

# INFRASTRUCTURE AS A PREREQUISITE FOR EAST ASIAN ECONOMIC INTEGRATION

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## Abstract

The regional economic integration in East Asia has been developing relatively intensively recently. ASEAN member states, as well as China, Japan, and South Korea, are increasingly involved in the processes of market-driven regionalization, and to some extent in regionalism. A regional economic integration usually requires meeting three basic conditions: an economic structures complementarity, a favorable policy, and a well-developed infrastructure. Thus, improvements in the physical infrastructure connectivity are of key importance for a more advanced integration in East Asia. Without good connectivity, the diversity that exists in East Asia will bring disparity instead of prosperity. Physical connectivity (infrastructure) is crucial in supporting the complementarities in production processes across the region, especially under conditions of highly developed regional production networks in East Asia.

The main purpose of the article is to describe and analyze selected infrastructure developments in East Asia and to identify the most significant challenges in the field. To achieve the goal, the author will use analytical and descriptive methods, a critical review of the literature and an inference method based on statistical data.

**Key words:** infrastructure, connectivity, East Asia, economic integration

**JEL Code:** F15, F21, O18

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## Introduction

A countries' or regions' infrastructure occupies an important place among factors of economic growth. It contributes to reducing poverty and development disparities between countries (Dissou & Didic, 2013, pp. 5–46). Infrastructure also plays one of the key roles in promoting regional cooperation and economic integration. Without well-developed infrastructural links contributing to the improvement of communication between countries of a specific geographical region, there is no possibility of initiating and developing an effective economic cooperation. This means that in addition to the complementarity of economic structures and a

favorable integration policy, the existence of an appropriate infrastructure is one of the basic conditions for effective economic integration. This predominantly pertains to the technical infrastructure that allows develop product implementation, service creation or capital links. The existence of a developed communication infrastructure is conducive to reducing transport costs improving the speed and ability of communications (Bhattacharyay, 2009, p. 2). When integration is treated as a dynamic and evolutionary process, giving all entities equal access to markets and resources and contributing to the free flow of goods, services, capital and people, then the importance of infrastructure becomes even more visible. Where there is a well-developed infrastructure, trade, and other economic links develop, while where weak infrastructural connections are found, economic links also remain weak (ADB, 2009, p. 6).

The main purpose of this article is to describe and analyze selected infrastructure developments in East Asia<sup>1</sup> and to identify the most significant challenges to economic development in that area. To achieve the goal, the author will use analytical and descriptive methods, a critical review of the literature and inference based on statistical data.

## **1 Infrastructure in regional economic cooperation**

Regional economic integration is a dynamic and evolutionary process that offers all its participants access to markets and resources, allows goods and services to move easily across borders and lets citizens travel freely (ADB, 2017a, p. 91). One of the basic conditions for integration is achieving a high degree of connectivity within a region. In turn, the efficiency of connectivity depends on the quantity and quality of hard and soft infrastructure (Bhattacharyay, 2010, p. 1). A hard (physical) infrastructure covers such elements as a transport infrastructure (roads, rail lines, airports, seaports), an energy infrastructure (oil and gas pipelines, electricity grids) and a telecommunications infrastructure. On the other hand, a soft infrastructure consists of such elements as an appropriate policy (e. g. trade facilitation policies and procedures) and a favorable legal system, regulations and procedures, as well as institutions that enable the proper functioning of the physical infrastructure (Bhattacharyay, 2010, p. 1).<sup>2</sup>

The existence of an appropriate regional infrastructure, including transport infrastructure, is perceived as one of the most important determinants of regional economic integration and development. Economic integration can also be defined with respect to the

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<sup>1</sup> The APT (ASEAN Plus Three) grouping consists of ten ASEAN member states, China, Japan, and South Korea. In this paper, all 13 countries constitute the East Asian region.

<sup>2</sup> Due to space limitations of the paper, it is focused on hard infrastructure. But it should be remembered that a soft infrastructure is at least of equal importance.

transport infrastructure itself. Hamaguchi (2008, p. 119) claims that integration is a process that reduces transportation costs between producers and consumers within a specific region. According to the claims of economic geography, longer distances increase transportation costs leading to negative effects on trade flows between partners. On the other hand, there are numerous studies confirming that the improvement of the infrastructure has a positive effect on bilateral trade and investments (Yu, 2017, p. 45).

