BRC RESEARCH REPORT No. 20

High-Speed Railway, the EEC, and the Change of the Landscape of Thailand and its Neighboring Countries

March 2018

Edited by

Daisuke Hiratsuka

Bangkok Research Center
JETRO Bangkok / IDE-JETRO

Bangkok Research Center, JETRO Bangkok/IDE-JETRO
16th Fl. of Nantawan Bldg., 161 Rajadamri Road, Bangkok 10330, THAILAND

Introduction

High-Speed Railways (HSR), and the Landscape Changes of Thailand and its Neighboring Countries

Daisuke Hiratsuka
The Bangkok Research Center, IDE-JETRO

In 2018, Southeast Asia entered the era of high-speed railways (HSR). Thailand plans to develop four HSR projects: (1) Bangkok-Nong Khai HSR; (2) Bangkok-Chiang Mai HSR; (3) Bangkok-Hua Hin HSR; and (4) Bangkok-Rayong HSR. Of which, the Bangkok-Nong Khai and the Bangkok-Rayong routes are at the advanced planning stage The Bangkok-Nakhon Ratchasima route of 252km, which is the first phase of the Bangkok-Nong Khai route of 615km, will be the first HSR in Thailand and in Southeast Asia. The piling work of the first phase linking Bangkok and Nakhon Ratchasima, a contract worth 179 billion baht, commenced on December 21, 2018, and the operational service will start in 2022. The Bangkok-Rayong route of 240 km will open for bidding in 2018, and completion of construction and the start operational service will be in 2023. The Bangkok-Rayong route will be commercially successful, since it links the three international airports of Don Muaeng, Suvarnabhumi, and U-Tapao. U-Tapao airport is planned to have a new runway and a new terminal building linking with its underground HSR station, so that it will accommodate 30 million and 60 million travelers per year in 10 years and 20 years respectively. The Kuala Lumpur-Singapore HSR route of 350kms will open for bidding in 2018. The Vientiane-Luang Phrabang-Boten Line running from north to south of Laos has started construction, although this railway is a medium-speed construction with a maximum speed of less than 150kms per hour. Thailand and China had a held discussions about connecting Nong Khai in Thailand with Vientiane in Laos, February 7-9, 2018, in in Beijing.

Recognizing the above, the Bangkok Research Center of IDE-JETRO, JETRO Bangkok, conducted the research project, entitled "High-Speed Railways and the Landscape Changes in Thailand and its Neighboring Countries by 2030" during fiscal 2017/18, focusing on the HSR services in Thailand. This project aims to clarify what will the HSR service affect, and by how much will the HSR change the landscape, and how large will be the dispersion forces affecting the neighboring countries.

The HSR service will reduce the travel time for passengers. When the HSR service starts operating, passengers will be able to travel faster than ever before. Incorporating this feature of the HSR, Li and Xu (2002) theoretically argued that the HSR will force the services sector to disperse to the neighboring cities located within in a short distance from the core city, but conversely, the manufacturing sector will disperse to cities

located farther from the core city.

IDE-JETRO has prepared a Geographical Simulation Model (IDE-GSM) that contains an economic database as well as the transport network data by province of 30 Asian countries/economies. The simulation analysis results using the IDE-GSM model provide evidence to support the arguments by Li and Xu (2002). They are summarized as follows:

