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Article

Financing cross-border road connectivity: Potential impact on Sabah's output—An input-output table analysis

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Abstract: Fiscal spending for road construction to link Kalabakan, Sabah, Malaysia with North Kalimantan, Indonesia is an idea that have been proposed for over 20 years. The announcement for the relocation of Indonesia's capital city from Jakarta to East Kalimantan give a strong justification for the construction of the Serudong-Simanggaris road. The fact that population size is big in Kalimantan and strong purchasing power is estimated in North and East Kaliamantan provide a strong argument for the need to have a road link. Having said that, the effect of road construction on output growth is not clear. The purpose of this study is to estimate the impact of road construction and the business activities across two sectors being assumed on output Sabah's output growth. Based on the input-output analysis conducted using the output multiplier, the one-off road construction would lead to 1.8% growth in Sabah's overall output.

Keywords: fiscal; financing; Sabah; Kalimantan; road infrastructure; para-diplomacy; input-output table; economy

1. Introduction

Borneo island is one of the biggest islands in the world with population of over 20 million people. The island itself is divided and owned by few countries. The island has recorded gradual development in the past few decades. The proposed relocation of the capital city of Indonesia to East Kalimantan is expected to bring a significant impact on the economic growth of Borneo Island, particularly in the Kalimantan region. This effect is further magnified by the neighboring Malaysian government's idea to establish road connectivity with North Kalimantan, a move that could potentially lead to a surge in the demand for goods and services, a significant influx of investment, a boost in cross-border trade, and a hastened advancement of infrastructure. Looking through the lens of Malaysia's perspective, there is a prevailing sense of hope that Sabah and Sarawak will experience an enhanced level of economic interaction with the neighboring Kalimantan provinces, ultimately resulting in an upswing in bilateral trade, a greater influx of tourists, and an increased demand for services in specific strategic domains, such as tourism, logistic, education and health.

The proposed relocation of capital city and potential road link are interesting development if materialize because the population size in Kalimantan is big and reported to be over 15 million in sum. In addition, higher purchasing power in North Kalimantan and East Kalimantan (Badan Pusat Statistik, 2024) in comparison to Sabah (DOSM, 2024) provide a strong argument for the need to have a road link. **Figure 1**

is an illustration to show the potential border point that can be considered for road connectivity between Sabah and North Kalimantan.

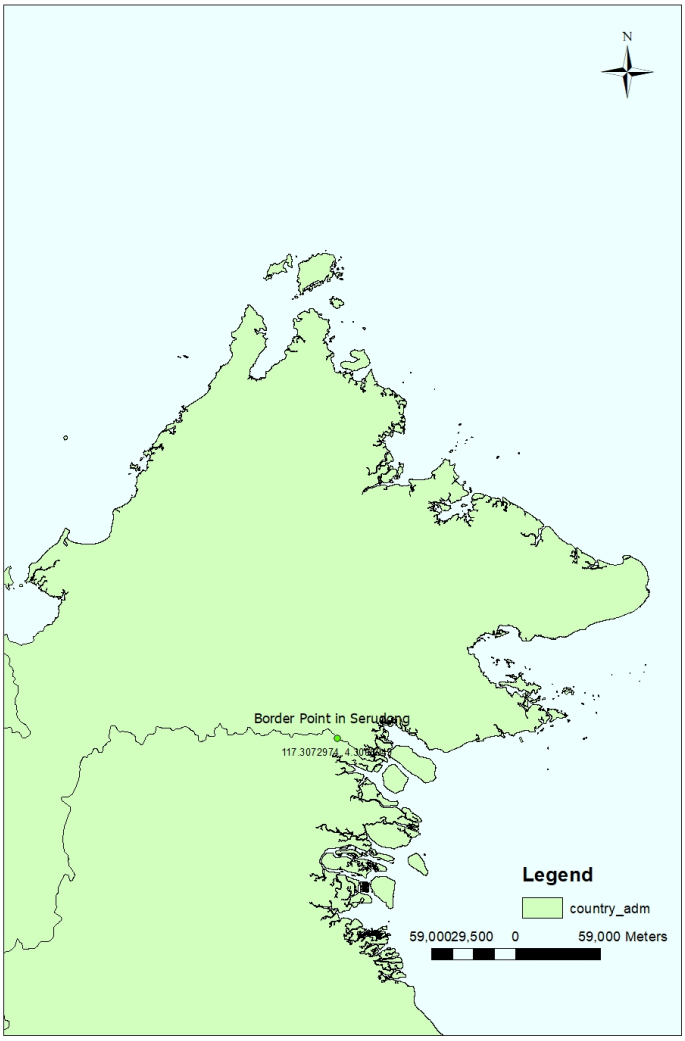

Figure 1. Potential border point for road connectivity.

