



ERIA PUBLICATIONS CATALOGUE 2021

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COVID-19

Older People and COVID-19 in Indonesia

Edited by Osuke Komazawa, Ni Wayan Suriastini, Ika Yulia Wijayanti, Maliki, Dinar Dana Kharisma



The phone survey of older people and coronavirus disease (COVID-19) in Indonesia was conducted as a joint project by ERIA, Bappenas, and SurveyMETER. Its aim was to (1) measure the general knowledge of older people about COVID-19, (2) compare the welfare and health status of older people before and during the COVID-19 pandemic, (3) understand their difficulties during the COVID-19 pandemic, (4) monitor the assistance they receive, and (5) identify the policies required to mitigate the impact on them.

The results revealed that more than half of older people saw their income fall, particularly those who depended on income from work or their children's income. Significantly more older people received government support compared with before the pandemic. One in six older persons reported a deterioration in their health during the pandemic, while most older people maintained their social interaction despite the pandemic. The government is encouraged to strengthen its efforts to develop the support system for older people to ensure realisation of the vision set out in the National Strategy for Older People.



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This publication is also available in Bahasa Indonesian:

<https://surveymeter.org/id/Lanjut-Usia-dan-COVID-19-di-Indonesia>

COVID-19 and Southeast and East Asian Economic Integration: Understanding the Consequences for the Future

ERIA Policy Brief 2020 no. 1

by Economic Research Institute for ASEAN and East Asia

The coronavirus disease (COVID-19) pandemic has severely affected East and Southeast Asian economies, especially by disrupting the flow of goods and services in the region's global value chains (GVCs). Since a similar pandemic is likely to happen in the future, we must learn from the experience, make efforts to build new economic and social systems, and invent new methods of doing business, economic governance, and regulation to keep adverse pandemic impacts to a minimum. It is, therefore, important for the Association of Southeast Asian Nations (ASEAN) Member States (AMS) and Dialogue Partners to strengthen economic integration by sustaining seamless connectivity and opening up the trade and investment regime. The adoption of the technology of the Fourth Industrial Revolution (IR 4.0) – such as artificial intelligence, IoT, automation, and robotics – gives manufacturing firms a better chance of rapidly increasing production when the economy recovers.

ASEAN has successfully innovated its systems, with high responsiveness and resilience to change in these fast-moving times. As a resilient and responsive region, it can become the natural leader to demonstrate the optimum economic and social systems for undertaking all the adjustments needed to sustain economic integration in Southeast and East Asia, while offering an example for the global community. This policy brief presents the direction that AMS, together with their Dialogue Partners, can take to overcome the aftermath of COVID-19.

Implications of the COVID-19 Crisis for the Energy Sector and Climate Change in ASEAN

ERIA Policy Brief 2020 no. 2

by Economic Research Institute for ASEAN and East Asia

The coronavirus disease (COVID-19) will have multiple implications for the global energy situation and the endeavour to combat environmental problems – most notably, climate change.

The global economy is being pushed into a recession by the COVID-19 pandemic as a result of the preventive behaviour of individuals and governments' containment policies (e.g. lockdowns, travel restrictions, social distancing, and working from home). Manufacturing output is slowing down sharply in many countries, reflecting drops in external demand and growing expectations of declining domestic demand. Such an economic downturn is contracting overall energy demand and energy-related carbon dioxide (CO₂) emissions as well as emissions of sulphur oxides (SOX) and nitrogen oxides (NOX), while the situation differs across sectors (e.g. increased power use in the residential segment against a drop in educational and commercial buildings). An analysis by Carbon Brief estimated that China's CO₂ emissions dropped by 25% over a 4-week period since the outbreak. Countries currently struggling with COVID-19 will see similar reductions.

Demand and Supply Shocks of COVID-19 and International Production Networks: Evidence from Japan's Machinery Trade

ERIA Discussion Paper no. 366

by Mitsuyo Ando

This paper investigated the impacts of COVID-19 on international production networks in machinery sectors by shedding light on negative supply shocks, negative demand shocks, and positive demand shocks. Specifically, we examined changes in trade in the periods of falling trade during the first wave of COVID-19 using Japan's machinery trade at the most disaggregated level and decomposed them into two intensive margins, i.e. the quantity effect and the price effect, and two extensive margins, i.e. the entry effect and the exit effect.

Our empirical results demonstrated that i) trade relationships for parts and components are robust, and international production networks are almost intact, so far; ii) the intensive margin, mostly the negative quantity effect, induces the largest negative effects in the transport equipment sector amongst four machinery sectors; iii) positive demand shocks for specific products that are related to teleworking, disinfection, and stay-home activities partially explain sectoral differences; iv) direct negative supply shocks from China, suggested by a negative quantity effect and a positive price effect, exist in February 2020, with possible indirect negative supply shocks and substitution of source countries; and v) negative demand shocks are confirmed from negative quantity and price effects in many cases. As of October 2020, Japan's machinery trade seems to have largely recovered. If the COVID-19 pandemic lasts long, however, prolonged negative demand shocks would hurt production networks in East Asia.

How Is the Asian Economy Recovering from the COVID-19 Pandemic? Evidence from the Emissions of Air Pollutants

ERIA Discussion Paper no. 367

by Kazunobu Hayakawa, Souknilanh Keola

This study empirically examines how economic and social activities in Asia were affected by the COVID-19 pandemic by using the emissions amounts of various air pollutants to represent those activities. Review of the emissions data suggests that from 2019 to 2020, the amount of emitted air pollutants decreased in most subnational regions in Asia. Data also show how economic and social activities have restarted in some regions; regression analyses are used to uncover the regions that restarted early. Regional characteristics are identified by employing a remotely sensed land cover dataset (i.e. ESALC) and OpenStreetMap. Results reveal that for Association of Southeast Asian Nations (ASEAN) members, economic and social activities in cropland, industrial estates, accommodations, restaurants, education, and public services still have not returned to normal.

Maintaining Fiscal Sustainability during the Pandemic Crisis

ERIA Policy Brief 2020 no. 4

by Fauziah Zen, Fukunari Kimura

Managing a novel but highly contagious virus that rapidly evolved into a pandemic is the hardest job faced by world leaders in recent years. At first, most countries did not recognise the magnitude of the catastrophe created by coronavirus disease (COVID-19), so responses differed widely. Since the world was last hit by a pandemic more than 100 years ago, current world leaders were inexperienced in managing such a calamity. Indeed, the whole modern system – driven by technology, creativity, wealth, and interconnected people – appears to be unprepared. COVID-19 has disrupted almost all aspects of our lives. Even in the health sector, the almost exclusive focus on the pandemic has affected non-COVID-19 patients. In fragile and conflict-affected areas, disruptions in assistance and support have affected millions of people in vulnerable groups. In other areas, the world has paused temporarily.

Pandemic (COVID-19) Policy Regional Cooperation and the Emerging Global Production Network

ERIA Discussion Paper no. 328

by Fukunari Kimura, Shandre Mugan Thangavelu, Dionisius A. Narjoko, Christopher Findlay

In this paper, we explore the possible policy responses to the pandemic shock as well as the related economic (financial crisis) shocks on trade and global value chains (GVCs) in East Asia. We find that regional policy coordination is critical to mitigate and isolate the pandemic shock. It is important to identify the pandemic events early to flatten the pandemic curve at the national and regional level. This supports a recent study by the World Bank (2020) which highlights the importance of early mitigation policies during the pandemic shock. The cost of the pandemic and economic shocks increases significantly when several countries in the region experience the systemic pandemic shock concurrently. In this case, flattening the regional pandemic curve becomes important. The results also indicate the need for greater coordination in East Asia to mitigate the

pending economic shock in terms of unemployment, corporate bankruptcy, and financial market fragility. The paper also highlights that the stability of the GVC network is critical during the pandemic in terms of hedging the risk of disruptions to the procurement of critical medical and health products as well as the stability of the services linkages to manufacturing, such as the logistics sector. Regional policy coordination and the stability of GVCs are valuable in the post-pandemic recovery of the region.

The COVID-19 Pandemic and the World Trade Network

ERIA Discussion Paper no. 365

by Kozo Kiyota

Global trade is expected to suffer a significant contraction as a result of the COVID-19 pandemic. Did the relative importance of countries in the world trade network change as a result of the pandemic? The answer to this question is particularly important for Association of Southeast Asian Nations (ASEAN) countries because of their strong trade linkages with China, where the COVID-19 virus originated. This paper examines how the world trade network has changed since the COVID-19 pandemic, with a particular focus on ASEAN countries. Tracking the changes in centrality from January 2000 to June 2020, we find no evidence that centrality changed significantly after the pandemic started for most ASEAN countries. Our results suggest that the relative importance of the ASEAN countries in the world trade network is unchanged and will remain unchanged even after the pandemic.

The Impact of COVID-19 on Global Production Networks: Evidence from Japanese Multinational Firms

ERIA Discussion Paper no. 364

by Hongyong Zhang

Using aggregate-level data on Japanese multinational corporations (MNCs) in major host countries and regions, this paper investigates the impact of COVID-19 on global production and supply chains with a focus on East Asia. I use the numbers of COVID-19 cases and deaths as measures of the impact of the pandemic. I find that the pandemic had substantial impacts on the performance (sales, employment, and investment) of Japanese MNCs and global supply chains (exports to Japan and exports to third countries) in Q1–Q3 2020. China recovered quickly in Q2 and grew in Q3, whilst the countries of the Association of Southeast Asian Nations and the rest of the world had still not fully recovered in Q3 2020. Importantly, lockdown and containment policies in host countries had large negative impacts on the sales and employment of Japanese MNCs. In contrast, I did not find positive effects of economic support policies on firm performance. Interestingly, whilst the firm expectations and business plans of Japanese MNCs were negatively affected by the COVID-19 pandemic, their business confidence increased with strong overall government policy responses in host countries in Q1 2020.



Connectivity

Improving Digital Connectivity: Policy Priority for ASEAN Digital Transformation

ERIA Policy Brief 2020 no. 7

Edited by Lurong Chen and Lydia Ruddy

This brief proposes a policy framework for digital connectivity to support the development of e-commerce. Using this analytical framework for the Association of Southeast Asian Nations (ASEAN) economies, the brief suggests improving digital connectivity as a policy priority for ASEAN digital transformation. This calls for a region-wide institutional effort on:

- (i) digital related infrastructure in both the physical world and cyberspace,
- (ii) rules and regulations to ensure a dynamic and competitive online marketplace,
- (iii) connectivity-derived services to generate more value added, and
- (iv) collaboration on the governance of the digital economy.

The India–Myanmar–Thailand Trilateral Highway and Its Possible Eastward Extension to Lao PDR, Cambodia, and Vietnam: Challenges and Opportunities

ERIA Research Project Report 2020 no. 2

Edited by Fukunari Kimura, So Umezaki, Anita Prakash

The Trilateral Highway (TLH) exemplifies the letter and spirit of connectivity between India and the Association of Southeast Asian Nations (ASEAN). It connects India, Myanmar, and Thailand, and is linked with ASEAN's connectivity plans. Still a project under construction, its potential contribution to the economic growth and development of the region is indubitable. This study examines the maximising of these objectives through a proposed extension of TLH to Lao PDR, Cambodia, and Viet Nam.

Based on a mandate from the ASEAN–India Summit Meeting of 2018 and commissioned by the Government of India, the Economic Research Institute for ASEAN and East Asia (ERIA) has studied the feasibility of establishing

a seamless, efficient, and end-to-end transportation corridor along the existing TLH and its extension towards Cambodia, Lao PDR, and Viet Nam. This study offers physical, institutional, and economic pathways, along with policy recommendations for the development of TLH and its eastwards extension. The need for seamless physical connectivity has never been felt like it is now. The study on the TLH and its eastward extension fulfils this current need, and also lays down pathways for medium- and longer-term integrated connectivity solutions between India and ASEAN.

Joint Study on 10+3 Cooperation for Improvement of Supply Chain Connectivity: ASEAN Sub-Report

ERIA Research Project Report 2020 no. 20

Edited by Economic Research Institute for ASEAN and East Asia

This report provides insights into the operation and resilience of supply chains in the region in the face of uncertainties, such as the coronavirus disease (COVID-19), from the viewpoint of the Association of Southeast Asian Nations (ASEAN). This report is part of the Joint Study on 10+3 Cooperation for Improvement of Supply Chain Connectivity, which was submitted to the 23rd ASEAN Plus Three Summit in November 2020. Other parts of the joint study include the overview and joint policy recommendations published on the ASEAN Secretariat website.

Key findings from the ASEAN sub-report include: almost all firms interviewed were affected by the pandemic, which restricted economic activity and movement of people. The level of impact varied by sector and firm type. Some firms were able to switch to production of goods that became more in demand during the pandemic. Firms that sourced inputs domestically did not suffer much disruption in supply. Even when the impact of COVID-19 on public health was limited within a country and domestic economic activity could resume, firms along the supply chain were affected as they were interconnected with the regional and global supply chain. Additional costs were incurred due to regulatory inefficiencies caused by communication failure and traditional import-export formalities. Adoption of digital technology has risen in response to work-from-home

requirements and travel restrictions, thus accelerating the pre-pandemic trend of digitalisation. Some of these changes are likely to persist beyond the pandemic, increasing demand for connectivity infrastructure such as telecommunications.