1. The short Bangkok-Rayong route of 240kms will increase the services sector in the three HSR provinces and some provinces neighboring Bangkok, but decrease the services sector in Bangkok and most of provinces except a few. The manufacturing sector will decrease in most provinces, including the HSR provinces, except for a few provinces. Looking at the district level, the HSR station districts will increase the services sector, but decrease it in the other districts of the HSR provinces.
2. The Bangkok-Nong Khai route of 615kms, which is longer than the 240km Bangkok-Rayong route, will generate a greater impact than the Bangkok-Rayong route. The Bangkok-Nong Khai route will increase both the services and the manufacturing sectors. The services and manufacturing sectors will disperse to many provinces. This simulation result indicates that the longer the distance of the HSR, the greater will be the impact. Considering the transit time by the HSR service, the longer distance routes will encourage a switch from the existing road and air transportation networks to the HSR service, and as a result, the impact by the longer distance HSR routes will be greater.
3. The Bangkok-Rayong route, linking the three international airports of Don Muaeng, Suvarnabhumi, and U-Tapao, should generate about a five-fold greater impact than the non-linking the three international airports case At the district level, the services sector dispersion will spread to many districts within the provinces with HSR stations. This observation suggests that the improved connectivity will encourage travelers to use the HSR service. If the three international airports linked by the Bangkok-Rayong HSR double the operational frequency from one train every hour to one train every 30 minutes, the impact could be more than four-fold. The frequency of operation of the service is a very important factor.
4. Nevertheless, the economic impact generated by the HSR service will be very small. Even the more frequent service case will only increase Thailand's GDP by 0.1 percent by 2035.
5. In order to achieve a greater impact from the HSR program, urban planning is needed to improve the urban amenities and increase the productivity of the services sector. If Bangkok and the districts with HSR stations succeed to increase the services sector's productivity by 10 percent, it will increase Thailand's GDP by more than 30 times, an increase by 9.3 percent of GDP can be achieved, led by the services sector, But the manufacturing sector will likely decrease. This simulation result suggests that that the benefits of the HSR service will depend on how much the districts with HSR stations improve the local urban amenities through urban planning.
6. Regarding the impact on the neighboring countries, the HSR and the EEC will generate a much smaller impact than expected. Cambodia, Laos, and Myanmar will increase their GDP by about 0.1 percent of their respective GDP. The Bangkok-Rayong HSR and the EEC will not affect the neighboring countries. This

observation indicates that congestion will not be a factor due to development of the Bangkok-Rayong HSR and the EEC.

Based on the above findings, we would recommend the following transportation infrastructure policy for economic development:

1. Railway transportation, either HSR, medium-speed railway, or other railway systems for people, in order to increase the services sector. If it is a cargo railway, it only benefits the manufacturing sector.
2. Railway transport services should be linked to the existing transport network so that use of the various railway services increases.
3. Similarly, the frequency of the railway service is crucial, so that people or goods can switch from a truck or a bus to the railway service.
4. Nevertheless, the economic impact of such railway service will not be large. The inner-city railway service that improve urban amenities, and increase the productivity of the services sector, will achieve a greater economic impact than the inter-city railway network. The inter-city railway service should be closely linked with the inner-city railway transportation system in order to attract high quality human resources.
5. To encourage a railway transport mode society, a social welfare system for public transportation is necessary, whereby firms or governmental organizations compensate the commuting cost of the workers. In Japan, workers receive a commuting allowance from their company or a governmental organization, and this is a tax-free allowance.

Summary of the Simulation Results

HSR Routes	agr	auto	e.e	textile	food	oth	ser	min	GDP	% of GDP in 2015
Scenario 1: Northeastern Line, Bangkok–Nong Khai in 2025	3	82	59	43	65	171	804	0	1,228	0.3%
Scenario 4: Eastern Line, Bangkok–Rayong in 2023	−0	−3	−2	−1	−2	−4	60	−0	49	0.0%
Scenario 50: Eastern Line, linking the three international airports	−0	−11	−7	−5	−8	−19	291	−0	242	0.1%
Scenario 51: Eastern Line (SC50 plus high frequency)	−1	−39	−27	−18	−29	−74	1,284	−0	1,095	0.3%
Scenario 52: Eastern Line (SC51) + to Ayutthaya in 2025	−1	−39	−27	−18	−29	−73	1,339	−0	1,152	0.3%
Scenario 6: Eastern Line (SC52) + EEC	−58	−1,014	−642	−412	−591	584	39,429	−7	37,288	9.3%

Source: IDE-GSM simulation result