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Infrastructure and Development in Asia: The Quality of Infrastructure and Project Implementation

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Fukunari Kimura¹

Keio University Global Research Institute

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Dean, Graduate School of Economics and Professor, Faculty of Economics, Keio University
Chief Economist, Economic Research Institute for ASEAN and East Asia

¹ E-mail: fkimura@econ.keio.ac.jp

Infrastructure and Development in Asia:
The Quality of Infrastructure and Project Implementation*

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Fukunari Kimura
Dean, Graduate School of Economics and Professor, Faculty of Economics,
Keio University
Chief Economist, Economic Research Institute for ASEAN and East Asia

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Abstract

Infrastructure development is essential to economic development in less developed countries (LDCs). In particular, ASEAN Member States (AMS) and developing East Asia have applied development strategies that aggressively utilize global value chains (GVCs), and logistics infrastructure and industry-supporting infrastructure services have been crucial. In addition to the long-lasting effort of the official development assistance (ODA) and other official funds (OOF) provided by OECD-DAC countries and international organizations, the recent deeper commitments of China and other newly developed economies to infrastructure development further activate infrastructure development in the region.

We however have to notice that the current bottleneck in infrastructure development is not necessarily the availability of investing money but how to identify and implement good projects accompanied with long-term commitments. Countries should think much of infrastructure of quality appropriate for its economic development and implement projects of good quality. These principles must be applied for all projects including what China and other stakeholders participate in. In addition, the emergence of new players such as China will eventually call for new international rules on the information disclosure, discipline on government's involvement, and the positioning of foreign aid. Supporting regional effort in further utilizing GVCs for economic development, Japan and China should lead the establishment of efficient and dynamic policy environment for infrastructure development.

1. Infrastructure to support global value chains

Forerunners of ASEAN Member States (AMS) and China have been successful in participating in manufacturing production networks, and some of them have started forming industrial agglomeration together with tight links with global value chains (GVCs). Although the key manufacturing subsectors are designed and controlled by multinational enterprises (MNEs), industrialization has continuously been rapid as well as being effective in enhancing the income level and reducing the population below the poverty line. This was a novel development strategy different from what Japan, Korea, or Taiwan applied in the 1950s to 1970s.

Infrastructure is essential to effectively utilizing GVCs in development strategies. To set up quick and frequent transactions with time precision, logistics infrastructure becomes crucial. Once industrial agglomeration starts to be formed, large-scale economic infrastructure services such as electricity and water supplies and metropolitan logistics infrastructure are required. Infrastructure development has actually made a decisive competitive edge for AMS and China vis-à-vis other parts of the developing world in effectively utilizing GVCs. Economic integration in the form of free trade agreements (FTAs) and the enhancement of connectivity, soft and hard, are the core elements of regional effort for economic development.

Although AMS and China have a number of similarities in their development paths, they are different in a few important points. One is the abundance of human capital and entrepreneurship. Another is the political system. As for infrastructure development, the political system makes crucial differences in the government budget allocation and land acquisition. Although the efficiency should be empirically assessed, China has been at the end very successful in setting up infrastructure. On the other hand, most of AMS have experienced difficulties in investing in infrastructure smoothly, particularly after democratization. Although causality may work in both directions, better infrastructure is apparently correlated with better performance in utilizing GVCs. By following the world trend, financial resources for infrastructure development have gradually shifted from 100%

public, including foreign aid from bilateral donors and international organizations, to some combination of public and private money or, in a wide definition, public private partnership (PPP). Private participation, however, has not been an easy job for countries with relatively weak governance.

Since the Global Financial Crisis, China has drastically enhanced its political and economic presence in the global scene. In the context of infrastructure development, the establishment of Asian Infrastructure Investment Bank (AIIB) in December 2015 and the One Belt One Road (OBOR or B&R) initiative moved in parallel are regarded as the epoch-making progress of the Chinese international commitment. In the past two decades, China was already one of the largest foreign aid donors even though it did not belong to either Organisation for Economic Co-operation and Development (OECD) or its Development Assistance Committee (DAC). Novel aspects of the new Chinese commitments are software, not just money. China now intends to provide an organization or a conceptual framework for infrastructure development in the world. Although large incumbents such as the US and Japan seemed to have some resistance in accepting the new initiatives immediately, many countries in the world, particularly potential recipients of the financial support, basically welcomed China's new initiatives. LDCs are certainly happy to enjoy multiple sources of possible financial aid.

