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# Analyzing the roles of the construction sector by using multiplier analyses: the cases of Indonesia and Japan

*by Dr. Ubaidillah Zuhdi*

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## Analyzing the roles of the construction sector by using multiplier analyses: the cases of Indonesia and Japan

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**Abstract.** This study aims to analyze the roles of the construction sector in the Indonesian and Japanese national economies by employing simple output and simple household income multipliers, the analysis devices in the analysis of Input-Output (IO). The analysis periods of the study are 2010 and 2011. The former year is an analysis period for the case of Indonesia while the Japanese case utilizes the latter one. The study uses 2010 Indonesian and 2011 Japanese IO tables as data. The results show that, by utilizing simple output multiplier, the discussed sector included in the top five sectors for both cases on the analysis periods. Based on the results, one can say that the sector had the important positions in the national economies of both countries on the periods of analysis. On the other hand, by using simple household income multiplier, the analyzed sector included in the top five sectors on the analysis period for the Japanese case.

### 1. Introduction

The national development discussion cannot be separated from the roles of industries in supporting the national economy. One of the important industries in the national economy is the construction industry. According to [1], the construction refers to infrastructure and building works in many industries in both individual and commercial residential areas, such as energy, defense, and transportation. They also describe that the infrastructures that include in the construction sector are transportation systems, bridges, dams and irrigation systems, ports, airports, oil pipelines, and trendy buildings like residential and shopping centers. In other words, the scope of the construction sector in the national economy is broad.

There are many previous studies in the area of the construction sector. For example, [2] reviews the sources of photogrammetric error and their effects on surveying and modeling for construction quality control, quantity takeoff, and site safety monitoring applications. On the other hand, [3] examines the construction sector's capacity in the socio-economic development of Nigeria utilizing economic data on the aggregate GDP and the construction industry. For the case of Nigeria, the relationship between real GDP and construction sector is significant. Besides, [4] proposes a research on supplier-contractor partnering and its effect on the construction performance. The object of the research is the Malaysian construction industry.



Meanwhile, [5] critically examines the factors that affect the productivity of labour, and classifies these factors into groups based on previous studies in various nations. Besides, [6] evaluates the cost impact of health and safety management within the construction sector in Abuja. This research shows that implementing the programs of safety and health on the construction site tend to escalate the overall budget of the project.

On the other hand, [7] critically reviews the literature regarding cost overrun in construction projects in different nations to determine the primary potential causes. The other previous study is [8]. The purpose of the research is to analyze environmental aspects of construction sector development and related policies in Latvia, including the last trends of green building certification development.

The topic of the international comparison regarding the roles of the construction sector in the national economies includes in the minority group based on the mentioned previous studies. The discussion of the topic is still needed in order to obtain the characteristics of the sector so the recommendations for improving the national economies of analyzed countries through the industry can be made appropriately. This study is conducted in order to fill the gap.

The goal of the current study is to analyze the roles of the construction sector in the Indonesian and Japanese national economies. Indonesia is a representative of developing country while Japan is a developed one. The study uses the analysis of Input-Output (IO) as an analysis tool. More specifically, the study employs simple output and simple household income multipliers in the process of analysis. Both multipliers are suitable devices in describing the roles.

The rest of this paper is described as follows. Section 2 scientifically explains the methodology of the study. Section three describes the results of calculations. The results analysis is also conducted on this section. The next section, section four, shows the conclusions of the study, and suggestions for the further researches.

## 2. Methodology

This part scientifically explains the methodology of the current study. The first step of the methodology is to explain the data used. The study utilizes 2010 Indonesian and 2011 Japanese IO tables as data. The study uses these years as analysis periods. More specifically, the analysis period for the Indonesian case is 2010 while for the case of Japan is 2011. The sources of the tables for Indonesian and Japanese cases are [9] and [10], respectively. The former table consists of seventeen industries while the latter one has thirteen industrial sectors. The Indonesian table uses basic prices while the Japanese one employs producer's prices.

