

Japan's Connectivity Initiatives in the Free and Open Indo-Pacific: An Economic Assessment

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1. INTRODUCTION

Conceptualisations of an Indo-Pacific region have been widely shared by countries and economies bordering the Pacific and Indian Oceans, including the US, Japan, Australia, India, the Association of Southeast Asian Nations (ASEAN) and others. Japan is one of the most active promoters of the Indo-Pacific. Japan's initiative of a Free and Open Indo-Pacific (FOIP) was first addressed by Prime Minister Shinzo Abe at the Sixth Tokyo International Conference on African Development (TICAD6) in Nairobi in 2016. In his speech, Abe highlighted that the goal of bringing "stability and prosperity to the world" could be realised through connecting two continents, Asia and Africa, and two oceans, the Pacific Ocean and Indian Ocean.¹ The FOIP consisted of three pillars: (1) promotion and establishment of the rule of law, freedom of navigation, and free trade; (2) pursuit of economic prosperity by improving connectivity (physical infrastructure, institutional and people-to-people); and (3) commitment to peace and stability. Scholars argue that the FOIP evolved from the values-based diplomatic policy and the quadrilateral security cooperation known as the Quad, which intends to respond to the rapid rise of China and its Belt and Road Initiative (BRI).² The FOIP has broadened its sphere and shifted towards becoming a comprehensive regional cooperation because of Asian countries' concerns that they could be perceived as being part of an anti-China camp and to improve Japan's

¹ Ministry of Foreign Affairs of Japan, Address by Prime Minister Shinzo Abe at the Opening Session of the Sixth Tokyo International Conference on African Development, https://www.mofa.go.jp/af/fr/af2/page4e_000496.html, accessed on 24 April 2020.

² Soeya, Yoshihide, "Japan and the Indo-Pacific: from strategy to vision", Australian Strategic Policy Institute (ASPI), 22 January 2020.

relations with China.³ Thus, the Japanese government changed the title of the FOIP from “strategy” to “vision”. It is therefore important to understand the FOIP from a broader perspective.

Akihiko Tanaka has pointed out that the FOIP is a concept that has emerged due to the long-term development of the world economy. In the 1970s, then-Prime Minister Masayoshi Ohira proposed a “Pacific Rim Community Concept” with a view to realising the great potential of economic growth in the Asia-Pacific region. This eventually led to the creation of Asia-Pacific Economic Cooperation (APEC) in 1989. New developments have emerged in the 21st century. Today, the centre of gravity of the global economy has been shifting towards an emerging Asia. In addition to East Asian countries, India has been recording a high growth rate. Sub-Saharan African countries also show great economic potential. With this trend, it is forecasted that the centre of gravity of the global economy in the mid-21st century would be somewhere between the Pacific Ocean and the Indian Ocean.⁴

As is well known, Japan has played an important role in East Asian economic development through providing Official Development Aid (ODA). In particular, Japan has traditionally made a lot of effort to invest in economic infrastructure and to enhance regional connectivity that results in attracting foreign direct investments (FDI) and spurring manufacturing supply chains; this is labelled as the infrastructure and FDI nexus model.⁵ Japan has also actively pursued a rules-based trade policy and has promoted regional free trade agreements such as the Trans-Pacific Partnership Agreement (TPP) (now called the Comprehensive and Progressive Agreement for Trans-Pacific Partnership) and the Regional Comprehensive Economic Partnership (RCEP), which underpin regional economic integration. The second pillar of the FOIP aims to advance these efforts in the Indo-Pacific region by improving three forms of connectivity: physical connectivity with quality infrastructure, people-to-people connectivity and institutional connectivity.⁶

However, the concrete policy plan of the FOIP is not necessarily clear. Connectivity plans for Asia and Africa, and for the Pacific Ocean and Indian Ocean have not been fully studied. Moreover, literature examining the economic prospects

³ Ibid.

⁴ Tanaka, Akihiko (2018), “Jiyūde hiraka reta indotaiheyō senryaku no shatei [Range of a free and open Indo-Pacific strategy]”, *Gaiko*, Vol. 47, pp. 36-41.

