Economic Integration between ASEAN+5 Countries: Comparison of GDP

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Abstract

This study aims to investigate the causality direction of economic integration among ASEAN countries together with five other neighboring countries, namely Australia, China, Japan, New Zealand and South Korea. The analysis is based on the economic integration of GDP covering the sample period from 1967 to 2007. Empirical results from the Toda and Yamomoto (1995) Granger non-causality tests depicted the existence of bi-directional causality relationships between the GDP of ASEAN and China; GDP of ASEAN and Japan; GDP ASEAN and South Korea, and also GDP of ASEAN and New Zealand. This indicates that there is a great potential for ASEAN countries moving towards higher degree of economic integration via strengthening the relationship with those countries within the region.

***Keyword**: Toda and Yamomoto; Economic Integration; ASEAN+5*
***JEL classification**: C19; F15; F50*

1. Introduction

The endurance of the economies in this globalization era depends much on the integration level within the economies in a region. In general, economic integration refers as assimilation of different aspects between the countries where plummeting discrimination among the countries serve as essential element. Trade barriers between the countries will diminish correspond to the higher degree of integration (Balassa, 1961). Despite that, integration indicates unification of two or more countries in a regional trading arrangement and process of plummeting discrimination such as diminishing barriers on international trade, payments and factor mobility (Carbaugh, 2008).

There is a number of economic integration around the world and mostly in western region. For instance, Central African Common Market of the Economic Community of Central African States (ECCAS), Economic Community of West African States (ECOWAS), African Economic Community (AEC) and North American Union. Nevertheless, the most thriving economic integration is the European Union. On the other hand, the only integration that exists in East Asia region is the Association of Southeast Asian Nations (ASEAN) which established in 1967. There are several efforts adopted by the ASEAN countries in moving towards higher level of integration. One of the efforts was the proposal of ASEAN Free Trade Area (AFTA) in 1992 and full implementation in 2002 mainly aiming at tariff reduction within member countries. Besides that, ASEAN countries also participated in the discussion of economic integration which leads to the proposed formation of ASEAN Vision

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2020[1] during inaugural meeting in 1999. This in fact indicated the formation of ASEAN Economic Community (AEC) by that time which indicates higher degree of economic integration. Moreover, ASEAN Bali Concord II in 2003 also reflects commitment of the ASEAN countries towards the achievement of economic integration.

Nonetheless, many doubt the continuous effort of ASEAN countries during the wake of the Asian Financial Crisis in 1997 which leave severe inverse implications towards the region. This is due to their belief that ASEAN countries would withdraw into isolationism and abandoned their intention to form ASEAN Economic Community (AEC) by 2020. However, the crisis in fact became the core medium for the ASEAN countries towards deepening their cooperation and degree of economic integration.

2. ASEAN+5 Economic Cooperation and Prospect

In this study, ASEAN+5 comprise of ten ASEAN countries and five additional countries namely Australia, China, Japan, Korea and New Zealand. This is due to the international trade linkage between ASEAN and those counties. This can be seen by a series of discussion on the establishment closer trading agreement such as ASEAN-China Free Trade Area (ACFTA), ASEAN-Japan Closer Economic Partnership (AJCEP), ASEAN, Australia and New Zealand Free Trade Area (AANZFTA) and ASEAN+3 (Japan, South Korea and China). In fact, ASEAN countries have developed prominent relationship with Northeast Asia countries and Oceania countries at early stage. For instance, Australia and New Zealand play significant role as Dialogue partner to ASEAN since 1974 and 1975 respectively. Various dialogues were held regarding on trade accessibility impediments and technical assistance on regional projects such as research and development (R&D) in food-related fields. Moreover, other areas also being enhance such as governmental, business and human relation.

Meanwhile, the relationship between ASEAN and China as a Dialogue Partner formally embark in 1996 and expanding vigorously. Among the magnificent achievement between ASEAN and China relationship are the establishment of Strategic Partnership for Peace and Prosperity in 2003 and ASEAN-China Free Trade Area by 2010 for the ASEAN-6, and 2015 for CLMV in 2004. On the other hand, the formation of ASEAN-Japan Forum in 1977 has remarked as the commencement of linkage between ASEAN and Japan while South Korea became Dialogue partner to ASEAN in 1991. Despite broadening the cooperation in political and security, financial and economic, and social and cultural areas, two of the major achievements were the establishment of Tokyo Declaration for the Dynamic and Enduring ASEAN-Japan Partnership in the New Millennium" and the adoption of the "ASEAN-Japan Plan of Action in 2003.

