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THE ECONOMIC IMPACT OF TRANSPORTATION INFRASTRUCTURE DEVELOPMENT UNDER ONE BELT ONE ROAD INITIATIVE IN ASEAN

Master's thesis

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I have written this master's thesis independently. All viewpoints of other authors, literary sources and data from elsewhere have been fully referenced.

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Abstract

In 2013, China announced the One Belt One Road Initiative (OBOR), an ambitious initiative aimed at promoting regional economic growth and stimulating integration. OBOR is implemented primarily through large investments in transportation infrastructure in order to improve transportation connectivity as well as reducing trade costs. Although the initiative has been implemented years ago, it is unclear to what extent the development of transportation infrastructure has influenced the economic performance of the participating countries. In this paper, ten member states in Association of Southeast Asian Nations (ASEAN) are the study subjects to evaluate the comprehensive effects that the OBOR exerts through improving transportation infrastructure since ASEAN is China's largest trading partner.

This study conducted an in-depth analysis of investment in transportation infrastructure under the OBOR using a computable general equilibrium (CGE) model called Global Trade Analysis Project (GTAP). Empirical evidence shows that OBOR countries, especially larger and export-oriented economies, can achieve economic development through large-scale transportation infrastructure under the OBOR.

Keywords: China, Association of Southeast Asian Nations, One Belt One Road Initiative, GTAP

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Introduction

Research Motives

In 2013, China launched its One Belt One Road (OBOR) initiative. The objective of this strategy is to facilitate economic integration among different countries. One of the main focuses of OBOR is to improve infrastructure connectivity through investment. Infrastructure connectivity refers to the development of "railways, highways, air routes, telecommunications, oil and natural gas pipelines, and ports" in order to promote regional economic integration (Pop, 2016).

Under OBOR, infrastructure investment of approximately $4 to 8 trillion will connect China and the countries in Asia, Europe and Africa. OBOR is expected to benefit 65 percent of the world's population in over 68 countries, contributing more than 40% of global GDP. It will also account for more than 30% of global trade across regions along OBOR each year (Wang and Huo, 2019).

Southeast Asia is an important area in the OBOR and strengthening the transportation infrastructure is a priority. The OBOR is potentially good news for countries in the Southeast Asia since it is expected to drive economic growth (Jusoh, 2018). However, there are concerns that OBOR will lead to debt distress for countries in the Southeast Asia. According to Hurley et al. (2019), countries like Lao are at a significant risk of debt distress due to the implementation of OBOR. Laos is one of the poorest countries in Southeast Asia, with the majority depending on agriculture. Since 2013, the International Monetary Fund (IMF) has expressed concerns about Laos' ability to service its debts if it starts to build the China-Laos railway as well as other major projects. The $6 billion cost for the China-Laos railway account for almost half the GDP of Laos. Despite the fact that officials from the Lao Ministry of Finance underline that the government would not guarantee the vast majority of the financing from Exim Bank of China, the government of Laos will face significant pressure to

cover any losses. Although many financial terms of the railway project are still unknown, it is reported that Exim Bank of China will offer a $465 million loan with a 2.3 percent interest rate, a five-year grace period, and a twenty-five-year maturity for the joint company building and operating the railway. Besides, the government of Lao has also signed a $600 million loan agreement with Exim Bank of China for building a hydropower project in its Xieng Khuang Province (Hurley et al., 2019). Laos' large amount of borrowing from China creates serious concerns that it would likely result in debt.

In the case of Thailand, the Thai-Chinese railway project is likely to have a relatively moderate impact on the overall debt position for Thailand. The government of Thailand budgets $5.8 billion for Phase one of the railway project. The overall cost for the full route will be upwards of $9.9 billion, accounting for approximately 2 percent of the size of Thailand's economy. Since major infrastructure projects are often under-budgeted, they can end up costing several times more than the original budgets. Public transportation infrastructure usually brings more economic and social benefits than pure financial gain to citizens (Lam, 2019). Is OBOR really beneficial to the economics in the Southeast Asia or it will eventually lead to an inevitable "debt trap"? To clarify the question, the paper aims to provide a comprehensive assessment of the economic impact of transportation infrastructure under the OBOR with ten states in Association of Southeast Asian Nations (ASEAN) as the main focus.

Research Purposes

China's OBOR announced the noble concept of common prosperity, promising to bring huge profit to Southeast Asia. Will the transportation infrastructure investment benefit Southeast Asia? The purpose of this study is to evaluate the effect of transportation infrastructure investment under China's OBOR on trade and welfare in

ASEAN members states.

In the paper, the background and contents of OBOR will also be discussed, hoping to grasp potential effects of OBOR under more comprehensive analysis. Then, this paper will use a model analysis to simulate the economic benefits of OBOR. Finally, the findings of this paper could be regarded as reference when any country has been or will be engaged in dealing with OBOR issues with China.

Research Structure and Method

This study uses the Global Trade Analysis Project (GTAP), one of the most widely used computable general equilibrium (CGE) model for quantitative analysis of global economic issues, and the latest GTAP 10 database to analyze the effects of the establishment of the OBOR transportation infrastructure. The outline of this paper is as follows:

Chapter one reviews relevant literature. The development of OBOR in ASEAN member states will be introduced in Chapter two. Chapter three introduces the structure of GTAP model as well as two assumed scenarios to evaluate the potential impact of the OBOR on trade and welfare in Southeast Asia. In Chapter four, the paper presents the GTAP results and the interpretation. Chapter five concludes the thesis and discusses future work.

Keywords: China, Association of Southeast Asian Nations, One Belt One Road Initiative, GTAP

Research classification code(s) (CERCS): S180 Economics, econometrics, economic theory, economic systems, economic policy

1. Literature review

Despite huge investment and project implementation, there is still a lack of empirical understanding of the economic impact of OBOR transportation infrastructure investment. One of the reasons is that measuring at such a broad geographic scale is challenging (Chen and Li, 2021). In the first part of this chapter, the paper reviews general assessment of infrastructure's economic impact. Then, specific assessments of transportation infrastructure projects are presented in the context of OBOR.

1.1 Economic Impacts of Transportation Infrastructure

According to salient paradox theory, transportation infrastructure has a huge impact on a country's economy (Yii et al., 2018). Infrastructure improvement can lead to a reduction of transportation costs, which may facilitate an industrial agglomeration (Chen and Li, 2021). According to Chen et al. (2016), rail infrastructure investment in China has facilitated economic growth through increased demand and output expansion.

Several studies have also found that the improvement of transportation infrastructure has played a significant role in reducing international trade costs (Limao and Venables, 2001; Donaldson, 2018). Scholars such as Mold (2012) points out that public investment in infrastructure could significantly increase the productivity of private capital due to low levels of infrastructure development. Kumo (2012) used a bivariate vector auto regression model to conduct Granger causality tests between economic infrastructure investment, economic growth and employment in South Africa from 1960 to 2009. The results indicate that there was a strong causality between economic infrastructure investment and the growth of GDP. This implies that economic growth in South Africa was driven by economic infrastructure investment, while improved growth led to increased public infrastructure investment.

1.2 The Impact of OBOR Transportation Investment

Many scholars have found that transportation infrastructure projects in the OBOR countries improve regional and interregional connectivity, as well as international trade (Sheu and Kundu, 2018; Chan, 2018; Wang et al., 2020). According to Brooks and Hummels (2009), infrastructure development plays a vital role in trade expansion in Asia. De Soyres et al. (2018) analyzed the impact of the transportation infrastructure projects under OBOR. They pointed out that transportation infrastructure will reduce shipment times and trade costs in the OBOR countries significantly. According to their research, transportation infrastructure development in OBOR countries has reduced shipment time and trade costs by 1.7 to 3.2 percent and 1.5 to 2.8 percent, respectively.