⁵ Shimomura, Yasutami (2020), “A New Mission of Japan’s Infrastructure-FDI Nexus Model in the Beyond-Aid Era”, *AJISS-Commentary*, Japan Institute of International Affairs, 31 March 2020.

⁶ Ministry of Foreign Affairs of Japan, “Towards Free and Open Indo-Pacific”, <https://www.mofa.go.jp/mofaj/files/000407643.pdf>, accessed on 24 April 2020.

of the Indo-Pacific region is rather scarce. This article seeks to fill that gap. The first part examines the FOIP and other connectivity initiatives that connect Southeast Asia, South Asia and Africa. The second part examines the economic impacts of fostering connectivity in the Indo-Pacific region using the Computable General Equilibrium (CGE) model.

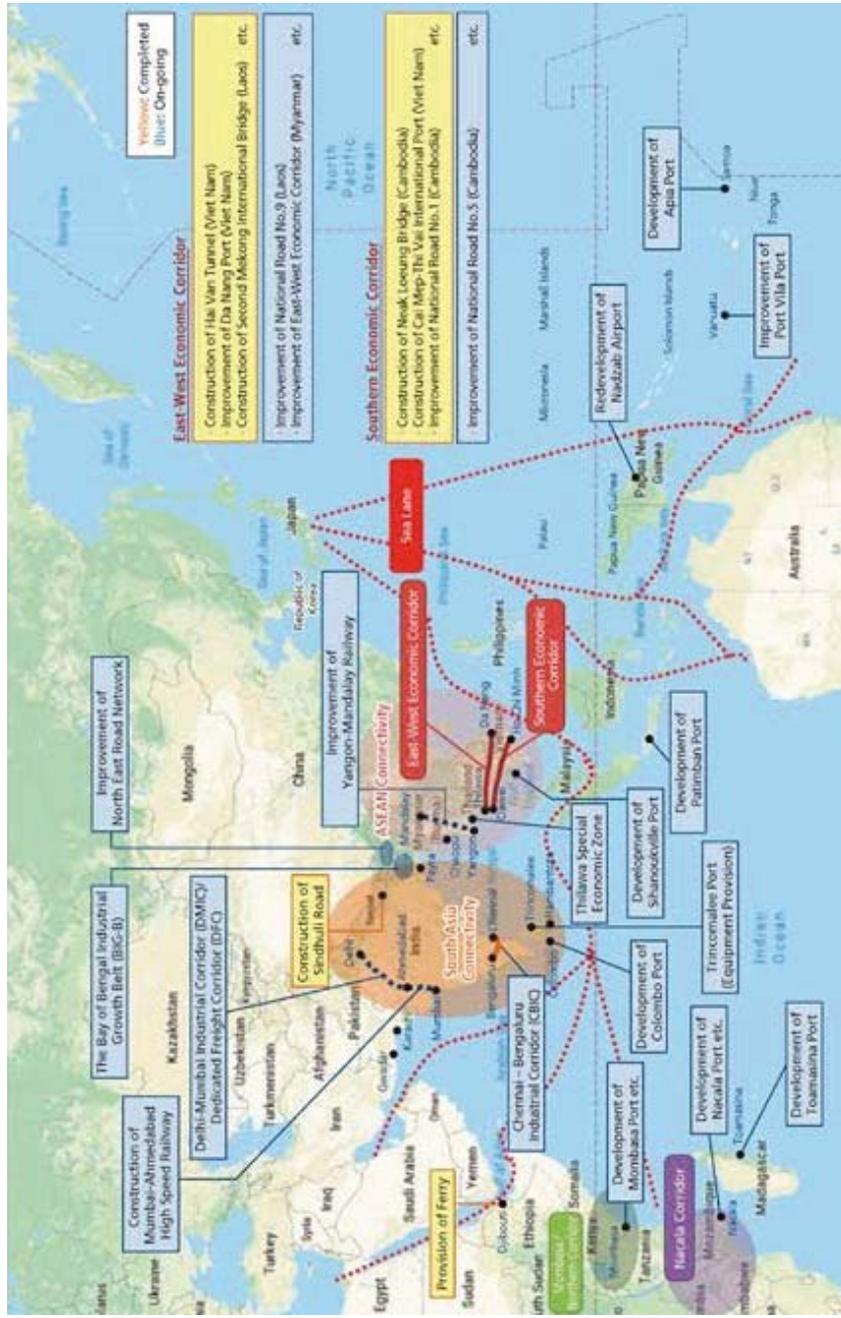
2. JAPAN'S CONNECTIVITY INITIATIVES IN THE INDO-PACIFIC REGION

Japan's connectivity initiatives in the Indo-Pacific region were presented in the white paper on ODA,⁷ shown in Figure 1. As 99.7% of Japan's trade is carried out by sea, it is natural that its vision of the Indo-Pacific region is comprehensively connected through maritime routes. Japan has been active in developing cross-border transport infrastructure in Asia. Tokyo has also been supporting ASEAN connectivity with the development of the East-West Economic Corridor (Mawlamyine–Da Nang) and the Southern Economic Corridor (Dawei-Bangkok-Phnom Penh-Ho Chi Minh) as well as the seaports in the seafaring nations of ASEAN. Furthermore, Japan is highly interested in improving the connectivity between ASEAN and South Asia. Partnering with Bangladesh, Bhutan and India, ODA has provided for projects such as the Bay of Bengal Industrial Growth Belt (BIG-B) and the North East Road Network. India has been regarded as a strategic partner in the FOIP. Under the Japan-India Special Strategic and Global Partnership, Japan has been supporting the development of the Delhi-Mumbai Industrial Corridor, the Chennai-Bengaluru Industrial Corridor, and the construction of the Mumbai-Ahmedabad High Speed Railway. In Africa, the Nacala Port and the Mombasa Port are integral parts of the economic corridor projects supported by Japan. Through the Tokyo International Conference on African Development (TICAD), the surrounding corridors, the Nacala Corridor and the East African Northern Corridor, were identified as priority projects.

