Jurnal Ekonomi dan Studi Pembangunan, 14 (1), 2022
ISSN 2086-1575 E-ISSN 2502-7115

Regional Cooperation and Economic Integration: Recent Evidence from ASEAN

Rama Vandika Daniswara[1], Ivana[1], Deshinta Rahma Dhani[1], Shafira Aulia Utami[1], Mohamad D. Revindo[2]

[1]Department of Economics, Faculty of Economics and Business, Universitas Indonesia
[2]Graduate School of Strategic and Global Studies, Universitas Indonesia

E-mail: ramavandika@gmail.com

Received: September 29, 2021; Revised: March 14, 2022; Accepted: March 21, 2022
Permalink/DOI: http://dx.doi.org/10.17977/um002v14i12022p038

Abstract

The Asian financial crisis in 1997/98 and the global financial crisis in 2007/8 suggest that more research on economic integration is needed. This study aims to examine the depth and path of integration in the real and financial sectors among ASEAN member states during 1999-2019. The Augmented Dickey-Fuller–Generalised Least Squared (ADF-GLS) test results show stronger evidence of ASEAN real sector integration than its financial sector. Further, time lag analysis shows that the adjustments of interest rates in ASEAN countries are slower than those of price levels in the real economy. Academic and policy implications of the findings are provided, mainly on the need for stronger cooperation in ASEAN's financial sector.

Keywords: Economic Integration, ASEAN, real economy, financial economy, ADF-GLS
JEL Classification: F15, F14, F36

INTRODUCTION

The Asian Financial Crisis (AFC) that took the world by surprise 20 years ago was a major turning point for many of the region's economies in terms of international dependence. Most crisis-stricken countries have reduced their country's dependence on external financing and strengthened financial stability with sound macroeconomic fundamentals and policies, flexible exchange rates, adequate foreign exchange reserves, and strong regional cooperation (Park & Villafuerte, 2017). The AFC began in Thailand in July 1997 and spread the spill-over effect on trading partners in all regions of the world. There were three main causes of the AFC, namely currency mismatch, maturity mismatches, and inefficient allocation of foreign capital flows (Park & Villafuerte, 2017). There have been several regional responses to this crisis. The first response was the formation of bilateral assistance (Park & Villafuerte, 2017). When the crisis first hit Thailand, it formed 'Friends of Thailand' countries to provide initial financial assistance,

contributors that included Australia, the People's Republic of China (PRC), and Japan. The second response was multilateral assistance. In response to the spreading crisis, the international community such as IMF and the World Bank mobilized conditional loans of US$ 118 billion. The third response was the regional cooperation initiatives to stabilize the regional financial system.

In parallel to the strengthening of financial and monetary cooperation, the region also pursues closer real sector cooperation. In January 2007, leaders from ASEAN reaffirmed their commitment to the establishment of the ASEAN Economic Community (AEC) in 2015 to turn ASEAN into a region with free movement of goods, services, investment, labour skills, and freer capital flows. This commitment has produced significant results with data from the 2017 ASEAN Economic Community Chartbook showing an upward trend of trade in goods in the region, both extra-ASEAN and intra-ASEAN, every year. This is despite in 2016 the region's total trade in goods slightly decreased by 1.6% to US$2,236 billion from US$2,273 billion in the previous year while both extra-ASEAN and intra-ASEAN trade in goods were down by 2.0% and 1.5% (Figure 1).

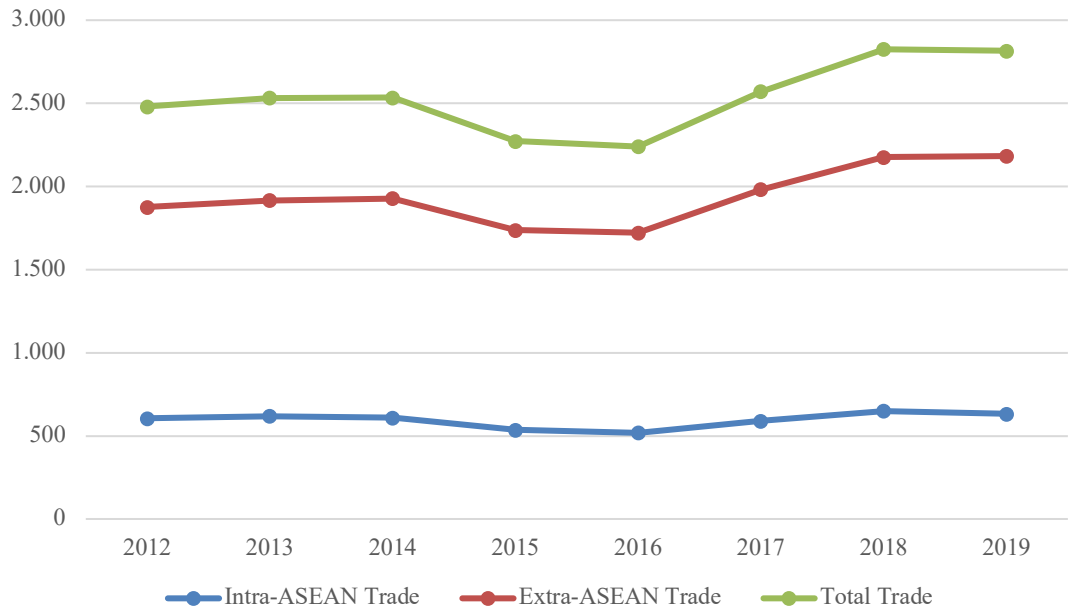

Figure 1. Intra-and-Extra-ASEAN Goods Trade Value
Source: ASEAN External Trade Statistics (2020)

Despite high gains from trade integration, there are still gaps in Southeast Asia's macroeconomic indicators (Table 1). In 2018, Singapore's GDP per capita was 48 times of Myanmar's. In addition, the Human Development Index (HDI) values of Laos, Cambodia, and Myanmar are still very uneven compared to that of Singapore and Brunei Darussalam. Although there are doubts that the gap can worsen the economic performance of the region after the integration (Suman et al. 2017), net benefits are expected to be gained by all ASEAN countries.

Table 1. ASEAN Economic Indicators

Country	Population	GDP per Capita (USD)	Average Inflation (1999-2018)	HDI (2018)	Growth Rate (%) 1999-2018
Indonesia	267,663,435	$3,893.60	7.47	0.707	5.049
Malaysia	31,528,585	$11,373.20	2.27	0.804	5.146
Thailand	69,428,524	$7,273.60	2.00	0.765	4.082
Singapore	5,638,676	$64,581.90	1.54	0.935	5.299
Myanmar	53,708,395	$1,326.00	14.14	0.584	9.985
Philippines	106,651,922	$3,102.70	4.01	0.712	5.235
Laos	7,061,507	$2,542.50	12.75	0.604	7.176
Brunei Darussalam	428,962	$31,628.30	0.29	0.845	0.915
Cambodia	16,249,798	$1,510.30	4.21	0.581	8.036
Vietnam	95,540,395	$2,566.60	6.43	0.693	6.366

Source: World Development Indicators the World Bank (2020)

It has been suggested that to narrow the economic performance gap, ASEAN should pursue comprehensive integration including in trade, capital, services, human movement, and monetary policy, which remains a major challenge to achieve. Kabir and Salim (2014) argued that although there have been converging patterns in some economic indicators, there are still differences in inflation management, exchange rates, and interest rates between ASEAN countries. This can affect the future development of the economic integration of ASEAN. Thereby, the AEC agenda is also expected to encourage stronger and deeper integration between ASEAN member countries.