Understanding Quality Energy-Related Infrastructure Development in the Mekong Subregion: Key Drivers and Policy Implications

ERIA Discussion Paper no. 363

by *Han Phoumin, Sopheak Meas, Hatda Pich An*

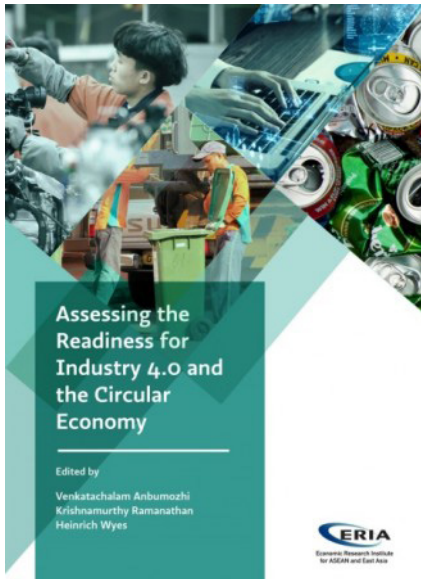
Many players have supported infrastructure development in the Mekong Subregion, bridging the missing links in Southeast Asia. While the influx of energy-related infrastructure development investments to the region has improved the livelihoods of millions of people on the one hand, it has brought about a myriad of challenges to the wider region in guiding investments for quality infrastructure and for promoting a low-carbon economy, and energy access and affordability, on the other hand. Besides reviewing key regional initiatives for infrastructure investment and development, this paper examines energy demand and supply, and forecasts energy consumption in the subregion during 2017–2050 using energy modelling scenario analysis. The study found that to satisfy growing energy demand in the subregion, huge power generation infrastructure investment, estimated at around \$190 billion–\$220 billion, is necessary between 2017 and 2050 and that such an investment will need to be guided by appropriate policy. We argue that without redesigning energy policy towards high-quality energy infrastructure, it is very likely that the increasing use of coal upon which the region greatly depends will lead to the widespread construction of coal-fired power plants, which could result in increased greenhouse gas and carbon dioxide emissions.

An aerial photograph of a solar farm. The solar panels are arranged in long, parallel rows that stretch across a green, hilly landscape. In the background, there are fields of crops, possibly corn, and some trees. The image is overlaid with several semi-transparent geometric shapes in shades of green and yellow. The word "Energy" is written in a bold, white, sans-serif font in the center of the image.

Energy

Assessing the Readiness of Industry 4.0 and the Circular Economy

Edited by Venkatachalam Anbumozhi, Krishnamurthy Ramanathan, Heinrich Wyes



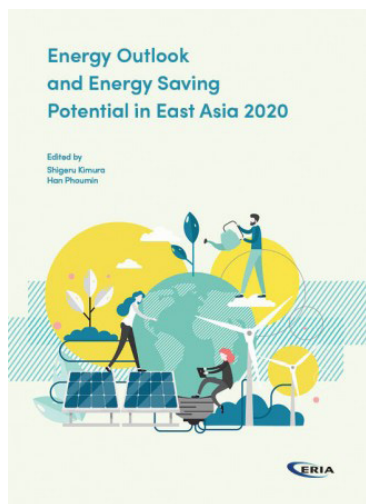
Globalisation, technological advancement, and resource consumption have historically served humanity well by typically delivering both economic growth and social progress. But as these drivers have accelerated, there has been increasing divergence between economic growth and environmental sustainability. The emerging concepts of Industry 4.0 and Circular Economy offer promising opportunities to correct the course – with the right governance, an enabling environment, and public–private partnerships. The results of assessments of the readiness of national economies and companies to adapt to and adopt these initiatives play an important role in building an operational strategy for Industry 4.0 and Circular Economy. The book presents assessment frameworks of differing magnitude for embracing Industry 4.0 and Circular Economy in the context of fast-growing emerging Asian economies. Different approaches to the assessment of readiness and use of different qualitative and quantitative key indicators are examined in detail. The book also provides an integrated Self-assessment Tool for Industry 4.0 and Circular Economy – the first comprehensive, quantitative measure constructed by ERIA for use by firm managers and policymakers.



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Energy Outlook and Energy Saving Potential in East Asia 2020

Edited by Shigeru Kimura and Han Phoumin



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The Economic Research Institute for ASEAN and East Asia (ERIA)–East Asia Summit (EAS) Energy Outlook was updated in 2019–2020 based on a revision of macro assumptions, such as economic and population growth as well as lower crude oil prices. This outlook also incorporates more recent information on the EAS17 member countries’ energy-saving goals and action plans, and power development plans such as those regarding renewable electricity. The EAS17 Outlook 2020 includes an estimation of the investment cost required for power generation and the whole energy infrastructure, including liquefied natural gas (LNG) receiving terminals and oil refineries. The outlook again focuses on analysing the additional energy savings that might be achieved by the individual countries above and beyond the Business-as-Usual scenario (BAU) projection. It continues to examine two scenarios – BAU and the Alternative Policy Scenario (APS) – and predicts energy supply, consumption, and CO₂ emissions from 2017 up until 2050. The APS includes not only more ambitious energy-saving targets but also rapid advances in low-carbon energy technologies, especially renewable energy. The outlook also assesses the Intended Nationally Determined Contributions (INDC)/NDC reported by EAS17 countries. Energy supply security has become a top priority energy issue for the EAS17 region. Implementing Energy Efficiency and Conservation measures and increasing renewable energy shares will certainly contribute to maintaining regional energy security through the reduction of imported fossil fuel consumption and increasing the use of domestic energy. Regional energy networks, such as the Trans-ASEAN Gas Pipeline and the ASEAN Power Grid, and oil stockpiling are recommended to be set up and their use accelerated to maintain energy supply security. Nuclear power generation always remains one of the energy options for securing the region’s energy supply.

Biomass and Coal Co-combustions in the ASEAN Region (Phase 2)

ERIA Research Project Report 2020 no. 22

Edited by Murakami Kazuyuki, Yamada Fumiko, Han Phoumin

Biomass utilisation is an important issue for ASEAN Member States, where agriculture and forest industry remain crucial. Most biomass residues are treated as waste and either incinerated or sent to landfills – practices which may cause environmental degradation if continued. This waste, which varies in type, grade, and characteristic, is sufficient in quantity for co-combustion with coal. Biomass is expected to be one of the most promising renewable fuels for CO₂ emission reduction and for rural electrification, which is crucial for rural development. This study aims to suggest policy measures for ASEAN Member States to achieve an appropriate biomass mixing rate with coal for co-combustion in power generation – a strategy that will help to abate emissions.

Brunei Darussalam Energy Consumption Survey: Residential and Commercial and Public Sectors

ERIA Discussion Paper 2020 no. 3

Prepared by Economic Research Institute for ASEAN and East Asia and Brunei National Energy Research Institute

Brunei Darussalam is rich in energy resources such as oil and gas, but its total final energy consumption increased significantly, by 3.4% per year, in 1990–2015, while gross domestic product (GDP) grew by an average annual 2.9% over the same period. Total final energy consumption is forecast to grow by 7.4% per year in 2015–2040, with an assumed GDP growth rate of 5.6%. Energy elasticity to GDP was and will be more than 1. Brunei Darussalam, therefore, needs to promote energy efficiency and conservation (EEC) in residential and commercial activities, where demand for electricity will continue to grow more strongly than demand for gasoline and diesel oil as transport fuel. To be able to put in place appropriate energy efficiency policies for the residential and commercial sectors, however, policymakers must know their current energy consumption

situation and level. The Economic Research Institute for ASEAN and East Asia (ERIA) supported the Ministry of Energy in conducting the Brunei Darussalam Household Energy Consumption Survey (BDHECS) in 2015 and the Commercial Buildings – Brunei Darussalam Energy Consumption Survey (C-BDECS) in 2018, in collaboration with the Brunei National Energy Research Institute (BNERI).

Air conditioning represented almost 60% of national average household electricity demand, with its share varying from 60.5% in the Brunei-Muara district (highest income) to 54% in the Temburong district (lowest income). Other major electricity-consuming services were refrigeration (18% of national household electricity demand), lighting (7%), and water heating (6%). Households in high-income districts had higher electricity demand shares of air conditioning and water heating than those in low-income ones. Conversely, the share of refrigeration tended to be higher in low-income than in high-income districts because low-income people owned more refrigerators than air conditioners.

The building survey used building energy intensity (BEI) as the index (kWh/m²/year) to assess the energy performance of commercial and public buildings. Four–five-star hotels were the most energy intensive, consuming 371 kWh/m²/year. Other energy-intensive buildings with BEI values above 300 kWh/m²/year were hospitals (334), large mosques (323), and retail buildings (308). Buildings with BEIs of about 200 kWh/m²/year were office buildings (average of 258) and medium-sized mosques (227). One–three-star hotels had a BEI of 177 kWh/m²/year and small mosques and prayer rooms 169. Small mosques had a lower average BEI because they used much less air conditioning than other types of buildings.

The BDHECS results suggest that high-energy performance standards should be promoted and that a labelling system should be applied to appliances that use a significant amount of energy, such as air conditioners, refrigerators, lighting, and water heaters. The C-BDECS results also suggest that applying building energy intensity labelling will be crucial.

Brunei Darussalam: Shifting to a Hydrogen Society

ERIA Research Project Report 2020 no. 4

Prepared by Economic Research Institute for ASEAN and East Asia

Brunei Darussalam has started to produce hydrogen, called SPERA Hydrogen, from processed gas to be generated during the production process of liquefied natural gas (LNG) and has been exporting it to Japan since the end of 2019. Hydrogen is basically classified as clean energy because no carbon dioxide (CO₂) is emitted after its combustion and it is therefore expected to be used globally in the future. Brunei's CO₂ emission is mainly from road transport due to high consumption of gasoline and diesel oil, and power generation which relies on consumption of natural gas. If Brunei could shift from oil and gas to hydrogen, it could drastically reduce CO₂ emissions. This means that hydrogen could be a sustainable energy or technology for Brunei, but hydrogen's much higher supply cost than that of oil and gas is still an obstacle to such a shift. This study suggests that if hydrogen demand will be more than 70,000 m³ per hour, the hydrogen supply cost at a refueling station of 1,000 Nm³/h will decline to around US\$0.80/m³. This is still higher than current gasoline and gas prices, but these prices are fully subsidised by the Brunei government. Considering the two major benefits of hydrogen, which are a reduction of CO₂ emissions and savings in oil and gas consumption, hydrogen's supply cost of US\$0.80/m³ could become acceptable in Brunei.

Demand and Supply Potential of Hydrogen Energy in East Asia – Phase 2

ERIA Research Project 2020 no. 16

Edited by Shigeru Kimura, Ichiro Kutani, Osamu Ikeda, Ryo Chihiro

Throughout fiscal year 2019–2020 ERIA conducted the phase 2 study on hydrogen demand and supply potential in the East Asia Summit (EAS) region. It involved a) a review of future hydrogen demand through interviews with experts on fuel cell electric vehicles and hydrogen power generation; b) an introduction to Japan's hydrogen demonstration project being implemented in the southern part of Australia; c) holding workshops to introduce the outcomes of phase 1 and phase 2 of ERIA's hydrogen study; and d) setting up of a EAS hydrogen working

group to discuss national hydrogen policies, Japan's hydrogen demonstration projects being implemented in Australia and Brunei Darussalam, and the hydrogen supply chain. The phase 2 study also assessed how to reduce hydrogen supply cost through chemical and liquefaction processes. The hydrogen potential phase 2 study highlighted the following results: 1) hydrogen demand to be used for gas power generation (mixing hydrogen and gas) will be essential; 2) The cost of liquid hydrogen is expected to fall as much as liquefied natural gas; 3) Raising demand for hydrogen will be key to reducing hydrogen supply cost; and 4) increase of common understanding of hydrogen as zero carbon energy in future.

Energy Efficiency and Conservation Master Plan of Cambodia

ERIA Research Project Report 2020 no. 7

Edited by Shigeru Kimura, Han Phoumin, Leong Siew Meng

Cambodia's final energy consumption is expected to double in 2015–2040, during which period the industry sector is expected to grow at an average annual rate of 3.5%, reaching 2.41 Mtoe in 2040, an increase from 1.03 Mtoe in 2015. For the residential and commercial sectors, energy demand is predicted to grow at an average annual rate of 2% in 2015–2040, reaching 5.67 Mtoe in 2040, an increase from 3.45 Mtoe in 2015. Transport is expected to see the highest growth rate, of 3.9% in 2015–2040, reaching 3.59 Mtoe in 2040, an increase from 1.39 Mtoe in 2015. As energy demand increases, energy efficiency and conservation (EEC) becomes significant in curbing demand growth whilst maintaining economic growth as the same amount of energy use will lead to greater output. Energy efficiency is also known as the hidden fuel and can be seen as an energy resource for the nation as it will become energy available for other economic activities and supply the greater population. Savings on electricity consumption are even more significant as every kilowatt-hour unit saved would result in greater savings in fuel consumption, such as coal and gas, to generate power. The Government of Cambodia is now acting swiftly to prepare the necessary power development plan to meet the growing electricity demand in all sectors. The energy efficiency plan will help Cambodia avoid building more power plants and help it to save investment money for the economy.