The second step is to show Indonesian and Japanese industries used in this study. Tables 1 and 2 describes those industries. For the Indonesian case, the analyzed sector is represented by the sector number 6, construction. On the other hand, the discussed industry for the case of Japan occupies the sector number 4, construction.

The third step is to conduct the calculations by employing simple output and simple household income multipliers. These multipliers are the components of IO analysis. The equations of both multipliers are explained by [11] as follows:

$$m(o)_j = \sum_{i=1}^n l_{ij} \tag{1}$$

$$m(h)_j = \sum_{i=1}^n a_{n+1,i} l_{ij} \tag{2}$$

The first equation describes the simple output multiplier while the second one explains the multiplier of simple household income. More specifically,  $m(o)_j$ ,  $m(h)_j$ ,  $a_{n+1,i}$ ,  $n$ , and  $l_{ij}$  are simple output multiplier for sector  $j$ , simple household income multiplier for sector  $j$ , the coefficients of labor-input, the number of analyzed industrial sectors, and a matrix of sector-to-sector multipliers, respectively.

According to [11], an output multiplier for sector  $j$  is the total value of production in all industries of the economy that is required in order to fulfill a currency's worth of final demand for the output of sector  $j$ . The reference also explains that, in the case of the multiplier of simple output, the total value of production is coming from the model of household exogenous.

On the other hand, [11] mentions that the multiplier of simple household income is used to explain the economic impacts of a new final demand as calculated by the new household income by employing the model of household exogenous. The next action is to analyze the roles of the construction industry in the economies of Indonesia and Japan on the analysis periods. Conclusions of the study, and suggestions for further researches are described on the final step.

**Table 1.** Indonesian industrial sectors used in this study (Source: [12]).

Sector Number	Sector Name
1	Agriculture, forestry, and fishing
2	Mining and quarrying
3	Manufacturing
4	Electricity and gas
5	Water supply, sewerage, waste management, and remediation activities
6	Construction
7	Wholesale and retail trade; repair of motor vehicles and motorcycles
8	Transportation and storage
9	Accommodation and food service activities
10	Information and communication
11	Financial and insurance activities
12	Real estate activities
13	Business activities
14	Public administration and defence; compulsory social security
15	Education
16	Human health and social work activities
17	Other services activities

**Table 2.** Japanese industrial sectors used in this study (Source: [13]).

Sector Number	Sector Name
1	Agriculture, forestry, and fishery
2	Mining
3	Manufacturing
4	Construction
5	Electricity, gas, and water supply
6	Commerce
7	Finance and insurance

Sector Number	Sector Name
8	Real estate
9	Transport and postal services
10	Information and communications
11	Public administration
12	Services
13	Activities not elsewhere classified

### 3. Results and discussion

Tables 3 and 4 show the top five industries of Indonesia and Japan seen from the simple output multiplier values on the periods of analysis, respectively. For both cases, the analyzed sector includes in those industries. For the Indonesian case, the value of the simple output multiplier of the sector is 2.300. The value explains that in order to satisfy a rupiah's worth of final demand for the sector's output, all Indonesian industrial sectors need to make the products which the total value is Rp2.300. On the other hand, the value is 2.268 for the case of Japan. The value indicates that all economic sectors of Japan need to make the products which the total value is ¥2.268 in order to satisfy a yen's worth of final demand for the output of construction sector.

Meanwhile, for the case of Indonesia, the highest simple output multiplier value on the period of analysis was owned by electricity and gas, industry number 4. The value was 2.889. For the Japanese case, the highest simple output multiplier value on the period of analysis was 2.739. The value was owned by the manufacturing industry. One can argue that, based on the results, an additional final demand for the discussed industry would give attractive impacts to the Indonesian and Japanese economies on the analysis periods. More attention should be given to the case of Indonesia because in the Indonesian economy in 2010, the analyzed sector occupied the second position viewed from the value of simple output multiplier.