It is often said that a huge demand for infrastructure exists in East Asia. This is true, but the amount of available money is not the current bottleneck. From the viewpoint of LDCs, the real issue is how to design good infrastructure projects and make proper financial arrangements with long-term commitments. While taking advantage of a sort of competition among outsiders, LDCs should have good eyes to look at "the quality of infrastructure." There are two components here: the quality of infrastructure itself and the quality of the design and implementation of infrastructure projects. This paper discusses these two aspects of the quality of infrastructure.

In addition, we argue that a new set of international rules will eventually be required in order to set a healthy and efficient competition among various stakeholders. Information disclosure among various

stakeholders will become increasingly important for infrastructure development in LDCs. In addition, as liberalization of trade in goods, trade in services, and investment proceeds, policy discipline on governments' involvements in economic activities will surely attract attention. The paper discusses the framework of international commercial policy order in this aspect.

The paper plan is as follows: the next section will provide the conceptual framework of the tier structure in effectively utilizing GVCs in order to identify a proper quality of infrastructure. The third section will discuss the issue of the quality of infrastructure projects from several angles. The fourth section will argue the necessity of new international rules among various stakeholders for infrastructure development. The last section will conclude the paper.

2. Quality of infrastructure

Governments in LDCs always face with small fiscal space and thus tend to jump into “cheap” projects. But in general, inexpensive projects tend to be low in quality. We always need to make a decision on how to set the proper quality for infrastructure, considering the cost at the same time. The Japanese Government has a campaign that claims the importance of the quality of infrastructure from 2013, and Asia-Pacific Economic Cooperation (APEC) and Asian Development Bank (ADB) followed up the initiative in various forums.¹ From the viewpoint of expanding infrastructure projects abroad, it is natural for Japan or developed countries to sell infrastructure of high quality. However, from the viewpoint of LDCs, infrastructure of high quality is almost certainly more expensive than of low quality. The important thing is to choose infrastructure of appropriate quality with reasonable cost consideration.

How to choose infrastructure of proper quality? There is certainly a sophisticated method to make project appraisals at the project level. However, the overall assessment of economic benefit is not easy to quantify.

¹ See Government of Japan (2015) and APEC (2014).

Thus the sectoral masterplan is going to be important. The issue is that such a masterplan is often drafted only by engineers and the economic role of infrastructure is not analyzed enough. For example, logistics infrastructure such as roads, ports, and airports is sometimes designed from purely an engineering viewpoint, and we do not explicitly consider issues such as how such infrastructure would be used, what sort of cargos would be carried on, and how the improved connectivity would promote industrial development.

One approach to solve this issue proposed by ERIA is to utilize the framework of the tier structure in effectively utilizing GVCs (ERIA CADP Research Team. (2015)). Figure 1 illustrates how AMS utilizes GVCs. Tier 3 is a stage of establishing a relatively slow type of connection with GVCs or, in Richard Baldwin's wording (Baldwin (2011)), the 1st unbundling type operations. It is typical in resource-based or labor-intensive industries in rural, mountainous, or island areas. For Tier 3 type operations, we do not need very high-grade logistics infrastructure, but the connectivity should be steady and reliable. Tier 2 is to start participating in production networks (Ando and Kimura (2005)), fragmentation of production (Jones and Kierzkowski (1990)), or the 2nd unbundling type production networks. For this type of operations, we must secure a time-sensitive high-grade logistics infrastructure as well as the procurement of appropriate infrastructure services such as electricity, water, and industrial estate services. In Tier 1a, industrial agglomeration is formed together with thick connectivity with GVCs. We need large-scale logistics infrastructure as well as metropolitan development to support efficient agglomeration. In the last step, Tier 1b, a country must create an innovation hub and attract good people by preparing good urban amenities. AMS includes countries at widely different development stages. Each country has economic activities in different tiers at the same time, but a bottleneck to resolve would be found for each country. In Figure 1, we show a rough idea of each country's position on what tier is a key for smooth economic development.

==Figure 1==

Table 1 summarizes what sort of infrastructure is required in each tier. Tier 1a and Tier 1b are merged in this table. Infrastructure for medium and long distance connectivity is tabulated as infrastructure for connectivity while infrastructure for urban and suburban development is in infrastructure for innovation. Each country has different regions and different industries to support, and thus infrastructure development in different tiers should be simultaneously taken care of. However, there typically exists a bottleneck of economic development that requires special attention. This is a useful guidance to choose appropriate quality for infrastructure.