Taking into consideration those developments, this study seeks to examine the level of integration of the ASEAN region both in the real sector and the financial sector 20 years after the AFC and after the formation of the AEC. Despite abundant literature in this area of research, specific research is needed with lower criteria and stringency to tolerate the differences between nominal levels of each economy with deviations that remains stochastic in nature. This study fills the need to evaluate the integration of all ASEAN members, whereas the previous related studies were limited to a part of ASEAN or other regions (see for example Tang, 2012; Candelon & Gil-Alana, 2006;), were limited to either financial or real sector aspect of the integration (see for example Nguyen et al. 2016; Zhang & Matthews, 2019), or examining a specific event (Rahman & Shahari, 2019). More importantly, this study is the first on this topic that investigates the impact of the establishment of the AEC on the pace and direction of ASEAN economic integration.

The remainder of the paper is structured as follows. The next section explains the research methodology including the theoretical foundations of regional economic integration and international parity, the data, and the data analysis method. The third section provides and discusses the results while the fourth section concludes.

METHOD

Conceptual Framework

Economic integration can be defined as the removal of economic barriers between two or more countries. Based on Balassa's (1961) theory and experience from the European Union, the process of forming regional economic integration consists of several main stages: Free Trade Area (FTA), Customs Union (CU), Common Market (CM), Single Monetary Union (SMU), and Single Currency (SC). Thus, regional economic integration is the transformation of trade and investment liberalization into financial integration between countries in the region.

At present, ASEAN is still in the stage of trade integration with the formation of the ASEAN FTA and is starting to carry out financial integration within the framework of the AEC Blueprint 2025. The formation of AFTA is a significant stage in the formation of regional economic integration, through which economic efficiency and productivity in the region can be achieved (Kabir & Salim, 2014). Verico (2011) found that the formation of AFTA has a positive impact on intra-ASEAN trade, although the form of regional integration in ASEAN is different from those of the European Union.

Volz (2013) argued that financial integration is an important part of ASEAN to realize the AEC. In the AEC blueprint, one of its main objectives is the liberalization of financial services between member countries to achieve freedom of mobility of goods, services, investment, and capital in the region. The establishment of the AEC, according to ADB (2013), can benefit from the liberalization of financial markets in every country in the region. Further, harmonization in regulations can strengthen coordination between countries within the region. However, Nguyen et al. (2016) found that the ASEAN+3 deal mostly benefited the large and/or advanced economies and partner countries in terms of economic integration.

In analyzing economic integration, both in the financial market and the real market, there are three important conditions to consider, namely real interest parity (RIP), uncovered interest parity (UIP), and purchasing power parity (PPP) (Cheung et al., 2003). Integration between financial markets can usually be measured by the deviation of UIP (Cumby and Obstfeld, 1984), while integration in the real market can be measured through PPP (Adler and Lehmann, 1983). PPP theory states that the exchange rate between two countries will reach equilibrium when purchasing power in the two countries is similar. In addition, RIP can also measure financial market integration. Therefore, these three conditions can illustrate the economic integration of a region. It should be underlined that RIP conditions depend on two other parity conditions (UIP and PPP). Although the UIP is held, the RIP cannot be fulfilled consistently if there is an asynchronous movement in PPP as it implies that there are differences in the real cost of borrowing between countries even though the financial markets have been fully integrated (Marston, 1993). However, in some cases, RIP may be held when there is a deviation from PPP and UIP if both movements are opposite (Cheung et al 2003). Therefore, in analyzing regional economic integration between ten countries in ASEAN, these three conditions of parity will be used in this current study.

Jayaraman, Lee, & Lee (2006) studied regional economic integration in Pacific Islands Forum (14 Pacific Island countries, Australia, and New Zealand). They found that there is a low degree of integration between Australia and Pacific

Island countries, although they argued that the Pacific Agreement on Closer Economic Relations (PACER) will result in the strengthening of regional economic integration. Cheung et al. (2003) studied the economic integration in three countries namely China, Hong Kong, and Taiwan from the 1996 to 2002 period. The three economies pursued integration in the real and financial sectors by deepening the reference interest rates, the exchange rate, and the price levels prevailing in each economy. By using RIP, UIP, and deviation from PPP as indicators, real capital mobility, financial mobility, and integration are found to take place in the goods market within Greater China.

Boon Tang (2010) used the United States as a comparison to test UIP hypotheses in four of the five ASEAN countries, where evidence supporting the UIP hypothesis was weak. Indonesia, Malaysia, Thailand, and the Philippines cannot maintain the UIP, except for Singapore. The four countries share similar characteristics of imperfect financial liberalization, less robust macroeconomic fundamentals with low GDP per capita, but high nominal interest rates and high inflation. Furthermore, Chang et al. (2012) examined the PPP conditions of eight ASEAN countries namely Cambodia, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand, and Vietnam during 1980 to 2008. They found that PPP conditions could be maintained in only three ASEAN countries namely Indonesia, Malaysia, and Thailand, but all three had non-linear adjustment patterns.

Estimation Strategy

This study analyses integration with tolerance for higher and long-term value adjustment periods. Accordingly, this study uses the ADF-GLS (Augmented Dickey-Fuller – Generalized Least Squared) criteria (Elliott, Rothenberg, & Stock, 1996). ADF-GLS test is a variant of the standard Dickey-Fuller test, modified by transforming the series into a generalised least squares regression. ADF-GLS has shown greater power compared to the original form as it can tolerate certain trends in the level of ASEAN real and financial integration.

To analyze integration, this study performed an analysis of the parity conditions in real and financial indicators and a combination of both. The real sector is represented by PPP, the financial sector is represented by UIP, and RIP is the combination of the real and financial sectors. The analysis will be conducted in three stages. The first step is the stationarity test, followed by trend estimation, and finally time-lag estimation. The first stage, the stationarity test, serves to test the strength of integration between countries. Following the definition and practical understanding of UIP, PPP, and RIP, the parity is stationery, and deviations are adjusted quickly to return to the parity rate. If it is not stationary, then the theorem does not hold. In this current study, the stationary requirements are defined as covariance stationarity to provide the possibility of trends and time-lags, especially in long-term analysis. The stationarity tests used ADF-GLS with trends or without trends to accommodate the presence or absence of integration trends (or *vice versa*) in the long run. The Schwarzer criterion is used, which is the standard criterion for measuring stationarity.