Energy Reality and Emissions in ASEAN: Energy Modelling Scenarios and Policy Implications

ERIA Discussion Paper no. 349

by Han Phoumin, Fukunari Kimura, Jun Arima

The Association of Southeast Asian Nations (ASEAN) faces tremendous challenges regarding the future energy landscape and how the energy transition will embrace a new architecture – including sound policies and technologies to ensure energy access together with affordability, energy security, and energy sustainability. Given the high share of fossil fuels in ASEAN's current energy mix (oil, coal, and natural gas comprise almost 80%), the clean use of fossil fuels through the deployment of clean technologies is indispensable for decarbonising ASEAN's emissions. The future energy landscape of ASEAN will rely on today's actions, policies, and investments to change the fossil fuel-based energy system towards a cleaner energy system, but any decisions and energy policy measures to be rolled out during the energy transition need to be weighed against potentially higher energy costs, affordability issues, and energy security risks. This paper employs energy modelling scenarios to seek plausible policy options for ASEAN to achieve more emissions reductions as well as energy savings, and to assess the extent to which the composition of the energy mix will be changed under various energy policy scenarios. The results imply policy recommendations for accelerating the share of renewables, adopting clean technologies and the clean use of fossil fuels, and investing in climate-resilient energy quality infrastructure.

Energy Storage for Renewable Energy Integration in ASEAN and East Asian Countries: Prospects of Hydrogen as an Energy Carrier vs. Other Alternatives

ERIA Research Project Report 2020 no. 9

Edited by Yanfei Li, Farhad Taghizadeh-Hesary

Hydrogen energy provides an option to integrate renewable energy into the energy mix and increase its share. Hydrogen is also a means to couple renewable energy and transport. This study investigates the economics of

using hydrogen to store renewable energy in Association of Southeast Asian Nations and East Asian countries. The study analyses two categories of downstream applications of hydrogen energy in power generation and in road transport, respectively. In the case of the power sector, the cost of electricity stored as hydrogen and then returned to the grid as electricity is estimated in United States (US) dollars per kilowatt-hour and compared with electricity stored in lithium batteries and as pumped-storage hydropower. In the case of the transport sector, the total cost of owning and driving fuel cell electric vehicles is estimated in US dollars per kilometre and compared with alternative powertrains such as battery electric vehicles, plug-in hybrid electric vehicles, and internal combustion engine vehicles. Hydrogen and its downstream applications are not competitive against other mature alternatives at this time. The study indicates how big the cost gaps are and shows that significant economies of scale exist in hydrogen supply pathways. We expect factors such as technological progress, learning effects, maturing of the supply chain, and economies of scale to substantially reduce the cost of hydrogen and its applications and make them economically competitive in the near future. Site visits in China and interviews at companies in Japan complement the findings from modelling and desktop studies. We draw policy implications based on these findings.

Energy Supply Security Study for Myanmar

ERIA Research Project Report 2020 no. 11

*Prepared by Oil and Gas Planning Department, Ministry of Electricity and Energy of the Union of Myanmar,
Supported by Economic Research Institute for ASEAN and East Asia*

Myanmar has been a country richly endowed with natural gas resources, but its gas production is expected to decline while electricity consumption, currently heavily dependent on gas-fired power plants, would increase remarkably. The Ministry of Electricity and Energy is aware of this future situation. This report presents an energy supply security scenario for Myanmar based on a recommended power generation mix in 2040 made up of 19% coal, 11% natural gas, 56% hydropower, and 12% renewable energy and biomass. This is a better-balanced composition than that of the business-as-usual scenario in which the share of natural gas is still important (51%). Policy measures in several areas are needed to ensure successful implementation of the

scenario, e.g. improving energy efficiency and conservation, reducing the cost of renewable energy power generation, strategic oil stockpiling, facilitation of the biomass supply chain, and application of more efficient biomass stoves. CO₂ emissions of the recommended energy supply security scenario will be a bit higher than under the business-as-usual scenario, as the utilisation of domestic coal for power generation with a robust coal supply chain in Myanmar and the deployment of hybrid power systems (combined hydropower and solar photovoltaic generation) will be parts of the recommended strategy. The recommended security scenario is designed to ensure accessibility and affordability.

Evaluation of CO₂ Emissions Reduction by Mobility Electrification and Alternative Biofuel Introduction in East Asia Summit Countries

ERIA Research Project Report 2020 no. 15

Edited by Makoto Toba, Shinichi Goto, Shoichi Ichikawa, Nuwong Chollacoop, Venkatachalam Anbumozhi

Efforts to decarbonise the transport sectors are now greater than ever in the East Asia Summit countries. With a quarter of total carbon dioxide emissions coming from transport energy use, there are roughly three options to reduce emissions – reducing transport energy demand, improving vehicle fuel efficiency, replacing mobility fuel with low-carbon varieties such as biofuel and electricity. This study report estimates the carbon emission reduction potentials of using biofuel in road vehicles, as a complementary strategy to increasing electrified vehicles in India, Indonesia, and Thailand. The simulation results indicate that a moderate electrification strategy alone is not sufficient to reduce carbon emissions to the level required by 2030, and a moderate to aggressive electrification combined with hybrid-promotion would have a maximum impact. The complementary use of both the conventional and next generation biofuels, as a substitute for transport fuel demand, will have total net positive carbon reduction and economic benefits. Hence, it is necessary to incentivise biofuels along with electric vehicles and hybrid automobiles as a part of a balanced portfolio of approaches to decarbonise the transport sector in the Association of Southeast Asian Nations and East Asia.

Feasible Solutions to Deliver LNG to Mid-sized and Large Islands in Indonesia

ERIA Research Project Report 2020 no. 18

Edited by Shigeru Kimura

Indonesia's electricity demand will increase significantly, by about 4.5 times, from 2015 to 2040, according to the 2018 edition of the ERIA-EAS Energy Outlook under the business as usual scenario. This increase will be realised not only by big cities such as Jakarta and Surabaya but also on Indonesia's small and mid-sized islands. As Indonesia is also rich in coal and natural gas, given the global challenges posed by climate change, natural gas will become an increasingly interesting source of power generation for Indonesia. This study focuses on the eastern part of Indonesia, which is made up of Sulawesi and West Papua, and several groups of very diverse smaller islands. The report proposes a strategy for delivering small-scale LNG carrier vessels from LNG production sites to LNG power generation plants in Eastern Indonesia based on a personal computer-based dynamic simulation model. According to projected LNG demand at LNG power plants, forecast based on electricity demand at each demand site in Eastern Indonesia, the model seeks feasible solutions for delivering LNG from the origin to a destination using a computer simulation approach. The major outcomes of the dynamic simulation model are necessary number of LNG ships, maximum capacity of LNG receiving tanks, and their costs, consisting of capital and operating costs. Several implications regarding LNG policies for Indonesia were presented.

Fuelling the Engines of Liberation with Cleaner Cooking Fuel

ERIA Discussion Paper no. 361

by Tushar Bharati, Yiwei Qian, Jeonghwan Yun

Using the staggered roll-out of the Indonesian Conversion to Liquefied Petroleum Gas (LPG) Programme, we show that a subsidy for the labour- and time-saving cooking technology increased female labour force participation. The programme also increased household consumption expenditure and the decision-making power of women in the household, especially in financial matters. A back-of-the-envelope calculation suggests

that the benefits of switching to LPG far outweighed the costs to the households. Based on previous research, we conjecture that intra-household externalities and gender differences in preferences drive the low rates of adoption of cost-effective technology. The programme's impact on the financial decision-making power of women suggests that subsidies which empower women, even if temporary, can encourage the adoption and sustained use of beneficial technology.

Improving Nuclear Safety and Use: An International Analysis

ERIA Research Project Report 2020 no. 10

Edited by Tomoko Murakami, Venkatachalam Anbumozhi

No industry is immune from accidents. In relation to nuclear power, safe use focuses on unintended conditions or events leading to radiological releases from authorised activities. A fundamental principle of nuclear power plant operation worldwide is that the operator is responsible for the basic safety. This is facilitated by, first by the national regulator who is responsible for ensuring the plants are operated safely by the operator. The second important safety principle is that safety regulations are to protect people and the environment, and regulations are made in sound technical grounds, taking into consideration the operation costs and benefits. Third, there are international standards in designing of nuclear power plants and certification of its reactors with several sets of codes and standards related to safety. From this context, this report investigates the design and operational concepts of nuclear power plants to minimise the likelihood of accidents, when they occur. The international analysis show that an optimum tolerable level of safety is feasible by applying an integrated deterministic method that incorporate the concept of probabilistic risk assessment. It concludes that safety is to be judged based on whether residual risks are within the tolerable range, which could also be regarded as safety goal to be set by the regulators.

Mongolia's Energy Efficiency Indicators 2019

ERIA Research Project Report 2020 no. 17

Edited by Mongolian Energy Economics Institute and Economic Research Institute for ASEAN and East Asia

Mongolia has been achieving stable economic growth over the last 10 years. This has resulted in a significant increase in energy consumption, especially conventional energy, such as coal, oil, and electricity. The Mongolian Energy Economics Institute (MEEI) requested the Economic Research Institute for ASEAN and East Asia (ERIA) to support the MEEI in producing energy efficiency indicators (EEl)s to serve as benchmarks for Mongolia's final energy consumption sectors and to improve current energy efficiency and conservation (EEC) policies and action plans. This report comprises a detailed methodology and calculation results of those indicators in industry, transport, commercial buildings, and the residential sectors of Mongolia.

Myanmar Energy Outlook 2020

ERIA Research Project Report 2020 no. 1

Edited by Oil and Gas Planning Department, Ministry of Electricity and Energy of the Union of Myanmar

The Myanmar Energy Outlook 2020 (ERIA, 2020) provides a useful tool for the analysis of the historical energy demand and supply situation of Myanmar. To help Myanmar analyse the future energy demand and supply situation, the Economic Research Institute for ASEAN and East Asia (ERIA) has continued to support the Oil and Gas Planning Department (OGPD), Ministry of Electricity and Energy (MOEE) to produce the Myanmar Energy Outlook 2040 based on the Myanmar Energy Statistics 2019. ERIA has provided training on an econometrics approach to OGPD, MOEE staff members.

This approach consists of two parts: (i) estimation of energy demand formulas applying the ordinary least squares method using Myanmar Energy Statistics 2019, and (ii) development of future simulation models that forecast energy balance tables up to 2040 under several macro assumptions such as growth rates of gross domestic product (GDP) and population.

Myanmar's total final energy consumption (TFEC) (by industry, transport, commercial buildings, and residences) will increase by 3.0% per year by 2040. Oil will increase by 4.9% per year and electricity by 7.0% by 2040.

Total primary energy supply (TPES) will increase by 3.5% per year by 2040. The main imported fuel is oil, but by 2040 all fossil fuels will depend on imports because domestic production will decline. As a result, current import dependency (14% in 2016) is forecast to increase to 49%. As Myanmar's energy supply security will be vulnerable, the following policies are recommended: (i) prioritisation of an energy efficiency and conservation policy, especially to mitigate electricity consumption mainly in commercial buildings; (ii) focusing on shifting from natural gas power generation to coal, using domestic coal and applying clean coal technology; (iii) promoting an increase in the use of biomass especially in rural areas with an efficient biomass cooking stove; and (iv), pushing the use of hydropower (especially during the rainy season) and solar/PV power (in the dry season), which can complement each other.

Potential Renewable Hydrogen from Curtailed Electricity for ASEAN's Clean Energy: Policy Implications

ERIA Discussion Paper no. 352

by Han Phoumin, Jun Arima, Fukunari Kimura

The power generation mix of the Association of Southeast Asian Nations (ASEAN) is dominated by fossil fuels, which accounted for almost 80% in 2017 and are expected to account for 82% in 2050 if the region does not transition to cleaner energy systems. Solar and wind power is the most abundant energy resource but contributes negligibly to the power mix. Scalable electricity production from wind and solar energy faces tremendous challenges due to system integration practices in ASEAN. Investors in solar or wind farms face high risks from electricity curtailment if surplus electricity is not used. Technologies for battery storage (lithium-ion batteries) have been developed to handle surplus electricity production from wind and solar energy but they remain costly. Hydrogen produced from electrolysis using surplus electricity, however, has numerous advantages that complement battery storage, as hydrogen can be stored as liquid gas, which is suitable for

many uses and easy to transport. Employing the policy scenario analysis of the energy outlook modelling results, this paper examines the potential scalability of renewable hydrogen production from curtailed electricity in scenarios of high share of variable renewable energy in the power generation mix. The study intensively reviewed potential cost reduction of hydrogen production around the world and its implications for changing the energy landscape. The study found many social and environmental benefits as hydrogen can help increase the share of renewables in decarbonising emissions in ASEAN.