The Asian Development Bank (2009, p. 20) views regional infrastructure as an increasingly critical aspect in the development of regional integration processes. According to this institution, regional infrastructure projects cover two kinds of activities: 1) projects that involve physical construction works and/or coordinated policies and procedures spanning two or more neighboring countries or 2) national infrastructure projects with a significant cross-border impact (their planning and implementation involve cooperation or coordination with one or more countries; they aim to stimulate significant amounts of regional trade and income, and they are designed to connect to the network of a neighboring or third country). According to Bhattacharyay (2009, p. 3) infrastructure, especially a regional (supra-national) infrastructure, serves several important functions from the point of view of regional economic integration. First, a basic infrastructure promotes an economic exchange between sectors of the economy locally and internationally. Second, infrastructure strengthens physical connectivity both within the country and between countries (on a regional scale). Third, infrastructure helps to achieve a greater regional integration due to the enhanced physical connectivity, facilitates trade and investment but also financial market development. Fourth, a regional (cross-border) infrastructure gives better access to regional and global markets. Thus, it promotes the improvement of a production efficiency and strengthens competitiveness, enabling enterprises to join regional production networks. This is particularly important in East Asia. Fifth, cross-border infrastructure allows economies to gain access to rare resources such as energy, capital or services.

## **2 Infrastructure performance and development in East Asia**

The economic achievements of the East Asian region are based, to a large extent, on the development of internal links, including primarily trade and investment.<sup>3</sup> On the one hand, these links strengthen the creation and development of regional production networks, and on the other

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<sup>3</sup> In 2014 the intraregional imports in ASEAN+3 stood at the level of 42.5%, while intraregional exports at the level of 35.1% (Pasierbiak, 2016, p. 89).

hand, regional production networks stimulate the development of economic ties between countries. The countries of East Asia are strongly involved in the intraregional trade of parts and components, which favors achieving comparative advantages and effective competition in global markets. A significant contributor in this area is Japan, which in the 1970s began to create production networks in East Asia. Now China is serving as the final production hub (Yu, 2017, p. 44). Maintaining the productive competitiveness of each country depends on other partners located in the same production network and is predicated on the effectiveness of trade links between them (Brooks, 2016, p. 191). Therefore, the pursuit of maintaining a competitive position creates a strong motivation for the development of infrastructure cooperation in order to reduce transaction costs. In addition, infrastructure development leads to an increase in internal demand in the region, which reduces the dependence on third countries. This is particularly important under the expected conditions of recurring global economic crises (1997-98, 2008+). East Asian countries are becoming more and more aware that building effective infrastructure is a factor that will allow them to maintain their leading position in the global economy. Meanwhile, a poor infrastructure can become a bottleneck for the region's economic position, negatively affecting the opportunities for cooperation and economic integration.

Such negative impacts occur in East Asia because the infrastructure here is relatively underdeveloped in comparison to the global infrastructure (Bhattacharyay, 2010, p. 1). The exception is infrastructure in the field of maritime transport. According to Brooks (2016, p. 183), while Asian ports dominate today among the most important container ports in the world, there is also a room for their efficiency improvement. This is important as the vast majority of East Asia's foreign trade is dependent on sea transport. With this said, the maritime infrastructure does not make up for the low ranking of other forms of transport infrastructure available in East Asia. Table 1 presents the changes that took place in the infrastructure performance of the East Asian countries since the global financial crisis (2008). The data illustrates the high level of infrastructure diversification between East Asian countries. In 2017, East Asia's top infrastructure performers were Singapore (2<sup>nd</sup> place in the ranking of 137 countries analyzed) and Japan (6), and South Korea (14). The remaining countries of East Asia were far removed from the top performers, and the worst performance is indicated in Myanmar and the Philippines. It is worth noting that in five cases (Brunei Darussalam, Cambodia, Malaysia, Philippines, Thailand) the quality of infrastructure has been decreased compared to 2008.