Some scholars assessed the economic impact of infrastructure development in OBOR countries using CGE models. CGE, as a cutting-edge impact assessment tool, has been widely used to assess the economic impact of OBOR-related policies. One of the most commonly used CGE models is the GTAP model. The paper summarizes relevant studies that examined the impact of OBOR using the GTAP model (Table 1).

Table 1. Studies that examined the impact of OBOR using the GTAP model

Study	Author(s)	Data	Result/contribution
The one belt, one road initiative: impact on trade and growth	James Villafuerte, Erwin Corong, and Juzhong Zhuang	GTAP 9	Improving the transportation network and trade facilitation might boost GDP growth by 0.1 to 0.7 percent in Central, West, and South Asia. (Villafuerte et al.,

			2016).
Modelling the economic impact of the China Belt and Road Initiative on East Africa	Rodgers Mukwaya and Andrew Mold	GTAP 10	OBOR infrastructure investment could have reduced transportation costs in East Africa. The simulation results show that the total exports of countries and welfare could increase by $192 million and $1 billion, respectively (Mukwaya and Mold, 2018).
China's belt and road initiative: a preliminary quantitative assessment	Zhai	GTAP 9	OBOR is expected to benefit the global economy in terms of trade and welfare (Zhai, 2018).
Assessment of the effects of infrastructure investment under the belt and road initiative	Gaoju Yang, Xianhai Huang, Jiahui Huang and Hangyu Chen	GTAP 9	The paper examined the effect of infrastructure investment on total factor productivity enhancement and reduction in trade cost. The results showed that economic growth, welfare and trade in most regions would be promoted (Yang et al., 2020).

Based on Mukwaya and Mold's research (2018), the reduction in trade margin as a result of OBOR investment provides a 0.4 to 1.2 percent growth in the East African economy.

Fan Zhai (2017) used a dynamic global CGE model to examine the relationship between infrastructure and per capita income. The simulation results indicate a global welfare gain of 1.3 percent of global GDP by 2030 with a boost to global trade by 5 percent. Findings of another research showed that a 25 percent reduction in international road transport margin and a 5 percent reduction in sea transport margin would have a positive influence on Asia's economy (Villafuerte et al., 2016). GDP growth could increase by 0.1 to 0.7 percent, while the economic welfare is likely to increase by $94 billion.

Over the years, a number of studies have been conducted to evaluate the economic impact of OBOR on the global scale. However, few discussed how OBOR will influence Southeast Asia. Since ASEAN and China have very close trade relationship and ASEAN is now China's largest trading partner, this paper expects to examine the relationship of infrastructure investment and economic performance focusing on ASEAN states with the latest GTAP database.

2. The Overview of China's OBOR

This chapter tries give an overview of China's OBOR. In the first section, this paper introduces the OBOR. The second section studies the development of OBOR in ten ASEAN countries, including Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam. The third section is about China's investment and construction contracts under OBOR in ASEAN.

2.1 The Introduction of OBOR

China's economy has risen significantly since its economic reform and opening policies, and it is now one of the world's largest economies (Cai, 2017). Undoubtedly, China has been playing a crucial role in the global trade. However, in the face of saturated domestic demand and excess capacity, China has begun to actively expand outward. On the one hand, China tries to export its domestic products; on the other hand, China is eager to strengthen its regional integration with other countries. In view of this, Chinese President Xi Jinping made a speech titled "Promote People-to-People Friendship and Create a Better Future" at Kazakhstan during his visit in September 2013. He proposed to build a Silk Road economic belt to build closer economic relations, deepen cooperation, and enhance development with countries along the route. He again proposed the building of the 21st Century Maritime Silk Road[1] in the same year in Indonesia. At the Boao Forum on 28 March 2015, China released the "Vision and Action on Jointly Building Silk Road Economic Belt and 21st Century Maritime Silk Road", which was issued by the National Development and Reform Commission, Ministry of Foreign Affairs, and Ministry of Commerce. These two above ideas were

[1] Speech by Chinese President Xi Jinping to Indonesian Parliament. http://www.asean-china-center.org/english/2013-10/03/c_133062675.htm

jointly named One Belt One Road (OBOR). They become one of China's national strategies (Hong, 2016).

"One Belt" signifies a network of land trade routes connecting Asia and Europe, the "Silk Road", which existed roughly between the 2nd century BC and the 18th century AD. "One Belt" is the Silk Road Economic Belt that envisages six economic corridors: (1) The New Eurasia Land Bridge Economic Corridor; (2) The China-Mongolia-Russia Economic Corridor; (3) China-Central Asia-West Asia Economic Corridor; (4) China-Indochina Peninsula Economic Corridor; (5) China-Pakistan Economic Corridor; and (6) Bangladesh-China-India-Myanmar Economic Corridor (Figure 1).

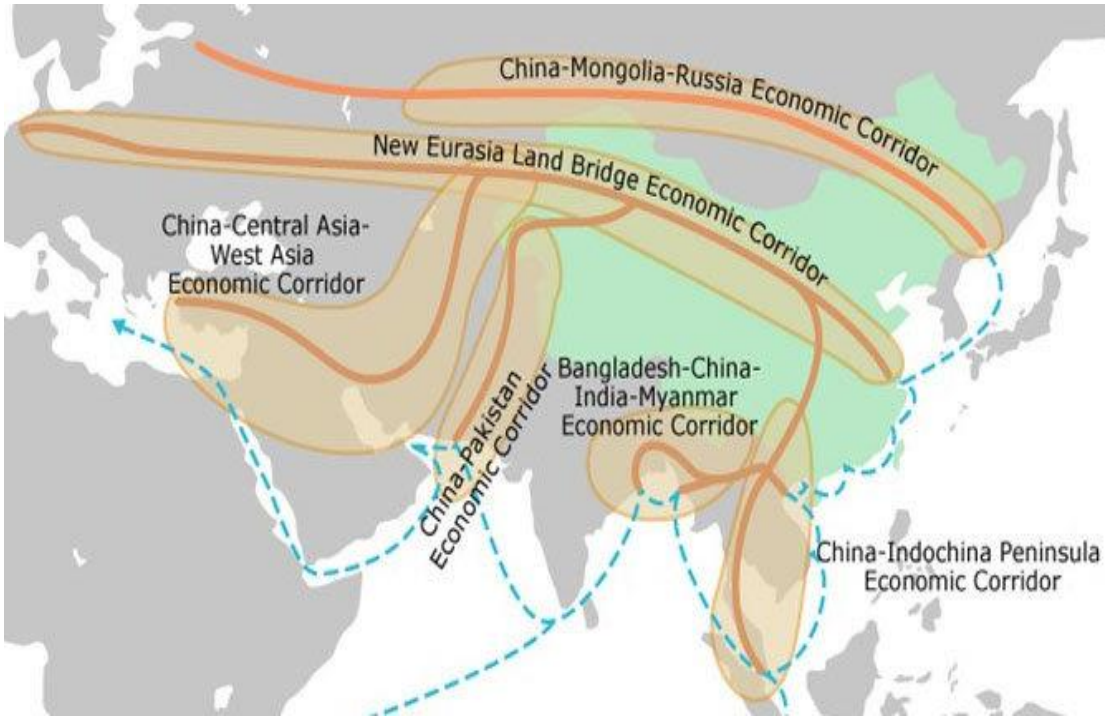


Figure 1. Six economic corridors of OBOR
Source: Losos, Pfaff, Olander, Mason & Morgan, 2019

On the other hand, "One Road" is known as the 21st Century Maritime Silk Road, which connects China to Southeast Asia, Indonesian, passing the Straits of Malacca,

Arabian Peninsula, crossing the Red Sea and eventually reaching Europe (Figure 2).