The null hypothesis for this stage would be that the variables (UIP, PPP, and RIP) have a unit root at the level. If it is rejected, they are stationary. If it is not rejected, the test proceeds at 1st difference. Although the stationarity test at the level would have been sufficient to reject the theoretical suggestion, testing further into

the 1st difference serves to sanity check that the unit root exists at 1st difference. If it is still not significant at 1st difference, then it still can be said that there is a unit root in the tested variable (which denies the instantaneous adjustment of parity from theorem), although the extent and type of the unit root are inconclusive.

It must be recognized that in the long-term sample period (20 years) there is an active ASEAN effort in economic integration. Hence, the second stage is testing the deviation trends from UIP, PPP, and RIP. The null hypothesis is that there is no trend in those variables. If the hypothesis is rejected, then there is a trend in the variables. If the average level is positive and the trend is negative, then there is a trend of decreasing deviations from these theories (while if the trend is positive, then there is an increase in deviation) which, in this context, is a deviation against integration. The opposite is also true. If the average level is negative and the trend is positive, then there is a decrease in the deviation of these theories (and if the trend is negative, then there is an increase in deviation) which, in this context, is a deviation towards integration.

The third stage is a time-lag estimation. This stage is intended to observe the effect of value changes on later periods. This can be analyzed because the nature of stationarity used is covariance stationarity, whereas stationarity is not required for each period (regardless of its position), but the covariance between two terms of the sequence depends on the relative positions of the two terms[1]. The longer the time lag, the longer the justification of UIP, PPP, and RIP values. The null hypothesis would be that there is no time lag. If the hypothesis is significantly rejected, the time lag is evidence that the UIP, PPP, and RIP levels do not adjust variable values quickly/ instantaneously and there is a spill-over effect from value changes from one period to the latter. The tests used the Schwarzer lag criterion, similar to the previous stage.

The formal estimation analysis is explained as follows. The condition of parity in ASEAN with RIP has been specified in various literatures (Chang & Su, 2015; Cheung, Chinn, & Fujii, 2003; Laurenceson, 2003) as:

$$r_t^{ke} - r_t^{k*e} = \left(i_t^k - \pi_{t+k}^e\right) - \left(i_t^{k*} - \pi_{t+k}^{*e}\right) \quad (1)$$

Where r_t^{ke} is the RIP that is expected in period k, i_t^k is the nominal interest rate in period k, and π_{t+k}^e is the level of inflation expectations (Consumer Price Index/CPI) in the period $t+k$. The notation of (*) indicates foreign, while variable without (*) notation indicates domestic country. Rearranging the right part of the equation yields:

$$r_t^{ke} - r_t^{k*e} = \left(i_t^k - i_t^{k*}\right) - (\pi_{t+k}^e - \pi_{t+k}^{*e}) \quad (2)$$

Laurenceson (2003) and Cheung et al (2003) altered the equation further, by inserting the exchange rate into equation (2) as a bridge between two countries. Integration into interest rates and inflation expectations can be done through the transformation of variables:

$$r_t^{ke} - r_t^{k*e} = \left(i_t^k - i_t^{k*} - \Delta s_{t+k}^e\right) - (\pi_{t+k}^e - \pi_{t+k}^{*e} - \Delta s_{t+k}^e) \quad (3)$$

With $\Delta s_{t+k} = s_{t+k} - s_t$ is expressed in logarithmic form. The PPP theory, assuming perfect movement of goods and services, states that the values in the right-hand portion of the equation, in the second bracket, can be arranged as:

$$\pi_{t+k}^e = \pi_{t+k} + \Delta s_{t+k}^e \quad (4)$$

[1] The more details and an in-depth definition of covariance stationarity can be found in Fischer et al. (1996) and Myers (1989)

Assuming perfect movement of financial capital, the UIP theory can ensure that the value in the left bracket of the right side of the equation as:

$$i_t^k = i_t^{k*} + \Delta s_{t+k}^e \quad (5)$$

If the two theories apply in ASEAN, then the differential value of interest rates will be stationary[2]. Collecting expectations data in Equation (3) are very difficult retrospectively. Laurenceson (2003) and Cheung et al (2003) assume that the future value is the best predictor of the *ex-ante* value of the real variable (in this case, the expectation variable). This is justified by the hypothesis of rational expectations of economic actors. Although developments in human behavioural science have undergone significant developments beyond the assumptions of *homo economicus*, the use of future values remains valid as a representation of the effects of actions or reactions to information held in the present. Based on this argument, the determined practical equations for empirical testing are:

$$r_t^{ke} - r_t^{k*e} = \left(i_t^k - i_t^{k*} - \Delta s_{t+k}\right) - (\pi_{t+k} - \pi_{t+k}^* - \Delta s_{t+k}) \quad (6)$$

The test was carried out on three variables, namely UIP $\left(i_t^k - i_t^{k*} - \Delta s_{t+k}\right)$, PPP $(\pi_{t+k} - \pi_{t+k}^* - \Delta s_{t+k})$, and RIP $(r_t^{ke} - r_t^{k*e})$. UIP represents integration in the financial economy, PPP represents integration in the real economy, and RIP represents overall integration between the two countries. The tests were carried out on all bilateral relations between pairwise of ASEAN countries.

Data

All data is sourced from the International Monetary Fund (IMF), International Financial Statistics (IFS), and the central banks of each country. Inflation and exchange rates data are sourced from CPI and exchange rates data from each country. Due to limited public data, the interest rate was taken from financial market interest rates from Thailand, Malaysia, Singapore, and the Philippines and deposit rates for Indonesia, Brunei, Myanmar, Cambodia, Laos, and Vietnam. Differences in interest rates made the differentials unlikely to be zero, but the deviations and the trend of equations (2), (4), and (5) can still be analysed.

Each sample is converted to a natural logarithm at the beginning of the calculation. The sample period is quarterly, from 1999Q2 to 2019Q3 (with additional data from 2019Q4 to complement expectations). Although other studies (Cheung et al. 2003; Jayaraman et al. 2006) used monthly data (for the acceptable reason, that the smaller the period time, the more thorough the hypotheses testing will be and allows less space for prolonged deviation), the use of quarterly periods is more appropriate for very long-term testing and the large geographical nature of ASEAN region.

RESULTS AND DISCUSSIONS

Table 2 and 3 show the ADF-GLS test results which show the strength of the ASEAN member countries integration, both from the real sector (PPP) and the financial sector (UIP). The ADF-GLS regression without trend results for PPP shows that from 45 pairwise relations of ASEAN member countries, there are 24 pairs of countries which had statistically significant results, which implies that 24 pairs of ASEAN member countries already had a fairly deep integration in the real

[2] More detailed theoretical explanation on RIP can be found on Frankel (1989)

sector. The remaining 21 pairs of ASEAN member countries showed statistically insignificant results, proving weak integration in the real sector.