Japan promotes connectivity through its Quality Infrastructure Investment (QII) project in the Indo-Pacific region. In this effort, Japan actively plays a role in setting international norms and standards of infrastructure investments that uphold the principles of openness, transparency, economic efficiency given life-cycle cost, and fiscal soundness through multilateral mechanisms such as the G7, G20 and OECD. During Japan's G20 presidency in 2019, Japan successfully came up with the G20

⁷ Ministry of Foreign Affairs of Japan, *White Paper on Development Cooperation 2017*, (Tokyo, 2018), https://www.mofa.go.jp/policy/oda/page_000017.html, accessed on 24 April 2020.

Figure 1. Japan's Connectivity Initiatives.



Source: Ministry of Foreign Affairs of Japan.

Principles for Quality Infrastructure Investment. The QII standards are also being expanded through bilateral and multilateral partnerships. Japan and India co-envision the realisation of a Free and Open Indo-Pacific, in which the two countries strengthen their cooperation and also work together with Africa on enhancing connectivity through quality infrastructure, a strategy called the Asia-Africa Growth Corridor (AAGC). Between Japan and the EU, the Partnership on Sustainable Connectivity and Quality Infrastructure has been signed as a comprehensive connectivity partnership, and the main feature is to ensure transparent procurement practices, debt sustainability, and high standards of economic, social and environmental sustainability. They work together with partner third countries in the Western Balkans, Eastern Europe, Central Asia, Indo-Pacific and Africa regions. The European Investment Bank (EIB) and Japanese agencies such as the Japan International Cooperation Agency, the Japan Bank for International Cooperation (JBIC) and the Nippon Export and Investment Insurance (NEXI) will strengthen their joint work. Furthermore, the US, Japan and Australia launched a Multi-Stakeholder Blue Dot Network led by a newly established US development agency named the US International Development Finance Corporation (DFC). The Blue Dot Network basically aims to evaluate and certify infrastructure projects according to commonly accepted standards and principles,⁸ which build on the G20 Principles for Quality Infrastructure Investment. All these efforts are being pursued in order to provide a common ground for diverse connectivity initiatives so that different stakeholders, institutions and partners can participate in connectivity projects in the Indo-Pacific.