Figure 2. Maritime Silk Road

Source: https://www.silkroadbriefing.com/news/2019/07/17/indias-ideas-belt-road-alternative-project/maritime-silk-road/

When China proposed OBOR along with strategies of the Chinese enterprises "going out", Southeast Asia undoubtedly became the primary region of Chinese grand strategy. If China fails to integrate with neighboring Southeast Asian countries, it will be more impossible to promote grand strategy to the rest of Asia. Southeast Asia is close to China, with frequent interactions. In 1992, the Greater Mekong Subregion Economic Cooperation Program (GMS Program) was established in order to promote mutual trade, investment, development and security through close cooperation among China and Mekong River countries, namely Cambodia, Lao, Myanmar, Thailand, and Vietnam.

In November 2002, China and member states of the Association of Southeast Asian Nations (ASEAN) signed the Framework Agreement on Comprehensive Economic Cooperation which provides the legal basis for the creation of the ASEAN-China Free Trade Area (ACFTA). ACFTA came into force from 1 January 2010.

Under ACFTA, three agreements aim to promote free flow of goods, services, and investments among China and ASEAN member states[2].

The Southeast Asia is considered to be one of the most important regions in the blueprint of OBOR. Trade between China and the ASEAN climbed from $8.36 billion in 1991 to $685.28 billion in 2020 with an average annual growth rate of 16.5 percent. In 2020, ASEAN has become China's largest trading partner, and China has retained its position as ASEAN's largest trading partner for the 12th consecutive year (Ministry of Commerce of the People's Republic of China, 2021). China has been investing plenty of infrastructures in order to strengthen the link with Southeast Asia, pushing the progress of Trans-Asian Railway. The Trans-Asian Railway project is an inter-governmental cooperation to enhance the efficiency and development of the railway infrastructure. Trans-Asian Railway project is expected to connect different countries, reduce trade costs and benefit economies. Details of Trans-Asian Railway project will be discussed in detail later.

2.2 OBOR as National Instrument to Maintain China's Growing Economy

According to "Political-Economic Geography of 'the Belt and Road' Initiative," Wang Wen-Cheng (2016) argues that 30 million workers were laid off in China after the financial crisis in 2008, "a recovery plan" is needed urgently to promote capital flows. One of the most effective methods is to "invest heavily in the infrastructure of developing countries." Therefore, this leads to the formation of the OBOR Initiative.

The OBOR is meant to maintain the continuation of China's economic development via cooperation with ASEAN countries. Ever since China embarked upon

[2] Three agreements include ASEAN-China Trade in Goods Agreement, Agreement on Trade in Services and Investment Agreement.

the path of economic reform back in the days when Deng Xiaoping was in power, China has taken a new path to tackle foreign affairs and started bonding with neighboring countries seeking new investment opportunities. The OBOR concept could be considered a broader version compared to the economic reform in the 80s and a deeper relation is to be found towards the countries with which China engages.

Huang Mei-Feng (2015) points out OBOR has three main functions: consolidating energy security; leveraging economic growth to boost economic development of border provinces in China; and realizing the "China Dream" to enhance China's international influence. OBOR is regarded as the vanguard of China's southward movement. It also aims to maintain energy transportation security. From the perspective of energy security, the conflicts and tension in the South China Sea are bound to continue or even worsen. The smooth and safe passage of the sea is the key to the stability of energy supply and trade for China, and the current U.S. dominance of the South China Sea and the Malacca Strait will threaten China's energy transportation security. The OBOR will further protect energy transportation security by bypassing the sea lane dominated by the U.S. government (Zhou, 2017).

An Xiao-Ming (2016) believes that the implementation of OBOR has a very important role in absorbing excess production capacity, promoting industrial transformation, upgrading the regional development pattern, strengthening national security, and promoting the rise of a nation. The OBOR accelerates the development of China to line up in a superpower league.

China provides sufficient funds to developing countries along the route to build more efficient transportation infrastructure, such as ports and railroads so as to enhance the overall trade volume and maintain closer economic ties. Today, China is heavily dependent on Straits of Malacca, especially for energy sources such as oil and natural

gas. In order to avoid over-reliance on a single strait as the center of national transportation, alternative routes are needed to transport through the Indian Ocean.

One of OBOR's six major corridors is the Nanning-Singapore Economic Corridor, also known as the China-Indochina Peninsula Economic Corridor (CICPEC). Its purpose is to strengthen economic ties between ASEAN countries and Yunnan, China's impoverished southwest region. The proposal aims to achieve this by making cross-border rail and road infrastructure projects easier to build, reducing customs procedures, and harmonizing rules (Geopolitical monitor, 2017). Trans-Asian Railway, the main transportation infrastructure in the region, will describe the next section.

2.3 OBOR Project in ASEAN: High-Speed Rail Infrastructure

According to China's OBOR plans, the fundamental goal in Southeast Asia region is to connect the capital of Yunnan province, Kunming with the major cities in ASEAN member states. This objective can be realized via the Trans-Asian Railway (also referred to as Singapore-Kunming Rail Link, SKRL). The Trans-Asian Railway will enable rapid transportation of Chinese goods for export to all countries within mainland Southeast Asia, including Lao, Cambodia, Myanmar, Thailand, Vietnam, Singapore and Malaysia.

The Trans-Asian Railway has three routes: the central route, the western route, and the eastern route (Figure 3). The rail network that extends through Cambodia, Laos, Thailand, Malaysia, and Singapore, will allow Chinese products to reach all of the region's major cities as well as presenting an alternative route to reach Indonesia beyond the traditional sea-trade route via the South China Sea. On the western front of this railway project, one of the primary areas of development of the Bangladesh-China-India-Myanmar (BCIM) Economic Corridor will be the rail connection between

Myanmar's largest city, Yangon (previously known as Rangoon), and Kunming. The eastern route passes across Vietnam and Cambodia before heading south to Thailand's capital Bangkok.

Figure 3. Trans-Asian Railway Routes
Source: Geopolitical Monitor, 2017

Among these three routes, the central route has made the most substantial progress in recent years. The Vientiane–Boten Railway, a 414-kilometer electric-powered railway in Laos between its capital Vientiane and the town of Boten on the border, where it connects with China's national rail network, is one of the major sections of the central route. It will connect with the Thai railway network on the south, leading to Bangkok and then Singapore. Completed in early December 2021, the railway marks a major milestone in the Trans-Asian rail network since it can change Laos, a least industrialized state in ASEAN from a landlocked country into a land-linked hub that

connects. The Boten-Vientiane railway that enables Loas government to benefit from more trade between provinces, ASEAN neighbors, and China by improving connectivity. Annually, 300,000 containers from Laos will be transported via the railway to Europe from China. This number is likely to rise to between 1.2 and 1.8 million per year (Medina, 2021).

2.4 China's OBOR Investment in ASEAN

The ASEAN countries have long been important trade partners for China. After ACFTA came into effect on 1 January 2010, multinational corporations gradually restructure their supply chains, resulting in a closer bond between ASEAN and China. ASEAN is a rapid-expanding trade bloc in Asia with a growing economic presence. With a combined population of over 655 million, ASEAN's economic size was about US$3 trillion in 2020. Therefore, this paper will analyze the economic benefits of OBOR with the focus on Southeast Asian states.