The choice of infrastructure quality is a dynamic decision, and we may need to consider a proper sequence of infrastructure upgrading over time. One consideration should be placed on the life cycle cost structure. If we choose the lowest cost structure policy, the infrastructure would be constructed quickly and at a cheap cost (see Figure 2). However, the benefit from the infrastructure would be low in the future. We might need to upgrade the infrastructure pretty soon. On the other hand, if we would like to maximize the time-discounted benefits minus costs, we would choose the life cycle cost policy where the proper quality of infrastructure is chosen.

==Figure 2==

Another possible consideration would be the opposite. When the future demand for the infrastructure, for example, subways, is not sure, we may want to start the project small and make a judgment on whether to expand or not after removing some uncertainty for the future demand. This is a sort of “option.”

In any case, the choice of the quality of infrastructure should be made in considering the dynamic evolvement of project implementation and over-time costs and benefits.

3. Quality of infrastructure projects

The other important element to consider is the quality of infrastructure projects. I would like to separate this issue from the quality

of infrastructure itself because many other important considerations are coming in.

(1) How to finance the project

One important decision is how to finance the project, which will certainly affect the quality of infrastructure projects.

One of the fundamental difficulties in procuring infrastructure comes from the nature of infrastructure. Infrastructure generates positive externalities or works as a sort of public goods and thus the “financial” return to the project, i.e., the return to the project itself, would be too small even if the “economic” return of the project, i.e., the return to the whole economy, were large.² This is a typical market failure and explains why necessary infrastructure may not be provided only by the private sector. And thus in the past, it was taken for granted that infrastructure should be provided 100% by governments.

However, some infrastructure could be financial profitable, and actually the private sector might do a better job in efficiently providing such infrastructure. Based on these thoughts, there was a boom of privatization in various public services and infrastructure procurement in the 1980s. However, we eventually realized that privatization did not help provide the whole infrastructure in demand. Naturally, the private sector would do so-called cream skimming, concentrate on their operations in the profitable portion, and possibly neglect universal services. We then started thinking of how to combine the role of governments and the private initiative in a proper manner.

Figure 3 illustrates the emergence of PPP. Some infrastructure has a very low financial return despite a high economic return so that we should still depend on 100% public scheme. On the other extreme, some infrastructure is financially viable so that the private sector can 100% take

² The wording of “financial” and “economic” returns here follows the literature of project evaluation. The former means the return directly captured by the operating body while the latter includes the return to the whole economy including positive/negative externalities.

care of it. The issue is in between. In the middle range, if we can set a proper job demarcation between the public and the private in terms of financing or operating a project, the infrastructure may be provided efficiently. We here define PPP in a wider sense as such.

==Figure 3==

Figure 3 depicts that the boundary between public 100% and PPP and the boundary between PPP and private 100% depend on the country's development stage or the ability of governance. Indeed, the design and implementation of PPP are not often straightforward in LDCs. In designing PPP, we basically separate the whole project into a financially viable portion and a non-viable portion and let the private work on the former while the public takes care of the latter. Various risks regarding project implementation, exchange rate fluctuation, policy changes, and others should be clearly allocated to the private and the public in the contract. The whole process of the design and the implementation must be transparent and keep healthy competition among private stakeholders in order to avoid various adverse effects and corruption when the public and the private work together. Careful, well-thought project design is essential, and still we may encounter some unexpected difficulties in the process of implementation. In such a case, all stakeholders must sincerely cooperate and overcome problems.

These are not easy operations. The most successful areas for PPP in the wide definition are electricity generation. The system of independent power producers (IPP) is widely accepted, and the established job demarcation between the public and the private is commonly applied. In cases of large ports, there also exists a widely accepted understanding that the base infrastructure is taken care of by the public while container yard operations may be provided by the private. However, in other fields in infrastructure such as roads, railways, airports, water supply, and other social services, the job demarcation between the public and the private is still pretty much case by case, the matter of negotiation.

A difficulty comes when the public and the private walk in with

different incentives. If the public tries to minimize the fiscal expenditure and risks that it has to bear, there may be an empty set for the contract. With such an attitude, even if the project begins, further difficulties will surely emerge when some unexpected troubles come. An important thing is a strong initiative by the government for creating a “market” for the private counterparts. At least, the government should bear the cost of a policy risk that is caused by policy changes during the implementation. Risks due to exchange rate fluctuation are also crucial to take care of in an agreeable manner.

