The Indonesian Capital Market Review

Volume 11
Number 2 *July*

Article 5

7-30-2019

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Recommended Citation

Nugroho, Setyo and Danarsari, Dwi Nastiti (2019) "The Impact of Trade Openness and Financial Openness on Information Efficiency of Five ASEAN Countries' Stock Market 2000-2014," *The Indonesian Capital Market Review*: Vol. 11 : No. 2 , Article 5.
DOI: 10.21002/icmr.v11i2.12352
Available at: https://scholarhub.ui.ac.id/icmr/vol11/iss2/5

Indonesian Capital Market Review 11 (2019) 130-140

INDONESIAN
CAPITAL MARKET REVIEW

The Impact of Trade Openness and Financial Openness on Information Efficiency of Five ASEAN Countries' Stock Market 2000-2014

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(Received: May 2020 / Revised: July 2020 / Accepted: August 2020 / Available Online: August 2020)

This paper investigates the impact of trade openness and financial openness towards information efficiency of the ASEAN countries' stock market. The sample consists of the five most developed stock markets in the ASEAN region – Indonesia, Malaysia, the Philippines, Singapore, and Thailand, covering research period of 2000-2014. This study employs panel data analysis in the model. The result suggests that, when Singapore is excluded from the sample, de facto trade openness has a negative impact on information efficiency, while de facto financial openness has a positive impact on information efficiency. De jure measure is shown to have no significant impact on information efficiency.

Keywords*: Efficient Market Hypothesis, Financial Openness, Information Efficiency, Trade Openness*

JEL Classification: G10, G14, G15

Introduction

As the world economy becomes more open, many countries have become involved in international trade. In the Southeast Asian region, several free trade area agreements have been undertaken, for instance the ASEAN-China Free Trade Area (ACFTA), China-Australia Free Trade Area (ChAFTA), ASEAN-India Free Trade Area, ASEAN-Japan Comprehensive Partnership (AJCEP), and ASEAN-Korea Free Trade (AKFTA). Despite the benefits of international trade, as the world economy becomes more interconnected, a situation that arises in one country may have an impact on other countries.

In 2008 and 2009, the ASEAN countries' stock market plummeted as the economic crisis hit the United States, the third-largest trade partner of ASEAN. Then, again in 2015, the ASEAN stock market also fell quite significantly. The Malaysian stock market led the bearish trend with a 41.75% drop (in USD), followed by Indonesia with a 37.99% drop (in USD). Other ASEAN countries, while not as severe as Malaysia and Indonesia, also dropped significantly. These bearish trends in the Southeast Asia stock market indices are supposed to be caused by the economic slowdown by China. This economic slowdown policy for China reduces the export value of ASEAN countries to China by 12.17%. According to Chien et al. (2015), China as a big trade partner of ASEAN countries significantly affects the performance

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of the stock market in these countries.

Some works of literature show the impact of trade openness on the economic condition of a country (Santos-Paulino, 2005 in Lim and Kim, 2011). Also, research that investigated the relationship between trade openness and financial development suggested the positive relationship between the two variables (Chinn-Ito, 2006 and Zhang et al., 2015). Zhang et al. (2015) asserted that trade openness and financial openness significantly affects efficiency in the economy together. Some other research also indicated the impact of trade, especially international trade towards various macroeconomic variables in a country, which then can empirically affect the stock market return in that country (Chen, 1986).

A few past studies examined international trade and its impact on stock market performance between countries, such as Edwards (1992), Dollar (1992), Sachs and Warner (1995), and Eris and Ulasan (2013), while Hutson and Stevenson (2010) found that international trade can affect the performance of stocks listed in the stock markets.

