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Economic Potential of the Vientiane–Ha Noi Expressway Based on Experience of the Mekong Region

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Abstract: *The Vientiane–Ha Noi Expressway (VHE) will connect the capitals of Lao People's Democratic Republic (Lao PDR) and Viet Nam, which have established special relations in politics, security, and ideology. Vientiane, however, has closer economic relations with Thailand than with Viet Nam and is further from Ha Noi than from Bangkok. Lao PDR trade is skewed towards Europe and India but weaker with the Pacific island countries, with which the VHE has the potential to increase trade. The economic effects of developing an expressway in northern Viet Nam show that the VHE could promote tourism, attract foreign direct investment, and create agricultural infrastructure for supplying vegetables and fruits to major cities; such effect on foreign direct investment is verified statistically. To ensure the VHE's success, cross-border costs need to be reduced on both sides, and relations amongst friendship cities and provinces in Lao PDR, Viet Nam, and Thailand need to be deepened and expanded.*

Keywords**:** Lao PDR, Viet Nam, Thailand, Transportation, Expressway, Road Infrastructure, Regional Cooperation
JEL Classification**:** R11, R42, R58

Introduction

Lao People's Democratic Republic (Lao PDR) and Viet Nam have had special relations based on ties between the Lao People's Revolutionary Party and the Communist Party of Viet Nam since the revolutionary period (Savada, 1994).[1] Bilateral ideological, political, and security relations have been particularly tight.

The Truong Son mountain range (or Annamite Range), however, has hampered exchange between the two capitals (Keola, 2013) and the construction of a road directly connecting them. Two of the three economic corridors in the Greater Mekong Subregion Economic Cooperation Program are National Highway (NH) No. 9 of Lao PDR and Viet Nam, a part of the East–West Economic Corridor (EWEC); and NH No. 3 of Lao PDR, which connects Chiang Rai Province of Thailand and Yunnan Province of China, and is part of the North–South Economic Corridor (NSEC). Lao PDR's relations with Thailand are substantially closer than with Viet Nam (Kimura, 2000) and economic relations with Bangkok have become more important for Vientiane, especially since the First Mekong Friendship Bridge was built in 1994. It is not a good strategy, however, for Lao PDR to continue to strengthen economic relations only with Thailand. For example, trucks that deliver and collect Lao PDR imports or exports to and from Bangkok or Laem Chabang Port all belong to Thailand or foreign and not Lao PDR firms, partly because Thailand authorities are reluctant to allow Lao PDR trucks on Thailand's roads for safety reasons, despite the 1999 road transport agreement between Thailand and Lao PDR (Andersson and Banomyong, 2010). For Lao PDR, being able to send and pick up exports and imports to and from Hai Phong or Lach Huyen Port is strategically important. For Thailand, improving connectivity between Bangkok and Ha Noi should be beneficial.

[1] Lao PDR became independent in 1953, led by Lao People's Revolutionary Party.

Lao PDR has closer economic relations with Thailand than with Viet Nam but has closer political and security ties with Viet Nam than with Thailand. Would the development of the Vientiane–Ha Noi Expressway (VHE) change this situation? The first section of this paper examines the potential for change by describing the situation of national highways between Vientiane and Hai Phong via Ha Noi and those between Vientiane and Bangkok, as well as trade relations between Lao PDR and Viet Nam and Thailand. The second section considers the potential of tourism. The third section shows possible economic effects of developing expressways using a case study of expressways in northern Viet Nam. The fourth section focuses on expressways' economic effects on foreign direct investment (FDI) approvals using econometric analyses. The fifth section recommends utilising the friendship of cities and provinces in Lao PDR, Viet Nam, and Thailand to improve trade, and presents challenges to reducing cross-border costs. Finally, the paper recommends policies.

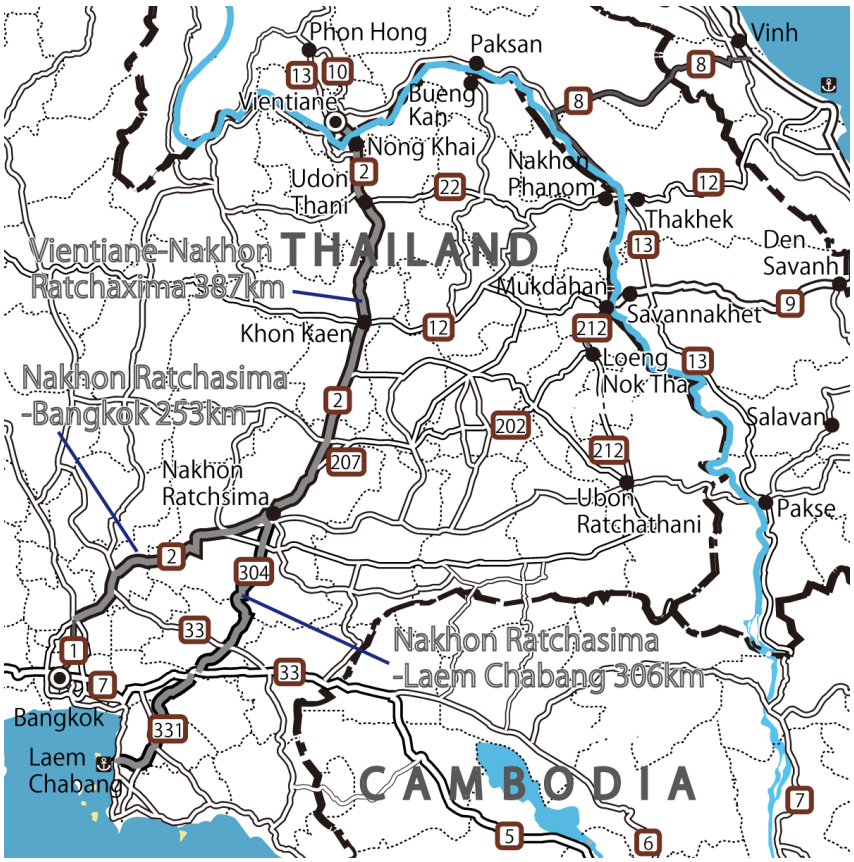
1. Vientiane–Ha Noi Expressway and the Road to Bangkok and Laem Chabang

What difference would the construction of the VHE make for landlocked Lao PDR's access to the port? The distance from Vientiane to Bangkok and to Laem Chabang Port is compared with that to Lach Huyen Port, which is expected to be replaced by Hai Phong Port, Viet Nam, by way of an existing route similar to the VHE's. This distance is also compared with that to Vung An Port, in which the Lao PDR government holds shares, in Ha Tinh Province, Viet Nam. Then Lao PDR–Viet Nam trade will be comparable to Lao PDR–Thailand trade.

