore, it is geographical diversification in sourcing and sales, not the reallocation of production and supply chains, that makes firms and the economy more resilient to supply chain disruptions and disasters. Resilience in global supply chains can be increased through building buffer stocks and making

standardized inputs easier to replace, identifying places and suppliers that are less subjective to risk, and assessing the time to recovery for each type of supplier (Miroudot 2020). Policies in the future should support business efforts to build more robust and resilient supply chains.

Editor's note

The main research on which this column is based first appeared as RIETI Discussion Paper 21-E-014.

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Footnote

1. Sources: IMF, WTO, and UNCTAD.

Impacts of the Vaccine Intellectual Property Rights Waiver on Global Supply



Banri Ito

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In a policy reversal, the U.S. has announced its support for a proposed temporary waiver of intellectual property rights on COVID-19-related pharmaceuticals, although it is unclear how much of the undisclosed information regarding unpatented elements would be disclosed in order to facilitate technology transfer to developing countries. This column argues that the most efficient way to achieve equitable vaccine access would be to concentrate production in a smaller number of countries with sufficient production capacity. It also looks at the implications for Japan, which is caught in a dilemma between the need to vaccinate the population quickly and the need to secure incentives for developing domestic vaccine capacity for future pandemics.

The U.S. has announced its policy of supporting a proposed temporary waiver of intellectual property rights on COVID-19-related pharmaceuticals that was discussed at a meeting of the General Council of the World Trade Organization (WTO) on May 5-6, marking a policy reversal from its previous opposition to the waiver. It is said that behind this change of course is a growing tide of international criticism, mainly among developing countries, that the monopoly on vaccines by developed countries is impeding both equitable supply and the U.S. government's attempt to counter the "vaccine diplomacy" being promoted by China and Russia. Will the policy reversal by the U.S. actually lead to an improvement in vaccine supply?

Will a waiver of intellectual property protection promote technology transfer?

Regarding waivers of vaccine patents, there have been some voluntary initiatives. On October 8, soon after South Africa and India proposed a waiver of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement on October 2, 2020, Moderna, a U.S. pharmaceutical company, expressed its intention not to exercise its patent rights on its COVID-19 vaccine.¹ Although Moderna reached an agreement with South Korean pharmaceutical company Samsung Biologics on consignment production of the vaccine on May 22, 2021, so far, there have been very few confirmed cases of efforts to reproduce Moderna's vaccine or of licenses being granted to other companies.

With respect to the COVID-19 vaccines developed by Pfizer (jointly with BioNTech of Germany) and Moderna, it appears

that the whole body of relevant technical knowledge has not necessarily been patented but that some of the technical knowledge remains undisclosed as trade secrets. Patenting is only one means of ensuring "appropriability," which refers to a company's capacity to secure profits from its own technological innovation. While patent information may make it possible for outsiders to achieve development results similar to those achieved by the patented technology through a similar method without infringing the patent right, keeping the technology undisclosed as a trade secret or incorporating complex processes into it may be an effective means of ensuring appropriability. Pharmaceuticals can easily be counterfeited through "reverse engineering," which refers to a process in which the active ingredients of a drug are identified as a result of deformation. Therefore, as a general rule, it is considered important to exclude the risk of counterfeiting through patenting.

While it is not clear how much of the relevant technological knowledge remains unpatented, there are apparently some technical reasons for not obtaining full patent protection. The Pfizer and Moderna vaccines use advanced technology based on messenger RNA (mRNA), representing the first case of practical application of such technology. Although I, a non-expert in this field, will refrain from going into further detail, it is highly likely that those vaccines cannot easily be counterfeited as their production requires complex processes and unique technology.

Patenting involves public disclosure of technical knowledge, providing information on how to reproduce patented inventions. It has the function of lowering technology trade costs by

clarifying property rights on technical knowledge. If the technical knowledge necessary for manufacturing a certain product remains undisclosed as a trade secret, it may not be recorded in a written or other tangible form, and it may become necessary to pass down the technical information as cumulative implicit knowledge. As a result, technology transfer may become difficult.

Perhaps in view of that risk, in April 2021, the World Health Organization (WHO) established a COVID-19 vaccine technology transfer hub as a scheme to promote the sharing of mRNA-based technology. However, there are no media reports to date indicating that technical knowledge has been provided through this scheme.²

Using data from patent applicants for drugs for the three major infectious diseases (HIV/AIDS, Tuberculosis, and Malaria), we examined the applicants for their corporate attributes and found that pharmaceutical companies that cover various disease fields have an advantage in drug development for infectious diseases (Ito and Yamagata, 2007). In the case of drug development, economies of scope may be effective. In fact, there have been many reports of drug repurposing due to similarities in the therapeutic drugs for COVID-19, and it seems that drugs used to treat a wide range of conditions may be applicable to COVID-19 treatment, with those drugs not being limited to known treatments for infectious diseases. Given the economies of scope entailed in the development of pharmaceuticals, mRNA-based advanced technology may become applicable to other common diseases in the future. The scope of the proposed TRIPS waiver under discussion at the WTO extends beyond patent protection to include the protection of industrial designs, copyrights, and undisclosed information.³ However, even if the waiver of the TRIPS agreement is applied to the Pfizer and Moderna vaccines, it remains unclear for the moment how much of the undisclosed information regarding unpatented elements will be disclosed in order to facilitate technology transfer to developing countries.

Will equitable vaccine supply be realized?

If technical knowledge regarding patented vaccines is disclosed and if it becomes possible to produce the vaccines in third-party countries, as a general rule, a supply increase would bring benefits to consumers as the elimination of a monopoly lowers prices. Among past cases, we should look at the application of the waiver of the WTO TRIPS agreement to drugs to treat HIV/AIDS in 2001. According to an estimate by Médecins Sans Frontière, the prices of patented drugs dropped to less than a tenth of the previous level in one year, improving access to the drugs around the world.⁴ Given that the principle of

competition works, access to the COVID-19 vaccines is expected to improve.

On the other hand, the successful experience of the waiver applied to the HIV/AIDS drugs may be hard to replicate if, as the pharmaceutical industry argues, developing countries lack the technology necessary for producing and managing the vaccines, if a rapid increase in demand for the raw materials of the vaccines disrupts production around the world, or if restrictions are imposed on exports of the raw materials.⁵ Moreover, even if a patent waiver is applied, unrestricted dispersion of production sites would be inefficient given that the principle of economies of scale applies when fixed costs (costs of factories, storage facilities, etc.) for vaccine production are enormous. The most efficient method would probably be to concentrate production in a smaller number of particular countries with sufficient production capacity and export the vaccines from there.

Impact on Japan and Japan's position

For Japan, where vaccination is lagging, it would be desirable if a waiver of the protection of intellectual property rights on the COVID-19 vaccines led to an improvement in vaccine access. However, the proposed temporary waiver of the TRIPS agreement is primarily intended to assist countries with poor access, and therefore, the impact on Japan, which has concluded purchase contracts to cover most of its needs, will be limited. Rather, Japan, which has maintained opposition to the proposed waiver, must consider what action to take in response to the U.S. policy reversal.⁶

As Japan is preparing to realize the supply of Japanese vaccines now under development, the country will face a difficult decision between the need to secure development incentives and the expectations for the waiver. Even if the waiver of the TRIPS agreement is applied only to U.S.-developed vaccines, vaccine producers in other countries, including Japan, are expected to be negatively affected by it due to the fact that, as a general rule, it would be desirable for producers if prices remain high across the market. However, if price competition occurs in an oligopolistic market like the market for the COVID-19 vaccines, in which the number of vaccine producers is limited, a price cut by a producer will force other producers to lower their prices as well.⁷

As vaccine projects are subject to externalities, they are prone to the problem of supply shortages (Kremer 2000). Advance market commitments (AMCs) to promote investment in vaccine development have been successful in supplying pneumococcal vaccine to developing countries in the past and have been applied in this pandemic.⁸ After the policy reversal by the U.S., the

government of Japan announced a governmental procurement plan for domestically developed COVID-19 vaccines on May 13, 2021, as an AMC procedure. It is important to secure incentives for the development of domestic vaccines in order to prepare for future pandemics. On the other hand, unless the COVID-19 pandemic is contained everywhere in the world, prospects remain dim for the normalisation of the Japanese economy, which is internationalized in all aspects. It can be said that Japan is caught in a dilemma between the need to vaccinate the population quickly to allow for quicker return to a normal situation and the need to secure incentives for developing domestic vaccine capacity for future pandemics.

A quick solution would be to expand both production capacity and export capacity within G7 members. Castillo et al. (2021) insist on the need for additional investment to increase vaccine supply capacity because of the overwhelming global benefits of vaccines relative to their cost. Japan started to provide AstraZeneca vaccines manufactured in Japan, through the COVAX Facility (COVID-19 Vaccine Global Access Facility),⁹ to 15 developing countries and also to Asian countries with serious infection numbers such as Indonesia and Malaysia, based on bilateral negotiations.¹⁰ If production and export capacity were expanded within G7 members, global rollout of COVID-19 vaccines would be accelerated by the international trading system unless limited by excessive export restrictions.