Public Perception and Acceptance of Nuclear Power: Stakeholder Issues and Community Solutions

ERIA Research Project Report 2020 no. 8

Tomoko Murakami, Venkatachalam Anbumozhi

All over the world, public acceptance of nuclear power is a crucial factor in decisions on public and private investment in nuclear power plants. Therefore, it is important to understand the determinants of public acceptance of nuclear power and the driving factors behind individual perceptions. This report examines the effects of local economic benefits, social inclusion, and effective communication on risk management. In Finland, Japan, the United Kingdom, and the United States, through field visits and interactive workshops, different levels of stakeholder acceptance and related driving factors to effect changes in perceptions are identified. Local economic wealth creation, lower cost of generating electricity, and low-carbon energy provision appear to have the strongest positive effect on public acceptance of nuclear power. The report also identifies and recommends an effective communication and risk sharing mechanism amongst sub-regional authorities and non-governmental organisations that could lead to positive changes in community perception.

Securing the Resilience of Nuclear Infrastructure against Natural Disasters

ERIA Research Project Report 2020 no. 5

Edited by Tomoko Murakami, Venkatachalam Anbumozhi

The ASEAN and East Asian Region is more vulnerable to natural disasters than any other part of the world. Recent disasters such as the Great East Japan Earthquake or the Thailand floods have made us understand our vulnerabilities to the forces of natural disasters and their wider consequences for energy security, which stretch far beyond the directly affected areas. The Fukushima disaster in particular showed how the impact of natural disasters can be hugely amplified by technological hazards such as nuclear power plant shutdowns. This report reviews the key disaster management strategies and energy security actions being adopted in Japan, Europe, and the United States from the perspective of nuclear power plant operations. Based on a barrier analysis of ASEAN countries, this study proposes an integrated policy framework that could enhance appropriation of resources – technology, finance, and decision-making capacity – for improved resilience of future nuclear infrastructure investments.

Study on the Potential for the Promotion of Carbon Dioxide Capture, Utilisation, and Storage in ASEAN Countries: Current Situation and Future Perspectives

ERIA Research Project Report 2020 no. 21

Edited by Shigeru Kimura, Kikuko Shinchii, Shunsuke Kawagishi, Ulysses Coulmas

This ‘Study on the Potential for the Promotion of Carbon Dioxide Capture, Utilisation, and Storage in ASEAN’, uses a multi-aspect survey approach. The study covers findings on recent trends in policies, technologies, and business development from countries with experience of Carbon Dioxide Capture, Utilisation, and Storage (CCUS). It also looks into the potential for CCUS development in the Association of Southeast Asian Nations (ASEAN) and the East Asia Region. Based on discussions held at the 3rd East Asia Energy Forum, the report

reiterates the important role CCUS can play in the region to achieve both energy transition and decarbonisation objectives. It also explores the potential and benefits of a regional collaborative approach, which is proposed as the Asia CCUS Network to create an enabling environment for business cases of CCUS.

Temburong Ecotown Development Phase 4

ERIA Research Project Report 2020 no. 19

Edited by Shigeru Kimura, Alloysius Joko Purwanto, Keisuke Ueda, Leong Siew Meng, Kazuhisa Fujioka

Temburong district is famous for its rich nature and is has become more attractive because of easy access from Bandar Seri Begawan since completion of the Temburong Bridge. If it is developed into an ecotown or smart city, Temburong will become one of the best examples of an ecotown or smart city in ASEAN. The research study of the project conducted in 2019–2020 focused on concrete and applicable aspects to support Temburong’s ecotown development – (i) preparation of energy efficiency and conservation guidelines for commercial buildings (both new buildings and retrofitting) in Temburong district; (ii) clean electricity supply to Temburong district through applying smart-grid technology; and (iii) a proposal for a smart transport system. An overall road map for the development of an ecotown in Temburong district was also included. ERIA hopes the Ministry of Energy of Brunei Darussalam will initiate development of an ecotown in Temburong District with the collaboration of the Temburong District Development Authority (AKDT) and makes use of this report.

The Influence on Energy and the Economy of Electrified Vehicle Penetration in ASEAN

ERIA Research Project Report 2020 no. 14

Edited by Shigeru Suehiro, Alloysius Joko Purwanto

The study analyses the effects of electric vehicle deployment in Indonesia, Malaysia, Thailand, and Viet Nam especially in terms of energy supply and demand, CO₂ emissions, the macroeconomy, and employment.

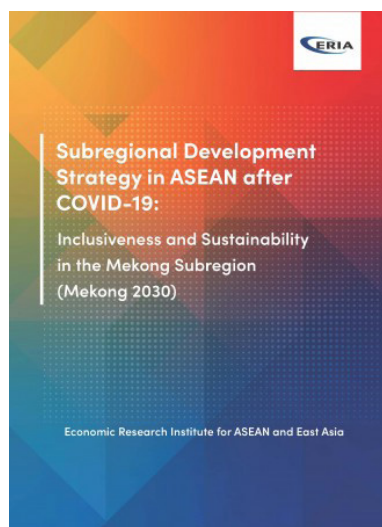
The study points out that introducing electric vehicles into ASEAN countries would fulfil various policy purposes, but their massive deployment might have negative economic side effects. The study presents four recommendations. First, it is important to decarbonise the power supply along with the penetration of electric vehicles. Second, it is important to estimate the cost-effectiveness of subsidies with respect to the amount of CO₂ reduction. Third, it is important to pay attention to the ripple effects of electric vehicles. The production of battery electric vehicles with a small number of material parts may reduce employment in the automotive industry compared to producing internal combustion engines and hybrid electric vehicles. Promoting e-motorcycles may stimulate job creation if the savings on fuel expenditure can be diverted into other goods and services. Finally, it is important to consider appropriate country-specific pathways to vehicle electrification.



Environment & Climate Change

Subregional Development Strategy in ASEAN after COVID-19: Inclusiveness and Sustainability in the Mekong Subregion (Mekong 2030)

by Economic Research Institute for ASEAN and East Asia



The Mekong Subregion (MSR) has been a model subregional development initiative, having achieved high economic growth and rapid poverty alleviation with extensive and innovative international collaboration over the past 3 decades. The remaining development gaps within the region remain substantial, however.

Over the next decade, the MSR will face the challenge of raising the whole region to upper middle-income status. To achieve inclusive and sustainable economic growth, clear policy guidance will be required to upgrade its industrial structure and enhance people's welfare.

This report proposes four priority policy areas – connectivity, industrialisation, human welfare, and sustainability – and provides a series of policy recommendations.

The subregional approach has proved to be particularly effective for addressing development gaps, enhancing connectivity, and promoting international coordination. The Association of Southeast Asian Nations (ASEAN) is encouraged to continue to adopt a multilayered approach to deeper economic integration and to activate other subregional initiatives.



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Strengthening Waste Management Policies to Mitigate the COVID-19 Pandemic

ERIA Policy Brief 2020 no. 5

by Hidetoshi Nishimura, Michikazu Kojima, Fusanori Iwasaki, Hendro Putra Johannes, Ellen Putri Edita

The coronavirus (COVID-19) pandemic has raised issues with waste management. In Association of Southeast Asian Nations (ASEAN) countries, the increasing amount of medical waste during the pandemic is not in line with the availability of waste management facilities. Furthermore, the amount of plastic waste is also rising because people rely more on food delivery services. This causes a plastic waste ban roll-back in some countries. In this difficult situation, it is crucial for ASEAN countries to strengthen their waste management policies. Also, protection of all parties, including informal workers, must be considered to enforce a clean and healthy work environment.

A Quantitative Analysis of Disaster Risk Reduction Investment Effects for Sustainable Development: Indonesia Case Study

ERIA Discussion Paper no. 334

by Hiroaki Ishiwata, Hiroyuki Wada, Koji Suzuki, Makoto Ikeda, Naoto Tada

This paper analyses the long-term impacts of large-scale disasters on the economic growth of developing countries in the Association of Southeast Asian Nations (ASEAN) Community, by the scale of disaster risk reduction (DRR) investments. As a means of quantitatively analysing the optimal level and economic efficiency of DRR investments, a case study was conducted on Indonesia by using a dynamic stochastic macroeconomic model. The results showed that in Indonesia, although greater economic growth is expected when additional DRR investments are made, an excessive DRR investment may contrarily lead to a slowdown in economic growth: an optimal level of DRR investment exists and maintaining its level is essential for sustainable economic growth. Furthermore, it was confirmed that there is a break-even point when the amount of accumulated disaster damage mitigation benefits exceeds the amount of accumulated DRR investment. This demonstrated that the funds invested in DRR could be recovered. Additionally, the results also showed that even if no disaster

damage is caused over a long period of time, DRR investments are by no means redundant as the ‘ex-ante risk reduction effect’ will be generated when the optimal level of DRR investment is made. Lastly, it was determined that providing a continuous DRR investment is important in achieving the global target set forth in the Sendai Framework for Disaster Risk Reduction. In addition, it is considered desirable to maintain a higher level of DRR investment than that which is currently being implemented.

Economic Damage from Natural Hazards and Local Disaster Management Plans in Japan and Thailand

ERIA Discussion Paper no. 346

by Makoto Ikeda, Thawatchai Palakhamarn

Japan and Thailand are geographically similar in that both countries have a vast coastline and a population that is concentrated in urban areas. Natural hazards such as earthquakes, tsunamis, typhoons, floods, and landslides bring about a considerable amount of damage every year. To counter these natural hazards, both countries have developed disaster management laws at the national, provincial, and prefectural levels. Establishing and executing local disaster management plans is particularly important as the initial response to a disaster is first performed at the local level. In this study, we have focused on the local disaster management plans in Thailand and examined the state of the development of the plans, which are essential during a post-disaster period. We also found that in Japan there was a defined tangible system of cooperation with the private sector based on the unique characteristics of each local government.

Effects of Business Continuity Planning on Reducing Economic Loss due to Natural Disasters

ERIA Discussion Paper no. 350

by Takahiro Ono, Venkatachalam Anbumozhi

The Association of Southeast Asian Nations (ASEAN) economy has developed rapidly since the 1980s, centred on the automobile industry, and has been connected to economic regions around the world, including Japan, through supply chains. However, the ASEAN region is one where natural disasters frequently occur, and a region damaged by a disaster will have an impact on the region's economy, and the region's supply chain will have a major impact on the world. Protecting the fast-growing and supply chain-connected ASEAN region from frequent natural disasters and reducing economic damage are important to Japan and the rest of the world. In 2015, the 3rd United Nations World Conference on Disaster Risk Reduction adopted the Sendai Framework, which focused on economic loss. To reduce economic loss caused by natural disasters, companies' capability to continue doing business must be strengthened. Japan's government has promoted business continuity planning to minimise economic loss. This paper examines the policy, reviews several devastating disaster case studies, and recommends policies for utilising the policy to reduce economic loss in the ASEAN region.

Regional Waste Management – Inter-municipal Cooperation and Public and Private Partnership

ERIA Research Project Report 2020 no. 12

Edited by Michikazu Kojima

To reduce the risk of COVID-19 and the leakage of plastic waste to the ocean, waste collection and disposal services should be expanded middle and small cities, and rural area. But there is economy of scale in proper treatment and disposal facilities, such as waste to energy plant and sanitary landfill. Some Asian municipalities started to formulate regional or inter-municipal cooperation on waste management. This report shows economies of scale in waste management, reviews regional waste management in Japan, Philippines, Thailand

and Vietnam, and identifies some types of regional waste management schemes, including regional waste management with Public Private Partnership.

Sustainable Water Resource Development Scenarios and Water Diplomacy in the Lower Mekong Basin: Policy Implications

ERIA Discussion Paper no. 339

Edited by Han Phoumin, To Minh Thu, Thim Ly

This paper uses the current results of the Basin-wide water resource development scenario assessment of the Council Study of the Mekong River Commission Secretariat (MRCS) to analyse potentials benefits for economic development to meet the ambitious goal of the riparian states of the Lower Mekong Basin (LMB) countries for poverty reduction and, at the same time, analyse the risks of potential trans-boundary trade-off, which will require an appropriate mechanism to be in place. The scenario assessment results present both opportunities and risks associated with different levels of water resource development in the Mekong countries and the implications of the water diplomacy for both the lower and upper Mekong basin. All scenarios could be broadly placed into three main categories with different timeframes and assumptions. Scenario M1 – the early development scenario – characterises baseline water resource developments in 2007; Scenario M2 – the medium-term definite future scenario – characterises existing, under-construction, and firmly-committed water related developments in 2020; and Scenario M3 – the long-term planned development scenario – characterises the planned water developments in 2040 in addition to those assigned for 2020 for implementation over the following 2 decades. The main scenarios aggregate combinations of water resource developments enabling the cumulative assessment of environmental, social, and economic effects in the Member Countries. The Scenarios will bring both economic opportunities in terms of benefits from water resource development as well as risks related to biodiversity changes, the environmental damages and losses of livelihoods, and the dependency on the natural resources of the Mekong River. Each of the scenario results presents the trans-boundary trade-off which requires appropriate skills, capacities of the LMB riparian

countries, and water diplomacy to discuss and negotiate for the solutions. Finally, this paper provides some suggestions and policy implications that could be possible mechanisms and solutions for sustainable water resource development in the Mekong region.