Table 1 summarises the various connectivity initiatives on a sub-regional level in the Indo-Pacific region as well as Japan's approach. These are the Association of Southeast Asian Nations (ASEAN), Greater Mekong Subregion (GMS), South Asian Association for Regional Cooperation (SAARC), the South Asia Subregional Economic Cooperation (SASEC), and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC). These sub-regional projects are often backed by the Asian Development Bank (ADB), the World Bank and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), to name a few institutions. Also, China's BRI aims to establish a 21st Century Maritime Silk Road that geographically overlaps with the Indo-Pacific region. In particular, the BRI identifies major corridor projects such as the China-Indochina Peninsula

⁸ OPIC, *The Launch of Multi-Stakeholder Blue Dot Network* (New York, 2019), <https://www.opic.gov/press-releases/2019/launch-multi-stakeholder-blue-dot-network>, accessed on 24 April 2020.

Economic Corridor that overlaps with the Greater Mekong Sub-region; and the Bangladesh-China-India-Myanmar Economic Corridor that overlaps with the Bay of Bengal area. The Silk Road Fund and the Asian Infrastructure Investment Bank have been set up to finance those BRI projects.⁹

Table 1. Sub-regional Connectivity Initiatives and Japan's Approach.

	ASEAN	BRI	SASEC	BIMSTEC
Members	ASEAN member countries	China with over 100 countries	Bangladesh, Bhutan, India, Maldives, Myanmar, Nepal, and Sri Lanka	Bangladesh, India, Myanmar, Sri Lanka, Thailand, Nepal and Bhutan
Master Plan	Master Plan on ASEAN Connectivity (MPAC) 2025	Six Economic Corridors	SASEC Operational Plan (OP) 2016-2025	Master Plan for BIMSTEC Connectivity
Japan's Approach	<ul style="list-style-type: none"> Active engagement by identifying 70 flagship projects which Japan contributes. Coordinated through Japan-ACCC. 	<ul style="list-style-type: none"> Limited engagement. JBIC and CDB signed the MOU on Cooperation in third-country markets 	<ul style="list-style-type: none"> Indirect engagement through ADB. ADB supports approx. 60% of funds. ADB hosts the secretariat. 	<ul style="list-style-type: none"> Indirect engagement through ADB. Bilateral partnership with India and Bangladesh.

Source: Compiled from various official documents and analytical reports by the author.

3. ASSESSING THE ECONOMIC IMPACT OF ENHANCING CONNECTIVITY

3.1. Modelling framework and shock assumptions

The assessment of the economic ramifications of fostering connectivity in the Indo-Pacific region is based on the analysis by Yanagida.¹⁰ It uses a Computable General Equilibrium (CGE) model to estimate the economic impact of infrastructure improvements on GDP and trade in countries or regions as envisioned by the FOIP

⁹ HKTDC, *The Belt and Road Initiative* (Hong Kong, 2019), <http://china-trade-research.hktdc.com>, accessed on 24 April 2020.

¹⁰ Yanagida, Kensuke (2019), "Gankogata keizai hatten wa tsuzuku no ka? Chūgoku no 'itsutai ichiro' kōsō to 'indotaiheiyō' senryaku no inpakuto no moderu suikei [Does the flying-geese economic development continue? Estimation of the economic impact of China's Belt and Road Initiative and Indo-Pacific Strategy]", ITI Research Paper No. 81, Institute for International Trade and Investment, Tokyo.

in 2030.¹¹ The CGE Model analysis draws on the static model and ninth-edition database (benchmark year 2011) from the Global Trade Analysis Project (GTAP). In the analysis, the GTAP data are aggregated into 16 regions and 13 industries (see the appendix for the breakdown).

In addition to the standard specifications used in the static GTAP Model, the analysis also endogenises capital accumulation, labour supply, and productivity improvements with reference to the Japan Cabinet Secretariat's report.¹² Doing so allows for the incorporation of synergy effects along three growth paths when GDP expands due to infrastructure improvements: (1) capital increases and expands production through higher investment of savings, (2) labour supply increases as the result of a rise in real wages, and (3) productivity increases through expanding trade.