Figures 1 and 2 describe the values of simple output multiplier of all Indonesian and Japanese economic sectors in 2010 and 2011, respectively. For the case of Indonesia, the lowest value on the period of analysis was owned by water supply, sewerage, waste management, and remediation activities industry. Meanwhile, for the Japanese case, the real estate industry had the lowest value in 2011.

Both discussed countries have an Information and Communication Technology (ICT) sector. The sector is represented by sector number 10, information and communication(s). For the case of Indonesia, the simple output multiplier value of the sector was 1.695 in 2010. On the other hand, the value was 1.935 for the Japanese case in 2011. Interestingly, these values are below the average values.

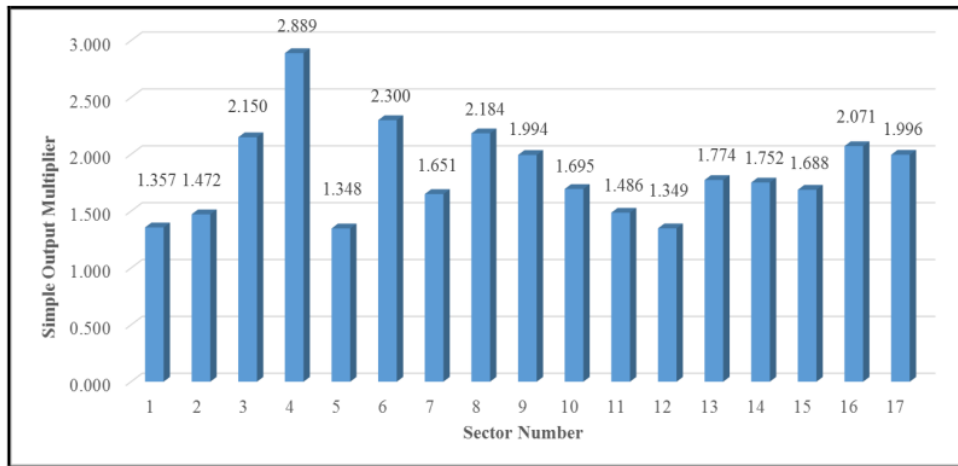
Tables 5 and 6 explain top five Indonesian and Japanese industries seen from the simple household income multiplier values on the periods of analysis, respectively. Unlike the previous multiplier, construction sector does not include in these industries for the case of Indonesia. For the Indonesian case, the value was 0.318 in 2010. The sector occupied the sixth position from the point of view of the simple household income multiplier on the period of analysis. For the Japanese case, the discussed sector includes in the top five industries. More specifically, the sector occupied the first position which the value was 0.646 in 2011 viewed from the multiplier. Based on these facts, one can say that an additional final demand for the analyzed industry would generate the attractive impact to the Japanese economies on the analysis period while the same argument might not be suitable for the Indonesian case.

**Table 3.** Top five Indonesian industrial sectors viewed from the values of simple output multiplier, 2010 (Source: [14]).

Number	Sector Number	Sector Name	Simple Output Multiplier
1	4	Electricity and gas	2.889
2	6	Construction	2.300
3	8	Transportation and storage	2.184
4	3	Manufacturing	2.150
5	16	Human health and social work activities	2.071