The Effects of Prenatal Exposure to Plentiful Rainfall on Cognitive Development in Viet Nam

ERIA Discussion Paper no. 352

Edited by Nobuaki Yamashita, Trong-Anh Trinh

We examine the impact of exposure to plentiful rainfall while in utero on the cognitive development of the same children from ages 5 to 15 from the Young Lives Project in Viet Nam. Using variations in the month and place of birth, we show that positive income shocks, proxied by above-average rainfall, are associated with better cognitive development up to age 8. The effect is more pronounced when positive shocks occur early in gestation. However, we find that such positive effects are not sustained in the longer term and are completely absent at ages 10, 12, and 15. Our results call for effective and early policy interventions providing a sustained pathway for the cognitive development of children in weather disaster-prone regions.



Finance & Macroeconomy

Financial Inclusion and Savings in Indonesia

ERIA Discussion Paper no. 344

by *Rashesh Shrestha, Samuel Nursamsu*

This paper discusses the status of financial inclusion in Indonesia and examines the impact of financial inclusion – based on availability of bank branches on household outcomes – in Indonesia. Based on analysis of the World Bank’s Financial Inclusion Survey (FINDEX) data, Indonesia has made some progress on expanding financial inclusion. The share of individuals with bank accounts rose from less than 20% to just under 50% in 2017. Interestingly, while the gain between 2011 and 2014 was greater for individuals in the upper 60 percentile of income, the gains between 2014 and 2017 were more pro-poor. This progress was made possible due to concerted government efforts to expand financial inclusion. In our empirical analysis, we study how financial inclusion enables households with income gains into savings for assets and earnings. Using the Indonesian Family Life Survey data, we find that living in areas with high density of bank branches helps poor households accumulate savings. The marginal effect of financial inclusion on savings is highest amongst the households in the bottom quintile of per capita consumption distribution. Thus, access to formal financial institutions can lead to improvement in household welfare.

Financial Inclusion, Active Bank Accounts and Poverty Reduction in India

ERIA Discussion Paper no. 345

by *Tony Cavoli, Ilke Onur, Patricia Sourdin*

Using the World Bank’s Global Findex data, this research first shows that the efforts by the Indian Government and the Reserve Bank have been successful in providing access to formal banking services, especially in the rural areas of the country. Similarly, financial account ownership gap has been eliminated in terms of gender and income. Further analysis, using the Financial Inclusion Insights dataset, shows that financial inclusion has a positive and significant effect on reducing poverty in India. A closer look at the utilisation of the financial accounts shows that active usage of these accounts would lead to further reductions in poverty levels in India.

Therefore, targeted programmes, such as offering financial education both in and outside schools, with the aim of improving financial literacy, could lead to further poverty reduction in India.

Measuring the Pro-Poorness of Urban and Rural Economic Growth in Indonesia, 2004–2014

ERIA Discussion Paper no. 351

by Takahiro Akita, Sachiko Miyata

This study measures the pro-poorness of urban and rural economic growth by region from 2004 to 2014 in Indonesia using pro-poor growth indexes, with data from the National Socio-Economic Survey (Susenas). It also conducts a probit analysis to explore the determinants of poverty. All regions (Sumatra, Java-Bali, Kalimantan, Sulawesi, and East Indonesia) experienced a substantial increase in expenditure inequality in both urban and rural areas; thus, the change in poverty incidence due to redistribution effects is positive. Apart from East Indonesia, they reduced the incidence of poverty in both areas, but their growth was not pro-poor in the strict sense. According to the pro-poor growth indexes, urban areas performed better than rural areas; in most regions, the growth of urban areas was moderately pro-poor, while that of rural areas was weakly pro-poor or anti-poor. The government needs to take urban-rural and regional differences into account when formulating poverty alleviation policies and programs since these differences would affect economic growth and changes in inequality.

Outcomes of Long-term Care Insurance Services in Japan: Evidence from National Long-term Care Insurance Claim Data

ERIA Research Project Report 2020 no. 13

Edited by Nanako Tamiya, Hideo Yasunaga, Xueying Jin, Kazuaki Uda, Osuke Komazawa

Japan has the oldest population structure in the world, with a share of 28.1% of people aged 65 years or above in 2018, and this rate is still increasing. In 2000, Japan introduced a compulsory public long-term care insurance (LTCI) programme to meet the challenges of its rapid population ageing and ensure equitable access to long-term care services. All citizens and foreign residents aged 65 years or above are eligible to receive LTCI services if they are certified to be the beneficiaries of LTCI based on the care-need level assessment. The method of assessment is specified by the national government and Japan retains all information on beneficiaries' long-term care insurance claims, making it easier to observe their functional changes over time. This study aims to investigate the predictors of care-need level change by focusing on the users of long-term care facility services, adult day service users, and day care users by applying national-level long-term care claims data.

The Composition of Financial Inclusion in ASEAN and East Asia: A New Hybrid Index and Some Stylised Facts

ERIA Discussion Paper no. 341

by Rajabrata Banerjee, Ronald Donato

The paper provides an overview of the existing measures of financial inclusion and critically evaluates the two widely used existing methodologies to measure the dimensions – the principal component analysis (PCA) method and the Distance method, respectively. We subsequently propose a new hybrid financial inclusion index, which draws on the strengths of existing measures. We propose four key stylised facts by critically evaluating three dimensions of financial inclusion – access, usage, and quality in 22 Asian countries in the period 2004–2015. Utilising PCA scores, we identify the top two indicators under each dimension and by country, which are directly relevant for policy perspectives. An important finding is that the top five and the bottom five countries

are the same under all three methodologies. There is a pattern across countries in adopting usage, access, and quality dimensions of financial inclusion over time. We also find that the top two indicators appear to play a significant role across all developing countries in the sample.

The Effects of Financial Inclusion on Development Outcomes: New Insights from ASEAN and East Asian Countries

ERIA Discussion Paper no. 342

by Rajabrata Banerjee, Ronald Donato, Admasu Afsaw Maruta

This study empirically examines the effects of financial inclusion on economic development, – economic growth, education, health, and income inequality – in 20 Asian countries in the period 2004–2015. The financial inclusion index at an aggregate level is constructed using a hybrid methodology (reported in the previous paper) and we empirically examine its relationship with particular development outcomes. We then disaggregate the index into the three dimensions of financial inclusions – access, usage, and quality – and further into the top two indicators from each dimension based on principal component analysis scores (reported in the previous paper), to examine whether specific dimensions or indicators are more strongly associated with particular development outcomes than with others. Our results show that aggregate financial inclusion has a strong positive effect on all development outcomes and this effect improves for countries with lower political risk. At the dimension level, while usage is the only dimension impacting on economic growth, and access is the only dimension impacting on health outcomes, both usage and access influence education and income inequality. Moreover, the top ranked indicators in each dimension exert a far greater positive influence on development outcomes than the second highest ranked indicators. Our findings show that adopting a single blanket policy may not be appropriate to realise the full potential of financial inclusion in a less developed country. Policy prescriptions should therefore target specific dimension and indicators of financial inclusion to maximise the positive effect on development outcomes.

The Nature and Landscape of Financial Inclusion in Asia

ERIA Discussion Paper no. 340

by *Tony Cavoli, Rashesh Shrestha*

This paper presents an examination of the key impacts of financial inclusion on economic prosperity and wellbeing, and on other development indicators such as those pertaining to health, education, gender, and social capital for Asia. It attempts to answer specific questions such as: What are the main individual dimensions of financial inclusion? Which of those are more effective at capturing the salient characteristics of financial inclusion? Does financial inclusion differ by gender, education, poverty, and other development outcomes (i.e. are there 'gaps')? What is the role of policy? Might there be particular policies relating to financial inclusion that are more effective than others in addressing development outcomes? We find that the growth in financial inclusion has mainly occurred in the South Asian, CLMV, and ASEAN5 groups rather than in the more developed plus3 and ANZ nations, and that this occurs with both the traditional indicators (ATMs, branches), as well as in areas of fintech and digital finance. We also find systemic development gaps in financial inclusion – particularly between poor and non-poor segments of society, and rural vs urban populations.

The Poverty-Reducing Effects of Financial Inclusion: Evidence from Cambodia

ERIA Discussion Paper no. 343

by *Kimty Seng*

This study analyses the effects of financial inclusion on poverty in terms of household income per capita in Cambodia, with data from the FinScope Survey carried out in 2015. The analysis describes the effects via financial literacy, accounting for endogenous selection bias resulting from unobserved confounders and for structural differences between users and non-users of financial services in terms of income functions. The findings suggest that the use of financial services is very likely to make a great contribution to reducing household budget deficits and poverty if the users, female in particular, have at least basic financial knowledge.

The Value-Added Tax Reform and Labour Market Outcomes: Firm-Level Evidence from China

ERIA Discussion Paper no. 337

by Yuxiang Yang, Hongyong Zhang

The tax incentives designed to stimulate firm investment may have a large impact on labour market outcomes. Using a comprehensive data set containing more than 1 million Chinese manufacturing firms during the period 2000–2013 with a difference-in-difference approach, we examine the impact of the value-added tax reform in 2004–2008 on the firm-level labour market outcomes. We find that firms in eligible industries and regions (treated firms) enjoying lower costs of purchasing fixed assets under the reform tended to increase capital investment and reduce employment relative to firms that did not have tax incentives (the control firms). Compared with the control firms, the treated firms became more capital intensive and had an increase in average wage but a decline in labour income share. We also provide evidence that the substitutions of labour input by capital input is associated with increases in firm productivity and the share of skilled workers, but not imported capital goods.



Industry & Manufacturing

ASEAN Development and Innovation Strategy in the Era of New Industrialisation

ERIA Policy Brief 2020 no. 6

by Masahito Ambashi

Foreign direct investment (FDI) and trade will continue to play an important role in the assimilation of the latest technologies within the Association of Southeast Asian Nations (ASEAN) Member States (AMS). However, it is also necessary for ASEAN firms to enhance their own innovation capabilities to create new business opportunities. Fostering this innovation requires developing human resources by not only equipping workers with appropriate knowledge and the skills needed by the manufacturing industry, but also nurturing ‘technology entrepreneurs’ who can innovate using the latest information and communication technology. While AMS can accelerate technology adoption by strengthening networks, particularly with developed countries, they also need to create unique ‘product innovation’ of goods and services in addition to cost-reducing ‘process innovation.’ With respect to national innovation systems, AMS can use ‘leapfrogging’ (skipping development stages) and ‘feedback’ (introducing advanced technologies into old industries) development strategies based on the Fourth Industrial Revolution (4IR) and establish an ‘innovation niche’ that is competitive, attractive, and unique to the rest of the world.

This policy brief presents goals, analyses, and policy recommendations on human resource development, technology adoption, and innovation to achieve quality growth in the era of new industrialisation.

Assessment of Industrial Cluster Policies in Viet Nam: The Role of Special Economic Zones in Attracting Foreign Direct Investment

ERIA Discussion Paper no. 333

by Dao Ngoc Tien, Nguyen Quynh Huong

Special economic zones (SEZs) are considered as one of important regional industrial policies to attract foreign investment in developing countries such as Viet Nam. The review of SEZs development in Viet Nam including

the comprehensive review of infrastructure and business environment in SEZs are presented in this paper for the first time. Moreover, the paper gives novel non-parametric evidence to indicate the positive causal linkage between the zoning policies and the attraction of foreign investment at district-level in the country during the period 2011–2015.

Exit Strategies for ASEAN Member States: Keeping Production Networks Alive Despite the Impending Demand Shock

ERIA Policy Brief 2020 no. 3

by Fukunari Kimura

Some Association of Southeast Asian Nations (ASEAN) Member States (AMS) are still fully engaged in emergency responses to the coronavirus disease (COVID-19). Human life is of the utmost importance and must be prioritised over other issues. It is crucial to keep the pandemic curve within the capacity of healthcare systems – even if the immediate pain from social distancing is huge. ERIA hopes that all AMS and countries in the rest of the world overcome this difficult challenge soon.

At this point, we must start considering the next stage. This policy brief will talk about the exit strategies for AMS after successfully taming the spread of the disease.

New Developments in International Production Networks: Impact of Digital Technologies

ERIA Policy Brief no. 322

by Ayako Obashi, Fukunari Kimura

We conducted a standard gravity exercise using worldwide disaggregated trade data to shed light on the influence of the spread of digital technologies on network trade. We found that growing investment in industrial

robots in relatively lagging countries, together with imported digitally deliverable services, is enhancing bilateral network trade flows in East Asia, but not necessarily in other parts of the world. This suggests that exploring complementarities between machines and human resources in production blocks supported by better service-link connectivity may allow newly developed economies to retain and expand the international division of labour.