Viewing various commitment and achievements towards strengthening association between ASEAN-5 countries, interdependence among the ASEAN+5 countries remain crucial. Barriers on the flows of goods and services among the countries should be diminished in this globalization era as to resemble high degree of

[1] The vision is an outward and forward looking ASEAN, living in peace, stability and prosperity, bonded together in partnership in dynamic development and in a community of caring societies.

interdependency among those countries. This is due to the cohesion relationship shared by those countries particularly in economic and financial relationship. These relationships will serve as the bond that unites those countries together. Nevertheless, the economic and financial relationship among the countries experienced several uncertainty such as the Asian Financial crisis in 1998, United States economic recession in 2001 and recently global crisis in 2008. As a result, the long-run economic and financial relationship among the ASEAN+5 countries remain ambiguous and feasibility of the establishing effective economic bloc will remain vague[2].

3. Related Literature Review

There are several previous studies exploring the interdependence relationship among the ASEAN+5 countries. Akhtar (2004) indicated existence of robust intraregional trade and integration of market-driven and investment trend in East Asia. This trend shows that the East Asia economies are integrated and possibility of deepening integration degree by creation of East Asia currency union in the long-run. Nevertheless, the realization of this creation depends much on the mutual sturdy political devotion and shared autonomy in policy making at regional level. The importance of the deeper integration among East Asia countries also depicted by study of Kawai (2004). He claimed that despite domestic structural, institutional and governance restructuring are essential for achieving sustainable economic growth, market-driven integration at regional and global market level also prominent. He believed that higher interdependence degree in the region can be achieved if diverse obstacles among the countries can be removed in order to forge closer regional cooperation.

Meanwhile, some studies are looking into the possibility of integrating ASEAN countries with the other neighbouring countries in the region. For instance, Rana (2006) examined the regression on ASEAN-5 countries with United States and three Northeast Asia countries, namely China, Japan and South Korea for a sample period of 1989 to 2004. The outcomes of the study specified that integration of market-driven in East Asia was expanding vigorously following the Asian Financial Crisis in 1998. This was greatly sustained by the initiatives from the governments and institutional arrangement with the objective to expand regional trading, investment and financial fields. In addition, the significant growth of these regional trade, investment and financial integration had assisted in enhancing the harmonization of business cycles among the countries in the region. In related to that, Lau and Lee (2008) conducted the study on the interdependence between ASEAN-5 and China using data sample from 1960 to 2000. His findings indicated that existence of high correlation between ASEAN-5 countries and China and moreover, high possibility of reciprocal economic linkage between those countries.

4. Data and Methodology

This study adopted data of real gross domestic product (GDP) of ASEAN+5 countries from 1967 to 2007 from *International Financial Statistics* (IFS) published International Monetary Fund (IMF). All the data are transformed into natural

[2] See for example Darrat and Al-Shamsi (2003).

logarithms with the purpose to enhance the accuracy of the results. Firstly, the Augmented Dickey-Fuller (ADF) (Dickey and Fuller, 1979) unit root rest will be adopted to determine the order of integration of the variables under study. Subsequently, the Granger non-causality test proposed by Toda and Yamamoto (1995) will be conducted as to examine the causal linkage of real GDP among those countries. One of the features of the Granger non-causality test is the employment of modified WALD test for restrictions on the parameters of a VAR(ρ) procedure, where k is the optimal lag length in the system and is depicted by Rambaldi and Doran (1996) using Seemingly Unrelated Regression (SUR) form. Consequently, the main requirement of this test is the identification of the optimal lag length (k) and estimation of ($k + d_{max}$) order of VAR formulated at levels, where d_{max} is the maximum order of integration suspected to occur in the system.

5. Empirical Findings and Discussions

Initially, ADF unit root test was performed as to identify the stationary property of the time series data. Our findings show that all the data are not stationary at the level, but they are stationary at the first difference, which means these data are in $I(1)$ processes (see Table 1). As such, the maximum order of integration (d_{max}) in the VAR system should equal to one.

Table 1: ADF Unit Root Test Results for Series in Level and First Difference

	Level with trend		First difference without trend	
Series	**Test statistic**	**Lag**	**Test statistic**	**Lag**
LYAS	-2.147	1	-4.267***	0
LYAU	0.334	0	-3.720***	0
LYCH	-1.099	0	-5.529***	0
LYJP	-0.576	0	-3.834***	0
LYKR	-1.359	0	-4.753***	0
LYNZ	-0.558	1	-3.248**	0

Notes: Critical values are obtained from Mackinnon (1996). The optimum lag lengths are determined by Schwarz Information Criterion (SIC). LYAS is natural logarithm of real GDP for ASEAN countries, LYAU is natural logarithm of real GDP for Australia, LYCH is natural logarithm of real GDP for China, LYJP is natural logarithm of real GDP for Japan, LYKR is natural logarithm of real GDP for South Korea, and LYNZ is natural logarithm of real GDP for New Zealand. Asterisks (***), (**) and (*) indicate statistically significant at the 1%, 5% and 10% levels, respectively.