Editor's note

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Footnotes

1. See the "Statement by Moderna on Intellectual Property Matters during the COVID-19 Pandemic." (<https://investors.modernatx.com/news-releases/news-release-details/statement-moderna-intellectual-property-matters-during-covid-19>)
2. <https://www.who.int/news-room/articles-detail/establishment-of-a-covid-19-mrna-vaccine-technology-transfer-hub-to-scale-up-global-manufacturing>
3. According to a written proposal submitted by India and South Africa in October 2020 (IP/C/W/669).
4. It is said that the prices of three antiretroviral drugs fell from \$10,000 per annual dose to \$700, comparable to the prices of generic drugs (<https://msfaccess.org/untangling-web-antiretroviral-price-reductions-2nd-edition>).
5. On May 5, the International Federation of Pharmaceutical Manufacturers & Associations issued a statement expressing disappointment at the United States' decision to support the proposed waiver of the TRIPS agreement, arguing that the decision would lead to disruption (<https://www.ifpma.org/resource-centre/ifpma-statement-on-wto-trips-intellectual-property-waiver/>).
6. At a meeting of the WTO General Council on intellectual property rights in general in October, Japan expressed its intention not to support the proposed waiver of the TRIPS agreement while recognizing the need for prompt access to pharmaceuticals, arguing that the waiver would undermine development incentives ([directdoc.aspx \(wto.org\)](https://www.wto.org/directdoc.aspx?lang=eng&docid=3421)).
7. This may be true according to an article in Nikkei Asia. Stock prices of Chinese vaccine makers fell after the U.S. announcement to support the proposal of TRIPS waiver (<https://asia.nikkei.com/Spotlight/Coronavirus/COVID-vaccines/Vaccine-patent-waiver-COVID-stopper-or-innovation-killer>).
8. Kremer et al. (2020) theoretically analyze advance market commitments (AMC) and show that optimal AMC design differs depending on development stages.
9. An international framework allowing high- and middle-income countries to make financial contributions for the supply of vaccines to developing countries and for the WHO and other organizations to use the financial contributions to implement joint vaccine purchases and internationally promote equitable vaccine supply. For information on the COVAX Facility, access the website of the WHO (<https://www.who.int/initiatives/act-accelerator/covax>).
10. The Government of Japan announced another U.S.\$800 million donation at the virtual Gavi COVAX Advance Market Commitment Summit on 2 June 2021.

ON TECHNICAL SUMMARY

Productivity of Working from Home during the COVID-19 Pandemic: Panel data analysis

Masayuki Morikawa, President & CRO, RIETI

1. Background

Following the expansion of the COVID-19 pandemic, there has been a rapid increase in workers practicing Work from Home (WFH). Within this context, there has also been a rapid increase in research on WFH during the pandemic. We have come to know what characteristics workers need to have in order to practice WFH as well as what kind of workers are actually engaging in WFH. Findings generally show highly-skilled, high-wage, white-collar employees who work in large firms tend to practice WFH, meaning that the expansion of WFH has tended to increase disparity in the labor market. In contrast, formal research on WFH productivity is still limited to a few studies both in Japan and abroad. This paper expands upon Morikawa (2020), which was based upon a survey conducted in June 2020. Another survey conducted in July 2021 is utilized to present new observations about changes in the practice of WFH and productivity during a year of the COVID-19 pandemic, the substitution of commuting time for working time, as well as other areas of focus.

2. Key results

- (1) The latest survey indicated that 21.5% of workers were practicing WFH, which is quite a decrease from the 32.2% a year prior. When tabulated using only continuing respondents, the extent of the decline was somewhat large. Of the employees who continued to reply to the survey, 3.2% just started practicing WFH during the past year, while 41.7% stopped practicing it. Of the employees practicing WFH, a large number had reverted to working at their usual workplace. Also, individuals with lower WFH productivity had a higher probability of exiting WFH.
- (2) Average WFH productivity was still 20% lower than productivity in the usual workplace, but an improvement of over 10 percentage points was observed during the past year. Figure 1 shows a comparison of the distribution of WFH productivity between the current survey and the one a year prior. From this Figure, it can be seen that the mode of productivity has shifted somewhat to the right and the lowest point of productivity distribution has contracted significantly.

Figure 1: Change in WFH Productivity Distribution

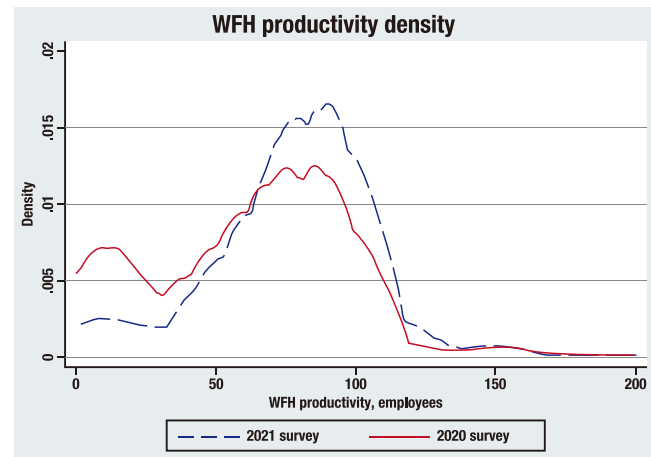
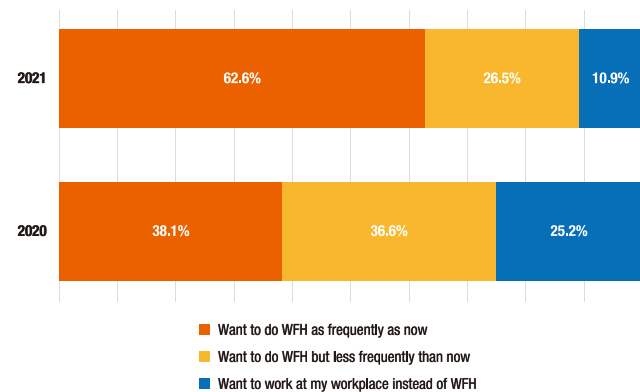


Figure 2: Intention to Continue WFH after the COVID-19 Pandemic



productivity employees from the WFH practice, and (2) the improvement in WFH productivity through “learning effect” contributed almost equally to the improved productivity of WFH.

- (3) An average of a little more than 40% of the commuting time saved due to WFH has been allocated to work time. The increase in labor input due to this has amounted to 3.0% of the total labor input of employees practicing WFH and 0.7% of the total labor input for all workers. Even taking into consideration the allocation of saved commuting time to work time, there is no substantive change in the conclusion reached about WFH productivity.

- (4) The number of individuals who said they would like to practice WFH at the same frequency as they currently do even after the COVID-19 pandemic subsides significantly increased (Figure 2), suggesting a high likelihood that WFH may become established as a highly-convenient and advantageous workstyle for workers engaged in work suited to WFH.

Reference

Morikawa, Masayuki (2020), "Productivity of Working from Home during the COVID-19 Pandemic: Evidence from an Employee Survey," *Covid Economics*, Issue 49, pp. 132-147.

* For details of the analysis, refer to Morikawa, Masayuki (2021), "Productivity of Working from Home during the COVID-19 Pandemic: Panel Data Analysis," RIETI Discussion Paper 21-E-078
<https://www.rieti.go.jp/jp/publications/dp/21e078.pdf>

ON TECHNICAL SUMMARY

Impact of Cash Transfers on Consumption during the COVID-19 Pandemic: Evidence from Japanese Special Cash Payments

Takahiro Hattori, The University of Tokyo / Norihiro Komura, Kyoto University / Takashi Unayama, Faculty Fellow, RIETI

During the COVID-19 pandemic, the Japanese government implemented a Special Cash Payment (SCP), comprising a uniform payment of 100,000 yen for each member of the resident population. Similar large-scale cash transfers were also implemented in many other countries. However, the impact of the SCP on household consumption was unclear in advance. Although it was possible that households might not increase their consumption out of fear of COVID-19, it was also possible that the SCP would significantly boost consumption due to an increasing number of households experiencing pecuniary constraints as a result of the pandemic. There was also the risk that increased household consumption would lead to the further spread of infections, depending on the type of consumption.

From this perspective, we estimate households' marginal propensity to consume (MPC) out of the SCP. We classify consumption based on the COVID-19 infection risk, estimate the MPC for each of these subcategories, and examine the ways in which households increased their consumption.

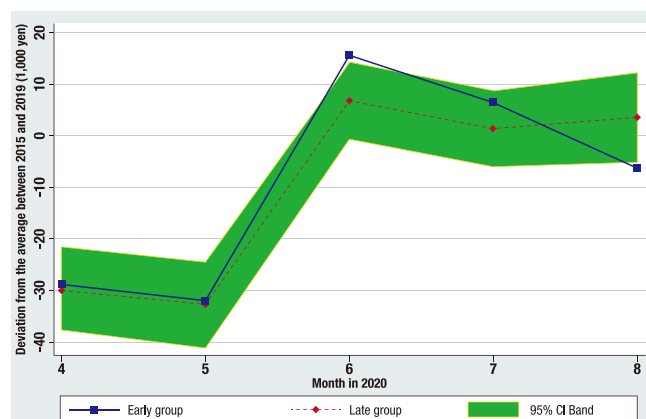
For this research, we use publicly available data from the Family Income and Expenditure Survey (FIES) published by the Statistics Bureau, Ministry of Internal Affairs and Communications of Japan. The FIES is a fundamental statistic under the Statistic Act and is regarded as the most reliable household-level expenditure data. In recent years, trends in the FIES correspond with GDP final household consumption expenditure, making it a suitable source of data for a

macroanalysis of the SCP. However, the SCP is recorded in the FIES as "special income" along with other temporary sources of income. Therefore, it is necessary to take econometric concerns into account when estimating MPC.