A scientist in a white lab coat and safety glasses is working in a laboratory. The scientist is holding a test tube and looking at it intently. The background is a blurred laboratory setting. The image is overlaid with several semi-transparent rectangular blocks in various colors, including shades of teal, yellow, and brown. The text "Innovation & Technology" is centered in the image in a white, bold, sans-serif font.

Innovation & Technology

Robotics Technology and Firm-level Employment Adjustment in Japan

ERIA Discussion Paper no. 348

by *Bin Ni, Ayako Obashi*

Unlike studies that analyse the impact of robotics technology on employment at the industry or firm level, this study investigates cross-division employment adjustment within a firm in an industry with large penetration and diffusion of robotics technology. By examining the changes in the composition of employment, we measured job creation and destruction at the division level and explored whether robotics technology, as a leading example of automation, not only displaces workers but also introduces new jobs in favour of labour. We made use of unique, division-level employment data for Japan's manufacturing firms, together with industry-level data on the installation of industrial robots. We found that industry-level adoption of robots positively affects the rates of firm-level job creation and job destruction. Because the magnitude of the impact is larger for job destruction, robot adoption has an overall negative impact on firms' net employment growth. Our finding suggests that the labour displacement effect of robotics technology and the emergence of new jobs due to technological change coexist even at the firm level.

Technology Imports and Employment in Developing Countries: Evidence from Viet Nam

ERIA Discussion Paper no. 335

by *Duc Anh Dang, Thu Thu Vu*

Advanced machines and technology replace workers through automation. However, capital-labour substitution need not reduce aggregate labour demand, as it induces simultaneous contrasting effects within industries. To explore these effects, we examine the relationship between employment in Vietnamese manufacturing firms and imported capital goods in 2011–2017. To solve the problem of potential endogeneity and measurement errors, we used Association of Southeast Asian Nations (ASEAN) imported capital goods as an instrument variable for imported capital goods in Viet Nam. We found that imported capital goods do not displace

employment and even increase employment and labour productivity. The impacts of imported advanced technology are more pronounced in large firms. More imported technology increases labour productivity in state-owned enterprises and the number of workers in large firms and firms in industrial zones. However, the increase in the level of employment is lower in industries and firms intensively using machines.

The image features a photograph of a grand, classical building with a series of large, fluted columns and a wide, dark stone staircase leading up to the entrance. The scene is overlaid with a semi-transparent teal color that covers most of the image. There are also several semi-transparent yellow rectangular shapes scattered across the composition, some overlapping the columns and the text. The text 'Regulation & Governance' is centered in a bold, white, sans-serif font.

Regulation & Governance

Interconnected Government: International Regulatory Cooperation in ASEAN

Edited by Derek Gill



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Promoting international regulatory cooperation (IRC) is gaining traction as a way to improve business competitiveness. Within the Association of Southeast Asian Nations (ASEAN), improving regulatory quality and reducing the costs of doing business is seen as beneficial for firms and as well as being supportive of facilitating international trade and investment. The ASEAN Economic Community Blueprint 2025 creates an imperative for such good regulatory practices.

But what exactly is IRC, what is promoting it, and what are the barriers to it? These are some of the issues explored in this book. Based on case studies and surveys from all ASEAN Member States, this book looks at the state of play of IRC within ASEAN, presenting the findings alongside country studies from Malaysia, the Philippines, and Thailand, and New Zealand as a +1 bilateral Partner. These findings can act as a guide for ASEAN Member States in moving forward in improving the effectiveness of regulations and increasing regulatory interoperability .

Under the Radar: International Regulatory Cooperation in ASEAN and New Zealand

ERIA Policy Brief 2020 no. 8

Edited by Derek Gill and Edo Setyadi

International Regulatory Cooperation (IRC) refers to a diverse range of ways government regulators from different countries work together on developing and enforcing regulations. IRC can occur through formal arrangements such as ASEAN Mutual Recognition for Professional Services, international organisations such as the WHO, or more informal networks and communities of practice. It has grown rapidly over the last 40 years but is little understood because much of it occurs beneath the radar.

IRC is important for the AEC as tariffs have come down to near zero in ASEAN for many areas of trade, and multilateral liberalisation has stalled. New research shows that ASEAN countries, along with the New Zealand Government, are deeply imbedded in a complex web of international regulatory cooperation arrangements. In ASEAN, these arrangements are predominately Multilateral (the UN system, for example) Bilateral and Regional (ASEAN and APEC). In New Zealand, bilateral arrangements with Australia predominate. Much of this cooperation occurs outside of formal free trade agreements and the Technical Barriers to Trade regime under the WTO. Instead regulators often work directly with their foreign counterparts through informal networks. The experience of COVID-19 has underlined the value of cooperative activities between states like information gathering and exchange. Dealing effectively with three of the principal issues confronting public policymakers – pandemics, climate change, and effective governance of the digital environment – all require extensive international cooperation.



The image is a composite graphic. The background is a dark, textured teal color. Overlaid on this are several semi-transparent images: a large gantry crane at a port, a cargo ship docked at a pier, and a close-up of a ship's deck with stacked containers. The word "Trade" is centered in a white, bold, sans-serif font.

Trade

E-Commerce Connectivity in ASEAN

by Lurong Chen and Fukunari Kimura



The next Asian miracle of growth could be born with the region's digital transformation. Digital connectivity is the cornerstone that will make the changes feasible and smoothen the transformation. It consists of not only physical connectivity that facilitates the movement of raw materials, intermediate goods, and goods, but also cyber connectivity to support free flows of data, information, and services.

This book provides policy insights for ASEAN to realise the potential of fast growth by improving regional digital connectivity with an emphasis on (i) data connectivity, (ii) logistics to facilitate the free flow of goods and services, (iii) connectivity to facilitate cash flows, and (iv) seamless links between the physical and cyber-space.



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Labour Market Impacts of Import Penetration from China and Regional Trade Agreement Partners: The Case of Japan

ERIA Discussion Paper no. 329

by Kazunobu Hayakawa, Tadashi Ito, Shujiro Urata

The impacts of imports on the domestic labour market have been hotly debated recently. The purpose of this paper is to empirically examine the effects of not only imports from China but also those under regional trade agreements (RTAs) on employment in Japan. As in previous studies in the literature, we found that the rise in import penetration from China significantly decreases employment in Japan. However, import penetration under RTA regimes is found to have insignificant effects on employment. The finding suggests that the increase in imports under RTA regimes might not be harmful to the domestic labour market. In addition, we did not find significant effects of import penetration via input–output linkages. This insignificant result may be because imports by Japanese manufacturing firms are mostly conducted in the form of intra-firm trade, enabling them to avoid negative impacts on employment.

Technological Advancement, Import Penetration, and Labour Markets: Evidence from Thai Manufacturing

ERIA Discussion Paper no. 336

by Juthathip Jongwanich, Archanun Kohpaiboon, Ayako Obashi

This paper examines the impacts of advanced technology on a possible change in workers' skills, wages, and employment due to such technological advancement. Three proxies of advanced technologies are used in the study: (i) information and communications technology, (ii) intensity of robot use, and (iii) value of e-commerce. Our study compares the effects of technological advancements on labour market outcomes with import penetration, delineating into raw materials, capital goods, and final products. Our results show that in Thailand, the impact of advanced technology in pushing workers out of the job market is limited. Instead, it tends to affect reallocation of workers between skilled and unskilled positions. The results vary amongst proxies of technology

and sectors. It seems that workers in comparatively capital-intensive industries, including automotive, plastics and chemicals, and electronics and machinery, are the most affected by advanced technology. Dampened wage/income is found only in some proxies of technology and sectors. Our results show less concern of negative impacts induced by imports, particularly imports of capital goods and raw materials, on employment status and income than technological advancement.

The Economic Impact of Globalisation in Indonesia

ERIA Discussion Paper no. 338

by Kiki Verico, Mari Elka Pangestu

This paper analyses the economic impact of globalisation in Indonesia from the end of the 1960s to date. The analysis found that globalisation generated a positive impact on Indonesia's economic growth through the trade and investment channel; reduced wage inequality and child labour participation; and increased labour absorption, including women's participation in the labour market. Through the trade channel, globalisation also contributed to Indonesia's productivity and structural economic transformation, benefited small and medium-sized enterprises (SMEs), contributed to poverty alleviation and reduced inequality, and increased trade in services such as tourism. Through the investment channel, there is evidence of the spillover effect of technology transfer, technology progress, improvement of the role of SMEs, and contribution to poverty alleviation. The waves of open and more restrictive trade and investment policies, which Indonesia has gone through in the last few decades, reflect the political economy reality – that is, the impact of globalisation is dynamic and only felt in the medium term, whereas the cost and potential negative impact is often felt more immediately throughout trade creation. The trade creation increases imports from countries with which free trade agreements have been negotiated, decreasing the domestic producer surplus. Since globalisation will create net benefits in the long run, Indonesia should continue its process of globalisation and integration with the world economy to ensure the net benefits and to move forward in its structural transformation, while managing the costs of globalisation and its transition process.

Trade Reform and the Evolution of Agglomeration in Vietnamese Manufacturing

ERIA Discussion Paper no. 330

by Doan Thi Thanh Ha, Huong Quynh Nguyen

It is well documented that agglomeration contributes to productivity growth. However, concentrations of workers could also lead to increasing regional income disparities. Therefore, understanding the evolution of agglomeration is relevant for the formulation of industrial policy and inclusive growth. This study documents the extent, pattern, and determinants of agglomeration in Vietnamese manufacturing during 2002–2016, a period when substantial economic reform took place. Our major findings are three-fold. First, agglomeration, as measured by the Ellison–Glaeser index, has declined since the mid-2000s. Second, there exists significant sectoral heterogeneity in the level and trend of agglomeration. Third, we do not find a significant impact of trade and foreign direct investment on agglomeration per se. However, foreign direct investment in port districts does contribute to disagglomeration.



**Training &
Human Capital**

Ageing and Health in Viet Nam

by Nguyen Cong Vu, Mai Thi Tran, Linh Thuy Dang, Choy-Lye Chei, Yasuhiko Saito



Edited by

Nguyen Cong Vu
Mai Thi Tran
Linh Thuy Dang
Choy-Lye Chei
Yasuhiko Saito



Ageing
and Health in
Viet Nam

The Longitudinal Study of Ageing and Health in Viet Nam (LSAHV) is the first multi-actor longitudinal study on ageing in Viet Nam with information collected from older Vietnamese people, their current and potential caregivers, and adult children. The 2018 baseline data provides comprehensive information on the health, economic status, and overall well-being of a nationally representative sample of older Vietnamese people aged 60 and above. These data will be a valuable resource for the crafting of evidence-based policies.

LSAHV is designed to (1) investigate the health status and well-being, as well as their correlates, of Vietnamese people aged 60 years and above; and (2) assess the determinants of health status and transitions in health status and overall well-being. The study is part of a comparative study of Viet Nam and the Philippines. LSAHV is funded by the Economic Research Institute for ASEAN and East Asia and implemented by the Institute of Population, Health and Development in Ha Noi.



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This publication is also available in Vietnamese

<https://www.phad.org/bao-cao-dieu-tra-ban-dau-cua-nghien-cuu-doc-ve-nguoi-cao-tuoi-va-suc-khoe-tai-viet-nam/>

Human Resources for the Health and Long-term Care of Older Persons in Asia

by Yuko Tsujita, Osuke Komazawa



The international migration of nurses and care workers is increasing. Many factors, such as population ageing and the development of healthcare services, contribute to the greater demand for nurses and care workers. Several mechanisms have been put in place to facilitate the mobility of nursing services professionals. For example, a mutual recognition agreement for nursing services amongst ASEAN Member States (AMS) came into effect in 2012. There are also bilateral mechanisms such as the economic partnership agreements between Japan and Indonesia, Japan and the Philippines, and Japan and Viet Nam. The migration of nurses is not always regulated by such frameworks. They migrate even to work as institutional or home care workers, and such migrants tend to be less regulated by the authorities and some of them work under informal contract arrangements. This report focuses on Indonesia as a country sending migrant nurses, Malaysia and Japan as destination countries, and Thailand as a country struggling to cope with the fastest population ageing amongst AMS. It is hoped it will give readers a better understanding of the overall picture concerning the mobility of nursing services professionals.