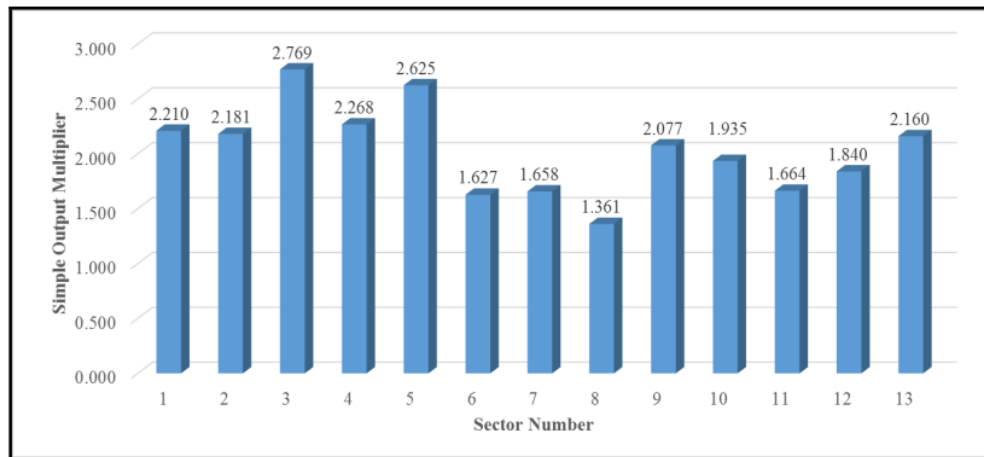
**Table 4.** Top five Japanese industrial sectors viewed from the values of simple output multiplier, 2011 (Source: [15]).

Number	Sector Number	Sector Name	Simple Output Multiplier
1	3	Manufacturing	2.769
2	5	Electricity, gas, and water supply	2.625
3	4	Construction	2.268
4	1	Agriculture, forestry, and fishery	2.210
5	2	Mining	2.181



**Figure 1.** The values of simple output multiplier of Indonesian industrial sectors, 2010 (Source: [14]).





**Figure 2.** The values of simple output multiplier of Japanese industrial sectors, 2011 (Source: [15]).

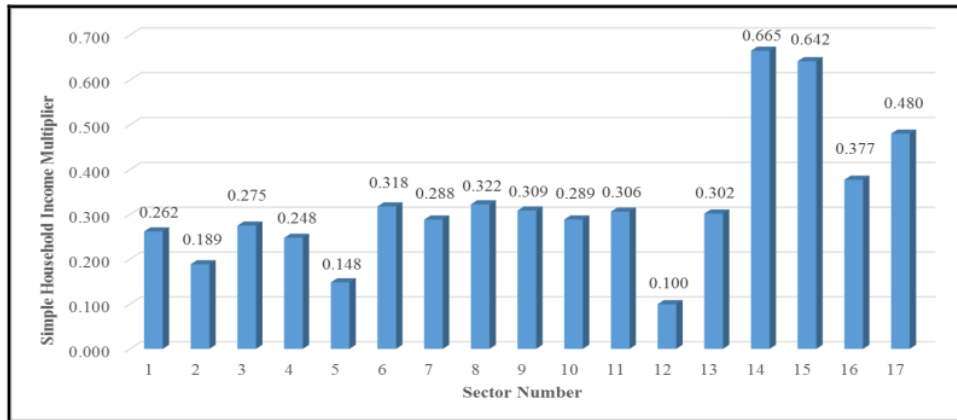
Figures 3 and 4 describe the simple household income multiplier values of all Indonesian and Japanese industries in 2010 and 2011, respectively. For the Indonesian case, the real estate activities industry had the lowest value on the period of analysis. As with the previous multiplier, in 2011, the lowest value of simple household income multiplier for the case of Japan was owned by the real estate industry. The values of ICT industry for the cases of Indonesia and Japan on the analysis periods were 0.289 and 0.480, respectively. The value on the Indonesian case is below the average value.

**Table 5.** Top five Indonesian industrial sectors viewed from the values of simple household income multiplier, 2010 (Source: [14] with the slight modifications).