**Tab. 1: Changes in Infrastructure Performance in East Asian countries, 2008/09-2017/18**

Specification	Quality of overall infrastructure		Quality of roads		Quality of railroad infrastructure		Quality of port infrastructure		Quality of air transport infrastructure		Quality of electricity supply	
	2017-18 Rank	Change	2017-18 Rank	Change	2017-18 Rank	Change	2017-18 Rank	Change	2017-18 Rank	Change	2017-18 Rank	Change
Brunei Darussalam	51	-12	33	-5	-	-	74	-39	63	-25	53	-8
Cambodia	99	-17	99	-19	94	+3	81	+10	106	-19	106	+11
Indonesia	68	+28	64	+41	30	+28	72	+32	51	+24	86	+6
Lao PDR	83	-	94	-	-	-	127	-	101	-	75	-
Malaysia	21	-2	23	-6	14	+3	20	-4	21	-1	36	-5
Myanmar*	138	-	134	-	94	-	125	-	137	-	117	-
Philippines	113	-19	104	-10	91	+4	114	-14	124	-35	92	-10
Singapore	2	0	2	+1	4	+6	2	-1	1	0	3	+10
Thailand	67	-32	59	-27	72	-24	63	-15	39	-11	57	-14
Viet Nam	89	+8	92	+10	59	+7	82	+30	103	-11	90	+14
China	47	+11	42	+9	17	+11	49	+5	45	+29	65	+3
Japan	6	+10	6	+13	2	+1	21	+4	26	+23	10	-4
Republic of Korea	14	+4	12	+1	7	0	23	+6	13	+13	21	0

\* 2014.

Source: Own calculations based on (Porter & Schwab, 2008; Schwab, 2017).

The highest level of infrastructure development progress in East Asian countries, measured by changes in the ranking, was recorded in road infrastructure, where almost all countries, except Thailand, recorded improvements. In general, however, it should be stated that less developed countries, i. e. Viet Nam, Cambodia, the Philippines or Myanmar are characterized by very poorly developed roads, railroads, obsolete seaports and air infrastructure, also in the supra-national dimension (Yu, 2017, pp. 49–50). This is not supportive of economic development and its ensuing integration process development. It seems that for these least developed countries in the region, a much more important factor accelerating their economic development is the expansion of technical infrastructure, rather than deepening integration in the form of, for example, tariff reduction or monetary integration (Volz, 2010, p. 113).

The relative weakness of the infrastructure is not a factor conducive to the development of economic integration processes in East Asia. Actions to improve the infrastructure should become a priority for East Asian countries. It is not only about bottom-up developments of the infrastructure, analogous to the development of intra-regional economic connections, but also, and perhaps above all, about a more organized, top-down, market-expanding and demand inducing development under institutional initiatives. Cooperation in the field of infrastructure is desirable due to at least several possible benefits to be obtained (ADB, 2009, p. 27). First of all, it is helpful in identifying needs, financing and implementing high priority new projects and

maintaining existing ones. Second, it can promote the efficient use of shared resources, including energy and water. Third, it can promote the harmonization of supranational rules, systems, and procedures, thus enabling the use of good practices from other countries.

In East Asia, the development of cross-border infrastructure initiatives takes place at several levels: 1) Pan-Asian infrastructure initiatives; 2) the subregional infrastructural cooperation, and 3) individual country initiatives. As part of the Pan-Asian initiatives, two key projects are being implemented: Asian Highway (AH) and the Trans-Asian Railway network (TAR). These projects are pillars of the Asian Land Transport Infrastructure Development initiatives launched in 1992 (ALTID) (ADB, 2009, p. 27). The third pillar is the facilitation of land transport projects through intermodal transport terminals. The AH covers 32 Asian countries, including 12 East Asian countries (without Brunei Darussalam) and aims to create 141,271 km of standardized highways, including 155 cross-border routes. On the other hand, in the TAR network 28 countries are participating, including ten East Asian countries. TAR's goal is to create 141,000 km of railroads which will allow access to the most important ports in Asia and Europe.

