ASL_Indonesian's Global and Regional Production Linkage

by Deden Dinar Iskandar

Indonesian's Global and Regional Production Linkages: A Multi Regional Input–Output Analysis

Deden Dinar Iskandar

Faculty of Economics and Business, Diponegoro University, Semarang, Indonesia

ASEAN has envisioned a regional economic integration in South East Asia. Various steps have been taken with the declaration of ASEAN Economic Community (AEC) in 2015 as the most current development. With this context as a background, the question regarding the degree of Indonesian's economic integration with other ASEAN countries and beyond becomes more prevalent. The production linkages are good indicators to locate the current Indonesian position on the map of regional and global economies. Accordingly, this paper attempts to examine the production linkages of Indonesia using Multi Regional Input–Output (MRIO) 2011 developed by Asian Development Bank (ADB). The MRIO analysis in this paper isolates the intraregional and interregional effects. While the first term describe the domestic effects of Indonesian's sector-specific production activities, the last term measure the effects of international production linkages on Indonesian's production activities and assess the level of integration between Indonesian's economy with regional as well as global economies. Intraregional and interregional effects of production activities in selected ASEAN countries are provided as comparisons.

Keywords: Economic Integration, Multi Regional Input–Output Analysis, Production Linkages, Regional Economics.

1. INTRODUCTION

ASEAN has envisioned a regional economic integration in South East Asia. Various steps have been taken with the declaration of ASEAN Economic Community (AEC) in 2015 as the most current development. Accordingly, the issue of Indonesian's economic integration (as indicated by the production linkage) with other ASEAN countries and beyond becomes more prevalent.

The system of input–output tables (IOTs) is an important quantitative framework for identifying and analyzing the production mechanism of different economies and the interactions among them.[1] An important attribute of the IOT is that it provides the details of the linkages between production within an economy and different economies in a systematic way, depending on the availability of data.

In particular, this study concerns with two effects based on the intrinsic cause driving the production of the output: intraregional and interregional effect. Intraregional effect measures the total output that a production sector needs to produce in order to meet the total intraregional demand for its output, which arises from an increase in the final demand for any given commodity. Interregional effect has a similar definition; however, it captures interregional instead of intraregional demand for the sector's product.

The data used in this study were Asian Development Bank-Multi Regional Input–Output (ADB-MRIO), a World Input–Output Database[3] augmented by the Asian Development Bank (ADB) with the economic input–output transactions data on five additional Asian economies.[2]

2. ANALYSIS

2.1. Intraregional Multiplier

The following Table I demonstrates the total intraregional multiplier of each country within ASEAN 4 (Indonesia, Malaysia, Philippines, and Thailand).

The total intraregional multiplier effect for Indonesia was 55.91, indicated that the increase of one unit in the final demand for every output produced in Indonesia led to 55.91 unit increases in total output through the production linkage. However, this total multiplier was lower than that of other ASEAN 4 countries. Malaysia, Thailand, and Philippines all demonstrate higher total intraregional multiplier.

2.2. Interregional Multiplier

Interregional Multiplier consisted of backward linkage and forward linkage. Backward linkage referred to the production linkage between one particular sector and other sectors in different regions that supplied input of production for the former; while, forward linkage indicated the linkage between one particular sector and other sectors in different regions that used output of the former as production input. Summing up backward and forward

Table I. Total intraregional multiplier.

Countries	Total intraregional multiplier
Indonesia	55.91
Malaysia	66.14
Philippines	60.24
Thailand	62.94

multipliers from all sectors in the economy would add up to the aggregated backward and forward interregional multipliers for the whole economy.

As displayed in Table II, the aggregated backward interregional multiplier of Indonesian economy is 0.49 for ASEAN 4 and 8.05 for the rest of the world respectively. These numbers indicated that the increase of one unit in final demand for output of all sectors in Indonesia lead to the increase of total output of other ASEAN 4 countries, which served as the input of production for Indonesian sectors by 0.49. On the other hand, the same level of increase would stimulate the growth of total output of the rest of the world by 8.05, or 16.36 times as high as its effect on fellow ASEAN 4 economies.

The fact that the multiplier for other ASEAN 4 economies was much lower than that for the rest of the world was also experienced by other ASEAN 4 countries. These results suggested that Indonesian economy (as well as other ASEAN 4) is more *backwardly* integrated to the rest the world than to the fellow ASEAN 4, in which the rest of the world contributes a bigger part of input for production process in Indonesia (and also other ASEAN 4 countries).

The results presented in the Table III shows that the Aggregated Forward Interregional Multiplier for Indonesian economy is 0.64 and 0.08 (or 1.14% and 0.14% of its intraregional counterpart) for other ASEAN 4 countries and the rest of the world respectively. These multipliers implied that one unit increase in final demand for all sectors' output in the rest of the world would stimulate the increase of total output in Indonesia that served as input of production for the former, by 0.08 unit. Meanwhile, an identical occurrence in other ASEAN 4 countries would raise total output generated within Indonesia economy by 0.64 unit, or 8.30 times the effect fuelled by the rest of the world. These

Table II. Total interregional multiplier (backward linkage).

Countries	Total interregional multiplier (backward Linkage)	
	ASEAN 4	Rest of world
Indonesia	0.49	8.05
Malaysia	0.80	10.04
Philippines	0.53	6.98
Thailand	0.60	10.33

Table III. Total interregional multiplier (forward linkage).

Countries	Total Interregional Multiplier (forward Linkage)	
	ASEAN 4	Rest of world
Indonesia	0.64	0.08
Malaysia	0.93	0.08
Philippines	0.12	0.02
Thailand	0.73	0.06

facts revealed that Indonesian economy is "*forwardly*" more integrated to other ASEAN 4 countries, meaning that Indonesia provided the input for production in ASEAN 4 countries at a greater degree than Indonesian's contribution to the rest of the world. The same situation also took place in other fellow ASEAN 4 countries, except Philippines.

3. CONCLUSION

The results of this study show that Aggregated Interregional multiplier of Indonesian industrial sectors, both through backward and forward production linkages, is much lower than the total intraregional multiplier. This finding is normal and experienced by most countries in the world.[a] However, the interesting findings concern with the aggregated backward and forward interregional multipliers. While aggregated backward multiplier for the rest of the world is bigger than that for fellow ASEAN 4 countries, the contrasting results are demonstrated by the aggregated forward multiplier for the ASEAN 4 countries. Further intriguing result is that the backward interregional multiplier of Indonesian economy for the rest of the world is much bigger than Indonesian's forward interregional multiplier for ASEAN 4 countries.

These interesting findings suggest that Indonesian economy is more dependent on the input production provided by the rest of the world; while, on the other hand, Indonesian output mainly contributes to production processes in ASEAN 4 countries (instead of the rest of the world). Furthermore, integration level of Indonesian economy with ASEAN 4 countries through forward production linkage is much lower than its degree of dependence on the rest of the world through backward production linkage. As a conclusion, this study provides the hint that Indonesian economy is yet to be more integrated with ASEAN economic community, particularly through backward production linkage.

References and Notes

1. R. E. Miller and P. D. Blair, Input–Output Analysis: Foundations and Extensions, Cambridge University Press, New York (**2009**).
2. J. Mariasingham, *Asian Development Bank* (**2015**).
3. Timmer, et al., *World Input–Output Database* (**2012**).

[a]This fact is confirmed during the analysis and available from the author upon request.

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