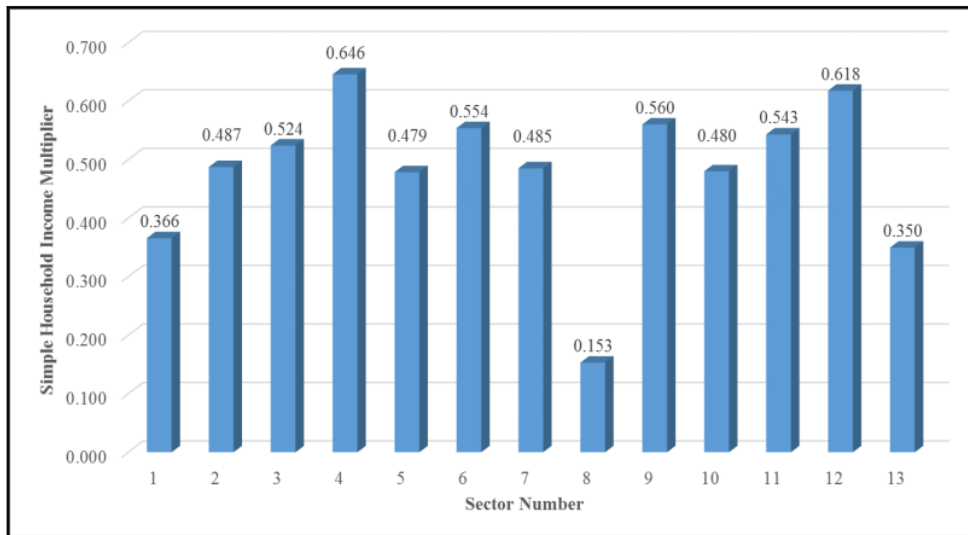
Number	Sector Number	Sector Name	Simple Household Income Multiplier
1	14	Public administration and defence; compulsory social security	0.665
2	15	Education	0.642
3	17	Other services activities	0.480
4	16	Human health and social work activities	0.377
5	8	Transportation and storage	0.322

**Table 6.** Top five Japanese industrial sectors viewed from the values of simple household income multiplier, 2011 (Source: [15]).

Number	Sector Number	Sector Name	Simple Household Income Multiplier
1	4	Construction	0.646
2	12	Services	0.618
3	9	Transport and postal services	0.560
4	6	Commerce	0.554
5	11	Public administration	0.543



**Figure 3.** The values of simple household income multiplier of Indonesian industrial sectors, 2010 (Source: [14]).



**Figure 4.** The values of simple household income multiplier of Japanese industrial sectors, 2011 (Source: [15]).

The calculation results of simple output multiplier <sup>6</sup> plain that, for both cases, construction sector included in the top five sectors on the analysis period <sup>4</sup>. This fact indicates that, from the point of view of the multiplier, the sector had important positions in the national economies of Indonesia and Japan on the periods of analysis. The activists of construction in Indonesia and Japan can use <sup>7</sup> results as references in making strategic steps for improving the industry. For the case of Japan, by using simple household income multiplier, the discussed sector included in the top five sectors on the analysis period too. Therefore, in this case, the reason for improving the sector is stronger.

Obviously Indonesian and Japanese governments can also use the calculation results of both multipliers as inputs in deciding the prioritized industries. These decisions will influence the directions of government movement for both countries. For example, the decisions will influence the number of export and import activities of industrial sectors.

#### 4. Conclusions

This study analyzes the roles of the construction sector in the national economies of Indonesia and Japan. The analysis periods for the cases of Indonesia and Japan are 2010 and 2011, respectively. The study uses the analysis of IO as an analysis tool. More specifically, the study employs simple output and simple household income multipliers in the processes of analyses. For the Indonesian case, the study focuses on the seventeen industrial sectors. On the other hand, thirteen industries are analyzed in the case of Japan. For the case of Indonesia, the discussed sector is represented by the sector number 6, construction. On the other hand, for the Japanese case, the analyzed sector is the sector number 4, construction.

The results show that, by using simple output multiplier, the analyzed sector included in the top five sectors for both cases on the analysis periods. More specifically, in 2010, by using the simple output multiplier, the sector occupied the second position in the Indonesian economy while the third position was owned by the sector in the Japanese case in 2011. Based on the results, one can say that the sector had important positions in the national economies of both countries on the periods of analysis. The construction activists and governments of Indonesia and Japan can use the results as references in making the strategic actions for improving the sector. On the other hand, by using simple household income multiplier, the discussed sector included in the top five sectors on the analysis period for the Japanese case. Therefore, in this case, one can argue that the reason for improving the sector is stronger.