Table 2. UIP Test Results with ADF-GLS and AR Length

COUNTRY	ADF-GLS		AR Length
	without trend	with trend	
Thailand to Indonesia	-0.748	-1.615	2
	(-0.852)	(-2.339)	
Malaysia to Indonesia	-0.190	-1.693	3
	(-0.842)	(-2.033)	
Singapore to Indonesia	-1.464	-1.545	1
	(-0.555)	(-2.209)	
Philippines to Indonesia	-1.753*	-2.167	3
		(-1.564)	
Brunei Darussalam to Indonesia	-0.951	-1.486	2
	(-6.007)***	(-6.221)***	
Myanmar to Indonesia	-1.334	-3.559**	0
	(-0.937)		
Cambodia to Indonesia	-3.468***	-3.502**	
Laos to Indonesia	-2.128**	-2.408	3
		(-1.491)	
Vietnam to Indonesia	-0.749	-1.406	2
	(-0.778)	(-4.274)***	
Malaysia to Thailand	-2.183**	-2.330	2
		(-6.807)***	
Singapore to Thailand	-1.283	-1.250	1
	(-2.438)**	(-9.216)***	
Philippines to Thailand	-1.220	-2.099	2
	(-6.243)***	(-6.479)***	
Brunei Darussalam to Thailand	-1.181	-1.796	2
	(-5.471)***	(-5.778)***	
Myanmar to Thailand	-7.136***	-7.232***	
Cambodia to Thailand	-1.015	-1.780	2
	(-5.614)***	(-6.125)***	
Laos to Thailand	-1.677*	-3.366**	
Vietnam to Thailand	-3.148***	-3.619**	
Singapore to Malaysia	-1.096	-0.927	2
	(-2.269)**	(-9.418)***	
Philippines to Malaysia	-0.550	-1.192	1
	(-8.045)***	(-8.190)***	
Brunei Darussalam to Malaysia	-0.421	-1.128	1
	(-6.186)***	(-6.485)***	
Myanmar to Malaysia	-7.958***	-8.115***	
Cambodia to Malaysia	-0.178	-1.112	1
	(-2.267)**	(-6.115)***	
Laos to Malaysia	-0.317	-3.331**	
	(-0.757)		

COUNTRY	ADF-GLS		AR Length
	without trend	with trend	
Vietnam to Malaysia	-1.408	-1.602	1
	(-7.516)***	(-7.608)***	
Philippines to Singapore	-1.264	-1.233	2
	(-1.013)	(-9.790)***	
Brunei Darussalam to Singapore	-1.459	-1.657	1
	(-10.608)***	(-10.728)***	
Myanmar to Singapore	-1.659*	-1.746	2
		(-13.434)***	
Cambodia to Singapore	-1.014	1.113	2
	(-2.993)***	(-10.473)***	
Laos to Singapore	-1.447	-1.459	1
	(-10.831)***	(-11.658)***	
Vietnam to Singapore	-1.282	-1.214	1
	(-2.215)**	(-2.987)*	
Brunei Darussalam to Philippines	-1.906*	-2.642	2
		(-5.860)***	
Myanmar to Philippines	-1.943*	-7.638***	2
Cambodia to Philippines	-0.973	-1.388	1
	(-3.466)***	(-6.334)***	
Laos to Philippines	-1.744*	-1.995	1
		(-1.784)	
Vietnam to Philippines	-1.503	-2.023	2
	(-6.559)***	(-6.807)***	
Myanmar to Brunei Darussalam	-1.757*	-6.129***	
Cambodia to Brunei Darussalam	-0.725	-1.599	1
	(-7.532)***	(-7.836)***	
Laos to Brunei Darussalam	-1.459	-1.429	1
	(-4.165)***	(-7.440)***	
Vietnam to Brunei Darussalam	-1.163	-1.560	2
	(-5.423)***	(-5.858)***	
Cambodia to Myanmar	-1.351	-3.506**	
	(-10.664)***		
Laos to Myanmar	-1.895*	-7.907***	
Vietnam to Myanmar	-8.484***	-8.913***	
Laos to Cambodia	-1.293	-1.594	1
	(-1.005)	(-2.375)	
Vietnam to Cambodia	-1.374	-1.833	3
	(-5.427)***	(-6.145)***	
Vietnam to Laos	-1.971**	-3.008*	2

Source: Data processed

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively. Number without parentheses is tested at level, while numbers inside parentheses are tested at 1st difference.

Table 3. PPP Test Results with ADF-GLS and AR Length

COUNTRY	ADF-GLS		AR Length
	without trend	with trend	
Thailand to Indonesia	-1.707*	-9.871***	0
Malaysia to Indonesia	-0.478	-2.640	0
	(-0.348)	(-2.242)	
Singapore to Indonesia	-0.991	-2.567	0
	(-0.007)	(-2.346)	
Philippines to Indonesia	-1.062	-8.176***	0
	(-0.146)		
Brunei Darussalam to Indonesia	-1.101	-2.736	0
	(-0.004)	(-2.367)	
Myanmar to Indonesia	-8.508***	-9.103***	0
Cambodia to Indonesia	-0.091	-6.739***	0
	(-0.069)		
Laos to Indonesia	-0.374	-1.755	0
	(0.134)***	(-2.735)	
Vietnam to Indonesia	-0.057	-1.545	0
	(-0.012)	(-1.972)	
Malaysia to Thailand	0.211***	-3.950***	0
Singapore to Thailand	-0.528	-1.370	0
	-0.139	(-2.735)	
Philippines to Thailand	-3.883***	-10.240***	0
Brunei Darussalam to Thailand	0.355***	-4.062***	0
Myanmar to Thailand	-8.671***	-9.051***	0
Cambodia to Thailand	-0.342	-4.667***	0
	(-0.141)		
Laos to Thailand	-0.275	-2.009	0
	(-0.412)	(-2.245)	
Vietnam to Thailand	-0.449	-1.439	0
	(0.045)***	(-1.790)	
Singapore to Malaysia	-7.862***	-8.133***	0
Philippines to Malaysia	-1.482	-3.080*	0
	(-0.273)		
Brunei Darussalam to Malaysia	-7.377***	-8.109***	0
Myanmar to Malaysia	-8.946***	-9.040***	0
Cambodia to Malaysia	-6.878***	-7.635***	0
Laos to Malaysia	-1.002	-4.389***	0
	(-0.179)		
Vietnam to Malaysia	-6.473***	-6.680***	1
Philippines to Singapore	-1.593	-7.629***	0
	(-0.605)		
Brunei Darussalam to Singapore	-4.222***	-7.247***	0
Myanmar to Singapore	-8.976***	-9.088***	0
Cambodia to Singapore	-7.732***	-7.615***	0

COUNTRY	ADF-GLS		AR Length
	without trend	with trend	
Laos to Singapore	-0.643	-1.949	0
	(-0.275)	(-2.021)	
Vietnam to Singapore	-6.153***	-6.767***	0
Brunei Darussalam to Philippines	-1.904**	-7.668***	0
Myanmar to Philippines	-8.798***	-9.080***	0
Cambodia to Philippines	-2.987***	-5.897***	0
Laos to Philippines	-0.564	-1.877	0
	(-0.113)	(-2.470)	
Vietnam to Philippines	-1.119	-2.809*	2
	(-0.828)		
Myanmar to Brunei Darussalam	-8.944***	-9.068***	0
Cambodia to Brunei Darussalam	-7.798***	-7.642***	0
Laos to Brunei Darussalam	-0.406	1.892	4
	(-0.262)	(-1.894)	
Vietnam to Brunei Darussalam	-5.498***	-6.245***	1
Cambodia to Myanmar	-8.973***	-9.128***	0
Laos to Myanmar	-9.083***	-9.085***	0
Vietnam to Myanmar	-9.096***	-9.160***	0
Laos to Cambodia	-0.955	-2.423	4
	(-0.081)	(-0.836)	
Vietnam to Cambodia	-0.997	-1.606	4
	(-0.133)	(-1.717)	
Vietnam to Laos	-1.196	-3.457**	4
	0.066***		

Source: Data processed
Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively. Number without parentheses is tested at level, while numbers inside parentheses is tested at 1st difference.