In the past several years, many AMS made substantial progress in establishing institutional arrangements for PPP and conducting the first bunch of PPP projects. PPP is not easy but can be a powerful tool to effectively and efficiently provide a certain type of infrastructure. ASEAN is now in a learning process to further utilize the mechanism. ERIA recently published the *ASEAN Public–Private Partnership Guidelines* (Zen and Regan, 2014) to promote this move.³

Although the effort for PPP should continue, it is obvious that PPP is not a panacea. We observe recent deep troubles in India where PPP and, in particular, viability gap funding were extensively introduced. Infrastructure development must still be at a hand of the government. To keep up with the speed of industrialization, we need investments on infrastructure at the level of at least 5-8% of gross domestic product every year. Some countries including the Philippines do not reach this level of investment. It is urgent for these countries to secure the fiscal space and the political will to invest in infrastructure.

(2) Project design and implementation

The construction of infrastructure takes time, and its financial and economic returns are realized over a long period. We must thus properly design projects in the time horizon. The project design should include the

³ Farquharson, Torres de Mastle, and Yescombe (2011) and The World Bank and others (2014) are also useful references for PPP.

whole period of the feasibility study, procurement, construction, operation/maintenance, and ex-post evaluation. Proper planning of the whole project is important not only for the sake of the project itself but also for the interface with the private sector's decision-making. This is because infrastructure is by nature tightly connected with the rest of the economy.

The bidding process is important to identify the most capable company or consortium to implement projects efficiently. In addition to its fairness and transparency, the quality of bidding depends on its openness. As a part of the government procurement, the government may want to limit bidders only for domestic companies in the logic of protecting infant industries. However, particularly in large-scale and technically difficult projects, the bidding had better be open to foreign bidders on the non-discrimination basis because more competition may result in infrastructure of better quality and possibly accelerate technology transfer and spillover. In the bidding process, we certainly have to consider the quality of infrastructure in addition to the cost consideration.

In construction, the timeliness is very important. A delay in construction may seriously affect the profitability of projects. This must be emphasized because some government officials do not care much about interest rates. A delay in construction occurs often due to difficulty in land acquisition and various legal procedures. Land acquisition is a difficult issue. Unfair displacement of residence is not acceptable, particularly in a democratic society. Yet, various forms of misuse of compensation scheme are observed in many countries. The establishment of a fair, transparent, and efficient procedure is necessary. On the other hand, legal procedures are mostly what the government should improve. Unnecessary regulatory burdens and paper works must be removed so as to make legal procedures predictable and timely. Strong support of the government for the implementation is needed.

A project does not end until efficient operation and maintenance are stably provided. Maintenance is often completely neglected in the overall planning of infrastructure projects. For example, in road construction, maintenance costs are not typically included in the project budget; they must

be covered by the annual government budget, which is often unstable over time. Although the maintenance cost is not huge, infrastructure does not work without it. One idea is to collect small amounts of toll fees from users. By doing so, even if the whole construction cost may not be recovered, some amount of money is secured for maintenance.

(3) Externalities and the interface with various stakeholders

An infrastructure project may possibly cause negative effects to a certain group of people or generate negative externalities that are not fully internalized in the market such as air pollution, noise, and others. Project planning should build in the structure to deal with such possibly negative impacts from the beginning. A typical concern about infrastructure projects is their possibly negative impact on the environment and local society, disaster prevention, and others. Specific studies on environmental and social impact, for example, must be incorporated in project planning and implementation. Such studies should be open to the public as far as possible. Public hearings and other opinion exchanges should likewise be held to solve incomplete information and minimize social conflict. Communication with various stakeholders, including the private sector, local governments, and local residence, is essential.

Infrastructure projects may also generate indirect positive effects as well as positive externalities. For example, projects may accelerate technology transfer and human resource development for engineers, managers, and operators. It is worth planning a built-in mechanism to enhance such positive impacts in the project design.

4. Necessity of new international rules on the involvement of governments

(1) Why are new international rules needed?

China's deeper involvement in infrastructure development has overall provided benevolent stimulus for accelerating infrastructure investment in AMS and the rest of the world. At the same time, because China does not belong to OECD or DAC and thus does not necessarily have

to follow traditional international rules, some friction emerges as China's involvement becomes sizeable. In particular, international policy discipline on the involvement of the government at various stages of infrastructure development have substantially nullified in the international arena. China and some other newly developed economies have by now become significant aid donors. Outward foreign direct investment (FDI) by China has been conducted mainly by state-owned enterprises (SOEs). Activities by sovereign wealth funds from newly developed economies have drastically extended the scope of their activities. Under OECD and DAC, developed countries (DCs) have been bound by certain policy disciplines, though very loose, when they have the government's involvement in investment, foreign aid, procurement, and others. New players including China do not care about such disciplines and enjoy freedom in introducing the government's involvement.