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Analysis of Global Value Chain Participation and the Labour Market in Thailand: A Micro-level Analysis

ERIA Discussion Paper no. 331

by Upalat Korwatanasakul, Youngmin Baek, Adam Majoe

This study assesses the links between global value chain (GVC) participation and the labour market to examine the relatively unexplored employment-related distribution effects of GVC integration. Based on the Mincer wage model, we examine the relationship between GVC participation and worker productivity and wages at the individual level. Our main estimation method is a simple ordinary least squares estimation using pooled cross-sectional data from the Thai Labour Force Survey for the period 1995–2011. We also separately examine the effects of forward and backward GVC participation on wages and wage distributions. Our results show that GVC participation induces higher monthly wages for individuals and increases productivity in the labour market through either the forward linkage or backward linkage. We even find that GVC participation can help mitigate inequality. Our findings show that GVC participation promotes inclusive job creation and provides more job opportunities for rural, female, and low-skilled workers. Policies to support leveraging the existing strong industries through upgrading, smoothing labour movements while improving agricultural productivity, and preparing to move towards a services economy can help prepare Thailand, and other developing countries in general, to upgrade to higher value chains. Although GVC participation may be a catalyst for higher wages, greater labour productivity, and more inclusive job creation, its employment effects are complicated. An unbalanced policy framework might contribute to uneven income distributions and exclusive job creation as participating in GVCs through different linkages can benefit different stakeholders in varying ways. Therefore, a policy framework that balances the benefits among stakeholders in terms of wage distributions and job inclusion is ideal.

Birth Order, Sibling Sex Composition, and Quantity–Quality Trade-offs – Evidence from India

ERIA Discussion Paper no. 362

by Ilke Onur, Malathi Velamuri

We use two waves of data from the India Human Development Survey to investigate the effect of family size on (i) parental expenditures on children's education; and (ii) test scores of proficiency in reading, writing, and maths for 8–11-year-old children. We investigate whether these effects vary by gender, birth order of children, and sibling sex composition. We address the endogeneity of family size, using an instrumental variable approach. Our ordinary least squares estimates provide evidence of quantity–quality trade-offs in children's educational expenditures, the existence of birth-order effects, and a sizeable pro-son bias. For test scores as well, ordinary least squares estimates indicate negative spillovers from additional children. The instrumental variable estimates, in contrast, find no evidence of quantity–quality trade-offs, birth order, or sibling sex composition effects in either expenditures or test scores. However, instrumental variable estimates of the male premium are bigger than ordinary least squares estimates. They also suggest that children enrolled in private schools do no better than those in government schools. Moreover, the advantage that boys appear to have over girls in maths is largely reversed in private schools.

Child Education: Rethinking Microcredit in Cambodia

ERIA Discussion Paper no. 357

by Kimty Seng

Conflicting and controversial conclusions about the potential effects of microcredit on socio-economic development raise concerns over the effects on child education. This study analyses the effects of microcredit offered by microfinance institutions on child education using data from the Cambodia Socio-Economic Surveys conducted in 2014 and 2017. The effects on textbook spending school dropout and child labour are quantified with regression models addressing the endogeneity of the household decision to use microcredit and of the

borrowed amount. The results suggest that microcredit is unlikely to promote household spending on textbooks but is liable to increase the likelihood of a child dropping out of school and the probability of child labour.

Determinants of School Enrolment: Relationship between Minimum Wage and Human Capital Investment

ERIA Discussion Paper no. 356

by Dyah Pritadrajati

Most economic research on minimum wage has focused on employment effects. Research analysing the effects of minimum wage on skill acquisition and educational investment is limited, especially in developing countries. To fill the gap in the literature, this paper investigates the relationship of minimum wage and human capital investment using the National Socioeconomic Survey (Susenas). This study is an effort to further analyse whether the minimum wage policy supports or even hinders recent government efforts to keep students in school. The government may be unaware of the possible interaction of different policies, especially in a developing country where inter-sectoral policy coordination is limited. This paper finds that minimum wage legislation has significant negative substitution effect on educational investment, i.e. individuals are more likely to drop out of senior secondary school due to an increase in minimum wage. There is no evidence of gender bias in human capital investment, at least as a response to increasing minimum wage. Even though the response to an increase in minimum wage amongst low-income households is positive, the results of a regression incorporating an interaction term suggest that the substitution effect is the dominant factor. Therefore, the positive result amongst low-income households might be generated by a fall in the probability of obtaining low-skilled employment that offsets the substitution effect.

Does Change in Intellectual Property Rights Induce Demand for Skilled Workers? Evidence from India

ERIA Discussion Paper no. 347

by Pavel Chakraborty, Prachi Gupta

Do incentives to innovate create demand for skilled workers more than proportionately? We study the question using the implementation of the Patent (Amendment) Act in India in 2002 to comply with the Trade-Related Intellectual Property Rights agreement. We find, first, stronger intellectual property protection has a sharper impact on demand for skilled workers for high patentable industries. Demand for skilled workers increased by 0.5%–2.9% for industries that are more patentable. The average compensation for skilled workers went up by 10% in high patentable industries but decreased for unskilled workers by about 2%. Second, the increase in wage inequality can partly be attributed to the increase in wages rather than incentives. Third, the increase in demand for skilled workers is due to both the increase in intensive margin (or price) and extensive margin (number). Fourth, the aggregate effect is completely driven by industries producing intermediate goods and big plants. Finally, the reforms led to a significant reallocation of resources between industries. The high patentable industries invested more in technology adoption, started to produce more product varieties at higher quality, and filed for more product patent claims. Broadly, we demonstrate that stronger intellectual property protection leads to higher wage inequality between industries.

Gender Digital Equality Across ASEAN

ERIA Discussion Paper no. 358

by Araba Sey

This paper provides an overview of the participation of women in the digital economy across ASEAN. By using available data sources, it compares and analyses levels of women participation in digital economy related occupations and activities across different ASEAN Member States. Overall, the analysis shows that the gap between women and men is bigger with respect to more advanced metrics of access to the digital economy

(including skills; entrepreneurship opportunities; access to science, technology, engineering, mathematics, and tech occupations) than for more basic access metrics. Access to digital economy related occupations and activities is particularly important for ASEAN, which is amongst the fastest growing digital economies in the world. The shift towards digital technologies during the coronavirus disease (COVID-19) pandemic is accelerating pre-pandemic trends and making it even more relevant to gain a better understanding of women participation in the digital economy. The paper concludes by providing an overview of policy initiatives in ASEAN Member States and details possible policy options.

Disclaimer: This paper was funded by the Australian Government through the Department of Foreign Affairs and Trade. The views expressed in this publication are the authors' alone and are not necessarily the views of the Australian Government.

Getting to Grade 10 in Viet Nam: Challenges from Deprivation, Discrimination, and a Booming Job Market

ERIA Discussion Paper no. 359

by Ian Coxhead, Nguyen Vuong, Phong Nguyen

Viet Nam has enjoyed more than a generation of rapid economic growth, led by labour-intensive exports. This form and pace of growth has increased schooling opportunities, but has also reduced incentives for some students to advance to higher education. We hypothesise that these conflicting influences help explain another puzzle – the relatively slow growth of educational progression to upper secondary school. Slow and unevenly distributed increases in schooling attainment are warning signs for the sustainability of future aggregate growth and for the distribution of growth gains. We use a new data set on participation rates and scores in an exam to enter Grade 10, the first year of upper secondary school, to analyse the variation in test participation rates due to demand- and supply-side factors. The data are drawn from less advanced provinces within Viet Nam. As such, they shed light on the challenges of expanding educational development at the extensive margins of lower socio-economic status and higher grades, especially in areas with large ethnic minority populations.

Intergenerational Transmission of Human Capital: The Case of Thailand

ERIA Discussion Paper no. 354

by Sasiwimon Warunsiri Paweenawat

This study provides evidence of intergenerational transmission of human capital in Thailand, using data from the Thailand Labor Force Survey of 1985–2017. Employing the instrumental variable approach using Thailand's compulsory educational reform of 1978 as the instrumental variable to minimise bias caused by the endogeneity of parental education, this study estimates the effect of parental education on children's education and their labour market outcomes. Besides reaffirming the conventional positive link between parental and children's years of education, new and intriguing evidence is put forth on the negative link between parental education and the child's brawn skill, based on the industry and occupation adopted by the child in the labour market. The influence of paternal education is found to outweigh that of maternal education, in contrast to the evidence from developed countries. High intergenerational educational persistence and low intergenerational mobility indicate unequal opportunities in the country, as individual welfare is largely tied to parental background. Therefore, it is recommended that the Government of Thailand weaken this linkage to improve equality in the country.

Pioneering an Integrated Rehabilitation System and Human Resource Development to Improve Rehabilitation Services in Cambodia, Lao People's Democratic Republic, and Viet Nam

ERIA Research Project 2020 no. 05

Edited by Chika Hamasaki, Masaki Nishio, Mihoko Nakayama, Osuke Komazawa

The world population is ageing at an unprecedentedly rapid pace and Southeast Asia is no exception. In the societies with more older people, more patients with brain injury, e.g. stroke, can be seen, as older people more often suffer from chronic conditions that carry a higher risk of brain injury such as hypertension and diabetes mellitus. Brain injury is one of the main reasons why people need long-term care including rehabilitation. As

populations age, the demand for long-term care rises. This study assesses if Cambodia, Lao PDR, and Viet Nam are ready for the increasing demand for rehabilitation. The study includes an assessment of the feasibility of introducing Japanese-style rehabilitation and Japanese-style capacity building of healthcare professionals in these three countries. It uses a variety of case studies and suggests some policy recommendations for developing rehabilitation systems.

The Link Between Global Value Chain Activity and Local Human Capital: Evidence from Indonesia's Manufacturing Sector

ERIA Discussion Paper no. 360

by *Rashesh Shrestha, Deborah Winkler*

For developing countries, participation in global value chains (GVCs) provides an opportunity to expand domestic human capital. Since GVC firms require qualified workers to meet high production standards, they have an incentive to invest directly in their workers' skills or to raise the demand for skilled workers, which indirectly creates an incentive for workers to enrol in vocational education. This paper explores the relationship between GVC activity and workers' skills in Indonesia. It combines National Labor Force Survey (SAKERNAS) data with the Large/Medium Industry Survey (IBS) to construct a pooled cross-sectional data set of Indonesian manufacturing workers which takes into account measures of GVC activity at the district-sector-year level. The findings suggest that higher GVC activity in a worker's district-sector-year is linked to a higher likelihood of vocational education of individual workers. A separate panel data analysis at the district level confirms the positive relationship between GVC activity and human capital. Finally, the results indicate that the wage premium for vocational education is higher in districts with greater intensity of GVC activity.

The Role of Innovation in Skill Development: Evidence from Small and Medium-Sized Enterprises in Viet Nam

ERIA Discussion Paper no. 355

by *Duc Anh Dang, Vuong Anh Dang*

Using the Small and Medium Enterprise Survey in Vietnam and three proxies of innovation, we study the impact of firm innovation on on-the-job training in the manufacturing sector from 2007 through 2015. To address potential measurement errors and omitted variable problems, we use the average level of innovation in the same sector in other districts as an instrument for firms' innovations. We find that firms provide additional training for existing workers when introducing new technology, and high-value-added firms provide additional training for existing workers. Moreover, government assistance may not be the main reason that encourages firms to provide training. The results also show that firms hire more skilled workers when implementing innovations.

Women's Participation in the Digital Economy: Improving Access to Skills, Entrepreneurship, and Leadership Across ASEAN

ERIA Policy Brief 2020 no. 9

by *Giulia Ajmone Marsan, Araba Sey*

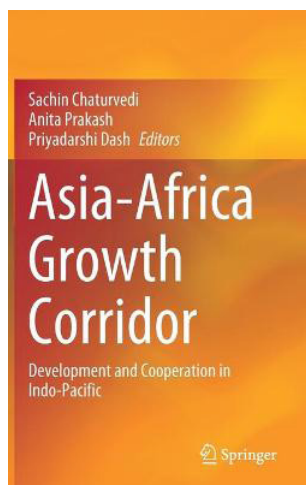
This policy brief provides evidence of the persistent digital gender divide across ASEAN and explains how it is of key importance to close this divide in order to 'build back better' based on more inclusive digital economies during the post pandemic economic recovery. This calls for a region-wide policy strategy and action plan to maximise access to skills, entrepreneurship, and leadership positions for girls and women in the digital economy across ASEAN. This policy brief is based on the discussion paper 'Gender Digital Equality Across ASEAN' prepared by Dr Araba Sey for ERIA's Strategy and Partnership Programme. –



Co-publications

Asia–Africa Growth Corridor: Development and Cooperation in Indo-Pacific

Edited by Anita Prakash

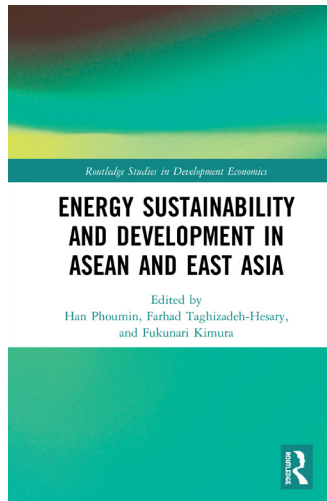


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This book is a rich addition to the existing knowledge on models of development partnership amongst developing countries. Unlike the Belt and Road Initiative (BRI), which exclusively focuses on physical infrastructure development with a strong financing component by China, the Asia–Africa Growth Corridor (AAGC) envisages a holistic approach toward development partnership based on the spirit of triangular cooperation, demystifying the donor-recipient model of development cooperation. By integrating four distinct pillars of cooperation – connectivity and physical infrastructure, capacity building and skill development, development cooperation projects, and people-to-people and business-to-business partnerships – the book provides a succinct account of how a demand-driven people-centric model of engagement amongst Asian and African countries could help achieve inclusive and sustainable development without creating any fatal dependence on specific countries or institutions for external funding. In sixteen chapters, the book covers various theoretical, analytical, and policy discussions with respect to the concept and modalities of the growth corridor approach under the free, open, and inclusive Indo–Pacific; potential opportunities and challenges in economic sectors and fields like agriculture, manufacturing, trade and investment, urbanisation, industrialisation, human resource development, and the blue economy; social sector priorities including health, education, skill development, disaster management, and women’s participation; and policy issues relating to trade facilitation, the identification of joint projects, modalities and instruments of project execution, and related aspects. The book offers a valuable resource for students and research scholars working in the fields of development economics, development cooperation, international political economy, and international economic relations. It also serves as a handbook for governments and policymakers on issues concerning the suitability of development projects, sources of and innovations in financing, implementation and execution challenges, private sector involvement, and so on.