The SCP was distributed from June to July 2020 amid dramatic changes in consumption, with the initial state of emergency declared from April to May, followed by initiatives such as the "Go To" Campaign in July. This makes it impossible to assess the effect of the SCP by simply examining household consumption time series data.

Rather, we use the differences in the timing of SCP distributions between cities to estimate the MPC. Specifically, we focus on timing differences in the start date of the acceptance of payment applications for each municipality. In the Figure (corresponding to Figure 4 in the paper), we divide the cities into two groups: those that started accepting applications for the SCP relatively early (on average before May 25; indicated by the solid line) and those that started relatively late (indicated by the broken line). We refer to these two groups as the "early group" and the "late group," respectively. The figure represents a comparison of household consumption trends between these two groups and shows how we used differences in the timing of payments to estimate the MPC.

Figure: Application Start Date and Consumption



In June, the group for which payments commenced relatively early saw a larger increase in household consumption than the late group, but this difference gradually diminished over time and was reversed in August. In other words, consumption increased earlier in cities that commenced payments earlier. This indicates the effect of the SCP in boosting consumption. In June, the early group had received 210,000 yen as a special income, whereas the late group received only 106,000 yen; the difference in the SCP received between two groups was 104,000 yen. The difference in household consumption between the two groups in June is 9,000 yen. The MPC is the ratio of the two, 8.7% (= 9,000/104,000). In the paper, we use a more rigorous regression analysis to calculate the MPC, producing a baseline estimate of 11%.

The value of this estimate is consistent with previous studies on cash transfers in Japan. This suggests that, even during the pandemic, households responded as usual to cash transfers. Our estimate suggests that the increase in consumption in response to the SCP was mainly driven by households with liquidity constraints. It has been pointed out that the macro MPC is closely equivalent to the proportion of households with liquidity constraints, which has been estimated at approximately 13% by previous research. Our estimate of MPC, at around 10%, leads to a narrative suggesting that it was households with liquidity constraints that responded to the cash transfers.

This conclusion is highly significant for evaluating the SCP. Specifically, targeting only households with liquidity constraints could produce the same stimulus effect on consumption as a uniform benefit for the entire population. The stated purpose of the SCP was not purely to stimulate consumption. Moreover, there is no guarantee that government authorities would be able to accurately identify households with liquidity constraints when implementing a cash transfer. However, it will be difficult to justify unconditional uniform payments to the entire population when drafting cash transfer measures in the future.

Assuming that 10% of the SCP was spent for consumption, this

corresponds to a boost in consumption of more than 1 trillion yen. This additional consumption may also have contributed to the spread of COVID-19. To assess this risk, we examine what goods and services were consumed by households.

By restructuring the detailed categories presented in the FIES, we are able to classify consumption according to our own criteria based on the risk of COVID-19 infection, to explore how households increased their consumption. Specifically, we classify consumption into four subcategories: spending on “face-to-face services” such as traveling and eating out, which carry a relatively higher risk; spending on “goods/services purchased at home” such as utilities and internet services, with the lowest risk; spending on “transfer payments” including gifts and remittances; and spending on other “goods/services purchased at stores.” Our estimates of the MPC for each consumption subcategory are presented in the table below (corresponding to Table 3 in the paper).

We find that consumption of “goods/services purchased at stores” increases by about 8%, and consumption of “goods/services purchased at home” and “transfer payments” both increase by around 2%. By contrast, we do not find a statistically significant change in “face-to-face service” consumption. These results suggest that households consider the risk of infection when deciding what to consume using the SCP. Based on these changes in consumption behavior, the SCP did not significantly increase the risk of spreading COVID-19.

Table: MPC out of SCP by Infection Risk

	(1) Store purchase	(2) Home purchase	(3) Face-to-face service	(4) Transfer payment
SCP	0.083*** (0.029)	0.022*** (0.005)	-0.022 (0.019)	0.017*** (0.005)
Estimation	111.3	111.3	111.3	111.3
Weak IV F-stat Sample	Jan–Dec	Jan–Dec	Jan–Dec	Jan–Dec
Period Observations	624	624	624	624

Standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

* For details of the analysis, refer to Hattori, Takahiro, Norihiro Komura, and Takashi Unayama (2021), “Impact of Cash Transfers on Consumption during the COVID-19 Pandemic: Evidence from Japanese Special Cash Payments,” RIETI Discussion Paper 21-E-043
<https://www.rieti.go.jp/jp/publications/dp/21e043.pdf>

ON TECHNICAL SUMMARY

The Impact of COVID-19 on Japanese Firms: Mobility and resilience via remote work

Daiji Kawaguchi, Faculty Fellow, RIETI / Sagiri Kitao, Senior Fellow, RIETI /
Manabu Nose, International Monetary Fund and The University of Tokyo

What effect did the dramatic decline in mobility due to the COVID-19 pandemic have on the performance of firms? In our research, we draw on a survey of Japanese firms during the COVID-19 pandemic to examine how changes in mobility due to the crisis affected firms' sales, employment and hours worked per employee, and how the implementation of Work from Home (WFH) arrangements helped firms to mitigate negative effects.

Lower mobility resulting from the Japanese government's declaration of a state of emergency and fear of infection led to a significant decline in the business activities of firms. As shown in Figure 1, the impact on performance was greater among firms that faced larger changes in mobility. We analyze this impact using mobility changes observed in the Google community mobility report and a survey of Japanese firms conducted by the Center for Research and Education in Program Evaluation (CREPE) at The University of Tokyo and Tokyo Shoko Research, Ltd. (TSR). We find that sales declined by an average of 2.8% and work hours by an average of 2.1% in response to a 10% drop in people's mobility, but we observe no effect on employment. This muted employment response is consistent with limited changes in aggregate employment at the extensive margin during COVID-19 in Japan. Analyzing this impact across different firm sizes and sectors, we find that the impact on sales and work hours was greater among smaller firms and those in higher-contact sectors such as retail trade and accommodation.

Did WFH arrangements help to mitigate the impact of this decline in mobility on firms' activities? We find that the impact on activities was effectively reduced among those firms that had adopted WFH arrangements by December 2019, prior to the advent of COVID-19. This result is shown in Table 1. As with the impact due to changes in mobility, we observe no effect on employment. However, we find that the adoption of WFH before COVID-19 mitigated the negative impact of the decline in mobility by approximately 55% in terms of sales and by approximately 35% in terms of hours worked. Moreover, we show that adapting to the

crisis environment by increasing the number of employees working from home also helped mitigate the negative impact on sales and work hours. However, we also find that the mitigation effect of WFH arrangements differed substantially across firms and was limited to those in low-contact sectors, with no effect observed in high-contact sectors.

Table 1: Impact of Mobility Change and the Status of WFH Arrangements in 2019 on Firms' Activities

	All	Low contact	High contact
Panel A: Sales			
Mobility	0.276** (0.021)	0.256*** (0.025)	0.313*** (0.036)
Mobility x Remote 2019	-0.153** (0.061)	-0.194*** (0.072)	-0.027 (0.113)
Panel B: Employment			
Mobility	0.011 (0.007)	0.011 (0.008)	0.009 (0.014)
Mobility x Remote 2019	0.004 (0.023)	0.008 (0.029)	-0.010 (0.034)
Panel C: Hours Worked			
Mobility	0.211*** (0.013)	0.206*** (0.017)	0.220*** (0.020)
Mobility x Remote 2019	-0.073* (0.038)	-0.079 (0.048)	-0.049 (0.054)
Samples	29,056	19,264	9,792

Note: Standard deviations are reported in parentheses. * p<0.1, ** p<0.05, *** p<0.01

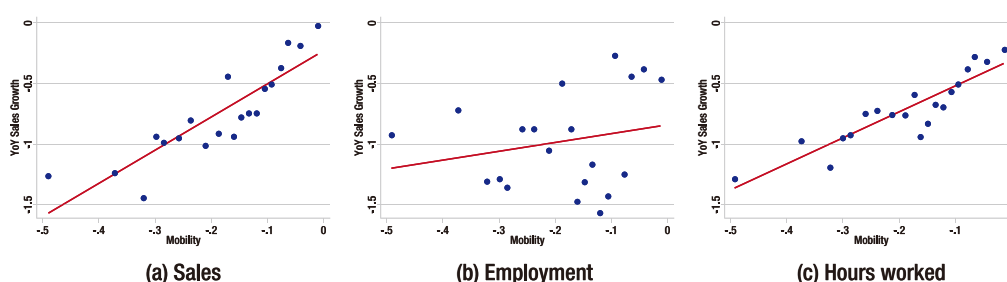
The COVID-19 pandemic caused a sudden and massive disruption in firms' sales and work hours due to a substantial decline in mobility. In the context of the economic crises resulting from epidemics such as COVID-19, we find that greater diversification in labor input through WFH arrangements provides an insurance device against unexpected shocks. At the same time, however, mobility change does not affect the performance of all firms in the same way, indicating heterogeneity in the mitigation effect due to WFH arrangements.

Footnote

1. The figure shows the average year-on-year changes in sales, employment, and work hours for 20 groups of firms, classified by the change in mobility for each firm.