The simulation is performed in the following order. First, a baseline is constructed for 2030, drawing estimates from the "2050 EconMap Database".¹³ Second, the analysis applies a policy shock assumption that infrastructure improvements would boost the Total Factor Productivity (TFP) through increases in (1) overall productivity and (2) energy efficiency in the form of intermediate input augmenting technological change. For (1), using the "Logistics Performance Index (LPI)"¹⁴ – a database on national logistics infrastructure for each country in the world – the assumption is that the LPI indices for each region will catch up to Japan, which has the highest score (Table 2). Specifically, it is assumed that the gap in LPI score relative to Japan closes by 25%. Based on the rate of improvement in the LPI index, the assessment calculates a numerical value for TFP improvement assuming a coefficient of 0.6. For (2), assuming that when electricity, gas, and water are used as intermediate inputs to produce products, the TFP can be seen as increasing by 20% based on "The IEA Efficiency World Scenario" projected by the International Energy Agency.¹⁵

¹¹ Japan's Indo-Pacific policies do not specify particular countries or regions. Therefore, we hypothetically include Southeast Asian, South Asian and African countries in this study.

¹² TPP Headquarters at the Japan Cabinet Secretariat (2015), "TPP kyōtei no keizai kōka bunseki [Analysis of the Economic Effect of the TPP Agreement]", Cabinet Secretariat, Tokyo.

¹³ Fouré, Jean, Agnès Bénassy-Quéré and Lionel Fontagné (2012), "The Great Shift: Macroeconomic projections for the world economy at the 2050 horizon," (Version 2.3: 2014), CEPII Working Paper, CEPII, Paris, and Fouré, Jean, Agnès Bénassy-Quéré and Lionel Fontagné (2013), "Modelling the world economy at the 2050 horizon", (Version 2.3: 2014), *Economics of Transition* 21(4), pp. 617-654.

¹⁴ World Bank, *Logistics Performance Index* (Washington D.C., 2018), <https://lpi.worldbank.org/>, accessed on 22 November 2019.

¹⁵ "Energy Efficiency 2018: Analysis and Outlooks to 2040", International Energy Agency, Paris.

Lastly, these policy shocks are applied to ASEAN member countries (ASEAN6 and Cambodia, Laos, Myanmar, and Vietnam [CLMV]), India, South Asia, and Africa (North Africa and Sub-Saharan Africa).

Table 2. Logistics Performance Index Score and Policy Shock Assumption.

	LPI	LPI gap to Japan	LPI increase (%)	TFP increase (%)
JPN	4.03	0.00	0.0	0.0
ASEAN6	3.23	0.80	11.6	3.6
IND	3.18	0.85	12.5	3.9
CLMV	2.94	1.09	16.9	5.3
NorthAfrica	2.64	1.39	23.2	7.4
SubSaAfrica	2.64	1.39	23.3	7.4
SouthAsia	2.53	1.50	25.9	8.3

Notes: Productivity increases assume a coefficient of 0.6.¹⁶

Source: Prepared by the author from the World Bank Logistics Performance Index for 2018.

3.2. Summary of Simulation Results

The results of the simulation are presented in this section. For the sake of convenience, I refer to ASEAN6, CLMV, India, North Africa and Sub-Saharan Africa as the FOIP economies.

¹⁶ Many studies have shown that improving infrastructure increases TFP. While it is certainly desirable to estimate reliable parameters, for the sake of convenience, I use a coefficient of 0.6, which I obtain using simple multiple regression analysis.

Table 3. Changes in real GDP (trillion, USD).

	% change	Pre (US\$ trillion)	Post (US\$ trillion)
NAFTA	0.6	22.8	22.9
EU18	0.7	18.5	18.6
China	-1.7	11.5	11.3
Japan	2.6	7.2	7.4
WesternAsia	1.1	4.8	4.8
India	36.0	2.7	3.6
ASEAN6	45.8	2.6	3.8
NIES	-1.7	2.5	2.5
Oceania	3.1	2.3	2.4
SubSafrica	46.4	2.3	3.3
CEECs	-0.2	1.9	1.9
NorthAfrica	45.6	0.9	1.3
SouthAsia	89.3	0.6	1.1
CentralAsia	0.4	0.4	0.4
CLMV	38.2	0.3	0.4

Source: Author's estimates based on GTAP.