The suggestion to construct a cross-border road connecting Serudong, Sabah, a Bornean Malaysia state, and Simanggaris, North Kalimantan, Indonesia has been put forth with the aim of stimulating economic growth in the area. The potential benefits of this road connectivity include increased export prospects for Sabah. However, limited studies have been conducted to assess the impact of road connectivity from Sabah's perspective. The development of the border area via road link aims to alleviate poverty, reduce regional disparities, increase income, and promote overall welfare. Para-diplomacy in this regard plays a critical role in managing borders and attracting attention to accelerate the development of underdeveloped border regions.

Limited studies have attempted to study the impact of opening new border entry points in terms of magnitude on output, especially for Serudong, despite the fact some have expressed their opinions on the costs and benefits associated with this action. Scholars and experts in the field have previously emphasized the favorable outcomes that can be expected, particularly from an economic perspective. However, it is still uncertain to what extent Sabah will experience quantifiable advantages as a result.

Furthermore, it is of great importance to determine the degree to which output will increase due to the construction of roads in Serudong. In addition, it is crucial to conduct study on the economic effects that could arise from an upswing in final demand within the construction sector, food and accommodation and wholesale and retail trade sector as a result of financing the road project. Although previous research has discussed the repercussions of heightened interaction on Sabah's economy, there is a scarcity of studies that have aimed to establish the extent to which such interaction influences the overall level of output. Therefore, the primary objective of this study is to estimate the impact of an increase in final demand for products on output in Serudong Sabah, utilizing the methodology of input-output table analysis.

Analyzing the impact of road connectivity between Serudong and Simanggaris on Sabah's output is crucial for various stakeholders such as policy makers and generally the public sector, private sector and for researchers.

Understanding how improved road connectivity influences Sabah's overall output can help the government make data-driven decisions regarding infrastructure development and economic growth strategies. It enables policymakers to assess the effectiveness of transportation investments and plan future projects to enhance productivity and competitiveness.

Besides that, policymakers can leverage the study findings to formulate policies that promote sustainable economic development, trade, and connectivity within Sabah. By gauging the impact on output metrics like GDP, employment, and industry growth, they can tailor policies to maximize positive outcomes and address any potential challenges arising from enhanced road connectivity.

Moreover, investigating the specific impact of road connectivity between Serudong and Simanggaris on Sabah's output helps address a research gap by providing empirical insights into the interplay between infrastructure development and economic performance. Researchers can use this information to enhance existing knowledge, identify areas for further exploration, and contribute to evidence-based policy recommendations.

In summary, preliminary study on the impact of road connectivity in Sabah can offer valuable insights for stakeholders to optimize economic outcomes, inform policy decisions, and advance research in understanding the relationship between infrastructure investments and regional development.

2. Literature review

Infrastructure facilities are the core of a country's development. Infrastructure such as roads, bridges, ports, clean water supply and electricity are important for the development of a nation. In discussing the importance, relationship and impact of financing fiscal spending for infrastructure on the economy of a country, there are many previous studies that have discussed this matter.

The relationship between infrastructure development and the economy, theoretically is positive (Hickey et al., 2020; Musgrave and Peacock, 1967; Mankiw et al., 1992). The infrastructure facilities facilitate and support the movement of goods, services, people and investment. The activities of producing goods and providing services are more efficient compared to situations where infrastructure facilities are

limited. It boosts the country's output, increases income, attracts direct investment, creates more job opportunities, reduces the incidence of poverty, improves the access to quality education and healthcare services.

From the point of view of empirical studies in general, many past studies share similar findings, at least from economic perspective which is positive. This can be seen in the study of Chen (2017); Deleidi et al. (2020); Hickey et al. (2020); Idris (2021); Kamps (2004); Mankiw et al. (1992).

Looking at the context of development in border areas, there are also many studies that give almost similar study findings. In the context of the development of border areas, especially in the border areas of Sabah and North Kalimantan, there are several studies that try to look at this aspect. For example, Idris (2021) study sought to estimate the impact of road construction connecting Sabah and North Kalimantan on Sabah's output. The finding of the study reveals that the impact of road link and increase in final demand would lead to positive output growth.