* For details of the analysis, refer to Kawaguchi, Daiji, Sagiri Kitao and Manabu Nose (2021), "The Impact of COVID-19 on Japanese Firms: Mobility and Resilience via Remote Work," RIETI Discussion Paper 21-E-063
<https://www.rieti.go.jp/jp/publications/dp/21e063.pdf>

Figure 1: Mobility and Sales, Employment, and Hours Worked¹



NON TECHNICAL SUMMARY

Are Applying for and Receiving Subsidies Worth It for Small Enterprises? Evidence from the government support program in Japan

Yuki Hashimoto, Fellow, RIETI / Kohei Takahashi, Waseda University

Higher labor productivity at small- and medium-sized enterprises (SMEs) is crucial for further economic growth in the context of population decline and was a focus of the *2020 White Paper on Small and Medium Enterprises in Japan*. However, many SMEs have made little progress in raising labor productivity since the 2000s. This is especially true of firms that cannot make the capital investments required due to factors such as funding constraints. Against this background, the Small and Medium Enterprise Agency established the Business Sustainable Subsidy (BSS) in 2013 to boost SME market development and labor productivity. In this paper, we examine the impact of application and receipt of the BSS on small enterprises' sales and productivity.

We analyze data by combining a list of all the firms that applied for the BSS in FY2013 and FY2014, and firm data compiled by Tokyo Shoko Research (TSR). We assess the effects of the subsidy by examining changes in sales, number of employees, and sales per capita before and after an application for the subsidy was made and received, for firms that applied for and received the subsidy, and comparing these with firms that did not.

Several opportunities are provided for firms to apply for the BSS each year, and a separate cutoff point for receiving the subsidy is established each time. We therefore employ a sharp regression discontinuity design (sharp RDD) to estimate the effects of receiving the subsidy and confirm the robustness of our findings through a difference in differences (DID) analysis. Regardless of the analytical method, we did not observe a significant increase in outcomes such as sales as a result of firms receiving the subsidy.

However, prospective applicants for the BSS are required to prepare a business plan with support from management advisors from the Japan Chamber of Commerce and Industry (JCCI) or the Central Federation of Societies of Commerce and Industry (CFSCIJ). The application process therefore gives firms the opportunity to identify the issues they face and examine their future business outlook. This mechanism may effectively enhance the business performance of subsidy applicants, even if they are not actually selected to receive the BSS.

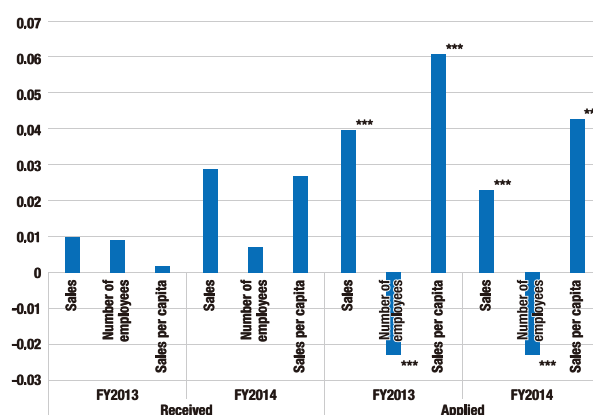
To estimate the effect of applying for the BSS, we therefore employ DID analysis of a data sample that includes firms that did not apply for the subsidy. The Figure shows the results of our estimation based on application and receipt of the BSS, respectively. For firms that applied for the BSS, while we observe a significant increase in sales after the application, when compared with firms that did not apply, there was a significant decline in the number

of employees. We also observe a significant positive correlation with sales per capita, which we treat as a productivity indicator. An analysis by industry (for the manufacturing, construction and service industries) indicates that this tendency is particularly apparent in the service industry.

We test the robustness of these results using a placebo analysis and find that the result for FY2013 is both significant and robust. For FY2014, however, there are indications of possible selection bias, with firms that could be expected to gain the greatest effects from the subsidy more likely to actually submit an application.

To summarize the results of our analysis, although we found no significant difference in outcomes between firms that received the subsidy and those that did not, we did find that productivity improved for firms that applied for the subsidy compared with those that did not. This suggests that the effects were due not to financial support from the subsidy, but rather to the application process itself. Our findings imply that external advice from organizations such as chambers of commerce and the preparation of business plans, which form part of the application process, provide firms with an opportunity to identify and address their issues, effectively improving productivity. It may be that the inclusion of such mechanisms to promote voluntary efforts is an effective design for the implementation of subsidy policies aimed at developing small enterprises.

Figure: Effects of the Business Sustainable Subsidy (BSS)



*** indicates statistical significance at the 1% level.

* For details of the analysis, refer to Hashimoto, Yuki and Kohei Takahashi (2021), "Are Applying for and Receiving Subsidies Worth It for Small Enterprises? Evidence from the Government Support Program in Japan" RIETI Discussion Paper 21-E-039 <https://www.rieti.go.jp/jp/publications/dp/21e039.pdf>

Report on Recent Activities



Yasuhiko Yoshida

Vice Chairman, RIETI

The impact of the COVID-19 crisis has been felt across RIETI's activities as significantly as across society. Even under these circumstances, RIETI has been vigorously continuing its activities while diligently adapting to the situation at hand. The various research project meetings and discussion paper (DP) review sessions were changed from a face-to-face to an online format. We had to get used to the unique characteristics of an online environment for presentations, Q&A sessions, sharing materials, and other activities, but we are now in a position where we can take advantage of its benefits, including remote participation, in continuing our research activities. We continue to actively engage in the publicity and dissemination of research through the transition to online symposiums, seminars, and other activities.

In terms of research topics, we have seen a rapid development in research related to COVID-19, in addition to existing research topics. We have disseminated the results of this research in DPs, columns on the RIETI website and in book form, as well as through symposiums and the like, which we report on in our PR magazine (*RIETI Highlight*) and on the RIETI website.

The Fifth Medium-term Plan in its second year

RIETI is an incorporated administrative agency established by the government under government law and is operated in accordance with a medium-term plan and medium-term targets. The fiscal year starting from April 2021 (FY2021) marks the second year of RIETI's fifth four-year Medium-term Plan (FY2020–2023). Examining the results obtained during FY2020, the first year of the plan, we published 168 research papers after internal review. In other words, we were able to publish an extremely large number of papers despite the COVID-19 crisis. (We published an additional 122 research papers during the period from April 1 to December 31, 2021.) No less than 67 research papers were published in internationally recognized, peer-reviewed academic journals and other specialized publications. Several papers were published in high-impact academic journals (such as *Journal of International Economics*, *American Political Science Review*, *Journal of Cleaner*

Production, and *ILR Review*). We published eight research papers on evidence-based policy making (EBPM), such as an analysis of the effect of manufacturing subsidies, the short-term impact of selection as a “Nadeshiko Brand” (for firms that are outstanding in terms of encouraging women's success in the workplace) on stock price, and the impact of minimum wages on employment. In terms of the integration of natural and social sciences, we published 11 research papers on topics such as the U.S. Foreign Corrupt Practices Act and market quality in emerging economies, and travel and COVID-19 diagnosis. We also published 39 research papers that included contributions by overseas researchers. Many of RIETI's research results were cited in government white papers, such as “White Paper on International Economy and Trade,” “White Paper on Small and Medium Enterprises in Japan,” “White Paper on Small Enterprises in Japan,” and “White Paper on the Japanese Economy and Public Finance.” Our research findings were cited by official government councils and the like, for example, the Industrial Structure Council, Growth Strategy Council, and the Central Environment Council. The number of cases where we provided policy advice to government ministries and agencies such as METI increased by more than 40%, compared to the past three years, demonstrating our contribution to policy formation.

Regarding the research related to COVID-19 mentioned above, we introduced a Fast Track system to facilitate the swift publication of research results to contribute to timely policy planning, based on three necessities: 1) urgency, 2) significant potential contribution to policy formation, and 3) importance for the international competitiveness of Japanese research. A large number of DPs were published through this system. In the seventh meeting of the Growth Strategy Council held by the government, many of RIETI's research results were cited as basic data on the economic impact of the COVID-19 crisis.

On another front, we launched the Global Intelligence Project, comprised of research into changes in the international order and Japan's medium- and long-term competitiveness. We are engaging in interdisciplinary, cross-cutting research from the perspectives of international political science, economics, and international economic law, focusing on topics that are expected to shape the international order in the future. We are also carrying out research into approaches to risk management in Japan, from a perspective that encompasses these fields.

These research efforts by RIETI have garnered high praise in Japan and overseas. One example is the 2021 NTJ Richard Musgrave Prize awarded to Faculty Fellow Takashi Unayama and David Cashin for their joint research paper “The Spending and Consumption Response to a VAT Rate Increase” (*National Tax Journal*, Vol. 74, No. 2). This paper is based on a RIETI Discussion Paper (16-E-052).

Enhancing research dissemination activities

At RIETI, we have always published research results widely, and disseminated them in various different forms. The online publication and dissemination of research have become more important than ever during the COVID-19 crisis, and we are actively working to further our initiatives in this area.

1 The RIETI website

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



The RIETI website is the centerpiece for announcing the results of research at RIETI. All discussion papers (DPs) and policy discussion papers (PDPs) produced by RIETI's research projects are published on this site and are available for anyone to read. We operate

English- and Chinese-language sites in addition to the Japanese site.

Research papers published in an academic form feature an abstract at the beginning. For Japanese readers, we also publish a separate non-technical summary (NTS) for each paper, written by the paper's authors to explain aspects such as the paper's policy implications.