ADF-GLS regression with trend results for PPP shows that more than 70% of the cases tested have significant results in stationarity tests. There are 32 pairs of ASEAN countries that have strong integration in the real sector while the remaining13 pairs of ASEAN countries are insignificant or show a weak level of real sector integration. Our findings differ from Chang et al. (2012) who found weak integration in the real sector. Hence, with a newer sample, we found improvement in ASEAN's real sector integration.

ADF-GLS regression without trends results for UIP from 45 pairs of ASEAN member countries shows weaker results in the financial sector compared to the real sector. In the real sector, there are 24 pairs of countries showing statistically significant results. For UIP testing in the financial sector, there are only 16 significant pairs of countries, while the remaining 29 pairs of countries have quite weak integration, including pairwise tests between Laos and Cambodia, Vietnam and Myanmar, and Philippines and Thailand. The tests for UIP with trends also found evidence of weaker integration in the financial sector. There are only 13 pairs of countries that show significant results for stationarity while the 32 pairs of ASEAN countries only show significance at first difference.

Table 4. RIP Test Results with ADF-GLS and AR Length

COUNTRY	ADF-GLS		AR Length
	without trend	with trend	
Thailand to Indonesia	-1.044	-1.988	2
	(-2.288)**	(-3.861)***	
Malaysia to Indonesia	-0.898	-2.811*	2
	(-2.534)**		
Singapore to Indonesia	-1.515	-1.554	1
	(-1.630)*	(-2.702)	
Philippines to Indonesia	-2.044**	-2.375	2
		(-3.604)**	
Brunei Darussalam to Indonesia	-0.999	-1.540	1
	(-5.886)***	(-5.992)***	
Myanmar to Indonesia	-0.869	-2.251	2
	(-1.824)**	(-3.237)**	
Cambodia to Indonesia	-3.975***	-3.502**	2
Laos to Indonesia	-2.906***	-2.408	2
		(-3.244)**	
Vietnam to Indonesia	-0.877	-1.312	3
	(-2.253)**	(-6.258)***	
Malaysia to Thailand	-2.052**	-2.242	2
		(-5.544)***	
Singapore to Thailand	-1.260	-1.231	1
	(-4.459)***	(-10.074)***	
Philippines to Thailand	-1.203	-2.128	2
	(-5.223)***	(-6.115)***	
Brunei Darussalam to Thailand	-1.313	-1.987	2
	(-4.968)***	(-5.271)***	
Myanmar to Thailand	-2.515***	-2.754	2
		(-5.642)***	
Cambodia to Thailand	-0.877	-1.780	2
	(-6.265)***	(-6425369)***	
Laos to Thailand	-1.307	-3.190**	2
	(-4.409)***		
Vietnam to Thailand	-2.804***	-3.531**	4
Singapore to Malaysia	-1.081	-0.899	2
	(-2.145)**	(-9.335)***	
Philippines to Malaysia	-0.835	-1.967	2
	(-5.214)***	(-5.635)***	
Brunei Darussalam to Malaysia	-0.643	-1.656	2
	(-5.903)***	(-6.064)***	
Myanmar to Malaysia	-2.362**	-2.485	2
		(-4.004)***	
Cambodia to Malaysia	-0.540	-1.623	1
	(-1.466)	(-2.214)	
Laos to Malaysia	0.113	-4.228***	1
	(-1.245)		
Vietnam to Malaysia	-1.397	-1.803	3
	(-8.337)***	(-8.572)***	
Philippines to Singapore	-1.244	-1.200	2
	(-1.144)	(-10.211)***	
Brunei Darussalam to Singapore	-1.458	-1.655	1

COUNTRY	ADF-GLS		AR Length
	without trend	with trend	
	(-10.599)***	(-10.752)***	
Myanmar to Singapore	-1.057	-1.332	1
	(-2.964)***	(-10.236)***	
Cambodia to Singapore	-0.983	-1.077	2
	(-3.097)***	(-10.684)***	
Laos to Singapore	-1.392	-1.430	1
	(-10.951)***	(-11.224)***	
Vietnam to Singapore	-1.289	-1.220	1
	(-2.215)**	(-3.042)*	
Brunei Darussalam to Philippines	-2.218**	-2.930*	2
Myanmar to Philippines	-1.008	-2.327	2
	(-4.236)***	(-5.483)***	
Cambodia to Philippines	-1.335	-1.766	2
	(-4.593)***	(-5.779)***	
Laos to Philippines	(-2.405)**	-2.679	2
		(-4.514)***	
Vietnam to Philippines	-1.603	-1.817	3
	(-6.590)***	(-6.608)***	
Myanmar to Brunei Darussalam	-0.469	-0.914	1
	(-6.623)***	(7.984)***	
Cambodia to Brunei Darussalam	-0.688	-1.447	1
	(-7.096)***	(-7.600)***	
Laos to Brunei Darussalam	-1.435	-1.399	1
	(-6.929)***	(-7.217)***	
Vietnam to Brunei Darussalam	-0.952	-1.684	2
	(-5.726)***	(-6.238)***	
Cambodia to Myanmar	-0.168	-0.755	1
	(-7.468)***	(-7.671)***	
Laos to Myanmar	-0.010	-2.210	1
	(-2.867)***	(-5.959)***	
Vietnam to Myanmar	-2.717***	-2.890*	3
Laos to Cambodia	-1.299	-1.523	2
	(-2.557)***	(-6.788)***	
Vietnam to Cambodia	-1.494	-1.954	2
	(-2.393)**	(5.278)***	
Vietnam to Laos	-1.693*	-3.034*	3

Source: Data processed

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively. Number without parentheses is tested at level, while numbers inside parentheses are tested at 1st difference.