The distance from Vientiane to Bangkok Port is 640 kilometers (km) while that to Laem Chabang Port is 693 km (Figure 1) (IDE–JETRO, 2017). Most of the cargo transport between Vientiane and Bangkok and its surroundings, and between Vientiane and third countries uses these routes. The distance from Vientiane to Lach Huyen Port is 886 km (Figure 2), from Vientiane to Paksan in Lao PDR 150 km, from Paksan to Vinh in Viet Nam 310 km

by way of NH No. 8, from Vinh to Phap Van in Ha Noi 289 km, and from Phap Van to Lach Huyen 137 km. On the other hand, according to the recommended route between Vientiane and Vinh and the North–South Expressway Masterplan of Viet Nam,[2] the distance from Vientiane to Vinh is 400 km and that from Vinh to Ha Noi is 294 km. Thus, the distance between Vientiane and Lach Huyen Port is 831 km; the distance from Vientiane to Phap Van around Ha Noi is 749 km and will be 694 km. The difference in distance to Laem Chabang Port and to Lach Huyen Port is around 193 km based on the existing road and 138 km based on the proposed route. The distance between Vientiane and Vung Ang Port is 540 km.[3]

Figure 1. Routes Connecting Vientiane and Bangkok and Laem Chabang

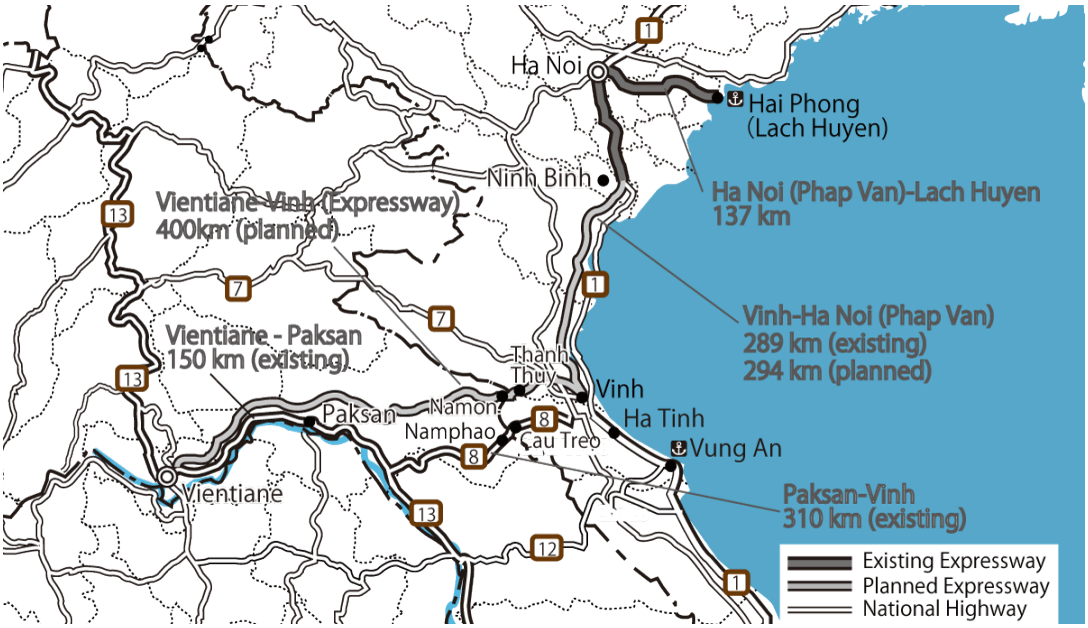


Source: Author.

[2] The distance of the recommended route between Vientiane and Vinh is based on JICA (2018), and the distance between Ninh Binh and Vinh indicated by the North-South Expressway Masterplan of Viet Nam is based on JICA (2010).

[3] The distance between Vientiane and Ky Anh near Vung Ang Port is 532 km according to a distance calculator. I calculated the distance between Ky Anh and Vung Ang Port at 8 km when I visited the port in 2011.

Figure 2. Highways Connecting Vientiane and Lach Huyen Port



Source: Author.

Lao PDR's exports from and imports to Thailand are around 40% and around 60% of Lao PDR's total exports and imports, respectively (Table 1). Lao PDR's exports from and imports to Viet Nam are 10%–20% and less than 10%, respectively. Lao PDR's trade with Thailand is greater than that with Viet Nam, and Viet Nam's imports from Lao PDR are declining. A comparison of Thailand's total exports and imports at borders with Lao PDR with the summary of imports to and exports from Lao PDR show that Thailand's exports at borders surpassed 100% of Lao PDR's total imports in 2017, while Thailand's numbers at the borders include transit trade by way of Lao PDR and by way of Thailand; exports and imports to and from Viet Nam, China, and Cambodia; and re-exports and exports to third countries by way of Thailand. It should be noted that exports are on a free-on-board basis and imports are on a cost, insurance, and freight basis.

Vung Ang Port is 540 km from Vientiane and nearer than Bangkok Port and Laem Chabang Port. However, few cargo ships drop at Vung Ang Port, which cannot compete with the two ports in Thailand. The distance to Lach Huyen Port is around 200 km longer than to Laem Chabang Port and Bangkok Port. The distance can be reduced to around 140 km with the

development of the VHE. The length of the section, however, where trailer speed should be below 30 km/h, is estimated at 34.3 km between Vientiane and Vinh (JICA, 2018).

Table 1. Lao PDR's Trade with Thailand and Viet Nam

	2005	2010	2015	2017
1) Total Exports of Lao PDR	555.0	1,897.3	3,813.1	4,963.9
2) Lao PDR's Exports to Thailand	212.1	715.7	1,381.8	2,115.5
2) / 1) x 100	(38.2)	(37.7)	(36.2)	(42.6)
3) Thailand's Imports from Lao PDR at Borders	137.5	736.0	3,206.8	4,690.5
3) / 1) x 100	(24.8)	(38.8)	(84.1)	(94.5)
4) Lao PDR's Exports to Viet Nam	92.0	275.2	553.3	516.0
4) / 1) x 100	(16.6)	(14.5)	(14.5)	(10.4)
5) Total Imports of Lao PDR	1,200.7	3,448.7	7,227.5	7,024.3
6) Lao PDR's Imports from Thailand	815.5	2,263.0	4,419.5	4,150.7
6) / 5) x 100	(67.9)	(65.6)	(61.1)	(59.1)
7) Thailand's Exports to Lao PDR at Borders	555.1	2,643.4	5,978.0	8,346.2
7) / 5) x 100	(46.2)	(76.6)	(82.7)	(118.8)
8) Lao PDR's Imports from Viet Nam	73.4	210.3	554.7	687.4
8) / 5) x 100	(6.1)	(6.1)	(7.7)	(9.8)

Notes:

1) Numbers of exports are on a free-on-board basis and those of imports are on a cost, insurance, and freight basis.

2) Thailand's border trade with Lao PDR includes transit trade by way of Lao PDR.

Source: ADB Key Indicators for 1), 2), 4), and 5); and Bank of Thailand for 3) and 6).