Table 3 summarises the changes in real GDP relative to baseline. The real GDP grows significantly in the FOIP economies where the policy shock is applied. The real GDP of the FOIP economies grows by 36% in India, 45.8% in ASEAN6, 46.4% in Sub-Saharan Africa, 45.6% in North Africa, 89.3% in South Asia and 38.2% in CLMV. The total GDP of the FOIP economies increases from 11.5 trillion USD to 15.9 trillion USD, accounting for 10.1% and 14% of the World GDP respectively. This shows that the FOIP economies have the potential for significant economic growth if they solve the problem of the lack of infrastructure.

In the absence of any direct effect from policy interventions, Japan still benefits through the spillover effects of the development of the FOIP economies and gains a 2.6% growth in real GDP. Likewise, NAFTA, EU18, Western Asia, Oceania and Central Asia also benefit. This occurs because income increases in the FOIP economies will result in demand for more imports from other regions, and their expanding trade spurs intermediate goods supply from other regions via global value chains.

On the other hand, China, NIES and CEECs suffer negative effects. This is because the FOIP economies begin to catch up thanks to productivity improvements, which enhance the price competitiveness of goods they produce for export, causing a “trade diversion” from China, NIES and CEECs, where no direct policy intervention takes place. This suggests that unless countries enhance their own productivity and perform upgrades to add value to their products, they risk falling into the so-called “middle income trap.”

Table 4 summarises the share of trade by partner countries or regions for ASEAN, South Asia and Africa. With enhanced connectivity, ASEAN significantly increases intra-regional trade, accounting for 28.3% in imports and 24.9% in exports. ASEAN’s trade with South Asia and Africa grows moderately. On the other hand, ASEAN reduces its share of trade, to a relatively large extent with China and Taiwan, and to a lesser extent with Japan, Europe and NAFTA. This suggests that there are shifts in manufacturing production from China and Taiwan to ASEAN countries. Japan remains important as the supplier of high-tech intermediate parts and components for ASEAN. Europe and NAFTA are important as large markets for final good exports.

South Asia increases intra-regional trade and trade with ASEAN and Africa at a moderate rate. However, this result shows the importance of South Asia’s geographic location connecting Southeast Asia and Africa. South Asia reduces its share of trade with China and Europe to a relatively large extent, and with Japan, NIES and NAFTA to a lesser extent. South Asia has a unique trade pattern. It has strong trade relations with Europe and NAFTA. Trade with China is not as significant as with ASEAN and Africa despite the geographical proximity. The economic relation with Japan is still rather limited.

Africa increases intra-regional trade, largely accounting for 15% in exports and imports. Africa’s trade with ASEAN and South Asia also grows. This again proves the potential of the ASEAN-South Asia-Africa economic relation in the future. Africa reduces its share of trade with China, Europe and NAFTA to a relatively large extent, and with NIES to a lesser extent. The uniqueness of Africa’s trade pattern is that it has very strong trade relations with Europe. Trade with China is also proven to be large. The economic relation between Africa and Japan is rather limited.

Table 4. Share of trade by partner countries or regions for ASEAN, South Asia and Africa.

Share (%)	ASEAN			South Asia			Africa			
	Import	Export	Δ (Post-Pre)	Import	Export	Δ (Post-Pre)	Import	Export	Δ (Post-Pre)	
ASEAN	28.3	24.9	4.8	4.3	7.2	0.8	0.7	3.2	0.5	0.7
Japan	7.0	8.1	-0.6	-0.9	1.9	-0.2	-0.1	1.8	2.1	0.0
China	14.1	11.8	-1.8	-1.7	5.6	-1.9	-1.9	11.1	10.5	-1.7
NIES	8.7	8.1	-1.3	-1.2	3.1	3.7	-0.5	3.9	2.7	-0.3
South Asia	3.1	6.2	0.2	0.3	6.7	1.1	1.5	6.0	9.1	0.8
Europe	9.6	13.5	-1.2	-0.5	11.6	24.6	-1.3	-0.3	26.8	-1.8
Africa	1.8	2.6	0.3	0.0	8.7	7.8	1.0	0.6	15.0	4.0
NAFTA	7.9	13.2	-0.6	0.0	6.4	18.7	0.1	-0.3	16.9	-0.3
ROW	19.6	11.8	0.3	-0.3	41.4	23.8	0.8	0.1	13.8	-1.1
Total	100	100			100	100		100	100	