We also publish columns on current issues, written by researchers participating in RIETI. On the "Perspectives from Around the World" page, we present research results on a range of topics, as well as suggestions and messages for Japan written by internationally renowned researchers and experts from the U.S., Europe, Asia and elsewhere.

In addition to this content, the RIETI website features systematic databases for policy analysis. We provide data through platforms such as the Japan Industrial Productivity Database (JIP Database), a basic resource for analyzing Japan's economic growth and changes in industry structure, the Regional-level Japan Industrial Productivity Database (R-JIP Database), a basic resource for analyzing industry structure and regional productivity differences in Japan, the Japan Economic Policy Uncertainty Index, which comprises part of the results from RIETI's international joint research with the IMF Regional Office for Asia and the Pacific, titled "Policy Uncertainty in Japan," and the Japanese Study of Aging and Retirement (JSTAR), containing data from a panel survey of middle-aged and elderly people aged 50 or older conducted by RIETI together with Hitotsubashi University and the University of Tokyo.

2 Symposiums and seminars

<https://www.rieti.go.jp/en/events/>



With the many restrictions imposed to prevent the spread of COVID-19, we have transferred our symposiums and seminars from conventional physical participation to an online format. Our symposiums and seminars attract high levels of participation, with timely, varied topics such as the COVID-19 pandemic, the international economic situation involving the U.S., China, and others, and the environment and energy. (See page 46 for a list)

3 YouTube "rietichannel"

https://www.youtube.com/playlist?list=PLrKLHCc7FQaNF9aKtY_iEownmNjNtL_e2



With the transition to an online format for RIETI events, the content presented on our YouTube channel "rietichannel" is rapidly expanding. The channel was previously devoted to recording and publishing events held in a physical setting, but now features content produced specifically for an online format, with more content that can be viewed more comfortably online.

In addition to symposiums, research seminars, and Brown Bag Lunch (BBL) webinars, we present video content such as discussions on issues facing Japan and interviews with experts and fellows on hot topics including economic, political, and social issues.

Videos with English titles are presented in English, and the channel features a "video in English" playlist with over 70 such videos.

4 RIETI Report, Twitter, and Facebook

The public can check the status of RIETI's latest activities by subscribing to our bi-weekly English-language newsletter, RIETI Report, as well as through RIETI's English-language accounts on Twitter and Facebook.

• Subscribe to RIETI Report:

<https://rieti.smktg.jp/public/application/add/5257?lang=en>

• Twitter:

<https://twitter.com/RIETIenglish>

• Facebook:

<https://www.facebook.com/en.RIETI>



5 International collaboration

RIETI has been expanding its research network and working to strengthen its research system in collaboration with researchers from overseas universities and research institutions.

Regarding our interaction with overseas research institutions, since 2007 RIETI has been partnering with the Centre for Economic Policy Research (CEPR), one of the world's top economic think tanks. We have been working with CEPR in disseminating information since 2012. For example, columns and other materials by RIETI have been published on VoxEU.org, the policy portal site operated by CEPR, and some columns by VoxEU.org on timely topics have also been reposted on the RIETI website.

Furthermore, we are strengthening ties with the Australian National University (ANU) through the co-hosting of symposiums and mutual publication of research papers. We have signed MOUs with research institutions around the world to enhance collaboration through an international research system. (See page 44)

Looking forward

The COVID-19 crisis has impacted RIETI's activities in various ways, but we have also been able to open up new horizons by adapting to the changes. We will leverage these new insights to drive RIETI's research results, dissemination activities, and contribution to policy planning in an even more dynamic way.

International Institutions with RIETI

RIETI UPDATE

EUROPE

United Kingdom

- ① Centre for Economic Policy Research (CEPR)
Chatham House
COVID-19 Genomics UK Consortium (COG-UK)
- ② Saïd Business School, University of Oxford
- ③ Durham University

France

- ④ Banque de France
Fondation France-Japon de l'EHESS
Institut national de la santé et de la recherche médicale (INSERM), CReMe3
Institut Pasteur
Organisation for Economic Co-operation and Development (OECD)

Germany

- ⑤ IZA Institute of Labor Economics (IZA)
- ### Switzerland
- ⑥ Graduate Institute, Geneva
University of St. Gallen

Netherlands

- ⑦ Clingendael Institute

Belgium

- ⑧ Bruegel
European Commission (EC)
European Corporate Governance Institute (ECGI)

Sweden

- ⑨ Varieties of Democracy (V-Dem),
University of Gothenburg

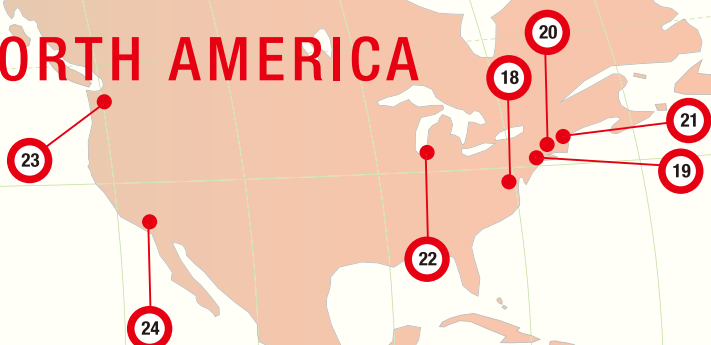
ASIA

OCEANIA

Institutions that Collaborated in 2021



NORTH AMERICA



ASIA

Republic of Korea

10
Korea Institute for Industrial Economics and Trade (KIET)

Taiwan

11
Taiwan Institute of Economic Research (TIER)

China

12
Institute of Japanese Studies, Chinese Academy of Social Sciences (IJS, CASS)
Peking University
Tsinghua University

Mongolia

13
The Mongolian National Development Agency (NDA)

Singapore

14
Asian Trade Centre
Asia-Pacific Economic Cooperation (APEC) Secretariat
ISEAS –Yusof Ishak Institute
Middle East Institute, National University of Singapore

Indonesia

15
Economic Research Institute for ASEAN and East Asia (ERIA)
Indonesia Research Institute for Decarbonization (IRID)

India

16
Centre for Policy Research

NORTH AMERICA

United States of America

18
Council on Foreign Relations (CFR)
Asia Society Policy Institute (Washington, D.C. Office)
Brookings Institution
Georgetown University
George Washington University
German Marshall Fund of the United States
International Monetary Fund (IMF)
Peterson Institute for International Economics

19
Syracuse University

20
Yale University

21
Harvard University

22
University of Chicago

23
Portland State University

24
University of California San Diego

OCEANIA

Australia

17
Australian National University

*Institutions in blue are institutions with which RIETI has signed Memorandum of Understandings (MoUs) to date.

List of Events in 2021

In 2021 RIETI hosted 76 events, welcoming various speakers from Japan and overseas. The seminars covered a wide range of topics including the impact of COVID-19 on the economy, green growth strategy, geopolitical issues, DX, Japan-Asia cooperation, and economic security. For the videos and summaries of the events, please visit: <https://www.rieti.go.jp/en/events/>