RIP, as the combination between UIP and PPP, found only 3 pairs of countries that is stationary at a level with at least 10% confidence level, using the ADF-GLS test with and without trend (Table 4). The findings of weak financial integration are in line with Zhang and Matthews' (2019) and Rahman and Shahari's (2019) results. One of the possible factors causing the rejection of the UIP hypothesis is the currency stabilization policy after the 1998 economic crisis (Candelon and Gil-Alana, 2006)

Country pairs that do not show significant results in both PPP and UIP indicate that the integration between them is still weak. Hence, PPP and UIP must adapt in the next period time, otherwise, there is an adjustment delay of the variables (inflation for PPP, interest rate for UIP) which signifies the weak integration. The period of delay in adjusting the balance is measured using the AR length test. It aims to find out the estimated timeframe required for the country to adapt to PPP and UIP when variable changes occur.

The lag estimations show results that are consistent with stationary testing of a total of 45 bilateral relations. They are listed in Table 2 (RIP), Table 3 (UIP), and Table 4 (PPP). In PPP, 38 of the 45 bilateral relations analyzed have no time lag, which implies that PPP adjustments are fast and show tighter integration of the real economy. By contrast, the estimated lag on UIP and RIP show a lower level of integration. In UIP, 14 relationships have lags of one period, 16 relationships show lags of two periods, and 4 relationships have three periods of lag. Meanwhile, RIP is estimated to have a lag of one period for 14 relationships and two periods for 25 relationships. These lag estimations show that the real economic adjustment rate is faster than the financial adjustment.

Table 5. Trend and Mean determination of PPP, UIP, and RIP

COUNTRY	PPP		UIP		RIP	
	Trend	Mean	Trend	Mean	Trend	Mean
Thailand to Indonesia	-1.12E-04	-0.022	0.009***	-1.506	0.009***	-1.484
Malaysia to Indonesia	0.0004	-0.018	0.012***	-1.099	0.012***	-1.081
Singapore to Indonesia	0.0003	-0.023	-0.014***	-2.701	-0.015***	-2.678
Philippines to Indonesia	6.25E-05	-0.011	-0.008***	-0.570	-0.008***	-0.558
Brunei Darussalam to Indonesia	0.0003	-0.027	-0.020***	-2.702	-0.020***	-2.678
Myanmar to Indonesia	0.001	0.071	0.008***	0.152	0.007***	0.081
Cambodia to Indonesia	0.0002	-0.014	-0.005***	-1.520	-0.005***	-1.507
Laos to Indonesia	-5.12E-05	-0.009	-0.012***	-0.790	-0.012***	-0.781
Vietnam to Indonesia	0.0003	-0.003	0.010***	-0.253	0.009***	-0.250
Malaysia to Thailand	0.0003*	0.004	0.003***	0.407	0.003**	0.403
Singapore to Thailand	2.11E-04	-0.001	-0.023***	-1.195	-0.023***	-1.194
Philippines to Thailand	-4.97E-05	0.010	-0.016***	0.937	-0.016***	0.926

COUNTRY	PPP		UIP		RIP	
	Trend	**Mean**	**Trend**	**Mean**	**Trend**	**Mean**
Brunei Darussalam to Thailand	9.13E-05	-0.005	-0.020***	-1.341	-0.020***	-1.338
Myanmar to Thailand	0.0002	0.093	-0.0003	1.659	-0.001	1.565
Cambodia to Thailand	1.37E-04	0.008	-0.014***	-0.014	-0.014***	-0.022
Laos to Thailand	-1.63E-04	0.013	-0.021***	0.717	-0.020***	0.704
Vietnam to Thailand	1.76E-04	0.019	0.0009	1.253	0.0007	1.235
Singapore to Malaysia	-1.09E-04	-0.005	-0.027***	-1.602	-0.027***	-1.597
Philippines to Malaysia	-0.0004**	0.007	-0.020***	0.530	-0.019***	0.523
Brunei Darussalam to Malaysia	-1.11E-04	-0.008	-0.027***	-1.747	-0.027***	-1.737
Myanmar to Malaysia	0.0003	0.090	-0.004	1.252	-0.005***	1.162
Cambodia to Malaysia	7.51E-04	0.004	-0.018***	-0.421	-0.017***	-0.425
Laos to Malaysia	-0.0005**	0.009	-0.024***	0.310	-0.024***	0.301
Vietnam to Malaysia	-1.45E-04	0.015	-0.003	0.847	-0.002	0.832
Philippines to Singapore	-0.0003	0.012	0.007	2.132	0.007	2.120
Brunei Darussalam to Singapore	-1.13E-06	-0.003	-0.007	0.113	-0.007	0.116
Myanmar to Singapore	0.0009	0.095	0.023***	2.854	0.022***	2.759
Cambodia to Singapore	-7.42E-05	0.010	0.009*	1.181	0.009*	1.171
Laos to Singapore	-0.0004*	0.014	0.003	1.912	0.003	1.897
Vietnam to Singapore	-3.51E-05	0.020	0.024***	2.449	0.024***	2.428
Brunei Darussalam to Philippines	0.0003	-0.015	-0.008***	-2.122	-0.008***	-2.110
Myanmar to Philippines	0.001	0.083	0.016***	0.722	0.015***	0.639

COUNTRY	PPP		UIP		RIP	
	Trend	Mean	Trend	Mean	Trend	Mean
Cambodia to Philippines	1.87E-04	-0.002	0.002	-0.951	0.002	-0.949
Laos to Philippines	-1.14E-04	0.003	-0.004***	-0.220	-0.004***	-0.223
Vietnam to Philippines	2.26E-04	0.008	0.017***	0.317	0.017***	0.308
Myanmar to Brunei Darussalam	0.0009	0.098	0.020***	2.995	0.020***	2.887
Cambodia to Brunei Darussalam	-7.31E-05	0.013	0.019***	1.114	0.019***	1.098
Laos to Brunei Darussalam	-0.000374*	0.018	0.003	1.872	0.004*	1.859
Vietnam to Brunei Darussalam	-3.40E-05	0.023	0.017***	2.635	0.018***	2.608
Cambodia to Myanmar	-0.0009	-0.085	-0.014***	-1.673	-0.013***	-1.588
Laos to Myanmar	-0.001	-0.080	-0.009***	-0.942	-0.019***	-0.862
Vietnam to Myanmar	-0.0009	-0.075	0.0005	-0.405	0.002	-0.331
Laos to Cambodia	-0.0003	0.005	-0.007***	0.731	-0.006***	0.726
Vietnam to Cambodia	3.91E-05	0.010	0.015***	1.267	0.015***	1.257
Vietnam to Laos	0.0003	0.006	0.021***	0.537	0.021***	0.531

Source: Data processed
Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table 5 shows the average differential values of PPP, UIP, and RIP for each pair of countries in ASEAN. Overall, the average PPP differential between countries is relatively smaller than the UIP and RIP. Further, this study also estimates the differential trends of PPP, UIP, and RIP between ASEAN countries changing with time. The results show that most of the testing of PPP time trends between country pairs are insignificant, indicating PPP changes cannot be explained in time trends. However, two country pairs have a positive average PPP but a negative significant PPP trend at the 5 percent level: Philippines-Malaysia and Laos-Malaysia. These imply that Malaysia and the two countries have lower PPP over time, which indicates an increasingly integrated real sector. Countries that have a similar pattern are Laos, Brunei Darussalam, and Singapore, although the magnitude of the trend is very small. Therefore, Laos is a country that has a greater integration of the real sector in ASEAN compared to other countries.