The total amount of money of China's investment under OBOR in ASEAN reached $115.23 billion during 2013 to 2021. Among the ASEAN countries, Singapore ranks the top with $29.4 billion investment, followed by Indonesia ($27 billion) and Malaysia ($16.8 billion). These three countries together take 63.6% of the total investment as shown in Table 2 (See Appendix A).

According to Table 3, there are different categories of the investment under OBOR in ASEAN, including agriculture, chemicals, energy, entertainment, finance, logistics, metals, real estate, technology, tourism, transportation, and utilities (See Appendix B). Among them, energy ranks the top (29.4%), followed by transportation (16.6%) and metals (13.5%), indicating that China is putting one of its focuses on infrastructural development as a priority over other categories. As energy is the emphasis of China's

investment, China is trying to retain more resources by building roads, ports and railways to relocate resources.

China's construction contracts under OBOR are as shown in Table 4 and Table 5 (See Appendix C and D). According to Table 4, Indonesia ranks the top among all member states with USD 18,410 million accounting for 20.6%, followed by Malaysia (18.6%), Singapore (13.2%) and Laos (11.9%). A large proportion of contractors are located in developing countries like Indonesia, and Malaysia. In other words, it can be assumed that developed countries that lack infrastructure investment are open to China's aid under OBOR. Table 5 shows that energy (39.3%) and transportation (34.5%) occupy 73.8% of the entire investment. This indicates that China is planning on transporting more resources, such as oil, coal and other essential natural resources from ASEAN.

3. The GTAP Model, Database and Scenarios

Over the past decade, various analytical techniques have been used to estimate the impact of OBOR. In this paper, GTAP model is adopted to examine the impact of OBOR transportation infrastructure toward ASEAN countries.

3.1. GTAP Model Structure

Developed by Thomas Hertel (1997), the GTAP model is a static and multi-regional CGE model that has been broadly adopted to examine the economic impact of international trade policies (Chen and Li, 2021). The GTAP's main feature is a global database that includes "input-output tables on bilateral trade flows, production, consumption, and intermediate uses of commodities and services, as well as transportation costs, tax, and tariff data" (Antimiani et al., 2012).

The GTAP model includes two kinds of relationships, which are behavioral equations and accounting equations. Behavioral equations are developed using microeconomic theory to describe the behavior of optimizing agents (production and demand functions), while accounting equations evaluates the accounting relationships between various agents, including as customers, producers, the government, and the rest of the world (Chen and Li, 2021). Due to the large amounts of equations in the GTAP model, it is difficult to provide a synthesis of the theory behind it. Figure 4 illustrates the basic accounting relationships in a multiregional open economy.

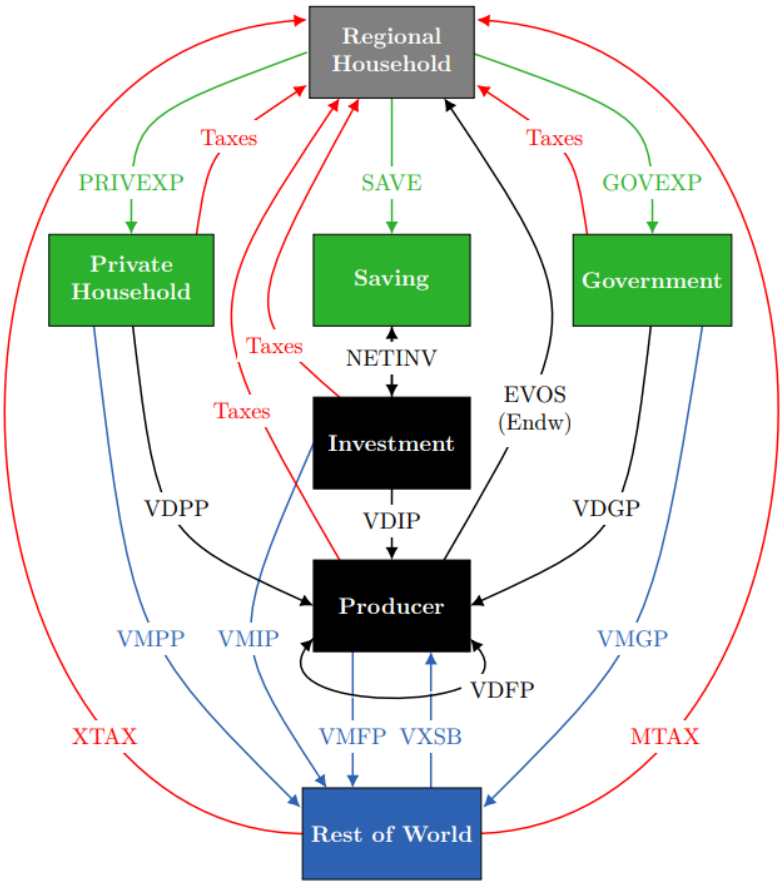


Figure 4. Circular flows in a regional economy[3]

Source: Aguiar, et al., 2019

[3] SAVE: net saving, by region; PRIVEXP: private consumption expenditure in region r; Taxes: different kind of taxes or subsidies; GOVEXP: government consumption expenditure in region r; EVOS: value of commodity i output in region r at agents' prices; NETINV: regional net investment; VDPP: domestic purchases, by households, at agents' prices; VDGP: domestic purchases, by government, at agents' prices; MTAX: tax on imports on good i from source r in destination s; XTAX: tax on exports on good i from source r in destination s; VMPP: import purchases, by households, at agents' prices; VMGA: import purchases, by government, at agents' prices; VDFP: domestic purchases, by firms, at agents' prices; VMFP: import purchases, by firms, at agents' prices; VXSB: non-margin exports, at market prices (Antimiani, et al., 2012)

In Figure 4, the regional household collects all income generated in the closed economy by each region (Brockmeier, 2001). According to a Cobb-Douglas utility function, regional income is allocated across three forms of final demands, namely private household expenditures, government expenditures and savings.

The GTAP production structure distinguishes between primary (land, skilled labor, unskilled labor, capital and natural resources) and intermediate factors. On the supply side, multi-product activities generate multiple outputs according to a constant elasticity of transformation (CET) function. On the other hand, commodities produced by various activities are combined using a constant elasticity of substitution (CES) function on the demand side. Private consumer optimizing behavior is represented in the GTAP by the constant difference of elasticity (CDE) expenditure function (Aguiar, et al., 2019).

The GTAP model also gives a wide range of closure options. Different policy experiments are linked to different closures, which are exogenously imposed as shocks.

3.2. GTAP Setting

This paper uses GTAP Data Base, version 10 (referred to as GTAP 10) which is released in July 2019. The database distinguishes 141 countries and regions. In terms of sectoral coverage, GTAP 10 considers 65 products and services (See Table 8 in Appendix E). To describe all economic activity in each country, GTAP classifies agricultural, food, resource extraction, manufacturing, and service activities (Aguiar et al, 2019).

Data on regions and commodities are aggregated in order to meet the objective of the current study. In this study, 141 countries and regions given in GTAP 10 database have been aggregated to 16 regions (Table 6). Similarly, the 65 sectors of GTAP 10 database have been mapped into 12 sectors (Table 7).