Energy Sustainability and Development in ASEAN and East Asia

Edited By Phoumin Han, Farhad Taghizadeh-Hesary, Fukunari Kimura



The rapid and sustained economic growth of the past two decades has led to marked increases in energy demand in the region and developing Asia will continue to lead the energy demand growth. The increase in energy demand threatens energy security and efforts to curb carbon dioxide emissions, affecting health and social well-being. These common energy challenges will need to be addressed through concerted efforts. This book provides several multi-dimensional quantitative analysis of the relationship between energy and other subjects including but not limited to income and economic growth, environment and health, food and agricultural production.

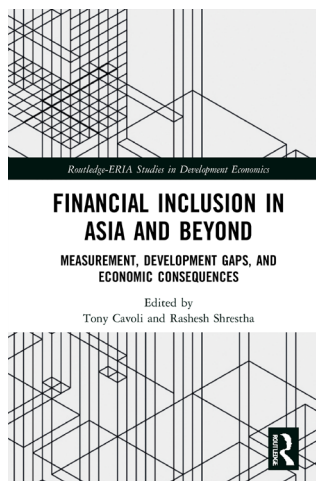
The book also provides the most constructive policy recommendations concerning the relationship between energy, economic development, social development, and environmental development.



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Financial Inclusion in Asia and Beyond Measurement, Development Gaps, and Economic Consequences

Edited By Tony Cavoli, Rashesh Shrestha



The World Bank considers financial inclusion to be an enabler for at least 7 of the 17 United Nation's sustainable development goals (SDGs). Financial inclusion, with its associated policy implications, is an important issue for ASEAN. This book examines the economic effects of financial inclusion. It explores issues surrounding measurement and impact of financial inclusion.

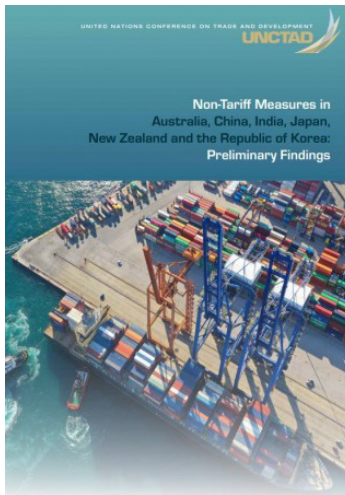
The book looks at various, salient topics including measurement of financial inclusion, the impact of (various indicators of) financial inclusion on development outcomes and macroeconomic volatility using aggregate data, as well as the effects of financial inclusion on poverty and development outcomes using micro data.



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Non-Tariff Measures in Australia, China, India, Japan, New Zealand, and the Republic of Korea: Preliminary Findings

Edited by Denise Penello Rial, Muhammad Rizqy Anandhika



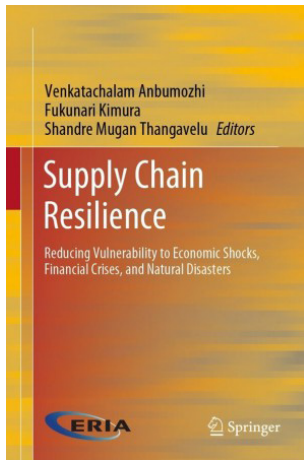
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Non-Tariff Measures (NTMs) are the new frontier for regional integration and market access, as tariffs have been continuously decreasing. NTMs are at the border and behind-the-border requirements. It is not new that these are relevant, probably more so than tariffs, in determining trade patterns, and flow magnitude and direction. Still, they often go unseen and do not receive appropriate attention. Negotiations amongst countries for deep integration through trade agreements often include NTMs as a key area, and often negotiations in this area are amongst the hardest. This shows the crucial importance of NTMs, including all the policy areas that fall within this definition.

This report highlights the results of the first-time data collection work in Regional Comprehensive Economic Partnership (RCEP) negotiating countries: Australia, China, India, Japan, New Zealand, and the Republic of Korea, apart from the Association of Southeast Asian Nations (ASEAN), which has been presented in other reports (ERIA and UNCTAD, 2016 and 2019). These data contribute to a global NTM database that opens for the public as a form of transparency on the information for researchers, businesses, and policymakers. Data collection was done with consistent methodology across all countries. This work was possible through the joint work of Economic Research Institute for the Association of Southeast Asian Nations and East Asia (ERIA) and United Nations Conference on Trade and Development (UNCTAD) in the area of NTMs.

Supply Chain Resilience: Reducing Vulnerability to Economic Shocks, Financial Crises, and Natural Disasters

Edited by Venkatchalam Anbumozhi, Fukunari Kimura, Shandremugan Thangavelu



This book investigates individual companies' and industries' supply chain risk management approaches to identify risk drivers and verify effective risk-reduction measures and business continuity plans.

Typically, supply chain risk assessments focus on normative guidelines based on single best practice examples or vulnerability events, and there has been little work exploring how the concepts of supply chain risk management and resilience are related. However, since this relationship has implications for developing integrated response strategies, a clear understanding of the possible consequences is a fundamental step in building socio-economic resilience along the supply chain.

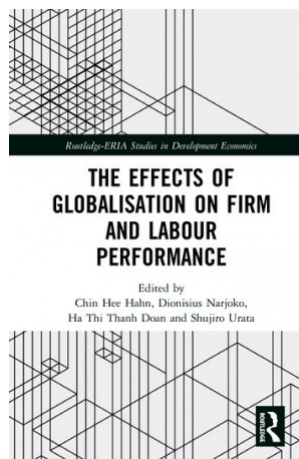


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Against this background, the book addresses three main topics: firstly, it defines the conceptual and sectoral domains of supply chain risk management and resilience by examining the welfare effects of extreme weather events and other economic shocks on selected global supply chains. It then presents an in-depth analysis of the scope of public-private partnerships to tackle the risks, by empirically exploring supply chain risk effects and information management. Thirdly, it proposes a regional cooperation framework in the context of major supply chain vulnerability events such as disasters and global financial crises.

The Effects of Globalisation on Firm and Labour Performance

Edited by Dionisius A. Narjoko, Doan Thi Thanh Ha, Shujiro Urata



This book examines driving factors and the effects of globalisation on economic development through firm and product-level data.

The book is organised into four themes, i.e. productivity, innovation, wage and income gap, and within-firm reallocation of resources. The comprehensiveness and richness of firm and product-level data shed light upon the channels through which trade and investment affect firms' competitiveness and unveil factors shaping firms' heterogeneous responses towards globalisation. The book looks at Asian economies as well as Australia and how they have experienced substantial structural change and become more integrated into the global economy and will be a useful reference for those who are interested in learning more about the relationship between globalisation and firm performance.



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This book will appeal to policy makers and researchers interested in the impact of globalisation on firm performance.



Translated Books

trans·la·tion /træ

rendering of something
language or into one
language. 2. a version
new

East Asian Integration: Goods, Services, and Investment (Japanese Version)

東アジアの経済統合: 財・サービス・投資

Edited by Lili Yan Ing, Martin Richardson, Shujiro Urata

Translated by Shujiro Urata



本書は、世界経済の中で最も急速に成長を遂げている東アジアにおいて、成長の原動力となっている貿易と投資の動向を明らかにする。

東アジアにおけるFTAによる制度面での地域統合の実態を明らかにするとともに、同地域におけるモノ・サービス貿易および直接投資による実態面での経済統合を制度面での動きと関連する形で分析する。成長の原動力となっている貿易と投資の動向を明らかにし、東アジアの望ましい地域統合の形成の議論に大きく貢献するものである。



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Người Cao Tuổi và Sức Khỏe tại Việt Nam

Edited by Nguyen Cong Vu, Mai Thi Tran, Linh Thuy Dang, Choy-Lye Chei, Yasuhiko Saito

Translated by Nguyen Cong Vu and Linh Thuy Dang



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Nhà xuất bản Lao Động

**Người Cao Tuổi
và Sức Khỏe
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Nghiên cứu dọc về Người cao tuổi và Sức khỏe tại Việt Nam (LSAHV) là nghiên cứu dọc đại diện toàn quốc đầu tiên về lão hóa ở Việt Nam với những thông tin từ người cao tuổi, người chăm sóc và người con trưởng thành của họ. Dữ liệu điều tra ban đầu cung cấp thông tin toàn diện về sức khỏe, tình trạng kinh tế và sự khỏe mạnh nói chung của những người từ 60 tuổi trở lên trên toàn quốc. Những dữ liệu này sẽ là nguồn thông tin giá trị cho việc xây dựng chính sách dựa trên bằng chứng.

Nghiên cứu LSAHV nhằm mục đích (1) tìm hiểu tình trạng sức khỏe và sự khỏe mạnh của người cao tuổi ở Việt Nam, cũng như các mối liên quan có thể có và (2) đánh giá các yếu tố quyết định tình trạng sức khỏe, sự chuyển đổi trong tình trạng sức khỏe và sự khỏe mạnh nói chung. Nghiên cứu LSAHV là một phần của một nghiên cứu so sánh về lão hóa và sức khỏe ở Việt Nam và Philippines, nghiên cứu được tài trợ bởi Viện Nghiên cứu Kinh tế ASEAN và Đông Á (ERIA) và được thực hiện bởi Viện Dân số, Sức khỏe và Phát triển (PHAD).

Tổng cộng 6050 người cao tuổi từ 60 tuổi trở lên đã được phỏng vấn tại cuộc điều tra ban đầu. Việc thu thập dữ liệu được thực hiện vào cuối năm 2018 và được hoàn thành vào tháng 5 năm 2019. Báo cáo điều tra ban đầu của nghiên cứu đã được hoàn thành và xuất bản.

Older People and Covid-19 in Indonesia (Bahasa Indonesia version)

Lanjut Usia dan Covid-19 di Indonesia

Edited by Osuke Komazawa, Ni Wayan Suriastini, Endra Dwi Mulyanto, Ika Yulia Wijayanti, Maliki,

Dinar Dana Kharisma

Translated by SurveyMeter team



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Survei telepon lanjut usia dan coronavirus disease (COVID-19) di Indonesia merupakan proyek kerja sama ERIA, Bappenas, dan SurveyMETER. Studi ini bertujuan untuk (1) mengukur pengetahuan umum lanjut usia tentang COVID-19; (2) membandingkan kesejahteraan lanjut usia sebelum, selama dan/atau sesudah pandemi COVID-19; (3) memahami permasalahan yang dihadapi oleh lanjut usia selama pandemi COVID-19; (4) memantau bantuan yang diterima oleh lanjut usia selama pandemi COVID-19; dan (5) mengidentifikasi kebijakan yang diperlukan untuk memitigasi dampak pandemi pada lanjut usia.

Hasil studi ini menunjukkan bahwa lebih dari separuh lanjut usia mengalami penurunan pendapatan, terutama mereka yang menggantungkan pendapatan dari bekerja dan dari pendapatan anaknya. Secara signifikan lebih banyak lanjut usia yang menerima bantuan pemerintah dibandingkan sebelum pandemi. Satu dari enam lanjut usia melaporkan bahwa kesehatan mereka menurun selama pandemi, sementara mayoritas lanjut usia tetap menjaga interaksi sosial mereka meskipun pandemi berlangsung. Pemerintah dianjurkan agar memperkuat upaya mereka dengan membangun sistem pendukung (support system) bagi lanjut usia demi merealisasikan visi Strategi Nasional (Stranas) Kelanjutusiaan.

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for ASEAN and East Asia



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The Economic Research Institute for ASEAN and East Asia (ERIA) is an international organisation providing research and policy support to ASEAN and the broader East Asia region and the ASEAN and East Asia summit processes. ERIA's policy research focuses on three pillars: deepening economic integration, narrowing developing gaps, and achieving sustainable development in the region.

ERIA's establishment was formally agreed amongst 16 heads of Government at the Third East Asia Summit in Singapore on 21 November 2007. It works closely with the ASEAN Secretariat, researchers, and research institutes from East Asia.

ERIA is based in Jakarta, Indonesia



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