Looking into many studies, there are many research work across different countries that have been undertaken with regard to the impact of opening up border entry point, border development, issues of border town, cross border trade and Sabah-Kalimantan economy. This can be seen in the work of Idris (2018); Idris et.al (2017); Idris (2021); Idris et al. (2021); Goh (2014); Kelly (2008); Lord and Tangtrongita (2014); Najimudin et al. (2020); Pelican and Steinberger (2017). However, most of the past studies did not attempt to estimate the impact of financing fiscal spending on output that can be generated for Sabah's economy. This study shall estimate the impact on Sabah's economy based on several assumptions to be discussed in the next section.

3. Materials and methods

The impact of increase in final demand on the economy is being estimated using input-output table analysis. Regional Input-Output Table 2015 is being used for the analysis and as a guide. For this purpose, the output multiplier is being computed as discussed in the study of Miller and Blair (2009).

The selection of the input-output table analysis method for the study of cross-border connectivity between Sabah, Malaysia, and North Kalimantan, Indonesia, can be justified based on several criteria:

1) Comprehensive analysis of interdependencies: Input-output analysis provides a comprehensive framework for analyzing the interdependencies between different sectors of the economy. Given the cross-border nature of the connectivity project, it is essential to understand how changes in one sector, such as infrastructure investment, affect other sectors within the economy. Input-output analysis captures these interdependencies by quantifying the ripple effects of changes in final demand throughout the economy.

2) Quantification of economic multipliers: Input-output analysis allows for the quantification of economic multipliers, which measure the total impact of changes in final demand on the entire economy. By estimating multipliers for relevant sectors involved in cross-border connectivity, researchers can assess the magnitude of the economic effects generated by infrastructure investments. This information is valuable for policymakers and stakeholders seeking to evaluate the cost-effectiveness and

potential benefits of connectivity projects.

3) Data availability and reliability: Input-output analysis relies on input-output tables, which provide detailed information on sectoral outputs, inputs, and interdependencies within the economy. If input-output tables are available for both Sabah and North Kalimantan, researchers can utilize existing data sources to conduct the analysis, thereby minimizing data collection costs and ensuring the reliability of the results.

4) Policy relevance and decision-making support: Input-output analysis produces quantitative insights into the economic impacts of cross-border connectivity projects, which are valuable for informing policy decisions and investment strategies. By quantifying the economic benefits and costs associated with infrastructure investments, policymakers can make more informed decisions regarding project prioritization, resource allocation, and implementation strategies.

5) Comparative analysis and benchmarking: Input-output analysis enables researchers to compare the economic impacts of cross-border connectivity projects across different sectors, regions, or scenarios. By benchmarking the results against alternative investment options or case studies, researchers can assess the relative effectiveness and efficiency of different connectivity strategies. This comparative analysis provides valuable insights for optimizing resource allocation and maximizing the socio-economic benefits of infrastructure investments.

Hence, the selection of input-output table analysis for studying cross-border connectivity between Sabah and North Kalimantan is justified based on its ability to provide a comprehensive analysis of interdependencies, quantify economic multipliers, utilize existing data sources, support decision-making, and enable comparative analysis. By applying this methodological approach, researchers can generate valuable insights into the economic impacts of infrastructure investments and inform policy discussions surrounding cross-border connectivity initiatives.

In this study, it is assumed that the final demand for these 3 sectors increase individually and being combined assuming it is a yearly effect. The scenarios for impact analysis are being divided into the following:

Scenario 1: increase in final demand for goods and services in food, beverages and accommodation sector amounting RM1 million a month, while other things remain unchanged, hence RM12 million in a year.

Scenario 2: increase in final demand for goods and services in wholesale and retail trade sector amounting RM1 million a month, while other things remain unchanged, hence RM12 million in a year.

Scenario 3: one off increase in final demand goods and services and in construction sector by RM600 million, while other things remain unchanged.

The value proposed for Scenario 1 and Scenario 2 are based on conservative figures assumed by the authors after consulting various stakeholders such as stakeholders in Tawau. Scenario 3 is based on the announcement made by the government. The values might not be 100 percent correct all the time as the economy is dynamic.

The study uses the output multiplier to compute the impact on output. The formula of the output multiplier are as follows:

$$\text{Output multiplier } (O_{\text{MULT}})_j = \Sigma_i L_{ij}.$$

The type I output multiplier for a particular industry is defined as the total of all outputs from each domestic industry required in order to produce one additional unit of output that is, the column sums (Σ_i) from the type I Leontief inverse matrix (L_{ij}).