The distance from the centre of Vientiane to the Tha Na Laeng–Nong Khai border with Thailand is just 19 km, but the distance to the Namphao–Cau Treo border with Viet Nam is 356 km; from the Cau Treo border to Phap Van (Ha Noi), 393 km; and to Lach Huyen Port, 530 km.[4] On the other hand, the distance from Vientiane to the Nam On border is estimated to be 339 km.[5] A truck has to leave Vientiane around 11:00h or 12:00h, assuming an average

[4] These distances are estimated with my traveling record in December 2010, because the distance calculator did not show the distances.

[5] The distance from the Thanh Thuy border to Vinh is estimated to be 61 km (JICA 2018).

speed of 40–50 km/h, for instance, if the border is closed at 20:00h, even though the distance to the border is shortened to 300 km. But if the truck crosses the border before 20:00h, it can arrive at Lach Huyen Port early in the morning. It would be better, therefore, if the border closing time could be made more flexible.

Viet Nam's share of Lao PDR's total exports is lower than Thailand's and declining. Viet Nam's share of Lao PDR's total imports is rising although it is still less than 10%. As of 2017, Lao PDR's second-largest source of imports was China, followed by Viet Nam (Table 2), Japan, the Republic of Korea (henceforth, Korea), Germany, Singapore, the United States, India, and Hong Kong. The fourth-largest destination for Lao PDR's exports is India, followed by Japan, the United States, Germany, the Netherlands, the United Kingdom, and Korea. Exports to the United States, Japan, and Korea are strategically important. The United States ranks much lower than East Asian countries and lower than Germany as an exporter to Lao PDR. India ranks higher than Japan and Korea as a Lao PDR export destination. For Lao PDR's trade with Pacific island countries, the VHE is more advantageous than the road to Bangkok and to Laem Chabang. Increasing trade with Pacific island countries is yet another reason to develop the VHE.

Table 2. Lao PDR's Trade with Major Countries

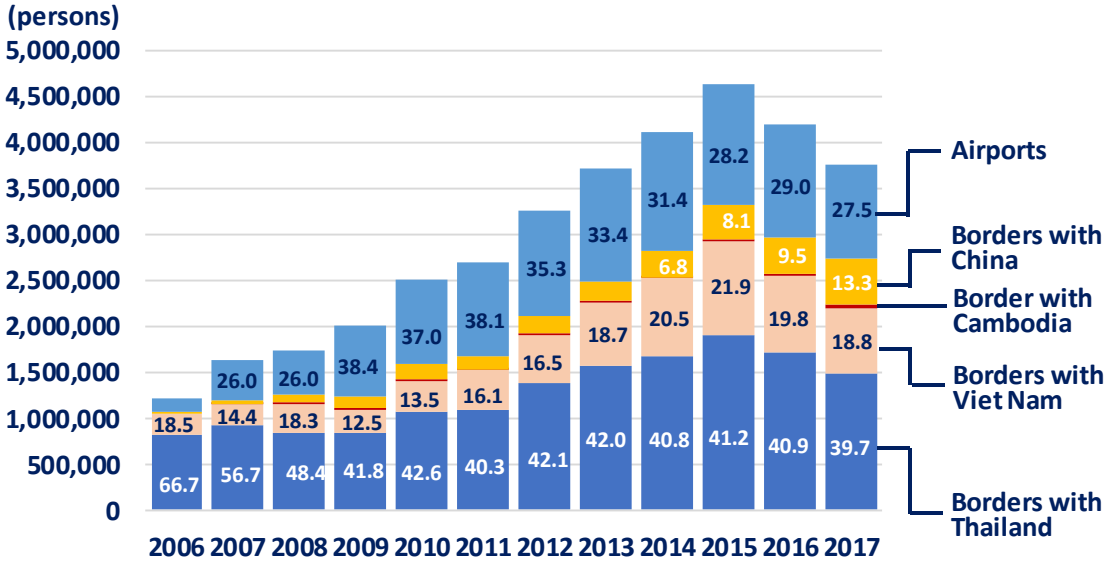
Imports, total	7,024.3	(100.0)	Exports, total	4,963.9	(100.0)
1. Thailand	4,150.7	(59.1)	1. Thailand	2,115.5	(42.6)
2. China	1,511.2	(21.5)	2. China	1,421.2	(28.6)
3. Viet Nam	687.4	(9.8)	3. Viet Nam	516.0	(10.4)
4. Japan	123.2	(1.8)	4. India	217.6	(4.4)
5. Rep. of Korea	100.7	(1.4)	5. Japan	140.7	(2.8)
6. Germany	36.2	(0.5)	6. United States	90.8	(1.8)
7. Singapore	33.8	(0.5)	7. Germany	81.6	(1.6)
8. United States	27.2	(0.4)	8. Netherlands	52.3	(1.1)
9. India	26.9	(0.4)	6. United Kingdom	25.8	(0.5)
10. Hong Kong	23.1	(0.3)	10. Rep. of Korea	25.1	(0.5)

Source: ADB Key Indicators 2018.

2. Potential of Tourism

How about the movement of people? The Lao PDR Department of Tourism Marketing, Ministry of Information, Culture and Tourism shows how many foreign tourists arrive by port of entry. Figure 3 shows the number and share by country. Tourists crossing the border with Thailand comprise the largest share—39.7%–66.7%—but this is declining. Tourists crossing the border with Viet Nam comprise 12.5%–21.9%, increasing until 2015. The trend of foreign tourists arriving in Lao PDR by way of Viet Nam was also upward until 2015 but declined after 2015.

Figure 3. Foreign Tourist Arrivals in Lao PDR by Border and Airport



Note: The numbers in the bars mean share (%) by country on the other side of the border.

Source: Based on figures from Tourism Department, Ministry of Information, Tourism and Culture, Lao PDR.

In 2015 and 2016, I interviewed tour agents in north-eastern Thailand and central Viet Nam. A tour agent at Ha Tinh, Viet Nam, said that tourists in Viet Nam who enjoy following routes have increased:

1) Ha Tinh or Vinh > Vientiane (first night) > Sightseeing in Vientiane > Udon Thani (shopping, second night) > Nakhon Phanom (Ho Chi Minh Memorial Complex) > Ha Tinh or Vinh (2

nights, 3 days). Some tourists visit Bangkok and Pataya after visiting Udon Thani.

A route that connects the Plain of Jars in Xieng Khouang, Luang Prabang, and Vientiane (4 or 5 nights) is also popular. The Ho Chi Minh Memorial Complex includes a house where 'Uncle Ho' lived for a while in the 1920s.[6] Tourists from Ha Noi may fly back to Ha Noi but those from central Viet Nam might be expected to use the VHE.