Subregional infrastructure cooperation covers specific programs, including the Master Plan on ASEAN Connectivity (MPAC), Greater Mekong Subregion (GMS), the Mekong River Commission (GMC), the Brunei-Indonesia-Malaysia-Philippine East ASEAN Growth Area (BIMP-EAGA), and the Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT). The Master Plan on ASEAN Connectivity, adopted in 2010, is a comprehensive framework for specific policies aimed at connecting the region with itself but also with the rest of the world (ADBI, 2014, pp. 168, 260). It covers areas related to physical infrastructure development, the institutions' connectivity (regulatory frameworks), and people-to-people exchanges. Among the other subregional initiatives mentioned above, the Greater Mekong Subregion (GMS) has the most notable achievements in the area of infrastructure (Bhattacharyay, 2010, p. 22). The GMS includes five ASEAN countries (Cambodia, Lao PDR, Myanmar, Thailand, Viet Nam) and two provinces of the PRC (Guangxi and Yunnan). From the mid-1990s, the GMS program has assisted the development of a transport infrastructure across continental ASEAN. For example, in 2016 when physical connectivity improved with the completion of three bridges along GMS economic corridors. The progress in implementing the GMS Cross-Border Transport Facilitation Agreement was also noticed. But still, a lot remains to be done. One of the issues is the need for greater coordination between GMS and MPAC in order to increase efficiency and avoid the duplication of activities.

With respect to developing infrastructure links in East Asia, the initiatives undertaken by the more developed countries with larger financial resources are of great importance. China, Japan, and South Korea are strengthening the intra-regional and the inter-regional connectivity with ASEAN countries by developing comprehensive networks of hard infrastructure. This is done by means of various activities, including (ADB, 2017a, p. 67; Yu, 2017, p. 53): 1) active participation in the implementation of the Master Plan on ASEAN Connectivity (MPAC); 2) the ASEAN-Japan Friendship and Partnership Scheme; 3) the Road and Belt Initiative (China); 4) the Republic of Korea's Eurasia Initiative, and 5) the Partnership for Quality Infrastructure (Japan). These initiatives create new opportunities for cooperation within the East Asian region, but they can also increase the risk of duplicative efforts if they are not adequately harmonized and coordinated.

### **3 Challenges in East Asian Infrastructure Development**

The development of infrastructure in the large and deeply diversified area of East Asia carries many challenges. The most important ones include: 1) the immense investment needs and limited financing possibilities; 2) the need to overcome geographical diversity; 3) the synchronization of national and subregional investment projects and sources of their financing; 4) the asymmetrical distribution of costs and benefits from the development of regional infrastructure between the participating countries; 5) the lack of proper cooperation and even a rivalry between China and Japan in the implementation of infrastructure projects.

Due to the scope limitations of this study, attention will be focused on two of the above mentioned challenges: 1) high investment needs and possibilities of their financing, and 2) rivalry between China and Japan. According to Asian Development Bank (2017b, p. 42), infrastructure investment needs in East Asia for 2016-2030 are estimated at 9,728 USD billion. This means that annual investments in this region should reach 649 USD billion. If the estimates include adjustments in relation to climate change, the annual value of infrastructure investments increases to 891 billion USD. The quoted data show the challenges that East Asian countries face in the financing of infrastructure investments. There are several ways to meet the financial needs for infrastructure development in East Asia. First, because most of the financing costs are taken over by the state, there is a need to increase the involvement of private entities in undertakings. The institution of public-private partnerships (PPP) could play a major role in this respect. Second, Asian countries have high foreign exchange reserves and internal savings, which are potentially important sources of financing for infrastructure investments. The

available resources of China and Japan would be particularly important. Third, there is a need to strengthen the financial and geographical expansion of the established ASEAN Infrastructure Fund by inviting China, Japan, and South Korea to join (ADBI, 2014, p. 261). This would significantly increase the financing possibilities. Fourth, there is a need to develop infrastructure bond markets in local currencies (Hyun, Park, & Tian, 2017, p. 364). A standardization and harmonization of markets under ASEAN+3 would facilitate the integration of individual East Asian markets and contribute to achieving greater liquidity of the entire market. This would significantly increase the possibilities of long-term financing of infrastructure investments. Fifth, greater involvement of multilateral development banks (MDBs) is recommended. In 2015, MDBs supported around 2.5% of developing Asia's infrastructure investments. It is not a large share and certainly should be increased, but the presence of institutions such as the World Bank or the Asian Development Bank means that entities from the private sector are more willing to engage in such projects. Recently, new financial institutions have been established, namely the Asian Infrastructure Investment Bank (AIIB) and the New Development Bank (NDB), whose task are to support the development of infrastructure.