Table 6. GTAP regional concordance

No.	Country/Region	GTAP concordance
1	China	China
2	Brunei	Brunei
3	Cambodia	Cambodia
4	Indonesia	Indonesia
5	Laos	Laos
6	Malaysia	Malaysia
7	Myanmar	Myanmar
8	Philippines	Philippines
9	Singapore	Singapore
10	Thailand	Thailand
11	Vietnam	Vietnam
12	Oceania	Australia, New Zealand, Rest of Oceania
13	Rest of East Asia	Hong Kong, Japan, South Korea, Taiwan
14	United States	United States
15	European Union	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden
16	Rest of World	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela, Costa Rica, Guatemala, Honduras, Nicaragua, Panama, El Salvador, Dominican Republic, Jamaica, Puerto Rico, Trinidad and Tobago, Caribbean, Belarus, Ukraine, Armenia, Georgia, Benin, Burkina Faso, Cameroon, Ivory Coast, Ghana, Guinea, Nigeria, Senegal, Togo, Rest of Western Africa, Ethiopia, Kenya, Madagascar, Malawi, Mauritius,

		Mozambique, Rwanda, Tanzania, Uganda, Zambia, Zimbabwe, Botswana, Namibia, South Africa

Table 7. GTAP sector concordance

No.	Aggregated commodities	GTAP sector code[4]
1	Agriculture	Paddy rice (PDR); wheat (WHT); cereal grains, NEC (GRO); vegetables, fruit, nuts (V_F); oilseeds (OSD); sugar cane, sugar beet (C_B); plant-based fibers (PFB); crops, NEC (OCR); bovine cattle, sheep and goats, horses (CTL); animal products, NEC (OAP); raw milk (RMK); wool, silkworm cocoons (WOL); forestry (FRS)
2	Fossil fuels	Coal (COA); oil (OIL); gas (GAS), gas manufacture, distribution (GDT); Petroleum, coal products (P_C), Other extraction (OXT)
3	Processed foods	Fish (FSH); bovine meat products (CMT); meat products, NEC (OMT); vegetable oils and fats (VOL); dairy products (MIL); processed rice (PCR); sugar (SGR); food products, NEC (OFD); beverages and tobacco products (B_T)
4	Wood and paper products	Wood products (LUM); paper products, publishing (PPP)
5	Textiles and wearing apparel	Textiles (TEX); wearing apparel (WAP); leather products (LEA)

[4] GTAP code is shown in Table 8 in Appendix.

6	Chemical, rubber, and plastic products	Chemical products (CHM); basic pharmaceutical products (BPH); rubber and plastic products (RPP)
7	Energy-intensive manufacturing	Mineral products, NEC (NMM); ferrous metals (I_S); metals, NEC (NFM)
8	Manufactures	Metal products (FMP); computer, electronic, and optical products (ELE); electrical equipment (EEQ); machinery and equipment, NEC (OME); motor vehicles and parts (MVH); transport equipment, NEC (OTN); manufactures, NEC (OMF)
9	Construction	Construction (CNS)
10	Business services	Financial services (OFI); Real estate activities (RSA); Other business services (OBS)
11	Transportation	Trade (TRD); Land transport (OTP); Water transport (WTP); Air transport (ATP); warehousing and support activities (WHS)
12	Public services	Electricity (ELY); water (WTR); public administration and defense (OSG); education (EDU); human health and social work activities (HHT); dwellings (DWE), accommodation, food and service (AFS); Communication (CMN)

3.3. GTAP Scenarios

To examine how transportation infrastructure affects the economy, namely Trans-Asia Railway project, this paper uses GTAP model and implement a shock of trade cost reduction, which is caused by reduced transportation and improved infrastructure

connectivity.

This paper assumes two scenarios with varying reduction in trade cost as follows. The first scenario is 1.5 percent reduction in trade cost and the second scenario is 2.8 percent reduction in trade cost to evaluate the economic impacts for ASEAN countries. The two scenarios are based on a study from Word bank. According to the study, implementing all OBOR transportation infrastructure projects will reduce trade costs between 1.1 percent and 2.2 percent on a global scale. Compared to other non-OBOR countries, trade costs will fall significantly for OBOR economies, ranging between 1.5 percent and 2.8 percent (de Soyres et al., 2019). Therefore, this study assumes two scenarios which are (1) 1.5 percent and (2) 2.8 percent reduction in trade cost to evaluate the economic impacts for ASEAN countries.

4. GTAP Simulation Results

In this chapter, this paper discussed the economic growth and welfare of ASEAN countries in the two scenarios based on the GTAP simulation results.

4.1 Results of GTAP Scenario One

In the first scenario, the paper assumes 1.5 percent reduction in trade cost. According to the simulation, ASEAN countries were found to have positive GDP growth with an average growth rate of 0.34 percent (Figure 5). The results suggest that transportation infrastructure investment can reduce trade costs, which may have a positive impact on the economies of the OBOR countries. Nevertheless, such impacts are found quite uneven among the ASEAN countries. In particular, Vietnam and Indonesia have experienced the highest growth in GDP as a result of transportation infrastructure investment under the OBOR, with 0.67 percent, 0.47 percent increase in GDP, respectively. Such a relatively higher impact is not surprising, given that the countries experienced higher growth in infrastructure investment from China during 2013–2020 as mentioned in Chapter three. In particular, among the ten ASEAN countries, Vietnam's trade with China has been on the rise over the last few years, with its share in China-ASEAN trade climbing from 10.3% in 2010 to 28.1% in 2020 (Fung, 2022).

Conversely, Brunei and Cambodia received relatively less benefit regarding GDP from the interregional trade cost reduction. Besides, large economies tend to be those with higher returns (Hahm et al., 2018).

Compared with ASEAN countries, the simulation results also suggest that the output gains for China are estimated to be smaller in terms of a percentage increase in GDP.

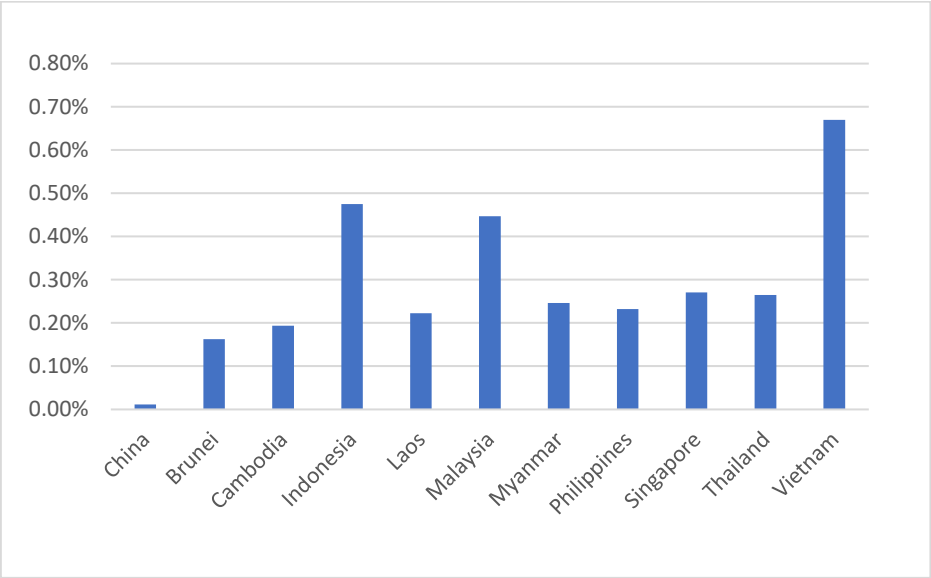


Figure 5. Change in value of GDP (%) in scenario one

Source: GTAP results

` Table 9 shows the percentage change in exports in scenario one. The results for the change in exports within the ASEAN are variegated—depending on the source of the reduction in value of the trade time as well as comparative advantage (Maliszewska and Mensbrugghe, 2019). Most of the large increases in exports occur in agriculture, extraction exports, and energy-intensive manufacturing. In particular, agricultural exports by the ASEAN states increase by 0.52 percent. The simulation results show that the increases in exports of agricultural products are larger than those of industrial products. Since agricultural products tend to be the subjects of more restricted trade measures, and perishable items benefit more from shorter transport times more than durable goods. Another reason is that agricultural sector is one of the key sectors in Southeast Asia, accounting for a substantial share of the GDP as well as employing a significant part of the workforce. Almost every country in ASEAN depends heavily on the agricultural sector except Brunei and Singapore. For example,

agriculture sector accounts for more than 40% of GDP in the least developed countries, such as Laos (ASEAN, 2022). This is in line with the simulation result since increase to agricultural exports is presented in poorer countries with large subsistence agriculture, such as Lao, Cambodia, and Myanmar. Therefore, OBOR could contribute to poverty reduction in these countries.