After the completion of the EWEC in 2005 and the Second Mekong Friendship Bridge in 2008, Thai tourists who enjoyed following tours increased temporarily:

2) Mukdahan > Hue (first night) > Sightseeing in Hue > Da Nang (second night) > Sightseeing in Da Nang and in Hoi An > Hue (third night) > Mukdahan (3 nights, 4 days)

Some Thai tourists who enjoyed the above tour also chose a tour such as the following:

3) Nong Khai > Vientiane (first night) > Sightseeing in Vientiane > Vinh (second night) > Ninh Binh (second night) > Sightseeing in Hoa Lu and Tam Coc > Ha Long Bay (third night) > Sightseeing in Ha Long Bay > Ha Noi (fourth night) > Vinh (fifth night) > Vientiane (sixth night) (6 nights, 7 days)

The tourists who enjoy this route are expected to use the VHE. Tourists in north-eastern Thailand may use the VHE, while tourists from Bangkok and suburbs usually take a direct flight to Ha Noi. The tour agent at Ha Tinh said some Thai tourists from Chiang Mai also use the above-mentioned route. Thai tourists in north-eastern and northern Thailand and Vietnamese tourists in central Viet Nam should, therefore, be targeted.

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[6] The interview with a tour agent at Ha Tinh on 21 October 2016 and this survey result are part of a research project, Greater Mekong Subregion Economic Corridors Focusing on Human Connectivity, supported by a Grant-in-Aid for Scientific Research (C) of the Japan Society for the Promotion of Science, Grant Number JP26360036.

3. Potential Economic Effects of Expressways

In northern Viet Nam, the following expressways have been developing rapidly over the past 10 years (Figure 4):

1) Phap Van–Cau Gie Expressway (completed on 1 January 2002)

2) Lang–Hoa Lac Expressway (completed on 3 October 2010)

3) Cau Gie–Ninh Binh Expressway (completed on 30 June 2012)

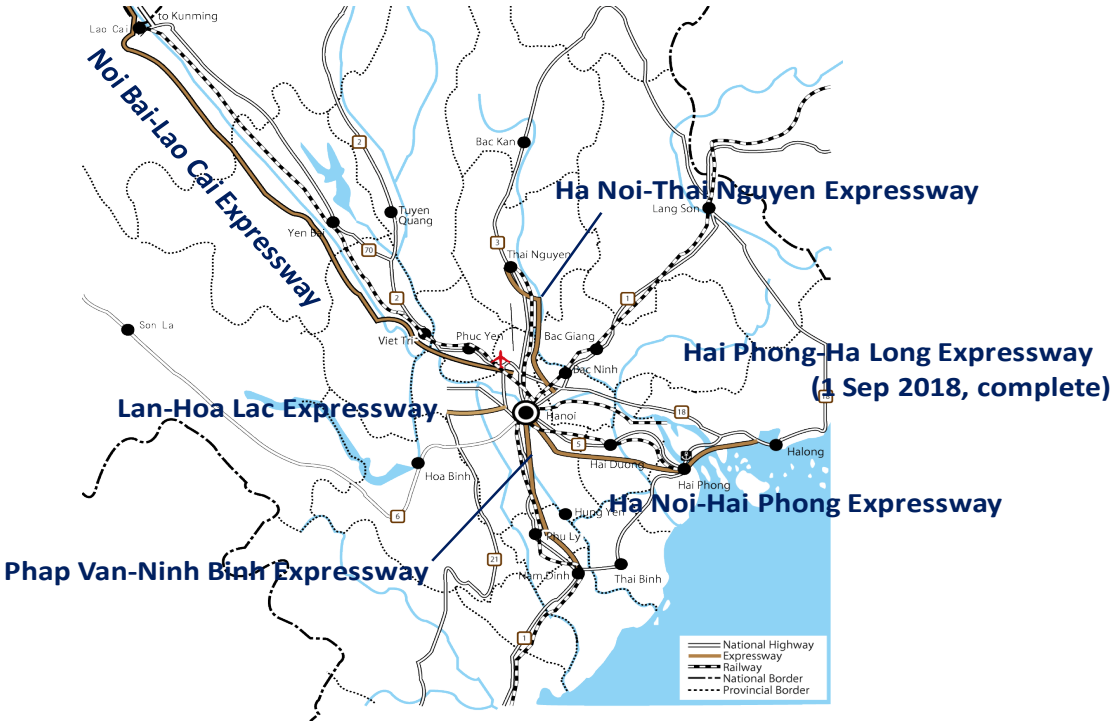
4) Ha Noi–Thai Nguyen Expressway (completed on 13 July 2013)

5) Noi Bai–Lao Cai Expressway (completed on 21 September 2014)

6) Ha Noi–Hai Phong Expressway (completed on 5 December 2015)

7) Hai Phong–Ha Long Expressway (completed on 1 September 2018)

Figure 4. Recent Development of Expressways in Northern Viet Nam



Source: Author.

To know more about the economic benefits of expressways, I interviewed the people's committees of Phu Tho, Yen Bai, and Lao Cai provinces along the Noi Bai–Lao Cai Expressway in January 2016. The interviews tell us that the experiences of Viet Nam affect not only the VHE section in Viet Nam but also that in Lao PDR.