In the next step, we attempt to find out the optimal lag length (k) via Schwarz Bayesian Criterion (SBC). Table 2 shows that the selected optimal lag length for the system is equal to one as indicated by the highest SBC value. Since the d_{max} and optimal lag length (k) are both equal to one, the VAR system should be estimated with two lags, that is, VAR(2). Nevertheless, to check for the robustness of the estimation results towards changes in time, we also estimate for the VAR(3) and VAR(4) models in this study. The results of the Granger non-causality tests are presented in Table 3 below.

Table 2: The Choice of True Lag Length (*k*) Based on the SBC

NLag	SBC: ASEAN+5
1	220.853*
2	182.258
3	157.891
4	151.814

Notes: Nlag is the number of lags used in VAR. Asterisks (*) indicates the lag order selected by the criterion.

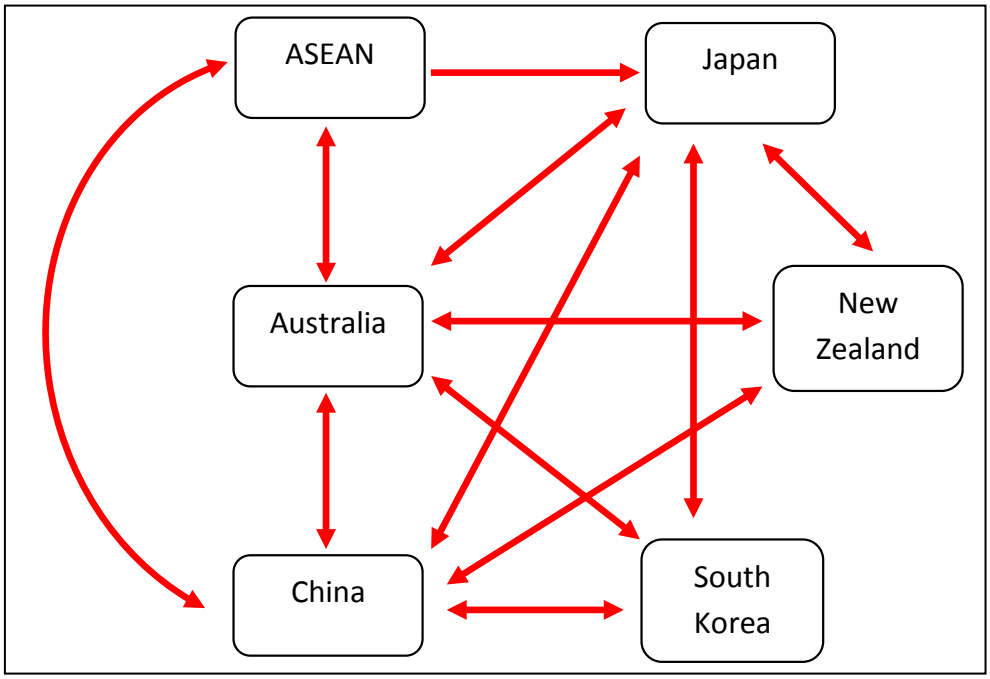
Table 3: Long Run Granger Non-Causality Tests Results