The initial reaction of recipient countries would be that loose international discipline on the government's involvement might rather strengthen their bargaining power in selecting advantageous counterparts to implement projects. However, eventually, they may also have domestic private players who face unfair competition vis-à-vis foreign subsidized players. Although the incumbent donors may not be completely clean in such disciplines, we may need to start talking about international rule making on those issues.

I do not think that such international rule making would start immediately. However, I would like to show where the problems would reside and discuss what sort of international rule should be developed in the future.

(2) Information disclosure

Infrastructure development includes various stakeholders, and strengthening partnership amongst stakeholders is the key for making projects be successful. Stakeholders include central and local governments, public utility companies, consultants, constructors, private banks, other private companies, local residences, non-government organizations, foreign

governments, foreign governmental financial institutions, international organizations, foreign consultants and constructors, foreign private banks, other private companies, and others. Although reconciling all sorts of conflict over costs and benefits of various stakeholders is difficult, we should strengthen the partnership amongst stakeholders as far as possible in a transparent way.

A problem is that communication amongst development partners often looks thin. It is important to strengthen partnership amongst development partners. For example, to keep the fiscal sustainability of recipients, we need information on the amount and term conditions in details for all sorts of foreign loans. We have to check whether the whole program of development partners is consistent with each country's development strategy. We would like to watch whether the ownership of recipients on the program is secured or not. However, some development partners do not fully disclose these types of information.

The establishment of AIIB is a good occasion for new partners to come into the international community. All kinds of bilateral donors and international organizations working as development partners in this region, including AIIB and OBOR Initiatives, must disclose basic information on lending and other activities and conduct objective ex-ante and ex-post evaluations.

(3) Government's involvement and competition

In the international rule making in the context of the World Trade Organization (WTO), free trade agreements (FTAs), and bilateral investment treaties (BITs), two trends have steadily advanced. One is liberalization or introducing the non-discrimination principle consisting of most-favored-nations (MFN) principle and national treatment (NT) principle, which is enforced for trade in goods, trade in services, investment, e-commerce, government procurement, and others. The other is international rules to support or supplement liberalization, which includes intellectual property right protection, competition policies, discipline on governments' involvements in the market such as subsidies, SOEs, sovereign wealth funds,

ODAs, as well as labor, environment, and others (Figure 4). Infrastructure development may fall into the category of services, investment, or government procurement, which is relatively a lagging behind area for liberalization. The government in the host country can so far have a lot of room for discretionary policies for infrastructure development. However, if the liberalization further proceeds in the future, some backups to level a playing field are going to be essential.

==Figure 4==

For example, think of a situation in which a foreign SOE subsidized by the foreign government wins bidding for an infrastructure project. If the liberalization principle is not imposed, the host government can freely say yes or no for the participation of the SOE. Although such discretion may generate inefficiency, the host government may not be noticed. However, once the liberalization principle comes in, the host government must accept everybody. This may surely make it notice a problem when, for example, some domestic competitor or a capable foreign firm is defeated in the bidding in an inefficient manner. Once we introduce the liberalization principle, we need a backup for leveling a playing field. Otherwise, the liberalization effort could lead to distorted choices of firms in charge, which would end up with inefficient implementation of infrastructure development.

So far, liberalization on services, investment, and government procurement has not been fully imposed. In the case of services, the General Agreement of Trade in Services (GATS) under the WTO imposes the non-discrimination principle, but most of the LDCs do not commit the high-level liberalization in the positive list method. Policy discipline on investment is largely incomplete in the WTO. Government procurement is a plurilateral agreement under the WTO, and very few LDCs participate in it so far. However, bilateral and mega FTAs as well as BITs have rapidly been developed, and some of them include advanced liberalization commitments on services, investment, and government procurement. It means that even

LDCs may increasingly obey the non-discrimination principle including MFN and NT.