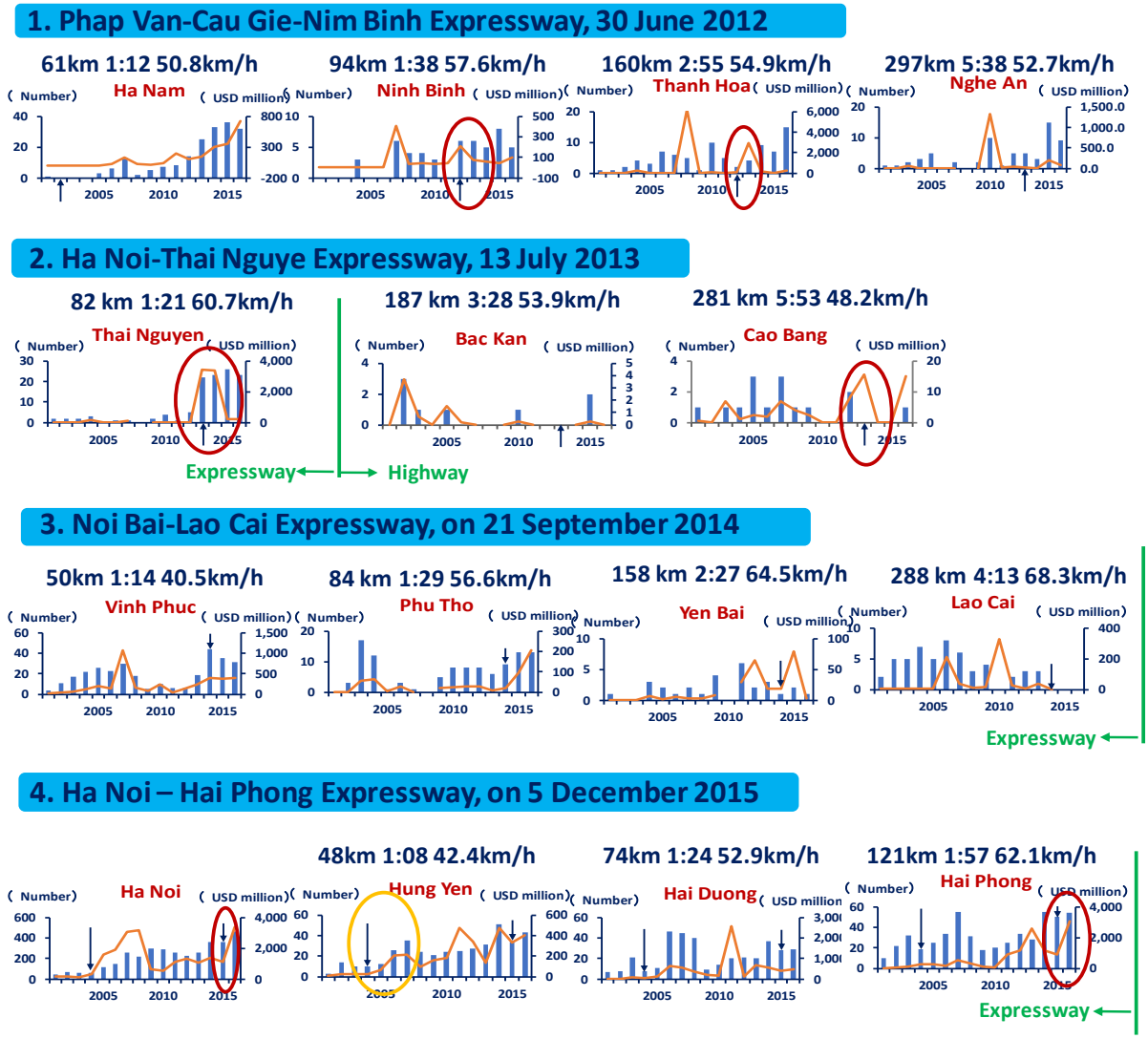
The People's Committee of Lao Cai Province, 292.8 km away from Ha Noi, said that the number of domestic tourists using their own cars from Ha Noi to Sa Pa, which attracts foreign and domestic tourists and is 321.9 km away from Ha Noi, dramatically increased. Before the expressway, tourists had to take the night train from Ha Noi to Sa Pa and back. But it takes only 4 hours to Sa Pa by car. Hotels and parking spaces could not keep up with demand.

The People's Committee also said shorter transportation time allowed farmers to transport vegetables and other perishable goods to Ha Noi. Lao Cai City is just 90 metres (m) above sea level, Sa Pa is around 1,200–1,800 m above sea level. The difference in elevation makes it possible to produce various agricultural products, including high-value-added

subtropical fruits and vegetables. Chiang Mai and Chiang Rai in Thailand also produce high-value-added agricultural products such as Doi Tung coffee, highland lettuce and carrots, tea, frozen vegetable juice, and cut flowers.

The people' committees of Phu Tho and Yen Bai provinces, which are 73.4 km and 158.5 km from Ha Noi, respectively, pointed out that new industrial estates around the expressway interchanges have attracted more FDI (Figure 5). FDI approvals in Ninh Binh Province have increased since 2012, when the Phap Van–Cau Gie–Ninh Binh Expressway was completed. FDI has increased in Thai Nguyen Province since the Ha Noi–Thai Nguyen Expressway was completed, and temporarily increased in Cao Bang Province when the expressway was extended. FDI increased in the provinces along the Noi Bai–Lao Cai Expressway, except in Lao Cai. FDI increased only in Ha Noi a year after the Ha Noi–Hai Phong Expressway was completed but there may have been other causes for this. FDI approvals increased in Hung Yen and Hai Duong provinces not after the expressway was developed in 2016 but after the road was expanded in 2000 and bridges strengthened in 2004 along National Highway No. 5.

Figure 5. Effects of Expressways on Foreign Direct Investment Approval



Notes: 1) Bars mean 'number' and polygonal lines mean 'amount' of FDI.

2) Distance, time, and speed are derived using a distance calculator.

Source: Calculated by the presenter based on Viet Nam's General Statistics Office data.

If the above-mentioned potential effects are promoted, the number of vehicles using the VHE will increase.

4. Econometric Analyses of Expressways' Effects on Foreign Direct Investment Approvals

The analyses of Figure 5 show some plausible effects of expressways' development on FDI approvals in the provinces traversed by expressways. Regarding the economic effects of road infrastructure, Fujimura (2018) estimates the growth rate of gross provincial product (GPP) of six Greater Mekong Subregion countries (Cambodia; Lao PDR; Myanmar; Viet Nam; Thailand; and Yunnan Province and Guangxi Zhuang Autonomous Region, China) by population growth, capital growth, and dummy variables for infrastructure. The analytical results show the significant effects of road transport growth on passengers and cargo, of the economic corridor on GPP growth, and of economic corridors on the import value of electric and transport machinery. Taguchi and Lar (2015) show the reduction of Viet Nam in the service-link cost and its integration into international production network, as well as the immature integration of Cambodia, Lao PDR, and Myanmar because of their higher service-link costs by logistics performance index of the World Bank, using import and export data of machinery in Thailand. The effects of road infrastructure on FDI have not yet been determined using positive analyses. I therefore analyse the effects using econometrics.

The model to estimate FDI is expressed as follows:

$$\textbf{Number of FDI Approvals}_{i,j} = \alpha\ \textbf{Real GDP}_{j} + \beta\ \textbf{Distance from Ha Noi}_{i} + \gamma\ \textbf{Expressway Dummy}_{i,j} + \varepsilon_{i,j} \quad (1)$$

or

$$\textbf{Amount of FDI Approvals}_{i,j} = \alpha\ \textbf{Real GDP}_{j} + \beta\ \textbf{Distance from Ha Noi}_{i} + \gamma\ \textbf{Expressway Dummy}_{i,j} + \varepsilon_{i,j} \quad (2)$$

The subscript *i* represents 25 provinces in the Red River Delta and in the Northern Midland and Mountainous Region, and of Nghe An and Thanh Hoa provinces on the way to Vientiane. The subscript *j* represents years, from 2001 to 2016. The number and the amount of FDI approvals (US dollars) is based on the General Statistics Office of Viet Nam. The amount of FDI is deflated by the deflator of capital formation based on World Development Indicators. Real GDP is also based on World Development Indicators. The expressway dummy, D1, is 1 where the expressway has been completed and 0 where the expressway does not yet exist. For example, the Phap Van–Ninh Binh Expressway was completed on 30 June 2012, so D1 is 0 from 2001 to 2011, 1 from 2013 to 2016, and 0.505464 (185 days from June 30 to December 31 / 366 days) in 2012. The effects of the expressways' development did not continue and were temporary. The positive growth of the number and amount of FDI continues 1.3 years on average after road improvements, based on cases in the Greater Mekong Subregion (Ishida, 2018). So D2 is defined as another expressway dummy variable with fade-out effects. In Ninh Binh Province, D2 was 1 in 2013, 1/2 in 2014, 1/3 in 2015, and 1/4 in 2016, with inverses of time trend.