A big beneficiary would be textiles and wearing apparel exports from Vietnam, increasing by 0.95 percent. As a land-locked developing country, Laos also stands out as a country that would see a significant growth in several sectors—particularly in the agriculture sector and textiles and wearing apparel sector. According to the study from Hahm et al (2018), land-locked developing countries, such as Kyrgyzstan, Kazakhstan and Mongolia in the OBOR economic corridor are expected to benefit significantly. Since the OBOR has provided cross-border connectivity, it has given land-locked countries access to the Chinese market, along with the world market.

Table 9: Percentage change in exports in scenario one

	Brunei	Cambodia	Indonesia	Laos	Malaysia	Myanmar	Philippines	Singapore	Thailand	Vietnam
Agriculture	0.02	0.99	0.16	1.03	0.39	0.97	0.22	0.03	0.70	0.76
Fossil fuel	0.59	0.05	0.95	0.04	0.79	0.17	0.12	0.02	0.06	0.28
Processed food	-0.02	-1.20	0.13	-0.07	0.08	-0.55	-0.56	0.11	-0.03	-1.69
Wood and paper products	0.22	0.47	0.14	0.25	0.20	0.51	0.38	0.01	0.12	0.65
Textiles and wearing apparel	0.41	0.51	0.09	0.94	0.36	0.22	-0.76	-1.37	-0.28	0.95
Chemical, rubber, and plastic products	0.17	0.01	0.15	0.19	0.22	0.16	0.11	0.18	0.09	0.23
Energy-intensive manufacturing	0.39	0.23	0.30	0.70	0.16	0.81	0.22	0.14	0.51	0.45
Manufacturing	-0.45	0.28	0.23	0.59	0.44	0.14	0.28	0.07	0.51	0.53
Construction	0.02	-0.46	0.28	0.91	0.02	-0.11	-0.16	0.12	0.15	-0.79
Business services	-0.4	-1.09	0.08	-1.55	-0.46	-0.48	-0.68	0.01	-0.35	-2.88
Transportation	-0.22	-0.89	0.11	-0.87	-0.15	-0.33	-0.5	0.06	-0.26	-1.58
Public services	-0.39	-1.43	0.11	-0.03	-0.27	-0.62	-0.62	0.05	-0.25	-2.74

Source: GTAP results

The impacts on welfare due to a trade cost reduction as a result of investments of OBOR transportation infrastructure differs among countries (Table 10). The size of a country's welfare gains is mainly determined by its economic structure and numerous factors, including "the relative share of agriculture, industry, and services in GDP; share of exports and imports in GDP; composition of export and import baskets; degree of trade restrictiveness; the current level of cross-border transport cost; and productivity level in different economic sectors" (Hahm et al., 2018). In this regard, the GTAP simulation results show that Vietnam, Malaysia and Indonesia yield the highest welfare gains, which is somewhat expected, given that these countries are export-oriented, with close trade links with China. On the other hand, countries, such as Lao and Cambodia received the smallest gain in welfare since they are still undergoing the transformation from subsistence-oriented and largely self-contained economies to commercially oriented economies.

In general, the GTAP's results reveal that ten ASEAN countries experienced an increase in welfare.

Table 10. Welfare Gains in scenario one ($US, Millions)

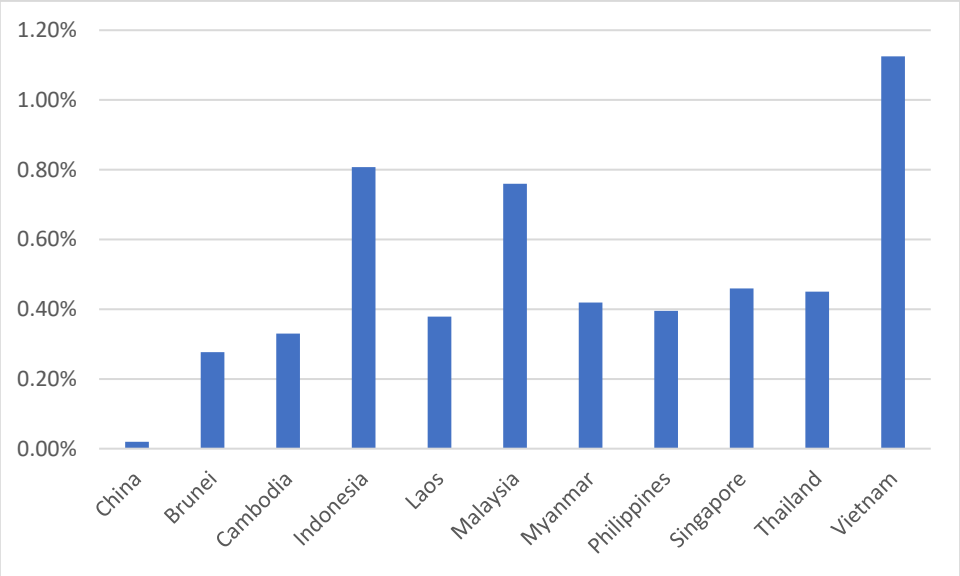
Country	$US (Millions)
China	1245.48
Brunei	19.18
Cambodia	10.38
Indonesia	178.46
Laos	9.44
Malaysia	254.58
Myanmar	49.93
Philippines	99.72
Singapore	119.78
Thailand	171.91
Vietnam	361.51

Source: GTAP results

4.2 Results of GTAP Scenario Two

In the second scenario, the paper assumes 2.8 percent reduction in trade cost. In this scenario, ASEAN countries would experience a larger increase in GDP compared to scenario one as shown in Figure 6. However, the influence is found again, uneven among different countries. The GDP effects range from 1.12 percent increase in GDP growth in Vietnam, to 0.28 percent increase in Brunei. This again supports that idea that large economies tend to be those with higher economic returns (Hahm et al., 2018).

Figure 6. Change in value of GDP (%) in scenario two



Source: GTAP results

Table 11 shows the percentage change in exports in scenario two. The improved connectivity will allow ASEAN states to expand their exports to other regions as well as to themselves, which reflects an intensification of regional value chains. Thanks to the shorten shipping time, agricultural exports increase the most among the ASEAN states since agricultural goods are one of the top ten goods exported from ASEAN to China (ASEAN, 2020).