	Explanatory variables (VAR(2))					
	ASEAN	Australia	China	Japan	Korea	New Zealand
ASEAN	7.76***	0.34	0.73	0.27	0.65	0.20
	(0.01)	(0.95)	(0.39)	(0.60)	(0.42)	(0.99)
Australia	0.32	4.23**	1.06***	8.58***	2.56	0.79
	(0.86)	(0.04)	(0.00)	(0.00)	(0.11)	(0.38)
China	0.69	0.20	20.86***	7.03***	0.82	0.53
	(0.41)	(0.96)	(0.00)	(0.01)	(0.77)	(0.46)
Japan	4.95**	0.45	1.73	66.01***	9.70***	0.118
	(0.03)	(0.98)	(0.19)	(0.00)	(0.00)	(0.73)
Korea	0.21	0.18	2.65*	0.75	2.76*	0.36
	(0.88)	(0.67)	(0.10)	(0.39)	(0.10)	(0.85)
New Zealand	0.16	6.82***	6.96***	5.07	1.43	29.26***
	(0.69)	(0.01)	(0.01)	(0.20)	(0.23)	(0.00)
	Explanatory variables (VAR(3))					
	ASEAN	Australia	China	Japan	Korea	New Zealand
ASEAN	3.09	2.52	1.22	12.45***	0.54	2.06
	(0.21)	(0.28)	(0.54)	(0.00)	(0.97)	(0.36)
Australia	2.32	10.90***	1.87	15.29***	2.42	1.41
	(0.31)	(0.00)	(0.39)	(0.00)	(0.30)	(0.49)
China	1.68	2.61	16.20***	10.03***	0.23	0.63
	(0.43)	(0.27)	(0.00)	(0.01)	(0.89)	(0.73)
Japan	10.42***	0.67	8.83***	70.32***	10.89***	0.22
	(0.01)	(0.72)	(0.01)	(0.00)	(0.00)	(0.90)
Korea	2.77	3.81	5.79*	11.42***	4.99*	1.94
	(0.25)	(0.15)	(0.06)	(0.00)	(0.08)	(0.38)
New Zealand	0.88	11.11***	8.80***	13.61***	0.72	28.62***
	(0.64)	(0.00)	(0.01)	(0.00)	(0.70)	(0.00)
	Explanatory variables (VAR(4))					
	ASEAN	Australia	China	Japan	Korea	New Zealand
ASEAN	0.78	6.53*	28.43***	4.51	2.66	4.64
	(0.85)	(0.09)	(0.00)	(0.21)	(0.45)	(0.20)
Australia	4.05	19.23***	30.41***	13.28***	1.46	2.74
	(0.26)	(0.00)	(0.00)	(0.00)	(0.69)	(0.43)
China	6.04	4.76	44.42***	5.60	1.12	7.62**
	(0.11)	(0.19)	(0.00)	(0.13)	(0.77)	(0.05)
Japan	8.75**	2.80	23.48***	69.78***	27.17***	7.39*
	(0.03)	(0.42)	(0.00)	(0.00)	(0.00)	(0.06)
Korea	5.20	7.31*	61.04***	16.40***	5.03	5.34
	(0.16)	(0.06)	(0.00)	(0.00)	(0.17)	(0.15)
New Zealand	3.45	12.06***	21.47***	26.45***	1.97	33.45***
	(0.33)	(0.01)	(0.00)	(0.00)	(0.58)	(0.00)

Notes: Numbers in parentheses show the *p*-value associated with the MWald-test. The vertical axis denoted the explained variable while the horizontal shows the explanatory variable. Asterisks (***), (**) and (*) indicate statistically significant at the 1%, 5% and 10% levels, respectively.

Table 3 indicates the results of Granger non-causality tests at various lags. Based on the outcomes of VAR(2), VAR(3) and VAR(4) models, there is an existence of causality linkages among the countries under study, and the longer the time period, these relationships become more obvious. For instance, VAR(4) model presents interesting findings where the null hypothesis of Granger-non causality can be rejected at 5% significance level for real GDP of ASEAN to real GDP of Japan. On the other hand, the real economic performance of ASEAN countries can be affected directly by China and Australia and indirectly by Japan, South Korea and New Zealand through the influences from China and Australia as well. Furthermore, the Granger non-causality tests results also show the existence of bi-directional linkages particularly from China and Japan to other countries, indicating the powerful economic influence of these two countries in the Asia region (See Figure 1).

Figure 1: Causality Relationship of ASEAN+5 Countries



6. Conclusion

The empirical outcomes from the Granger non-causality test obviously indicate the existence of causal association between ASEAN+5 countries. This indicates strong interdependence association while great potential in influencing income of other countries in the region in the long run as supported by Akhtar (2004), Rana (2006) and Lau and Lee (2008). The awareness and continuous effort in enhancing their cooperation with countries within the region as to strengthen ASEAN+5 economies have become the main reason for the high interdependence association in the region. In fact, ASEAN+5 countries are moving towards integrating their economic cooperation and the turning point of aggressive commitment in integrating the economies in the region embarked following the Asian Financial crisis in 1998 onward.

From the perspective of ASEAN, China and Australia are viewed as greater potential in enhancing direct relationship with ASEAN countries. Trade linkage between ASEAN and China has been growing robustly where both parties initiated the formation of ASEAN-China Free Trade Area (ACFTA) by 2010. This is due to the great reciprocal benefits gained by ASEAN in term of reasonable price of products such as machineries, textiles and others while China may be able to obtain raw materials from the ASEAN countries. Meanwhile, Australia became dialogue partner of ASEAN since 1974 and expanding their trade cooperation via discussion on the potential of forming ASEAN Free Trade Area (AFTA).

Furthermore, empirical outcomes also show that China and Japan are dominance in the region where both countries have the ability to influence the other nations in the region. This is due to its prominent role of China emerging country and huge market availability while Japan as source of high technologies and foreign investment to other neighbouring countries. Although real GDP of Japan has no causality impact on real GDP of ASEAN countries, the high interdependence linkages among the countries indicates the influence of Japan upon ASEAN indirectly via China and Australia.

In summary, this study provides empirical result supporting the existence of long run relationships among ASEAN+5 countries in term of their real GDP. Despite high degree of interdependence linkages, ASEAN+5 incomes have great prospective to move along together in the long run. Furthermore, ASEAN countries will be able to enlarge their trade activities with these countries within the region and benefit further from the sustainable bi-directional trade relationship.

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