Furthermore, UIP between ASEAN countries has a significant time trend of up to 1 percent in 34 pairs of countries. In accordance with the estimation results in Table 5, financial integration in a pair of countries is said to increase if it has a positive average UIP value but a negative time trend, or initially has a negative UIP average but has a positive time trend. There are nine pairs of countries such as Indonesia-Thailand and Indonesia-Malaysia which can be said to have increased financial sector integration. From 34 pairs of countries that have a significant time trend, there are 25 pairs of countries that have a pattern of weakening financial integration. This indicates the need for financial sector liberalization efforts between ASEAN countries going forward. In addition, countries that have a significant time trend on UIP differentials also have significant trends in RIP differentials. There are only six countries that have a trend of increasing financial integration. Singapore is the country that has the least financial integration with other countries, while the countries that in the course of integrating their financial sectors with each other are Indonesia, Thailand, and Malaysia.

Table 6. Post-AEC Dummy Least Squared Regression Results

COUNTRY	Post-AEC Dummy		
	RIP	**UIP**	**PPP**
Thailand to Indonesia	0.992	0.002	0.003
Malaysia to Indonesia	0.389***	0.407***	0.018
Singapore to Indonesia	0.624*	0.640*	0.017
Philippines to Indonesia	-0.196*	-0.177	0.019
Brunei Darussalam to Indonesia	-0.414***	-0.396***	0.020
Myanmar to Indonesia	0.122	0.056	-0.066
Cambodia to Indonesia	-0.022	-0.008	0.014
Laos to Indonesia	-0.665***	-0.651***	0.013
Vietnam to Indonesia	-0.068	-0.062	0.007
Malaysia to Thailand	0.391***	0.405***	0.014
Singapore to Thailand	0.625*	0.638*	0.013
Philippines to Thailand	-0.194	-0.179	0.015
Brunei Darussalam to Thailand	-0.226	-0.211	0.017*
Myanmar to Thailand	0.124	0.054	-0.070
Cambodia to Thailand	-0.021	-0.010	0.011
Laos to Thailand	-0.663	-0.653***	0.001
Vietnam to Thailand	-0.067	-0.064	0.003
Singapore to Malaysia	0.234	0.233	-0.001
Philippines to Malaysia	-0.585***	-0.585***	0.0006
Brunei Darussalam to Malaysia	-0.642***	-0.638***	0.002
Myanmar to Malaysia	-0.267***	-0.351**	-0.084
Cambodia to Malaysia	-0.412***	-0.416***	-0.004
Laos to Malaysia	-1.054***	-1.059***	-0.004
Vietnam to Malaysia	-0.458***	-0.469***	-0.011
Philippines to Singapore	-0.819***	-0.818***	0.002
Brunei Darussalam to Singapore	-1.221***	-1.216***	0.003
Myanmar to Singapore	-0.501	-0.584	-0.083

COUNTRY	Post-AEC Dummy		
	RIP	UIP	PPP
Cambodia to Singapore	-0.646**	-0.648**	-0.002
Laos to Singapore	-1.289***	-1.292***	-0.003
Vietnam to Singapore	-0.692	-0.702	-0.010
Brunei Darussalam to Philippines	-0.221	-0.223**	0.002
Myanmar to Philippines	0.318**	0.234	-0.085
Cambodia to Philippines	0.173	0.169*	-0.004
Laos to Philippines	-0.469***	-0.474***	-0.005
Vietnam to Philippines	0.127	0.115	-0.012
Myanmar to Brunei Darussalam	0.377***	0.275	-0.086
Cambodia to Brunei Darussalam	0.484***	0.475***	-0.006
Laos to Brunei Darussalam	-0.237**	-0.238***	-0.007
Vietnam to Brunei Darussalam	0.110	0.091	-0.014
Cambodia to Myanmar	-0.145	-0.065	0.080
Laos to Myanmar	-0.787***	-0.708***	0.079
Vietnam to Myanmar	-0.191**	-0.118	0.073
Laos to Cambodia	-0.642***	-0.643***	-0.0007
Vietnam to Cambodia	-0.046	-0.054	-0.008
Vietnam to Laos	0.596***	0.590***	-0.007

Source: Data processed

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% level

This study also analyzed the impact of the planned formation of the AEC since 2007 on the integration of the ASEAN region in terms of the real sector (PPP), the financial sector (UIP), and interest rate differential (RIP). We conducted the least-squares regression to observe the differences in ASEAN integration before the AEC was enacted (from 1999 to 2015) and after the AEC was implemented (from 2015 to 2019). The results are listed in Table 6.

In terms of real sector integration, only a slight differential change in PPP was found after the AEC. Only Brunei Darussalam's relationship with Thailand is statistically significant at a minimum level of confidence of 10%. For integration in the financial sector, there are 22 pairs of countries that exhibit greater integration after the establishment of the AEC. The only country experiencing a deeper financial sector integration sector with all other ASEAN member states is Singapore. By contrast, 23 pairs of countries exhibit weakening financial sector integration after the formation of the AEC. This shows that Singapore is the main link country in regional integration in the financial sector in ASEAN.

In terms of RIP, there are 26 country pair relations that have significant changes after the AEC formation. Specifically, 13 pairwise relations experience stronger integration, while the rest 13 move away from the balance suggested by the RIP theory. Hence, the effects of the AEC varied across ASEAN member states. One exception is Singapore that shows a stronger integration as compared to other countries, with a decrease in the differential RIP in all bilateral relations, six of which are statistically significant.

Overall, the estimation results provided above show that the ASEAN member countries have very diverse economic characteristics and performance.

Some of them are more open to trade than others, which means they trade and have more economic cooperation with other countries, especially outside ASEAN. The main finding in this study is that during 1999-2019 the ASEAN's real sector tends to be more integrated than its financial sector. With reference to Balassa's theory of economic integration, this finding indicates that the ASEAN member countries have performed stronger cooperation in the real sector while deeper cooperation is still required on the financial side.

This study also found that the ASEAN member countries are estimated to have faster and tighter integration in their real economy while the financial economy shows a slower pace of integration. This study further found that after the formation of the AEC, only a slight change in real economic integration (PPP) has taken place, while the RIP relations showed significant changes in terms of stronger integration, mainly due to the change in UIP relations.

These findings are also in line with the discourse on regional integration after the AEC announcement in 2015. Despite the officials talking about the great potential from AEC, the achievements have been below expectations. The pace of integration had slowed down where ASEAN has not succeeded in building the regional single market as trade barriers continue to prevail. There have also been concerns over onerous regulations hindering investment (Majid, 2017).