4. Results and discussion

Table 1 presents the findings of the input-output analysis, which showcases the outcomes derived from the examination. Assuming the premise that the boundary between Serudong-Simanggaris is easily accessible, it can be anticipated that there will be an augmentation in the movements of people, products and services between the Sabah and North Kalimantan. This anticipated increase in mobility would subsequently lead to a substantial rise in the final demand for products within the food, beverages and accommodation sector. Consequently, this surge in demand would result in a remarkable rise in the overall output. The examination of the input-output analysis reveals that the previously mentioned RM 12 million (USD 2.556 million) increases in final demand from the food, beverages, and accommodation sector would generate a growth in the overall output by 0.03%.

Table 1. Input-output analysis: Impact of increase in final demand in food, beverages, and accommodation sectors (Scenario 1).

Assumption	Section	By the amount	% change to overall output
An increase in final demand for products in	Food & beverages and accommodation sector	RM 12,000,000 or USD 2,556,182	0.03%

Based on **Table 2**, the anticipated increase in mobility would subsequently lead to a substantial rise in the final demand for products in the wholesale and retail trade sector. Consequently, this surge in demand would result in a remarkable rise in the overall output. The examination of the input-output analysis reveals that the previously mentioned RM 12 million (USD 2.556 million) increases in final demand from the wholesale and retail trade sector would generate a growth in the overall output by 0.02%.

Table 2. Input-output analysis: Impact of increase in final demand in the wholesale and retail trade sector (Scenario 2).

Assumption	Section	By the amount	% change to overall output
An increase in final demand for products in	Wholesale and retail trade sector	RM 12,000,000 or USD 2,556,182	0.02%

Table 3 shows the results of input-output table analysis for a one-off spending for the purpose of road construction. Assuming road construction takes place, causing the final demand for products and or services from construction sector to increase by RM 600 million (USD 127.8 million) only (and other things remain the same, it is estimated that would generate a growth in the overall Sabah output by 1.8%.

Table 3. Input–output analysis: Impact of increase in final demand in the construction sector (Scenario 3).

Assumption	Section	By the amount	% change to overall output
An increase in final demand for products in	Construction sector	RM 600,000,000 or USD 127,809,138	1.80%

Having said that, the said impact is very much dependent on various factors such as the dynamics of current economic situation, timing of real spending being made, policy related to people, goods, services and investment movement in border areas or between countries, the actual amount being spent by players in the economy and how far they are from the assumptions being assumed in this study. The impact can be more or even less, subject to the new dynamics in the economy, the role of para-diplomacy between the stakeholders in Sabah and Kalimantan, as well as other factors mentioned earlier.

Looking at the finding of other studies such as the one by Holzner et al. (2018) on the proposed European Silk Road, it is found that the impact of road on economic growth found to be positive. In a baseline scenario, the estimation show that the European Silk Road would have the potential to improve the GDP of the involved countries by 3.5%.

5. Limitations of the study

While highlighting the potential positive impact of financing fiscal spending for opening up border entry point by having road construction, it is also important to highlight that there are also many potential issues to be associated with this development. Indeed, all aspects of the economy and other areas should not be overlooked when considering this development. Other impacts are not part of this study.

6. Conclusion

Cross border road connectivity is important for economy as it makes movement of people, goods, services and investment to be smoother. Many past studies have indicated that public capital have positive impacts on growth. In the context of Sabah, Malaysia and North Kalimantan, Indonesia, linking two countries with road would have the potential of stimulating economic activities, hence economic growth at least in nearby border areas.

Financing fiscal spending for road construction in Serudong-Simanggaris is expected to bring positive impact from output growth perspective. The economic impact of enhancing road access to the Serudong-Simanggaris border entry point in Sabah is anticipated to be positive. Assuming road construction takes place, causing the final demand for products and or services from construction sector to increase by RM 600 million only and other things remain the same, it is estimated that would generate a growth in Sabah's overall output by 1.8%. Besides, a RM 12 million annual increase in final demand for the food, beverage, and accommodation sector will result in a 0.03% growth in economic output. The study also estimates that a RM 12 million increase in final demand from the wholesale and retail trade sector would generate a growth in the overall output by 0.02%.

Despite estimating positive growth in output, it is also important to highlight that

the actual future increase in final demand may extend beyond these three sectors. Moreover, further research is necessary to assess the effect of opening the border entry point on various areas such as environment, security, social, and cultural aspects among others.

The preliminary estimate in this study is hoped to give a reasonable indication for policy makers and other stakeholders on the likely impact of cross border road connectivity between Sabah and Kalimantan on Sabah's output. While investing on road to stimulate economic activities, there are many additional ways that can be used such as para diplomacy involving state or provincial departments or agencies in addition to the roles by business communities such as the business chambers.

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