The dataset is panel data composed of 27 provinces and 16 years. In the analyses, the model is estimated with the pooled data model, the fixed effect model, and random effect model. The fitting of the models between the pooled data model and the fixed effect model is evaluated by the redundant fixed effects test, and that of the models between the fixed effect model and the random effect model is evaluated by the Hausman test.

Table 3 summarises the key statistics. Table 4 shows the estimated results in cases where the dependent variable is the number of FDI. Table 5 shows those in cases where the dependent variable is the amount of FDI. In accordance with the redundant fixed effects test and the Hausman test, the fixed effect models are evaluated as the most appropriate in all four cases. In the case of the fixed effect models where the dependent variable is the amount of FDI with fade-out effects, the dummy variable of the expressway is significant at 5%. In other words, the amount of approved FDI could be US$296.3 million for the next year in the province where the expressway is completed. In other cases of the fixed effect model, the dummy variables are not significant and unexpected signs are shown in the case of the number of FDI approvals. However, the coefficients of all the pooled data model for the number and amount of FDI approvals are significant at 1%, and those of the random effect model for the amount of FDI are also significant at 5% or 1%. These positive effects of the expressway dummy variable might be absorbed by the provincial dummy variables in the fixed effect models, which do not show statistical significance. Table 6 shows the coefficients of provincial dummy variables for the amount of FDI with fade-out effects and the distances from Ha Noi in parentheses. Ha Noi (0 km), Bac Ninh (40 km), Hai Phong (121 km), Thanh Hoa (160 km), Hai Duong (74 km), Thai Nguyen (61 km), Bac Giang (44 km), Vinh Phuc (41 km) show positive coefficients of provincial dummy variables.

Table 3. Summary of Key Statistics

	Observation	Mean	Min.	Max.	S.D.
Number of FDI	432	17.0	0.0	462.0	49.2
Amout of FDI (Million USD)	432	215.3	0.0	6,169.2	600.0
GDP (USD)	16 (x27)	1.09E+11	6.49E+10	1.64E+11	3.02E+10
Distance (km)	27 (x16)	163.2	0.0	455.0	119.2

FDI = foreign direct investment, GDP = gross domestic product, km = kilometre, max. = maximum, min. = minimum, S.D. = standard deviation.
Source: Author's calculations.

Table 4. Estimated Results of the Number of Foreign Direct Investment Approvals

	Pooled	Fixed	Random	Pooled	Fixed	Random
Constant	9.175575	-16.34176	8.131203	11.48006	-15.9039***	8.60737
	(8.123368)	(4.824539)	(11.40472)	(7.455795)	(4.805474)	(7.781093)
Real GDP	1.48E-10**	3.15E-10***	2.98E-10***	1.06E-10	3.07E-10***	2.68E-10***
	(6.97E-11)	(4.52E-11)	(4.50E-11)	(6.60E-11)	(4.42E-11)	(4.40E-11)
Distance	-0.09300***		-0.14337***	-0.08593***		-0.13433***
	(0.018059		(0.052118)	(0.016901)		(0.031560)
D1	57.8359***	-8.770691	-1.86962			
	(57.83587)	(7.029921)	(6.797415)			
D2				84.0755***	-6.24358	11.24321
(Fade-out)				(7.455795)	(6.658838)	(6.350168)
Observation	432	432		432	432	
Adjusted R^2	0.263057	0.720368		0.340239	0.738096	0.121165
Redundant		F: 30.5708***			F: 25.6163***	
Hausman			Chi^2: 0.000			Chi^2: 0.000

D1 = expressway dummy without fade-out effects, D2 = expressway dummy with fade-out effects, GDP = gross domestic product, R^2 = R-square.

Notes:

1) 'Redundant' means the result of redundant fixed effects test and 'Hausman' means the results of the Hausman test.

2) The number in parentheses is a standard error. *: 10%, **: 5%, and ***1% significant.

Source: Author's calculations.

Table 5. Estimated Results of Amount of Foreign Direct Investment Approvals

	Pooled	Fixed	Random	Pooled	Fixed	Random
Constant	-6.532424	-191.206	-8.05083	11.71168	-177.4302	4.903312
	(107.7179)	(94.79698)	(125.8110)	(105.1468)	(93.97117)	(115.8439)
Real GDP	3.14E-09***	3.52E-09***	3.36E-09***	2.63E-09***	3.35E-09***	3.02E-09***
	(9.25E-10)	(8.88E-10)	(8.69E-10)	(9.02E-10)	(8.64E-10)	(8.54E-10)
Distance	-0.98607***		-1.05931**	-0.86895***		-0.98364***
	(0.239470)		(0.451116)	(0.231057)		(0.376299)
D1	346.444***	193.5876	259.6389**			
	(92.31491)	(138.1304)	(117.9126)			
D2				616.189***	296.301**	443.575***
(Fade-out)				(101.9315)	(130.2137)	(115.3442)
Observation	432	432	432	432	432	432
Adjusted R^2	0.12753	0.273096	0.073843	0.169712	0.27882	
Redundant		F: 5.04079***			F: 4.07828***	
Hausman			Chi^2: 0.000			Chi^2: 0.000

D1 = expressway dummy without fade-out effects, D2= expressway dummy with fade-out effects, GDP = gross domestic product, R^2 = R-square.

Notes:

1) 'Redundant' means the result of redundant fixed effects test and 'Hausman' means the results of the Hausman test.

2) The number in parentheses is a standard error. *: 10%, **: 5%, and ***1% significant.

Source: Author's calculations.

Therefore, with the expressway's development, FDI can at least temporarily increase, but as the pooled data model and random effect model have shown, the effects of attracting FDI depreciate with distance from Ha Noi. Based on the estimated coefficients, being100 km away from Ha Noi will decrease 9–14 FDI approvals or US$ 86.9–105.9 million.[7] Provinces that show positive coefficients of the provincial dummy variables in Table 6 are not so far from

[7] The coefficients of Distance in the 1st and 3rd column of Table 4 are –0.093 (absolute value is minimum) and –0.14 (maximum), respectively. This means that the number of FDI will decrease by 0.093 and by 0.14 with 1km away from Ha Noi. In case of 100km away from Ha Noi, it will be 9 and 14, respectively. The coefficients of 4th and 3rd column of Table 5 are –0.86895 (minimum) and –1.05931 (maximum). The unit of the amount of FDI is US$1 million . Hence, the amount will decrease US$86,895 and US$105,931 with one km. In case of 100km away from Ha Noi, the number can be US$86.9 million and US$105.9 million.