Note: In this table, ASEAN includes ASEAN6 and CLMV; South Asia includes India; and Africa includes North Africa and Sub-Saharan Africa.

Source: Author's estimates based on GTAP.

Table 5 subsequently summarises the changes in exports by industry. Notable is the extremely large growth projected for exports of electronic and other manufacturing from ASEAN6. Conversely, exports of electronic and other manufacturing for NIES and China suffer a significant negative growth due to the “trade diversion effect.” The simulation, however, does not depict the fact that firms in countries like South Korea and Taiwan are engaged in building supply chains through direct investment in the ASEAN countries. Japan still enjoys growth in heavy, automobile and other manufacturing exports and experiences a little decline in electronic exports. CLMV grows not only in light industry exports such as textiles and apparel, but also in capital-intensive manufacturing exports. Countries like Vietnam and Myanmar are seen as the next investment destination after China for manufacturing bases, and the simulation shows the potential for CLMV to develop its manufacturing industry.

In India, heavy and other manufacturing exports show large growth. The simulation also shows that growth in service industry exports is large, with strengths in IT services and business process outsourcing that take advantage of a highly skilled workforce. South Asia sees larger growth in the textile and apparel industry than CLMV by taking advantage of the comparative advantage afforded by low wages. On the other hand, China will not maintain its competitiveness in labour-intensive industries and sees negative growth in textile and apparel exports.

North Africa has an established economic base within Africa, particularly in Tunisia, Morocco, and Egypt. Manufacturing exports, mainly from labour-intensive industries such as textiles and apparel, expands. Transportation and communication exports also expands rapidly. For Sub-Saharan Africa, heavy manufacturing exports stands out while other industries grow moderately.

Exports of agricultural products and foods and natural resource exports will grow significantly in CEECs, the EU and NAFTA as demands for those goods expand in emerging economies in Asia and Africa. In particular, the EU enjoys large growth in heavy and service exports by taking advantage of strong competitiveness in those sectors. CEECs face harsh competition in the textile and apparel industry against North Africa, which has a comparative advantage, and in the electronic industry against ASEAN.

4. CONCLUSION

This article has examined Japan's Free and Open Indo-Pacific connectivity initiatives and assessed the likely economic impact of the implementation of the projects. From a long-term perspective, the concept of the FOIP emerged based on long-term economic development, which foresees dynamic growth in the emerging economies in the Indo-Pacific, including Africa. The FOIP initiatives are also based on values such as rules-based, free trade, freedom of navigation and the rule of law. The Quality Infrastructure Investments is one of the flagship projects of the FOIP, with partners including the EU. It aims to provide a common and level playing field for diverse stakeholders, institutions and partners in the Indo-Pacific. Japan has long been an ODA contributor to Asia. Under the FOIP, Japan supports the numerous connectivity projects related to economic infrastructures in ASEAN, South Asia and Africa. Given the fact that there are several sub-regional connectivity initiatives in the Indo-Pacific in addition to China's BRI, connecting different connectivity plans remains a vast challenge.