Date	Event	Date	Event
1/14	RIETI Open BBL Webinar: Global Intelligence Series The International Economic Policy Challenges for the Biden Administration	6/18	RIETI-ECGI-WBF Webinar Series A New Concept of the Corporation: [Part 4] The role of institutional investors
1/15	RIETI Open BBL Webinar Basis & Practice of Management Accounting in the Public Sector	6/22	RIETI Open BBL Webinar The 2021 White Paper on Manufacturing Industries (Monodzukuri): The new normal of manufacturing-industries resilience, green and digital
1/20	RIETI Open BBL Webinar: DX Series European AI Strategy for Digital Economy: What Japan should learn from the EU	6/24	RIETI & EU-Japan Centre for Industrial Cooperation Joint Webinar Toward Carbon Neutrality—Challenge of Japanese & EU industry and system
1/26	RIETI Open BBL Webinar: DX Series Going Digital: Implications of the COVID-19 crisis on digital transformation	7/1	RIETI-ERIA Open BBL Webinar How Will East Asia's Digital Transformation Change the Global Value Chain?
1/27	RIETI BBL Webinar: Global Intelligence Series Considerations on How Japan Can Unlock Its Full Potential in a Rapidly Evolving World	7/3	FPJ, IPJO, IFRJ-MFJ, RIETI, Kyoto University Seminar Socio-life Science Interdisciplinary Seminar: Stakes of COVID-19 vaccination
2/4	RIETI BBL Webinar: Global Intelligence Series Improving Productivity in Japan	7/6	AIG Global Trade Series 2021 Podcast Episode 5 Climate and Trade: On the road to COP26
2/5	RIETI Open BBL Webinar: Global Intelligence Series Multi-risk Governance—International and domestic response to emerging and reemerging infectious diseases	7/8	RIETI Open BBL Webinar: DX Series Blockchain Now: Applications of blockchain in digital ownership and data management
2/9	Japan Society for the Promotion of Machine Industry-Economic Research Institute Online Seminar Autonomous Driving, Driver Assistance, MaaS and ITS	7/12	Fondation France Japon-RIETI-Banque de France Joint Workshop How COVID-19 Impacts Supply Chains and the Economy: Evidence from Europe and Asia
2/10	RIETI BBL Webinar: Global Intelligence Series European Green Recovery Strategy and Industry Perspectives	7/15	RIETI Open BBL Webinar Energy White Paper 2021
2/12	RIETI Open BBL Webinar: Global Intelligence Series SDGs (Sustainable Development Goals) and VSS (Voluntary Sustainability Standards)	7/20	AIG Global Trade Series 2021 Podcast Episode 6 Digital Transformation: Standards, taxation, and global governance
2/18	RIETI Open BBL Webinar: Global Intelligence Series Policy Trends Related to the Application of Mobile Payments in China—From restaurant DX to SME credit ratings	7/21	RIETI-ECGI-WBF Webinar Series A New Concept of the Corporation: [Part 5] The purpose of the corporation and how to realize its purpose
2/19	RIETI Open BBL Webinar: Global Intelligence Series Evaluation of China's Innovation Power: Seen in patent macro data	9/1	RIETI Open BBL Webinar: Global Intelligence Series Emerging Economies Going Digital: Japan's potential as a co-creation partner
2/24	RIETI Open BBL Webinar: Global Intelligence Series Understanding the Turbulent Situation in the Middle East: Turkey's strategy and approach as a clue	9/6	RIETI Open BBL Webinar: Global Intelligence Series Economic Security Policy as Growth Strategy and Recent Developments in Trade Rules
3/2	CEPR-RIETI Symposium Changing Course: Multilateral cooperation toward green growth and digital transformation	9/8	RIETI Open BBL Webinar Food-tech: Putting Japan's advantages in food culture to work
3/16	RIETI-ECGI-WBF Webinar Series A New Concept of the Corporation: [Part 1] The purpose of the corporation and its implication for law and business in Japan	9/9	RIETI Open BBL Webinar: Global Intelligence Series China-U.S. Relations and Implications for Japan and Taiwan
3/23	RIETI-ANU Symposium Toward an Asia-Pacific Digital Economy Governance Regime	9/10	RIETI Open BBL Webinar DX Thinking
3/24	RIETI BBL Webinar: Global Intelligence Series China's Medium- and Long-term Economic Outlook: Aiming for both fairness and efficiency	9/10	AIG Global Trade Series 2021 Podcast Episode 7 Trade Integration and the Americas
3/31	AIG Global Trade Series 2021 Podcast Episode 1 Open Strategic Autonomy: Navigating the new direction of EU trade policy	9/16	RIETI Open BBL Webinar Evolution Thinking and Innovation Strategy
4/7	RIETI Open BBL Webinar: Global Intelligence Series Mongolia Long-term Vision 2050 and Expectations for Japan, Presented by Former Chairman of the National Development Agency of Mongolia	9/21	AIG Global Trade Series 2021 Podcast Episode 8 U.S.-China Relations: When decoupling meets dual circulation
4/13	AIG Global Trade Series 2021 Podcast Episode 2 Where Next for the World Trade Organization and Global Trade Rules?	9/27	Japan Society for the Promotion of Machine Industry-Economic Research Institute Online Seminar Solving Social Issues (UN SDGs) with AI and ESG
4/14	RIETI Open BBL Webinar: Global Intelligence Series Recycling-based Society: Advanced integration through open innovation	9/29	RIETI BBL Webinar: DX Series Management Structure Reform in the Yamato Group: Integrated promotion of DX and CX
4/15	RIETI Open BBL Webinar: Global Intelligence Series The Bureaucrats I Excommunicated	10/7	ISEAS-RIETI Joint Webinar Climate Action by Japan and Implications for Southeast Asia
4/17	RIETI-CGM-IPJO Joint International Workshop Socio-life Science: Public health and COVID-19 outbreak	10/11	AIG Global Trade Series 2021 Podcast Episode 9 Is Trade Working for All?
4/20	RIETI Open BBL Webinar Revitalising Multilateralism: Pragmatic ideas for the new WTO Director-General	10/12	AIG Global Trade Series 2021 Podcast Episode 10 Is the Future Regional?
4/28	RIETI-ECGI-WBF Webinar Series A New Concept of the Corporation: [Part 2] Fiduciary duties under the new conception of the corporation	10/15	RIETI Open BBL Webinar: DX Series Business Reinvention of Japan and DX: Challenges and opportunities
5/12	RIETI Open BBL Webinar: Global Intelligence Series Preparing for Earthquakes Directly Beneath Metropolitan Tokyo: Amazing economic effects of seismic motion prediction technology	10/19	RIETI Open BBL Webinar Autocratization Turning Viral in Pandemic Times
5/13	RIETI Open BBL Webinar COVID-19 and the Japanese Economy: How well we have survived and how the economy will recover	10/21	RIETI Policy Symposium Work Style Reform and Health Management
5/20	RIETI-ECGI-WBF Webinar Series A New Concept of the Corporation: [Part 3] Ownership of the new corporation—The role of activist funds	10/27	RIETI-TIER-KIET Workshop Sustainable and Resilient Recovery from COVID-19 in East Asia
5/20	AIG Global Trade Series 2021 Podcast Episode 3 Trade and the Indo-Pacific: CPTPP, BRI & RCEP	10/29	RIETI Open BBL Webinar: DX Series The SMBC Group Digital Strategy for Continuous Transformation and Evolution
5/24	RIETI Open BBL Webinar: Global Intelligence Series The Geopolitics of Biden's Green Deal	11/4	RIETI BBL Webinar: DX Series Hitachi's Approach to DX
5/25	ISEAS-RIETI Webinar SDGs and Business Contribution in Southeast Asia	11/10	Tohoku University-RIETI Symposium Society Changed by COVID-19
5/26	RIETI Open BBL Webinar World Economic Outlook and Asia Pacific Region—Managing divergent recoveries	11/18	RIETI BBL Webinar Analysis of Competitiveness and Patent Value Using Patent Information and Its Application: Responding to the publication of the Japan Patent Office Annual Report 2021 and others
5/27	ASEAN-JAPAN Business Week Special BBL Webinar International Politics and Economics Surrounding Southeast Asia: Perspectives on its relationship with the U.S. and China	11/19	RIETI Open BBL Webinar Design and Intellectual Property: After the Design-Driven-Management declaration
6/1	RIETI Open BBL Webinar 2021 White Paper on Small, Medium, and Micro-sized Enterprises in Japan	12/1	RIETI Open BBL Webinar World Economic Outlook and the Asia Pacific Region: Recovery during pandemic—health concerns, supply disruptions, and price pressures
6/2	RIETI Open BBL Webinar: Global Intelligence Series The Xi Jinping Administration and Science & Technology: The international order transformed by his "Chinese Dream"	12/3	RIETI Open BBL Webinar: Global Intelligence Series With the 50th Anniversary of the Normalization of Diplomatic Relations, What Current and Future Contributions Can China and Japan Make to the Global Community
6/11	The University of Electro-Communications' Center for Industrial and Governmental R&D Seminar The Creation of a Future Society and Security Measures through the Fusion of Culture and Science	12/8	RIETI BBL Webinar: DX Series Japan Railway's Business Strategy and Digital Transformation
6/14	AIG Global Trade Series 2021 Podcast Episode 4 After the Pandemic: Trade, health and protectionism	12/9	RIETI Open BBL Webinar Secular Stagnation of Labor Productivity and Real Wages: Analysis using the 2021 JIP database and company data
6/15	RIETI Open BBL Webinar The Economics of Competition Policy: Population decline, digitalization and industrial policy	12/23	RIETI EBPM Symposium Thinking about EBPM based on the COVID-19 Measures

*Events highlighted in green are special symposiums.










RIETI'S FIFTH MEDIUM-TERM PLAN

FY2020 to FY2023

In the Fifth Medium-term Plan period, RIETI will add research on the Fourth Industrial Revolution and the behavioral economics approach, which has been gaining popularity and credibility, to the AI-related research (e.g., using AI to analyze corporate performance and consumer behavior) it has promoted to date. The scope of this research creates opportunities for the participation of researchers in science disciplines outside economics and will gradually enable the establishment of a system that allows for integration of the humanities and sciences, including linkages between research in multiple disciplines and social science/economics. Additionally, RIETI will promote research on evidence-based policy making (EBPM), which is expected to become increasingly important in the future, to contribute to developing solutions to increasingly diverse and complex economic and social issues toward the formulation of economic and industrial policies.

Guided by medium- and long-term policy directions from the government, including its economic and industrial policies, RIETI will continue to engage in research activities while working with experts in other areas to initiate integration between the humanities and sciences including linkages between research in multiple external disciplines and social science/economics. In doing so, it will contribute to an evidence-driven transformation of economics and social systems.

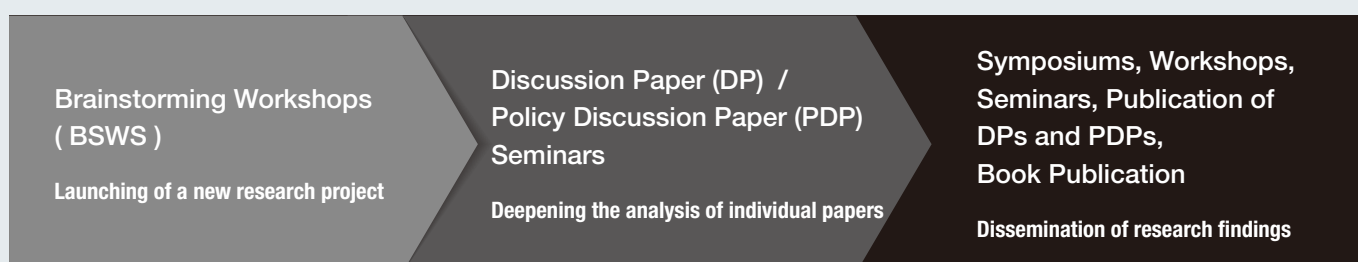
Research Programs

I	II	III	IV	V	VI	VII	VIII	IX
								
Macroeconomy and Low Birthrate/Aging Population	International Trade and Investment	Regional Economies	Innovation	Industry Frontiers	Raising Industrial and Firm Productivity	Human Capital	Integrated Research	Policy Assessment

Research Programs

Research Process

RIETI provides forums for discussion (e.g. brainstorming workshops and discussion paper/policy discussion paper seminars) and invites policymakers to these forums to improve the quality of our research and to build linkages between our research and future policies.