The second challenge for infrastructure development in East Asia of concern for this article is the rivalry between China and Japan for primacy in the region. The lack of cooperation between these countries manifests itself in many aspects, including in the area of infrastructure. In May 2015, just after China announced its willingness to create the AIIB, Japan announced that under the Partnership for Quality Infrastructure it would pay 110 USD billion for investments in Asia (Yu, 2017, p. 54). Another example of the competition is the aggressive approach in vying for construction contracts of high-speed railway lines (among others in Indonesia or India). Another aspect of the competition is the fact that both China (with its RBI) and Japan (with PQI) want to implement their own visions of infrastructure development, neither of which is not broadly agreed upon nor compatible with the others' vision. If this kind of policy continues, it may harm not only the development of the intra-regional infrastructure but also the prospects of the East Asian integration processes.

## **Conclusion**

In East Asia, the processes of regional economic integration have taken the form of bottom-up activities of enterprises responding to market incentives. Enterprises, engaging in production and investment activities in the region contributed to the creation of regional production networks and supply chains, which in turn resulted in competitive advantages of the region and



the relative importance of East Asia in the global economy. This has also affected the intensity of intra-regional trade and investment links. Currently, East Asia faces a dilemma of maintaining its international competitiveness, which depends largely on effective, fast and reliable infrastructure connections between the countries of the region. The infrastructure development to date has mirrored the standard integration development model, i. e. it had a bottom-up and market character. Currently, undeveloped infrastructure is becoming the bottleneck for economic development and is one of the most important factors slowing down the integration processes in East Asia. If countries want to maintain their position in the global economy, they should definitely increase their cooperation in the development of the infrastructure. Only the infrastructure that provides a smooth connectivity between countries of the region can shorten the economic distance between entities, reducing time and transaction costs between them. This, in turn, will contribute to the expansion and interconnection of East Asian markets. Thus, it will enable companies to benefit from economies of scale of production, facilitate greater specialization in production and allow for a more advanced division of labor. This would greatly facilitate accelerated development of regional economic integration.

## References

- ADB. (2009). *Infrastructure for a Seamless Asia*. Manila.
- ADB. (2017a). *Asian Economic Integration Report 2017. The Era of Financial Resilience?* Manila.
- ADB. (2017b). *Meeting Asia's Infrastructure Needs*. Manila: Asian Development Bank.
- ADB. (2014). *ASEAN 2030. Toward a Borderless Economic Community*. Tokyo.
- Bhattacharyay, B. N. (2009). *Infrastructure Development for ASEAN Economic Integration* (ADB Working Paper Series No. 138). Manila.
- Bhattacharyay, B. N. (2010). Institutions for Asian Connectivity. *Journal of International Commerce, Economics and Policy*, 1(2), 309–335.
- Brooks, D. H. (2016). Connectivity in East Asia. *Asian Economic Policy Review*, 11(2), 176–194. <https://doi.org/10.1111/aepr.12132>.
- Dissou, Y., & Didic, S. (2013). Infrastructure and Growth. In J. Cockburn, Y. Dissou, J.-Y. Duclos, & L. Tiberti (Eds.), *Infrastructure and Economic Growth in Asia* (pp. 5–46). London: Springer.
- Hamaguchi, N. (2008). Making Sense of the Timeliness of Transportation in Economic Integration. In D. Hiratsuka & F. Kimura (Eds.), *East Asia's Economic Integration*.

*Progress and Benefits* (pp. 118–139). Basingstoke: Palgrave Macmillan.

Hyun, S., Park, D., & Tian, S. (2017). Infrastructure Bond Markets Development in Asia: Challenges and Solutions. *Global Economic Review*, 46(4), 351–371.  
<https://doi.org/10.1080/1226508X.2017.1379910>.

Pasierbiak, P. (2016). Trade regionalization in contemporary East Asia. *Prace Naukowe Uniwersytetu Ekonomicznego We Wrocławiu*, 447, 83–94.  
<https://doi.org/10.15611/pn.2016.447.07>.

Porter, M. E., & Schwab, K. (2008). *The Global Competitiveness Report 2008-2009*. Geneva.

Schwab, K. (2017). *The Global Competitiveness Report 2017-2018*. Geneva.

Volz, U. (2010). *Prospects for Monetary Cooperation and Integration in East Asia*. Cambridge, London: The MIT Press.

Yu, H. (2017). Infrastructure Connectivity and Regional Economic Integration in East Asia: Progress and Challenges. *Journal of Infrastructure, Policy and Development*, 1(1), 44–63.  
<https://doi.org/10.24294/jipd.v1i1.21>

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