CONCLUSION

This study aims to examine the depth and path of integration in the real and financial sectors among ASEAN member states. The ADF-GLS test results show that there are significant differences in the integration of ASEAN's real and financial economy. The real economy tends to be more integrated as compared to the financial economy. Likewise, the time lag analysis shows that the adjustment in the interest rate balance is slower than that of the price level.

Time trends cannot explain patterns of movement of PPP among ASEAN countries, but they can explain patterns of movement in the UIP and RIP. In the real sector, only Laos appears to have a diminished PPP with other ASEAN countries. In the financial sector, there are only nine pairs of countries that show trends toward integration while 25 other pairs show a trend to stay away.

Summarizing, there are evidence that ASEAN's integration into the real sector is stronger than its financial sector. Several policy and academic implications can be drawn from those findings. First, the weak financial integration implies that financial assets between the pairs of ASEAN countries are not perfect substitutes and thereby leave room for arbitration. This suggests that further financial cooperation is in ASEAN is required, especially on policies to ease the capital transfers across member states.

Second, Vietnam shows weak integration with several other ASEAN member states, while on contrary Singapore shows strong bilateral integration with all ASEAN countries. Hence, in the ASEAN open regionalism model, further research can be carried out to analyze the possible role and impact of Singapore as an anchor in ASEAN regionalism.

Third, in order to meet the AEC goals and commitments, each ASEAN member state needs to formulate a national-level commitment, milestones, and targets that can meet the regional commitments. The national-level commitments need to focus not only on market opening but also on trade and investment

facilitation, such as transparency, infrastructure quality, and efficient financial services. Further, the trade barriers need to be lowered; its transparency should be improved, and an evaluation system between member states should be created. These efforts are pivotal to meet the intra-ASEAN real and financial economy integration in 2025 as mandated by the AEC blueprint. In terms of investment, ASEAN could propose that member states' negative list of investments be determined based on regional agreements.

Finally, future studies can also be carried out on how ASEAN's real and financial sectors' integration fare in weathering the COVID-19 pandemic. This is crucial as the pandemic may have put ASEAN at risk of capital flight (Pitakdumrongkit, 2020).

REFERENCES

Asian Development Bank. (2013). *The Road to ASEAN Financial Integration: A Combined Study on Assessing the Financial Landscape and Formulating Milestones for Monetary and Financial Integration in ASEAN.* Manila: Asian Development Bank.

Balassa, B. (1961). The Theory of Economic Integration. Homewood: Richard D. Irwin.

Candelon, B., Gil-Alana, L.A., 2006. Mean reversion of short-run interest rates in emerging countries. Review of International Economics 14 (1), 119–135.

Chang, Tsangyao, Chia-Hao Lee, Wen-Chi Liu. (2012). Nonlinear Adjustment to Purchasing Power Parity for ASEAN Countries. *Japan and the World Economy, Volume 24, Issue 4, 2012*, 325-331.

Chang, M.-J., & Su, C.-Y. (2015). Does real interest rate parity really hold? New evidence from G7 countries. *Economic Modelling 47*, 299–306. DOI: 10.1016/j.econmod.2015.03.005

Cheung, Y.-W., Chinn, M. D., & Fujii, E. (2003). China, Hong Kong, and Taiwan: A Quantitative Assessment of Real and Financial Integration. *China Economic Review 14*, 281-303.

Elliott, G., Rothenberg, T. J., & Stock, J. H. (1996). Efficient tests for an autoregressive unit root. *Econometrica*, 64(1), 813 – 836.

Fischer, M. Scholten, H. J. and Unwin, D. (1996). Spatial analytical perspectives on GIS. Bristol, PA: Taylor & Francis,

Frankel, J. A. (1989). Quantifying International Capital Mobility in the 1980s. *NBER Working Papers No. 2856*.

Jayaraman, T. K., Lee, H.-H., & Lee, H.-A. (2006). Regional Economic Integration in the Pacific: An Empirical Study. *Global Economic Review, Vol. 35, No. 2*, 177-192.

Kabir, S., & Salim, R. A. (2014). Regional Economic Integration in ASEAN: How Far Will It Go? *Journal of Southeast Asian Economics, Vol. 31, No. 2*, 313-335.

Kimura, F., Thangavelu, S., Narjoko, D., & Findlay, C. (2020). Pandemic (COVID-19) Policy, Regional Cooperation, and the Emerging Global Production Network. Asian Economic Journal, 34(1), 3-27. DOI: 10.1111/asej.12198

Laurenceson, J. (2003). Economic Integration between China and the ASEAN-5. *ASEAN Economic Bulletin, Vol. 20(2)*, 103-111.

Majid, M. (2017, August 3). *ASEAN Integration Lags the Real World*. Retreived from Nikkei Asia: http://asia.nikkei.com/Economy/ASEAN-integration-lags-the-real-world

Marston, R. C. (1993). Three parity conditions in international finance. In *Open-Economy Macroeconomics* (pp. 257-271). Palgrave Macmillan, London.

Myers, D.E. (1989). To be or not to be... stationary? That is the question. *Mathematical Geology. 21*, 347–362.

Nguyen, T. N. A., Pham, T. H. H., & Vallée, T. (2016). Economic integration in ASEAN+3: A network analysis. *Journal of Economic Integration*. https://doi.org/10.11130/jei.2016.31.2.275

Park, C. Y., Lee, J., & Villafuerte, J. (2017). 20 Years After the Asian Financial Crisis: Lessons Learned and Future Challenges. *ADB Briefs*.

Pitakdumrongkit, K. (2020). *Regional Finance Cooperation: Can It Weather the Storm?* Nanyang: S. Rajaratnam School of International Studies, Nanyang Technological University.

Rahman, M., & Shahari, F. (2019). Does the Financial Integration in ASEAN+3 Respond to Financial Cooperation Agreement and Influence the Real Sectors? *Review of Pacific Basin Financial Markets and Policies*, *22*(01), 1950002. DOI: 10.1142/s0219091519500024

Suman, A., Pantri Muthriana, E. K., Pinatih, N. K. D. A. (2017). Sub-national government and the problem of unequal development in ASEAN economic integration: case of Indonesia. *Journal of ASEAN Studies,* 5(1). DOI: 10.21512/jas.v5i1.2060

Tang, B. K (2011). The Precise Form of Uncovered Interest Parity: A heterogenous panel application in ASEAN-5 Countries. *Journal of Economic Modelling 28*, 568-573

Verico, K. (2011). The Impact of Direct Bilateral Free Trade Agreement (BFTA) to ASEAN's Intra-Regional Trade & Individual Country's Investment Creation: The Case of Indonesia, Malaysia & Thailand 1988-2008. *Economics and Finance in Indonesia, Vol. 59 (2)*, 191-214.

Volz, U. (2013). ASEAN Financial Integration in the Light of Recent European Experiences. *Journal of Southeast Asian Economics, Vol. 30, No. 2*, 124-142.

Zhang, T., & Matthews, K. (2019). Assessing the degree of financial integration in ASEAN—A perspective of banking competitiveness. *Research in International Business and Finance, 47, 487-500*. DOI: 10.1016/j.ribaf.2018.09.009