The analytical part of this article estimated the economic impacts of infrastructure improvements using the CGE model. Overall, the results show the great potential for economic growth of the FOIP economies, provided that they solve the problem of the lack of infrastructure. Japan is in a good position to benefit through the spillover effects of the growth of the FOIP economies whereas China, NIES and CEECs suffer negative effects. With the enhanced connectivity, South Asia substantially increases trade with ASEAN and Africa, which proves the importance of South Asia's geographic location connecting Southeast Asia and Africa. Finally, the sectoral results show that ASEAN will flourish as a hub of electronic manufacturing. CLMV will be integrated in the supply chains not only in labour-intensive manufacturing exports but also in capital-intensive manufacturing exports. India is shown to be competitive in heavy manufacturing and service exports, whereas South Asia sees large growth in the textile and apparel industry. North Africa will enjoy an increase in labour-intensive manufacturing exports while Sub-Saharan Africa will still face weak industrial development.

In light of the discussion and analysis above, the policy recommendations are threefold. First, against a backdrop of emerging connectivity initiatives involving geopolitical factors, it is important to promote international standard-setting of infrastructure investments to ensure that major actors behave under certain rules. The implementation of the QII is key, in tandem with project implementation. The Japan and EU connectivity partnership can play a significant role in this area, and Japan and EU cooperation would be of critical importance in Africa. Second, there

are several connectivity plans proposed by sub-regional groups as well as national governments. These plans are not well coordinated with each other due to the lack of political will, the diffusion of priority and inadequate financial resources. The donor countries, including Japan and the EU, and multilateral development agencies should engage in dialogues with the recipient countries to refocus their blueprints and provide the necessary assistance. Third, as indicated by the economic simulation, the improvement of Southeast Asia-South Asia-Africa connectivity would bring great economic benefits and combat poverty in the Indo-Pacific region. It is imperative to realise this potential by strengthening international cooperation.

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APPENDIX

GTAP database: 16 regions

1. NAFTA	USA, Canada, Mexico
2. Oceania	Australia, New Zealand
3. Japan	Japan
4. China	China
5. NIES	Korea, Taiwan, Hong Kong
6. ASEAN6	Brunei, Indonesia, Malaysia, Philippines, Thailand, Singapore
7. CLMV	Cambodia, Laos, Myanmar, Vietnam
8. India	India
9. CentralAsia	Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan, Tajikistan
10. SouthAsia	Bangladesh, Nepal, Pakistan, Sri Lanka
11. WesternAsia	Armenia, Azerbaijan, Georgia, Bahrain, Iran, Israel, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Turkey, United Arab Emirates
12. NorthAfrica	Egypt, Morocco, Tunisia
13. SubSaAfrica	Benin, Burkina Faso, Cameroon, Cote d'Ivoire, Ghana, Guinea, Nigeria, Senegal, Togo, Central Africa, South Central Africa, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Tanzania, Uganda, Zambia, Zimbabwe, Botswana, Namibia, South Africa
14. CEECs	Czech Republic, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia, Albania, Bulgaria, Croatia, Romania
15. EU18	Austria, Belgium, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal, Spain, Sweden, United Kingdom
16. ROW	Rest of World

GTAP database: 13 industries

1. GrainsCrops	Paddy rice; Wheat, Cereal grains; Vegetables, fruit, nuts Oil seeds; Sugar cane, sugar beet; Plant-based fibers; Crops; Processed rice
2. MeatLstk	Meat: cattle, sheep, goats, horse; Animal products; Raw milk; Wool, silk-worm cocoons; Meat: cattle, sheep, goats, horse; Meat products
3. Extraction	Forestry; Fishing; Coal; Oil; Gas; Minerals;
4. ProcFood	Vegetable oils and fats; Dairy products; Sugar; Food products; Beverages and tobacco products
5. TextWapp	Textiles; apparel
6. LightMnfc	Leather products; Wood products; Paper products, publishing; Manufactures
7. HeavyMnfc	Petroleum, coal products; Chemical, rubber, plastic prods; Mineral products; Ferrous metals; Metals; Metal products; Machinery and equipment
8. VehicleMnfc	Motor vehicles and parts; Transport equipment
9. ElectMnfc	Electronic equipment;
10. OtherMnfc	Other Manufacturing
11. Util_Cons	Electricity; Gas manufacture, distribution; Water; Construction
12. TransComm	Trade; Transport; Sea transport; Air transport; Communication
13. OthServices	Financial services; Insurance; Business services; Recreation and other services; Public administration; Defense; Health; Education; Dwellings