Then how about the backups for fair competition? The WTO has an incomplete coverage on subsidy. Only in the case of trade in goods, export subsidy is banned, and domestically subsidized exports would be subject to countervailing duties imposed by the importing country. However, the text of the Trans-Pacific Partnership (TPP) agreement includes a path-breaking chapter on SOEs and others. Although a lot of exemptions are listed, the chapter basically tries to provide an important policy discipline that levels the playing field when an SOE potentially subsidized by the home country sells or buys goods, services in the home country or abroad. This would be in principle applied to cases in which a foreign SOE would participate in bidding for an infrastructure project in the context of government procurement or would invest in the host country as independent infrastructure service provider. SOEs should basically prove themselves, when being requested, that they are not directly or indirectly subsidized so that the competitive environment is not distorted.⁴

As the overall liberalization will proceed in the future, I believe that we will eventually have to think of such international rule making seriously. This would affect the behavior of Chinese investment in which SOEs dominate. Actually, players from DCs may not be completely clean, either. Once a governmental institution such as Japan International Cooperation Agency (JICA), Japan Bank for International Cooperation (JBIC), or Kitakyushu City gets involved in the project, for example, it may need to prove that the consortium is not subsidized and thus does not jeopardize the competitive environment.

(4) Rethinking concessionality

⁴ The SOE chapter is one of the novel elements in TPP, which was in fact motivated by the US trying to keep fair competition against investment by Chinese SOEs.

Another issue is concessionality in foreign aid. In foreign aid programs, concessionality is the extent to which a soft loan reduces the return in terms of the amount or duration, compared with usual commercial loans. Of course, concessionality has its own logic in foreign aid. However, if concessionality is used as one of the weapons to enhance competitiveness in bidding, it may jeopardize the fair competitive environment and generate inefficiency.

There was a loose discipline on concessionality by OECD's DAC though new donors are not DAC members and thus do not follow it. If foreign aid and investment are not strictly separated, which is observed in cases of China's involvement in infrastructure development in LDCs, it may make the playing field uneven due to concessionality. Foreign aid agencies in DCs may not also be completely clean in this regard. For example, JICA sometimes participates in a consortium including private banks and companies to implement an infrastructure project. Although interest rates are currently very low everywhere in the world, these activities in principle include concessionality and may jeopardize the competitive environment.

One idea would be to limit the recipient countries, sectors, or types of projects for concessional foreign aid in order to avoid possibly adverse effects on the competitive environment. For example, foreign aid could be applied only for low-income countries. It would be applied for rural roads but not for highways. Or, it must head only for some humanitarian purposes. I guess that aid agencies like JICA may not want to limit its activities as such, but this would be a logical conclusion from the viewpoint of thinking much of fair competition.

Another idea is to limit concessionality to the financially unviable portion of the project. Then we can say that concessionality shows a good will to cover what the host government should take care of otherwise and financially viable portion is not jeopardized. Then of course, we may need another logic to justify why the participation of the aid agency in the consortium is required.

5. Conclusion

Infrastructure development has occupied a special position in the development strategies of ASEAN and developing East Asia where both institutional and physical connectivity have served for effectively utilizing GVCs to accelerate industrialization. Logistics infrastructure to support quick and time-sensitive international production networks as well as economic infrastructure to make industrial agglomeration effectively work has made notable differences from other parts of the developing world. To take advantage of forces of globalization, further development of infrastructure is essential. Countries in the region clearly recognize its importance.

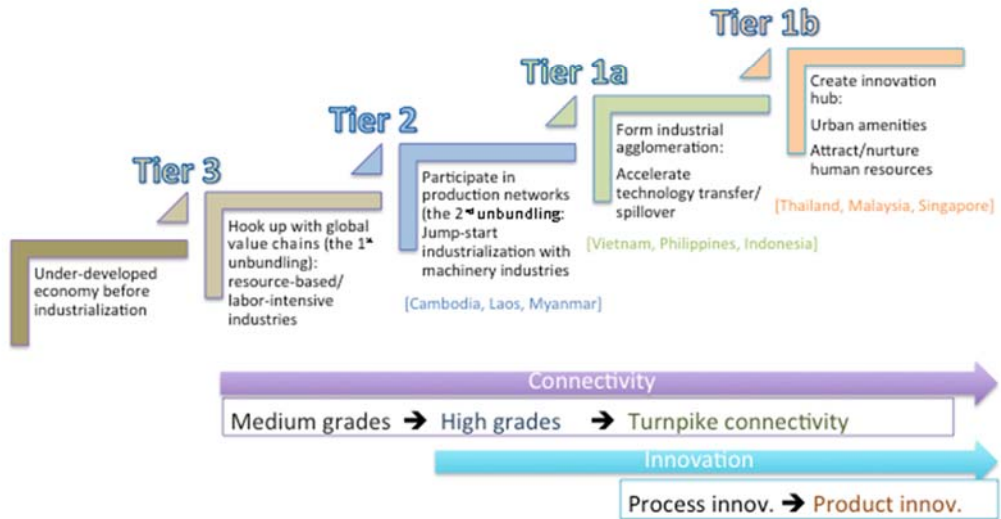
East Asia should be proud of steady economic development of countries in the region that have sequentially graduated from the ODA program and have started their own foreign aid program and outward FDI. At the same time, countries must be responsible for establishing efficient and vigorous economic environment. In this context, to think of the quality of infrastructure as well as the quality of infrastructure projects is imperative. The cooperation between Japan and China is essential in this regard.