Introduction of the Nine Research Programs

Program I

Macroeconomy and Low Birthrate/Aging Population



Program Director: Keiichiro Kobayashi

Faculty Fellow, RIETI / Professor, Faculty of Economics, Keio University /

Research Director, The Canon Institute for Global Studies /

Research Director, The Tokyo Foundation for Policy Research



Sustaining long-term growth is a common challenge for the global economy; however, Japan is facing a rapidly declining birthrate and aging population ahead of other countries. We will conduct research that will contribute to policy recommendations to help maintain the economic vitality of Japan and contribute to the future development of the global economy. Specifically, we will analyze the role of supply chains within and between industries in the Asian region, the trends in international finance and the global economy, and the mechanisms behind prolonged economic stagnation. In addition, we will engage in multifaceted, integrated research to analyze comprehensive panel data for the elderly, the direction of reform for the integration of social security and tax/fiscal policies, and policy recommendations for economic change and the transformation in the industrial structure caused by the coronavirus pandemic.

Active Projects

Macroeconomic Policy and Political Philosophy toward Economic Growth

Project Leader: Keiichiro Kobayashi (Faculty Fellow)

East Asian Production Networks, Trade, Exchange Rates, and Global Imbalances

Project Leader: Willem Thorbecke (Senior Fellow)

Macroeconomic and Social Security Policies under Demographic Aging: Dynamics of firms, individuals and inequality

Project Leader: Sagiri Kitao (Senior Fellow)

Exchange Rates and International Currency

Project Leader: Eiji Ogawa (Faculty Fellow)

Program II

International Trade and Investment



Program Director: Eiichi Tomiura

Faculty Fellow, RIETI / Professor, Faculty of Economics, Hitotsubashi University



Formulating economic and industrial policies requires a deep understanding of domestic and overseas economies; however, as globalization intensifies, research on the international economy has become even more significant. Amidst the increasing global uncertainty related to trade and investment, it is necessary to address policy concerns and to understand long-term trends. Thus, we will empirically analyze international trade, foreign direct investment, and various other international economic activities in the real economy using a variety of data including microdata from government statistics and our own surveys. We will also examine topics such as Japan's external economic policy, trade policies in other nations, rules on international trade, and the global activities of firms from both legal and economic perspectives.

Active Projects

Empirical Analysis of Firms amidst Globalization, Digitization and the COVID-19 Pandemic

Project Leader: Eiichi Tomiura (Faculty Fellow)

Comprehensive Research on the Current International Trade/Investment System (pt.V)

Project Leader: Tsuyoshi Kawase (Faculty Fellow)

Globalization and the Japanese Economy: Firm adjustment and global trade governance

Project Leader: Shujiro Urata (Faculty Fellow)

Economic Policy Issues in the Global Economy

Project Leader: Jota Ishikawa (Faculty Fellow)

Research on Relationships between Economic and Social Networks and Globalization

Project Leader: Yasuyuki Todo (Faculty Fellow)

Studies on Foreign Direct Investment and Multinationals: Impediments, policy shocks, and economic impacts

Project Leader: Naoto Jinji (Faculty Fellow)

Empirical Studies on Crises and Issues in Global Supply Chains

Project Leader: Hongyong Zhang (Senior Fellow)

Restructuring the International Trade Law System Based on Sustainability

Project Leader: Junji Nakagawa (Consulting Fellow)

Program III

Regional Economies



Program Director: Nobuaki Hamaguchi

Faculty Fellow, RIETI / Professor, Research Institute for Economics and Business Administration (RIEB), Kobe University



We will systematically organize place-based policies (PBPs) that take the uniqueness of each locale into consideration. For large cities, which are expected to take a leading role in innovation and international competition, we will identify both the infrastructure that utilizes the economic advantages of agglomeration while curbing the harmful effects caused by congestion and the methods of assisting economic actors. For non-metropolitan regions, we will identify the network and community structures and system designs that will promote structural transformation toward production activities that will generate high-added value via the innovative and sustainable use of each region's locally specific resources. We will also study policy measures that can optimize the balance between large cities and non-metropolitan regions.

Active Projects

Economic Policy for Post COVID-19 Japanese Regional Economies

Project Leader: Nobuaki Hamaguchi (Faculty Fellow)

Regional Economy and Roles of Regional Finance in the Post COVID-19 World

Project Leader: Nobuyoshi Yamori (Faculty Fellow)

Verification of Regional Revitalization and Regional and Urban Economies after the Coronavirus Pandemic

Project Leader: Ryohei Nakamura (Faculty Fellow)

Urban Policy from the View of Consumer City

Project Leader: Kentaro Nakajima (Faculty Fellow)

Geography, Inter-firm Network and Socio-economic Structural Change

Project Leader: Yukiko Saito (Senior Fellow (Specially Appointed))

Program IV

Innovation



Program Director: Sadao Nagaoka

Faculty Fellow, RIETI / Professor, Tokyo Keizai University



The creation of knowledge and its exploitation for solving economic and non-economic problems are the foundations of innovation, including the Fourth Industrial Revolution. We will develop original data that will allow us to understand this process, conduct cutting-edge research using these data, and perform analyses that will contribute to the formulation of policies for accelerating innovation. Specifically, we will examine the innovation capability of industries, the mechanism of the development of innovation-enhancing industrial organizational changes, such as vertical specialization, government policies that support research and development (R&D), including the intellectual property regime and setting of technological standards, and industry-academic collaboration. We will undertake research from an international perspective that will include international comparisons of innovation performance.

Active Projects

Building Innovation Capability and Incentive: Evidence from microdata

Project Leader: Sadao Nagaoka (Faculty Fellow)

Developing an Entrepreneurial Ecosystem

Project Leader: Yuji Honjo (Faculty Fellow)

Research on Innovation Ecosystem Formation Processes

Project Leader: Kazuyuki Motohashi (Faculty Fellow)

Quantitative Examination of the "Design" Effects on Organization Management

Project Leader: Yuichi Washida (Faculty Fellow)

Innovation, Knowledge Creation and Macroeconomy

Project Leader: Makoto Nirei (Faculty Fellow)

Program V

Industry Frontiers



Program Director: **Hiroshi Ohashi**

Faculty Fellow, RIETI / Dean, Professor, Graduate School of Public Policy, The University of Tokyo / Professor, Faculty of Economics, The University of Tokyo



As the public implementation of digital technology occurs and the integration of digital and real space gradually becomes a reality, it is necessary to redesign Japan's socioeconomic system and create new industrial frontiers in order to effectively incorporate technological progress. We are entering an era in which various economic activities are merged around data. In this context, we will study the nature of the policies for overcoming the challenges that Japan's economy faces by considering not only the traditional industry-specific policies but also cross-industrial policies.

Active Projects

Policy Analyses on Industrial Organization

Project Leader: Hiroshi Ohashi (Faculty Fellow)

Institutional Design for Desirable Acceptance of AI Technology

Project Leader: Shunsuke Managi (Faculty Fellow)

Macroeconomy under COVID-19 Influence: Data-intensive analysis and the road to recovery

Project Leader: Hideaki Aoyama (Faculty Fellow)

Globalization, Innovation, and Competition Policy

Project Leader: Noboru Kawahama (Faculty Fellow)

New Indicator Development and Economic Analysis Using Big Data: Service industries

Project Leader: Yoko Konishi (Senior Fellow)

Study Group on Corporate Finance and Firm Dynamics

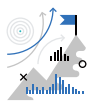
Project Leader: Iichiro Uesugi (Faculty Fellow)

Heterogeneity across Agents and Sustainability of the Japanese Economy

Project Leader: Hiroshi Yoshikawa (Faculty Fellow)

Program VI

Raising Industrial and Firm Productivity



Program Director: **Kyoji Fukao**

Faculty Fellow, RIETI / Specially Appointed Professor, Institute of Economic Research, Hitotsubashi University / Professor Emeritus, Hitotsubashi University



Since the 1990s, Japan has fallen behind other developed countries, such as the United States, the United Kingdom, and Germany, by a large margin in terms of its gross domestic product per capita and the increase in its real wage rate. The main factors causing this include the stagnation of the total factor productivity (TFP) and the significant slowdown in capital stock accumulation, including intangible assets and information and communications technology (ICT), particularly since the mid-2000s. This program will update and develop databases related to industry-level productivity and the factor inputs in Japan and China (Japan Industrial Productivity [JIP] Database and China Industrial Productivity [CIP] Database) and the Regional-level Japan Industrial Productivity (R-JIP) Database, which measures the TFP for each industry by prefecture. The program will also examine the types of policies required to improve productivity and facilitate investment via empirical analyses using these databases and firm/business-level data.