Table 11: Percentage Change in Exports in scenario two

	Brunei	Cambodia	Indonesia	Laos	Malaysia	Myanmar	Philippines	Singapore	Thailand	Vietnam
Agriculture	0.04	1.19	0.21	1.44	0.51	1.04	0.33	0.04	1.12	1.11
Fossil fuels	0.71	0.06	1.24	0.06	1.03	0.20	0.16	0.03	0.10	0.34
Processed foods	-0.02	-1.44	0.17	-0.10	0.10	-0.66	-0.73	0.15	-0.05	-2.03
Wood and paper products	0.26	0.64	0.18	0.35	0.26	0.61	0.49	0.01	0.19	0.78
Textiles and wearing apparel	0.49	0.61	0.12	1.11	0.47	0.26	-0.99	-1.92	-0.45	1.14
Chemical, rubber, and plastic products	0.20	0.02	0.20	0.22	0.29	0.19	0.14	0.25	0.14	0.28
Energy-intensive manufacturing	0.47	0.28	0.39	0.83	0.21	0.97	0.29	0.20	0.82	0.54
Manufactures	-0.54	0.34	0.30	0.70	0.57	0.17	0.36	0.10	0.82	0.64
Construction	0.02	-0.55	0.36	1.07	0.03	-0.13	-0.21	0.17	0.24	-0.95
Business services	-0.48	-1.31	0.10	-1.83	-0.60	-0.58	-0.88	0.01	-0.56	-3.46
Transportation	-0.26	-1.07	0.14	-1.03	-0.20	-0.40	-0.65	0.08	-0.42	-1.90
Public services	-0.47	-1.72	0.14	-0.04	-0.35	-0.74	-0.81	0.07	-0.40	-3.29

Source: GTAP results

Simulation results from the GTAP model show net welfare gains of $6562 million (Table 12) to consumers in the ten South-Eastern Asian countries. However, the distribution of these gains will be heavily skewed with 28 percent of welfare gains going to consumers in Vietnam, followed by Malaysia (20 percent) and Indonesia (14 percent). On the other hand, welfare gain in Laos is the least among ASEAN states. The results again show that large and export-oriented economies tend to benefit more than others.

Table 12. Welfare Gains in scenario two ($US, Millions)

Country	$US (Millions)
China	6338.4
Brunei	52.74
Cambodia	98.13
Indonesia	919.71
Laos	48.17
Malaysia	1308.66
Myanmar	254.89
Philippines	514.4
Singapore	624.42
Thailand	894.09
Vietnam	1847.73

Source: GTAP results

5. Conclusion

This study confirms that the OBOR has a positive effect in ASEAN countries. Based on GTAP simulation results, improving the transport network in countries along the OBOR route could drive the growth of GDP. It could also contribute to an increase in welfare. Exports of ASEAN countries could also increase in certain industries. However, the benefits of OBOR are not evenly distributed, with some nations benefiting more than others. The simulation results indicate that larger and export-oriented economies such as Vietnam, Malaysia and Indonesia tend to get higher economic returns. In terms of change in exports, land-locked country like Lao also enjoys a significant increase in a number of sectors due to the improved transportation networks. Since the OBOR has provided cross-border connectivity, it has offered land-locked countries access to bigger markets. In terms of sectors, the highest increase in exports occur in agriculture, extraction exports, and energy-intensive manufacturing. In particular, agricultural products benefit the most since they take advantage of shorter transit time. In general, empirical evidence shows that ASEAN countries can achieve economic development through large-scale transportation infrastructure under the OBOR.

However, some constraints may obstruct the achievement of OBOR's potential benefits. There is no certainty that enhanced infrastructure will encourage manufacturers to respond on the supply side. Other complementing strategies to enhance productivity would be required (Mukwaya and Mold, 2018).

While the GTAP analyses' findings may be beneficial for gaining a broad understanding of the impact of OBOR-related policies, the implications for real-world decision-making and planning may be limited. Besides, this paper has its own limitations that need to be improved in future studies. First of all, the paper can be improved if more data about infrastructure investment and the reduction of shipping

time can be collected. Secondly, GTAP does not take spatial spillover effect of the transportation infrastructure investment into consideration. Therefore, in the future research, incorporating spatial econometric analysis to capture the effects of intraregional trade and spatial effects of infrastructure investment would be rewarding.

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Appendices

Appendix A

Table 2. China's Investment under OBOR in ASEAN during 2013 to 2021

Country	Value (USD Millions)	Percentage	Number of Investor	Percentage
Brunei	3440M	3.0%	1	0.5%
Cambodia	5960M	5.2%	10	5.3%
Indonesia	27050M	23.5%	49	25.8%
Laos	12100M	10.5%	14	7.4%
Malaysia	16840M	14.6%	33	17.4%
Myanmar	3390M	2.9%	4	2.1%
Philippines	5250M	4.6%	6	3.2%
Singapore	29400M	25.5%	42	22.1%
Thailand	4170M	3.6%	12	6.3%
Vietnam	7630M	6.6%	19	10.0%
Total	115230 M	100%	190	100%

Source: American Enterprise Institute

Appendix B

Table 3. Sectors of China's Investment under OBOR in ASEAN

Sector	USD Millions	Percentage
Agriculture	1130	1.0%
Chemicals	110	0.1%
Energy	33880	29.4%
Entertainment	1720	1.5%
Finance	2610	2.3%
Logistics	13330	11.6%
Metals	15590	13.5%
Real estate	10940	9.5%
Technology	4740	4.1%
Tourism	1680	1.5%
Transportation	19170	16.6%
Utilities	730	0.6%
Others	9610	8.3%
Total	115230	100%

Source: American Enterprise Institute

Appendix C

Table 4. China's construction contracts under OBOR in ASEAN during 2013 to 2021

Country	Value (USD Millions)	Percentage (Total: USD million)	Investor	Percentage
Brunei	530M	0.6%	2	1.8%
Cambodia	6820M	7.6%	12	10.5%
Indonesia	18410M	20.6%	16	14.0%
Laos	10610M	11.9%	12	10.5%
Malaysia	16580M	18.6%	18	15.8%
Myanmar	2310M	2.6%	10	8.8%
Philippines	9480M	10.6%	11	9.6%
Singapore	11780M	13.2%	10	8.8%
Thailand	5610M	6.3%	12	10.5%
Vietnam	7200M	8.1%	11	9.6%
Total	89330M	100%	114	100%

Source: American Enterprise Institute

Appendix D

Table 5. Sectors of China's construction contracts under OBOR in ASEAN

Sector	Millions	Percentage
Agriculture	1000	1.1%
Chemicals	1710	1.9%
Energy	35070	39.3%
Entertainment	320	0.4%
Health	110	0.1%
Metals	6560	7.3%
Real estate	8980	10.1%
Technology	900	1.0%
Tourism	1150	1.3%
Transport	30850	34.5%
Utilities	2180	2.4%
Others	500	0.6%
Total	89330	100%

Source: American Enterprise Institute

Appendix E

Table 8. GTAP 10 sectors

Number	Sector Code	Description
1	pdr	Rice: seed, paddy (not husked)
2	wht	Wheat: seed, other
3	gro	Other Grains: maize (corn), sorghum, barley, rye, oats, millets, other cereals
4	v_f	Vegetable & Fruit: vegetables, fruit and nuts, edible roots and tubers, pulses
5	osd	Oil Seeds: oil seeds and oleaginous fruit
6	c_b	Cane & Beet: sugar crops
7	pfb	Fibres crops
8	ocr	Other Crops: stimulant; spice and aromatic crops; forage products; plants and parts of plants used primarily in perfumery, pharmacy, or for insecticidal, fungicidal or similar purposes; beet seeds (excluding sugar beet seeds) and seeds of forage plants; natural rubber in primary forms or in plates, sheets or strip, living plants; cut flowers and flower buds; flower seeds, unmanufactured tobacco; other raw vegetable materials nec
9	ctl	Cattle: bovine animals, live, other ruminants, horses and other equines, bovine semen
10	oap	Other Animal Products: swine; poultry; other live animals; eggs of hens or other birds in shell, fresh; reproductive materials of animals; natural honey; snails, fresh, chilled, frozen, dried, salted or in brine, except sea snails; edible products of animal origin n.e.c.; hides, skins and furskins, raw; insect waxes and spermaceti, whether or not refined or coloured
11	rmk	Raw milk
12	wol	Wool: wool, silk, and other raw animal materials used in textile
13	frs	Forestry: forestry, logging and related service activities