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Figure 1
The tier structure of utilizing global value chains in AMS



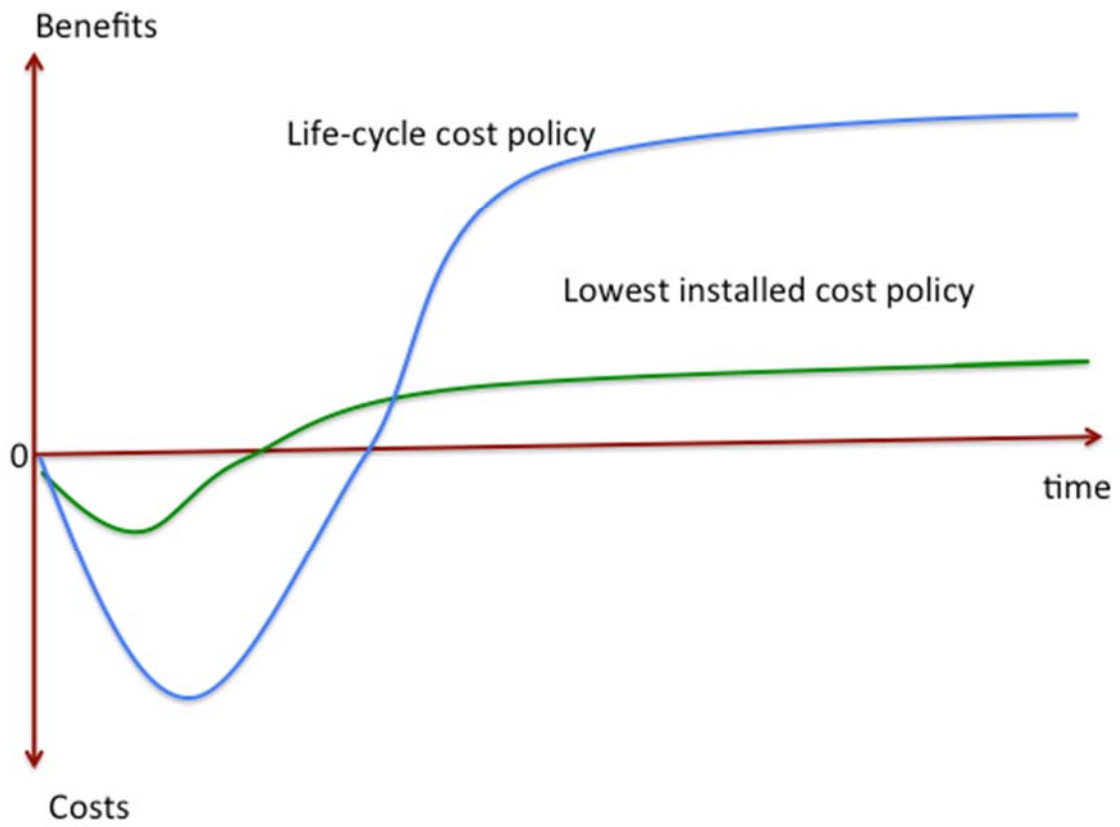
Source: ERIA CADP Research Team (2015) .