The understanding regarding the roles of the construction sector in the Indonesian and Japanese national economies on the analysis periods is obtained from the current study. However, for both countries, the study utilizes the aggregated economic sectors. In other words, the opportunity to conduct the deeper analysis regarding the discussed sector in both countries is still available especially in exploring the derivative construction sectors. Therefore, as a further research, the study suggests the same methodology by utilizing the disaggregated IO tables of Indonesia and Japan.

The other proposed further research from the study is to perform an international comparison between Indonesia and Japan by focusing on the other industries. The comparison can be focused on, for example, healthcare, ICT, and service industries. Besides, the other international comparison focuses on the construction sector can be conducted as a further research. One example is the comparison between Indonesia and the Philippines.

#### Acknowledgement

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#### References

- [1] Berk N and Biçen S 2018 Causality between the construction sector and GDP growth in emerging countries: the case of Turkey *Athens Journal of Mediterranean Studies* **4** pp 19–36
- [2] Dai F, Feng Y and Hough R 2014 Photogrammetric error sources and impacts on modeling and surveying in construction engineering applications *Visualization in Engineering* **2** pp 1–14
- [3] Okoye P U 2016 Optimising the capacity of Nigeria construction sector for socio-economic sustainability *British Journal of Applied Science & Technology* **16** pp 1–16
- [4] Mirawati N A, Othman S N and Risyawati M I 2015 Supplier-contractor partnering impact on construction performance: a study on Malaysian construction industry *Journal of Economics, Business and Management* **3** pp 29–33
- [5] Nurhendi R N, Khoiry M A and Hamzah N 2019 Review on factors influencing labour productivity in construction project *International Journal of Recent Technology and*

- Engineering* **7** pp 837–44
- [6] Muhammad B A, Abdulateef I and Ladi B D 2015 Assessment of cost impact in health and safety on construction projects *American Journal of Engineering Research* **4** pp 25–30
- [7] Aljohani A, Ahiaga-Dagbui D and Moore D 2017 Construction projects cost overrun: what does the literature tell us? *International Journal of Innovation, Management and Technology* **8** pp 137–43
- [8] Kauškale L, Geipelel, Vanags J and Lepkova N 2017 Environmental aspects of the construction industry development in Latvia *Baltic Journal of Real Estate Economics and Construction Management* **5** pp 209–25
- [9] BPS-Statistics Indonesia 2016 *Statistical Yearbook of Indonesia 2016* [online] [https://www.bps.go.id/website/pdf\\_publicasi/Statistik-Indonesia-2016--\\_rev.pdf](https://www.bps.go.id/website/pdf_publicasi/Statistik-Indonesia-2016--_rev.pdf) (accessed July 28, 2019)
- [10] Japanese Ministry of Internal Affairs and Communications 2016 *2011 Input-Output Tables for Japan* [online] [http://www.soumu.go.jp/main\\_content/000443188.pdf](http://www.soumu.go.jp/main_content/000443188.pdf) (accessed August 16, 2019)
- [11] Miller R E and Blair P D 2009 *Input-Output Analysis: Foundations and Extensions* (Cambridge: University Press)
- [12] Zuhdi U 2017 An analysis of the characteristics of Indonesian industrial sectors: 2005-2010 *IOP Conference Series: Earth and Environmental Science* **88** pp 1–7
- [13] Zuhdi U 2017 An analysis of the characteristics of Japanese industrial sectors from 2005 through 2011 *IOP Conference Series: Earth and Environmental Science* **88** pp 1–7
- [14] Zuhdi U and Herlambang T 2019 The applications of multiplier analyses in analyzing the roles of industrial sectors: the case of Indonesia *Advances in Social Science, Education and Humanities Research* **343** pp 427–30
- [15] Zuhdi U, Herlambang T and Nasori N 2019 Using multiplier analyses in analyzing the roles of Japanese industrial sectors *International Journal of Engineering and Advanced Technology* **8** pp 229–32

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