14	fsh	Fishing: hunting, trapping and game propagation including related service activities, fishing, fish farms; service activities incidental to fishing
15	coa	Coal: mining and agglomeration of hard coal, lignite and peat
16	oil	Oil: extraction of crude petroleum, service activities incidental to oil and gas extraction excluding surveying (part)
17	gas	Gas: extraction of natural gas, service activities incidental to oil and gas extraction excluding surveying (part)
18	oxt	Other Mining Extraction (formerly omn): mining of metal ores; other mining and quarrying
19	cmt	Cattle Meat: fresh or chilled; meat of buffalo, fresh or chilled; meat of sheep, fresh or chilled; meat of goat, fresh or chilled; meat of camels and camelids, fresh or chilled; meat of horses and other equines, fresh or chilled; other meat of mammals, fresh or chilled; meat of mammals, frozen; edible offal of mammals, fresh, chilled or frozen
20	omt	Other Meat: meat of pigs, fresh or chilled; meat of rabbits and hares, fresh or chilled; meat of poultry, fresh or chilled; meat of poultry, frozen; edible offal of poultry, fresh, chilled or frozen; other meat and edible offal, fresh, chilled or frozen; preserves and preparations of meat, meat offal or blood; flours, meals and pellets of meat or meat offal, inedible; greaves
21	vol	Vegetable Oils: margarine and similar preparations; cotton linters; oil-cake and other residues resulting from the extraction of vegetable fats or oils; flours and meals of oil seeds or oleaginous fruits, except those of mustard; vegetable waxes, except triglycerides; degras; residues resulting from the treatment of fatty substances or animal or vegetable waxes; animal fats

22	mil	Milk: dairy products
23	pcr	Processed Rice: semi- or wholly milled, or husked
24	sgr	Sugar and molasses
25	ofd	Other Food: prepared and preserved fish, crustaceans, molluscs and other aquatic invertebrates; prepared and preserved vegetables, pulses and potatoes; prepared and preserved fruits and nuts; wheat and meslin flour; other cereal flours; groats, meal and pellets of wheat and other cereals; other cereal grain products (including corn flakes); other vegetable flours and meals; mixes and doughs for the preparation of bakers' wares; starches and starch products; sugars and sugar syrups n.e.c.; preparations used in animal feeding; lucerne (alfalfa) meal and pellets; bakery products; cocoa, chocolate and sugar confectionery; macaroni, noodles, couscous and similar farinaceous products; food products n.e.c.
26	b_t	Beverages and Tobacco products
27	tex	Manufacture of textiles
28	wap	Manufacture of wearing apparel
29	lea	Manufacture of leather and related products
30	lum	Lumber: manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
31	ppp	Paper & Paper Products: includes printing and reproduction of recorded media
32	p_c	Petroleum & Coke: manufacture of coke and refined petroleum products
33	chm	Manufacture of chemicals and chemical products
34	bph	Manufacture of pharmaceuticals, medicinal chemical and botanical products
35	rpp	Manufacture of rubber and plastics products
36	nmm	Manufacture of other non-metallic mineral products

37	i_s	Iron & Steel: basic production and casting
38	nfm	Non-Ferrous Metals: production and casting of copper, aluminium, zinc, lead, gold, and silver
39	fmp	Manufacture of fabricated metal products, except machinery and equipment
40	ele	Manufacture of computer, electronic and optical products
41	eeq	Manufacture of electrical equipment
42	ome	Manufacture of machinery and equipment n.e.c.
43	mvh	Manufacture of motor vehicles, trailers and semi-trailers
44	otn	Manufacture of other transport equipment
45	omf	Other Manufacturing: includes furniture
46	ely	Electricity; steam and air conditioning supply
47	gdt	Gas manufacture, distribution
48	wtr	Water supply; sewerage, waste management and remediation activities
49	cns	Construction: building houses factories offices and roads
50	trd	Wholesale and retail trade; repair of motor vehicles and motorcycles
51	afs	Accommodation, Food and service activities
52	otp	Land transport and transport via pipelines
53	wtp	Water transport
54	atp	Air transport
55	whs	Warehousing and support activities
56	cmn	Information and communication
57	ofi	Other Financial Intermediation: includes auxiliary activities but not insurance and pension funding
58	ins	Insurance: includes pension funding, except compulsory social security
59	rsa	Real estate activities
60	obs	Other Business Services
61	ros	Recreation & Other Services: recreational, cultural and sporting activities, other service activities; private

		households with employed persons
62	osg	Other Services (Government): public administration and defense; compulsory social security, activities of membership organizations n.e.c., extra-territorial organizations and bodies
63	edu	Education
64	hht	Human health and social work
65	dwe	Dwellings: ownership of dwellings (imputed rents of houses occupied by owners)

Source:

https://www.gtap.agecon.purdue.edu/databases/contribute/detailedsector57.asp

THE ECONOMIC IMPACT OF TRANSPORTATION INFRASTRUCTURE DEVELOPMENT UNDER ONE BELT ONE ROAD INITIATIVE IN ASEAN

Resümee

Algatuse *One Belt One Road* raames transpordi taristu arendamise majanduslik mõju ASEANis

Hsin-wei Huang

Aastal 2013 kuulutas Hiina välja ambitsioonika algatuse *One Belt One Road* (OBOR), mille eesmärk on edendada piirkondlikku majanduskasvu ja stimuleerida integratsiooni. OBOR leiab peamist rakendust läbi ulatuslike investeeringute transpordi taristusse, eesmärgiga parandada transpordiühendust ja vähendada kaubanduskulusid. Kuigi algatus on rakendatud juba aastaid tagasi, on endiselt ebaselge, mil määral on transpordi infrastruktuuri arendamine mõjutanud osalevate riikide majandustulemusi. Käesolevas töös on uurimisobjektideks Kagu-Aasia Maade Assotsiatsiooni (*Association of Southeast Asian Nations*, ASEAN) kümme liikmesriiki, hinnates nendes OBORi algatuse terviklikku mõju transpordi taristu parandamisse arvestades, et ASEAN on Hiina suurim kaubanduspartner.

Käesolevas uuringus antakse põhjalik hinnang OBORi raames tehtavatele investeeringutele transpordi infrastruktuuri, kasutades arvutatava üldise tasakaalu (*computable general equilibrium*, CGE) mudelit *Global Trade Analysis Project* (GTAP). GTAPi simulatsiooni tulemuste põhjal võib ASEANi riikide transpordivõrgu parandamine suurendada SKP kasvu koos ekspordi kasvuga enamikes tööstusharudes ning võimaliku heaolu suurenemisega ASEANi riikides. Siiski ei ole OBORi eelised ühtlaselt jaotunud, kus mõned riigid saavad sellest rohkem kasu kui teised. Simulatsiooni tulemused näitavad, et ekspordile orienteeritud majandused, nagu Vietnam, saavad suuremat majanduslikku kasu. Ekspordi osas kogeb selline suletud maa nagu Laos tänu parematele transpordivõrkudele samuti märkimisväärset buumi mitmes sektoris. Kuna OBOR on taganud piiriülese ühenduvuse, on see andnud

maismaapiirkonna riikidele juurdepääsu suurematele turgudele. Empiirilised tõendid näitavad, et ASEANi riigid saavad OBORi raames ulatusliku transpordi taristu abil saavutada majandusliku arengut.

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