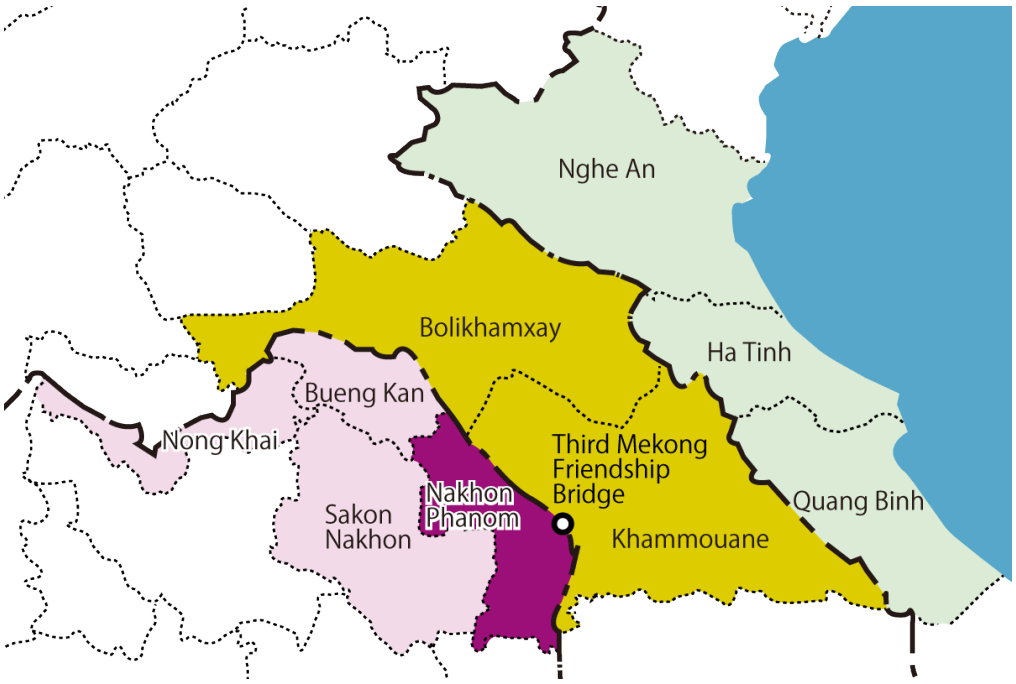
Ha Noi. Thanh Hoa is the farthest amongst the provinces that show positive coefficients. This is partly because projects that need a large amount of investment capital, such as a petrochemical refinery and a power plant, have been implemented in Nghi Son, which is 212.1 km from Ha Noi. Although Thanh Hoa is far from Ha Noi, it is a frontier area that can attract FDI such that the coefficient is positive. If these results are applied to Lao PDR, the frontiers that could attract FDI are Paksan, the capital of Bolikhamxay Province, or Vieng Kham, the T-junction of NH No. 13 with NH No. 8 (around 240 km from Vientiane) even though the recommended route of VHE does not pass Vieng Kham. This estimate coincides with future traffic volume projected by JICA (2018). In the mountainous area, which is more than 300 km from Ha Noi and Vientiane near the border between Lao PDR and Viet Nam, planting agricultural products such as high-value-added vegetables and promoting tourism could be profitable.

Table 6. Example of Coefficients of Dummy Variables
(Fixed effect model for amount of foreign direct investment with fade-out effects)

Province	Coefficient	Province	Coefficient
Lao Cai	-184.9886	Nghe An	-74.5932
Yen Bai	-219.0507	Thai Nguen	195.5134
Phu Tho	-194.0448	Bac Kan	-186.4580
Vinh Phuc	11.0982	Cao Bang	-182.7907
Ha Noi	882.8110	Quang Ninh	139.3025
Hung Yen	-28.0658	Thai Binh	-164.7337
Hai Duong	211.8722	Nam Dinh	-139.1644
Hai Phong	492.9790	Ha Giang	-184.3778
Bac Ninh	518.7079	Tuyen Quang	-177.8832
Bac Giang	32.1531	Dien Bien	-187.0208
Lang Son	-170.8994	Lai Chau	-186.8199
Ha Nam	-124.4967	Son La	-175.0677
Ninh Binh	-177.6032	Hoa Binh	-156.6855
Thanh Hoa	430.3070		

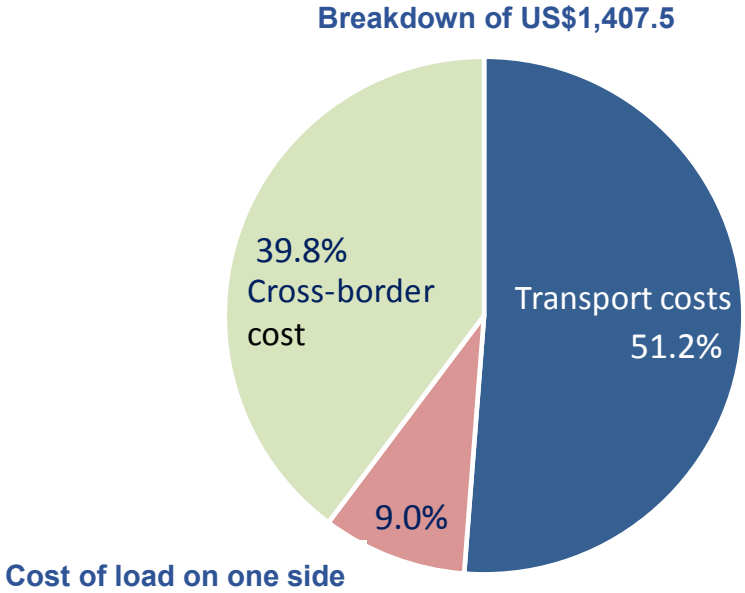
Source: Author's calculations.

Figure 6. Nine Provinces Party to the Friendship Agreement amongst Lao PDR, Thailand, and Viet Nam



Source: Author.

Figure 7. Breakdown of Logistics Cost between Bangkok and Vientiane



Source: IDE–JETRO (2017).

5. Recommendations and Challenges

Friendship agreements amongst cities and provinces should be used to promote the VHE. Four provinces in Thailand (Nakhon Phanom, Sakhon Nakong, Nong Khai, and Bueng Kan); two in Lao PDR (Bolikhamxay and Khammouang); and three in Viet Nam (Nghe An, Ha Tinh, and Quang Binh) meet twice a year to discuss trade, investment, education, and tourism. Originally, when the third Mekong Friendship Bridge was being planned, Nakhon Phanom Province, the two Lao PDR provinces, and the three Viet Nam provinces established friendships. At the opening ceremony of the Third Mekong Bridge on 11 November 2011, three other provinces in Thailand joined the friendship agreements.[8] Other provinces in the three countries should be invited to join. Vientiane and Ha Noi signed an agreement of friendship on 22 December 1978 and agreed to friendship city cooperation on 14 July 1987 (Institute of Developing Economies, 1979; Kimura 1988).