Table 1
Infrastructure for Connectivity and Innovation

	Tier 3: Rural development for creating business	Tier 2: Coming into production networks	Tier 1: Forming industrial agglomeration
Infrastructure for connectivity	<p>Medium-grade connectivity for various economic activities</p> <ul style="list-style-type: none"> - Agriculture/food processing, mining, labor-intensive industries, tourism, and others 	<p>High-grade connectivity to participate in production networks</p> <ul style="list-style-type: none"> - Dual-modal (cargo, passenger) - Capital city, border area, connectivity grid - Mitigate border effects - Institutional connectivity / soft infrastructure for trade facilitation 	<p>Turnpike connectivity with other industrial agglomerations</p> <ul style="list-style-type: none"> - Full-scale port with container yard/airport for regular carriers and LCC - Multi-modal (cargo, passenger) - Institutional connectivity for reducing transaction costs
Infrastructure for innovation	<p>Discovery and development of historical/cultural/natural heritage</p> <ul style="list-style-type: none"> - Premium tourism - Cultural studies 	<p>Urban/suburban development for medium-scale industrial agglomeration</p> <ul style="list-style-type: none"> - Urban/suburban development plan for a critical mass of industrial agglomeration - Economic infrastructure services (special economic zones, electricity, water, and others) 	<p>Metropolitan development for full-scale industrial agglomeration and urban amenities</p> <ul style="list-style-type: none"> - Highway system, urban transport (LRT, subway, airport access) - Mass economic infrastructure services (industrial estates, electricity, energy, water, and others) - Urban amenities to nurture/attract intellectual people

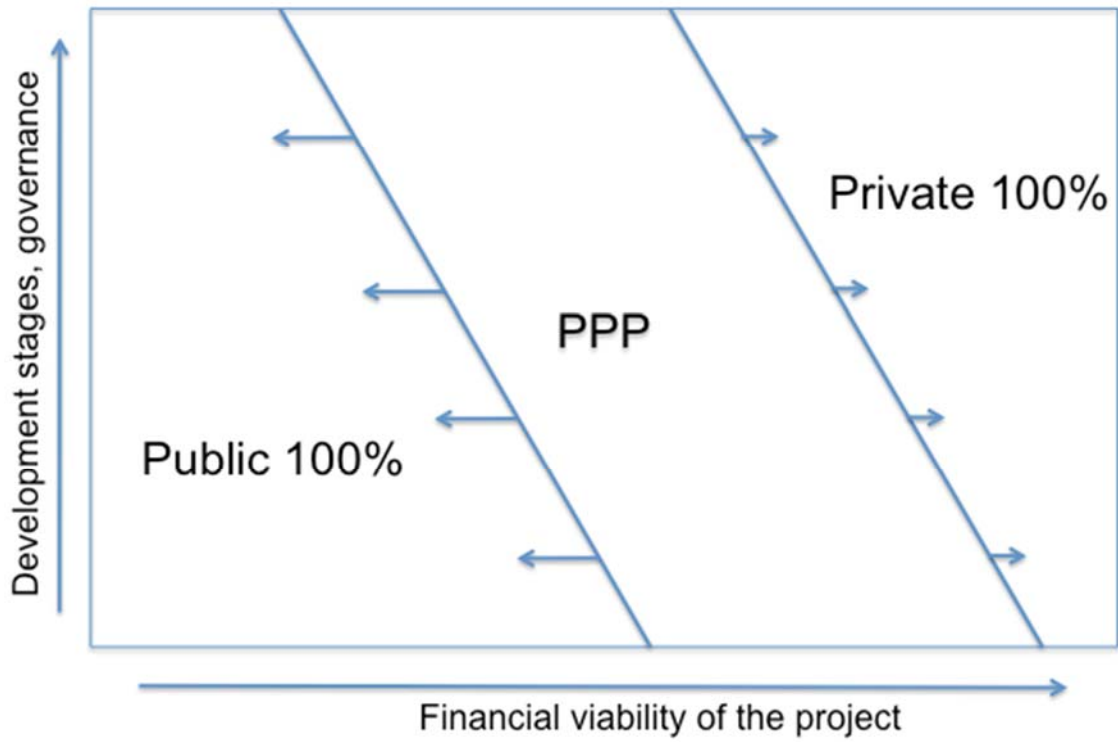
Source: ERIA CADP Research Team (2015) .

Figure 2
The Lifecycle Cost Structure



Source: the author.

Figure 3
The emergence of public private partnership (PPP)



Source: the author.

Figure 4

The framework of international commercial policy discipline

Liberalization or the non-discrimination principle (MFN, NT)	International rules to support/supplement liberalization
<ul style="list-style-type: none">• Trade in goods<ul style="list-style-type: none">– Tariffs– NTBs– Trade facilitation• Trade in services<ul style="list-style-type: none">– Modes 1-4, MA/NT• Investment<ul style="list-style-type: none">– Pre- and post-investment lib.– Performance requirements• E-commerce• Government procurement• ...	<ul style="list-style-type: none">• IPR protection• Competition• Discipline on governments' involvement<ul style="list-style-type: none">– Subsidies, SOEs, sovereign wealth funds, ODA, ...• Labor• Environment• ...