Active Projects

East Asian Industrial Productivity

Project Leader: Kyoji Fukao (Faculty Fellow)

Determinants of Firm Dynamics: Causal inference approach

Project Leader: Kaoru Hosono (Faculty Fellow)

Capital Accumulation and Productivity Growth after the COVID-19 Crisis

Project Leader: Tsutomu Miyagawa (Faculty Fellow)

Human Capital (Education & Health) Investment and Productivity

Project Leader: Tomohiko Inui (Faculty Fellow)

Program VII

Human Capital



Program Director: **Kotaro Tsuru**

Faculty Fellow, RIETI / Professor, Graduate School of Business & Commerce, Keio University



It is expected that our society and economy will be significantly transformed by the current decrease in population caused by the rapid acceleration of population aging, the intensification of global competition, and new technologies such as information and communications technology (ICT) and artificial intelligence (AI). Therefore, for resource-poor Japan to maintain and strengthen its economic vitality and innovation and drive its growth potential while leveraging its strengths, the utilization of human resources will be of critical importance. We will undertake multifaceted and comprehensive research on the redesign of employment/labor systems suitable for the age of AI, the development of capabilities/skills to complement AI, the required reforms in education/training for such purposes, and the ideal methods of improving the well-being of workers, such as health management. Greater use will be made of original datasets.

Active Projects

Employment and Educational Reform in the AI Era

Project Leader: Kotaro Tsuru (Faculty Fellow)

Empirical Studies on Issues of Foreign Employment and Technology Progress in a Society with a Persistent Labor Shortage

Project Leader: Yang Liu (Fellow)

Productivity Effects of HRM Policies and Management Quality

Project Leader: Hideo Owan (Faculty Fellow)

Fundamental Research for Restoring Vitality and Improving Productivity in the Japanese Economy and Society

Project Leader: Kazuo Nishimura (Faculty Fellow)

Wage Inequality and Industrial Dynamics

Project Leader: Ryo Kambayashi

Program VIII

Integrated Research



Program Director: **Makoto Yano**

Chairman, RIETI / Project Professor, Institute of Economic Research, Kyoto University / Professor by Special Appointment, Sophia University



One of the major issues afflicting the Japanese economy is the existence of barriers, such as the barriers between permanent and non-permanent employees and between men and women in the workplace. RIETI has been addressing various problems concerning these barriers in the economy.

Academia has also been suffering from this problem of barriers, for example, barriers between humanities and sciences, between legal studies and economics, between microeconomics and macroeconomics, and between theory and empirical testing. It is essential to remove these barriers to increase the capacity for innovation and enable organizations to become more sophisticated. The Integrated Research program uses this perspective to undertake research and incorporate knowledge from other disciplines, such as natural sciences, law, political science, and sociology, into economics and policy studies.

Active Projects

Social Scientific Studies on Self-replicating Natural and Technical Phenomenon

Project Leader: Yuichi Furukawa (Faculty Fellow)

Toward Building Socio-life Science

Project Leader: Shigeru Hirota (Faculty Fellow)

Basic Research for Exploring the Ideal Medical Intervention after the Advent of the New Coronavirus

Project Leader: Yoichi Sekizawa (Senior Fellow)

Advanced Technology and Democracy: Does new technology help or hurt democracy?

Project Leader: Yoshikuni Ono (Faculty Fellow)

Frontiers in Corporate Governance Analysis

Project Leader: Hideaki Miyajima (Faculty Fellow)



Program Director: **Daiji Kawaguchi**

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



The Policy Assessment program will accelerate evidence-based policy making (EBPM) by simultaneously researching the ideal form of EBPM and evaluating individual policies. Regarding the research on the nature of EBPM, we will employ a meta-perspective to analyze how policymakers should prepare evidence and formulate policies based on such evidence, as well as the extent to which EBPM is practiced. Regarding the evaluation of individual policies, the program will use high-quality microdata and empirical microeconomic techniques to provide credible evidence to contribute to policymaking in education, labor, tax, social security, and other areas.

Active Projects

Empirical Analysis on Japanese Labor Market

Project Leader: Daiji Kawaguchi (Faculty Fellow)

Implementing Evidence-Based Policy Making in Japan

Project Leader: Fumio Ohtake (Faculty Fellow)

Comprehensive Research on Evidence-Based Policy Making (EBPM)

Project Leader: Yoichi Sekizawa (Senior Fellow)

Microeconomic Analysis of Education Policy with Large Administrative Data

Project Leader: Ryuichi Tanaka (Faculty Fellow)



The Research Institute of Economy, Trade and Industry (RIETI) is a policy think tank established in 2001. Our mission is to conduct theoretical and empirical research, to maximize synergies with those engaged in policymaking, and to make policy proposals based on evidence derived from such research activities. RIETI has developed an excellent reputation both in Japan and abroad for its work in these areas.

Chairman: **Makoto Yano**

Vice Chairman: **Yasuhiko Yoshida**

President and CRO: **Masayuki Morikawa**

Vice President: **Tetsuya Watanabe**

Honorary Research Advisor:

Dale W. Jorgenson (Samuel W. Morris University Professor, Harvard University)

Advisory Committee Member:

Richard E. Baldwin (Professor, Graduate Institute, Geneva)

(As of March 2022)



Editorial Note:

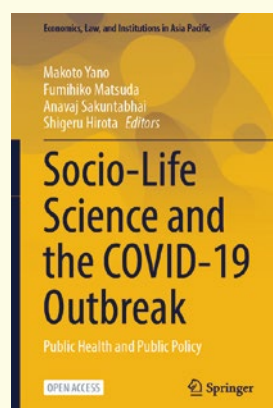
Some people may imagine Tokyo to be cold and gloomy in the winter, but Tokyo in winter has a high rate of sunny days. It's cold, but I see the blue sky outside my window and the sun is shining warmly as I write this text.

Since the start of the COVID-19 epidemic, the members of RIETI have all started to work from home, and meetings, interviews, and seminars are now all done online. While I am glad for the convenience of being able to instantly connect with people from all over the world at home, I am sure I am not the only one who misses the pleasure of chatting with others face to face and traveling and experiencing the culture and atmosphere of other countries.

By the time you read this issue, Tokyo will be in the beautiful cherry blossom season. I hope that it won't be too long before we will be able to hold seminars and symposiums in person and be able to welcome all of you to Tokyo again.

(RIETI Highlight Editorial Team)

For comments and suggestions on this issue, please contact: pr-general@rieti.go.jp



Socio-Life Science and the COVID-19 Outbreak

Edited by:
Makoto Yano (RIETI) /
Fumihiko Matsuda (Kyoto University) /
Anavaj Sakuntabhai (Institut Pasteur) /
Shigeru Hirota (RIETI)



Publisher: Springer / December 2021

In this book, we proposed research on what we call socio-life science. By socio-life science, we mean a field of research in which both social- and life-science factors are integrated in the study of humanity. 29 authors with different sets of expertise contributed to this book. Faced with the COVID-19 pandemic, the authors all saw the great importance of building socio-life science.

Personally, life science is one of the most exciting fields of science right now. Many new discoveries are being made on what life is about. I hope this may provide a new key to understanding what society is and what human beings are as social creatures.

Social science and life science complement each other very well. As a social scientist, I have always been interested in what holds a society together. In social science, social bonds are measured by means of what is called social capital. It is often assumed that the amount of social capital depends on such social scientific factors as income, wealth, education, sex, job experience, and childhood experience, etc. At the same time, however, it depends on genetics and physical and mental health. For a life scientist, what determines human health is an important question. It obviously depends on physical and mental factors as well as genetic factors. At the same time, health depends on social scientific factors. As this shows, it is impossible to understand humans without evaluating all these social scientific and life scientific factors together. This is what I want to understand as a social scientist and what my colleague Professor Fumihiko Matsuda of Kyoto University wants to understand as a life scientist. This is how we started our project seven years ago.

More generally speaking, I believe that the integration of social and natural sciences is one of the most urgent issues facing Japan. The problem is that many specialists are too focused on their specializations. Many observers have found that too many silos exist not just within the science and technology fields but in other domains such as bureaucracy. In a stable environment, having

silos makes perfect sense, but in today's world of drastically and rapidly changing technologies, rigid silos only hamper innovation. I want to experiment how one could "flatten" these silos in the field of science and create a new scientific approach for Japan.

Facing the COVID-19 pandemic, all the studies in the book emphasized the role of behavioral change and governmental policy to combat the menace this pandemic represents. In my own research, I found that political factors matter quite a lot in determining the spread of a pandemic at an early stage of an outbreak. Obviously, the spread of a disease is a natural phenomenon, but what political leaders do is critical in determining the way in which it spreads. The way in which political leaders deliver messages is also important. What political leaders do sometimes overwhelms such social-scientific factors as education, employment, and income. This is perhaps because information that political leaders deliver to the public is highly important in controlling a pandemic.

It is noteworthy that a chapter on sharing of research data using blockchain is included in this book. Blockchain is an internet technology that makes it possible to assign unique ownership to each piece of digital data. It is also possible to run programs on the blockchain. What makes blockchain unique is that all transactions can be done in a very secure manner at a very low cost. For the scientific community, data sharing is important to advance scientific knowledge. I am hoping that our initiative contributes to the creation of low-cost and secure data sharing methods, and it will also contribute to the sharing of medical data for the better use at the level of medical practice in the future.

Our research on COVID-19 should continue even after this pandemic subsides. The data we are putting together right now is important in understanding how to induce behavioral change in the face of any similar crisis.

Makoto Yano



Research Institute of Economy, Trade & Industry, IAA

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