One challenge is to reduce cross-border transport cost. The Institute of Developing Economies, Japan External Trade Organization (2017) conducted a study, *Logistics Cost in Lao PDR,* in 2016–2017. It estimated the cost of transporting a 20–40-foot container at US$1,407.50, of which pure transport cost was US$721.00 (51.2%), cross-border cost US$559.50 (39.8%), and cost of 'load on one side' US$127.00 (9.0%). The customs clearance fee for the Lao PDR side was US$200–217, and for the Thailand side US$133–150. To move an empty container over the border, a forwarder has to pay US$50 to Lao PDR customs and US$17 to Thailand customs. If the customs authorities of Lao PDR and Viet Nam charge cross-border forwarders the same kind of fees, transport operators may be discouraged.

Regarding 'load on one side', when a manufacturing firm in Vientiane exports products to a third country via Laem Chabang Port, for instance, a shipping firm, the owner of

[8] This survey result is a part of a research project, Greater Mekong Subregion Economic Corridors Focusing on Human Connectivity, supported by a Grant-in-Aid for Scientific Research (C) of Japan Society for the Promotion of Science, Grant Number JP26360036.

the container, requests the manufacturing firm to transport an empty container to Vientiane. When a Lao PDR manufacturing firm imports parts and components from a third country via Laem Chabang Port, the manufacturing firm must also transport an empty container to Laem Chabang Port. This is because a container is easily damaged, and it becomes difficult for the shipping firm to determine which consigner damaged the container if the consigners are different on the way to the destination and on the way back. Shipping firms, therefore, ask consigners to follow this rule. Transporting an empty container over 693 km between Laem Chabang and Vientiane, however, is a burden for a consigner in Lao PDR.

A solution is to establish an inland container depot (ICD) at Vientiane. A manufacturer can bring a container back to the ICD, a staff member of the shipping firm can then check the container for damage, then another manufacturer can use the container to export to a third destination. Even if such an ICD were established, however, not all the issues related to 'load on one side' could be solved because of the trade imbalance between Lao PDR and Thailand. Lao PDR imports more than it exports and empty containers will pile up at the ICD. In that case, the shipping firm has to bring the container back to Laem Chabang Port. If the VHE is developed, the container could be transported to Hai Phong or Lach Huyen Port, improving the situation.

Concluding Remarks

This paper examines the VHE's potential. The first section discusses whether the VHE can be substituted with the connectivity between Vientiane and Bangkok or Laem Chabang Port. The existing national highway to Lach Huyen Port from Vientiane is around 200 km longer than that to Laem Chabang Port. The distance to the border gate of Nampao–Cau Treo border from Vientiane is 368 km, much farther than to the Tha Na Laeng–Nong Khai border, which is only 19 km away. Of total Lao PDR exports in 2017, those to Viet Nam comprised 10.4%, less than those to Thailand (42.6%). Of total Lao PDR imports, those from Viet Nam

comprised 9.8%, also less than those from Thailand (59.1%). It is not easy to draw an optimistic picture, considering these situations.

Lao PDR's trade with Pacific island countries is less than that with Europe and India. This situation can be changed by improving access to Lach Huyen Port via the VHE. As of 2017, the number of tourists visiting Lao PDR has been increasing; their numbers could increase even more with the VHE. Tourists from north-eastern Thailand to northern Viet Nam, and from central Viet Nam to Vientiane and Thailand may also increase once the VHE is developed. Lao PDR should strategically promote trade with the Pacific island countries and tourism targeting people in north-eastern Thailand and central Viet Nam.

Viet Nam's experience in developing its expressway network suggests the VHE's potential. Planting vegetables and fruits in mountainous areas should be promoted, as should attracting FDI to Paksan. Foreign investors will be encouraged to set up factories once the 5th Mekong Friendship Bridge between Paksan and Bueng Kan is built and roads in Thailand to Bangkok are improved. The potential of the VHE can be enhanced by deepening and expanding friendship agreements amongst cities and provinces. Finally, cross-border costs, including customs clearance, should be reduced.

References

Andersson, M. and R. Banomyong (2010), 'The Implications of Deregulation & Liberalization on the Logistics Service Industry in Lao PDR', *International Journal of Economics*, 128, pp.68–76.

Fujimura, M. (2018), 'Evaluating the Impacts of Cross-Border Transport Infrastructure in the Greater Mekong Subregion: Three Approaches', in N. Yoshino, M. Helble, and U. Abidhadjaev (eds.), *Financing Infrastructure in Asia and the Pacific: Capturing Impacts and New Sources*. Tokyo: Asian Development Bank Institute, pp.296–329.

Institute of Developing Economies, Japan External Trade Organization (IDE–JETRO) (2017), *Logistics Cost in Lao PDR: Policy-Oriented Research Project Report.* Tokyo: IDE–JETRO. http://www.ide.go.jp/library/Japanese/Event/Reports/pdf/20170224_finalreport.pdf (accessed 15 February 2019).

Institute of Developing Economies (1979), 'Indochina in 1978', *Analysis of Current Affairs in Asia 1979* [in Japanese], Tokyo: Institute of Developing Economies 1978, pp.231–72.

Ishida, M. (forthcoming), 'Road Infrastructure Development of the Three Economic Corridors of the Mekong Region' (in Japanese), in V.T. Tran and S. Karikomi (eds.), *Asian Dynamism and Mekong River Basin Development* (in Japanese). Tokyo: Bunshindo.

JICA (2010), *The Comprehensive Study on the Sustainable Development of Transport System in Vietnam (VITRANSS 2), North–South Expressway Masterplan Final Report*. Tokyo: JICA.

JICA (2018), *Data Collection Survey for Enhancing Connectivity in Asia Region*, Final Report. Tokyo: JICA. http://open_jicareport.jica.go.jp/pdf/12319620.pdf (accessed 15 February 2019).

Keola, S. (2013), 'Impacts of Cross-Border Infrastructure Developments: The Case of the First and Second Lao–Thai Mekong Friendship Bridges', in M. Ishida (ed.), *Border Economies in the Greater Mekong Subregion*. London: Palgrave Macmillan, pp.163–85.

Kimura, T. (1988), 'Cambodia and Laos in 1987', *Analysis of Current Affairs in Asia and Middle East 1988* (in Japanese). Tokyo: Institute of Developing Economies, pp.229–54.

Kimura, T. (2000), 'Laos in 1999' (in Japanese), *Analysis of Current Affairs in Asia in 1999* (in Japanese). Tokyo: Institute of Developing Economies, pp.245–60.

Savada, A. M., ed. (1994), *Laos: A Country Study*. Washington, DC: US Government Printing Office.

Taguchi, H. and N. Lar, (2015), 'Fragmentation and Trade of Machinery Parts and Components in Mekong Region', *The Singapore Economic Review,* 60(5), pp.1–21.

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