However, the impact of international trade towards stock market efficiency, to the best of our knowledge, is still lacking in attention. Some studies that examined the impact of openness and information efficiency of stock markets are Basu and Morey (2005), Lim and Kim (2011), Rejeb and Boughrara (2013), and most recently Yaseen et al. (2016). Basu and Morey found that market liberalization can lead to improvement in information efficiency. Lim and Kim (2011) found that trade openness in the local stock market can increase information efficiency in developing countries. Rejeb and Boughrara (2013) discovered that financial openness can also improve market efficiency. Zhang et al. (2015) elaborated on the importance of the relationship between trade openness and financial openness as almost inseparable, while Yaseen et al. (2016) showed further relation between trade openness and stock market information efficiency. Yaseen et al. (2016) proved the positive and monotonic relationship between informed trading and the degree of asymmetric information after market liberalization. This suggested an improvement in stock market efficiency.

Furthermore, Lim and Kim (2011) concluded that, for financial openness in market liberalization to have any effect on *return predictability market* or on earlier classification as *weak-form efficient stock market,* it requires the effect of trade openness, which is examined in this paper. The research by Lim and Kim (2011) applied some control variables, market volatility (Sentana and Wadhwani, 1992) and trading volume (Campbell et al., 1993). Both of these control variables are predicted to have a negative relationship with return autocorrelation, implying a positive relation with information efficiency. Lim and Kim (2011) also considered the role of financial openness with regard to capital flow to explain time-series and cross-section variations on information efficiency.

This study focuses on five ASEAN countries: Indonesia, Malaysia, Singapore, Thailand, and the Philippines. ASEAN is a large, independent economic zone with various multirateral treaties between members, which mostly consist of developing countries. With AEC (ASEAN Economic Community) in effect, these ASEAN countries will become even more integrated and inseparable. Sample countries are chosen because the stock markets are at least 15 years old, so they satisfied the criteria for the data of a 15-year time span and also the availability of data. The purpose of this paper is to investigate the impact of trade and financial openness. Because ASEAN is a large, growing regional economic integration, this research offers an important contribution on the subject.

The remainder of this paper is outlined as follows. Section 2 discusses the issues regarding the theories and past research regarding trade and financial openness and informational efficiency. The following section then provides a description of the data used in this research. Section 4 utilizes panel regression to examine the impact of between-trade openness and financial openness towards stock market efficiency. The final section then concludes this paper, along with some recommendations for future research.

Literature Review

Trade Openness and Financial Openness

To measure trade openness, the proxy used is developed by Lane and Milesi-Ferretti (2007). To take into account other factors that might be significant, Lim and Kim (2011) also used financial openness as a variable to measure the degree of capital freedom in the stock market. Aizenman and Noy (2009) found a positive relationship between trade openness and financial openness, while other studies have also shown that these two variables are hard to separate. (Beck, 2002; Braun and Raddatz, 2005; and Mishkin, 2009)

In this paper, to measure trade openness, we use *de jure trade openness*, that is *proxy trade freedom* Heritage Foundation and *de facto trade openness* trade volume (import and export) to PDB as the *de facto* proxy of trade openness following Lim and Kim (2011), while for financial openness, will use *proxy de jure capital openness* using KAOPEN formed by Chinn and Ito (2006). The *de facto capital openness* is the intensity of capital freedom according to Lane and Milesi-Ferretti (2007) using total capital flow and inflow.

Trade Openness and Efficient Market Hypothesis

Basu and Morey (2005) are the researchers who managed to successfully develop an asset pricing model that explored the effect of trade openness towards the autocorrelation pattern of a stock market return. The model by Basu and Morey (2005) showed that trade openness is very important in its effect on stock market information efficiency in which stock price then forms a random walk after market deregulation is implemented.

The hypothesis in testing the theoretical model of Basu and Morey (2005) is that stock return autocorrelation is non-zero in a closed economy. However, after the opening of trade barrier by the implementation of market deregulation, the stock market autocorrelation is zero in an open economy. This model by Basu and Morey (2005) stated that financial openness not followed by trade openness will not further encourage a return-predictable market.

Variance Ratio Statistic in Testing the Efficient Market Hypothesis

Variance Ratio (VR) testing has been widely used in many works of literature to measure the efficiency of return predictability in the stock market (Charles and Darne, 2009; Lim and Brooks, 2011). Its usage is based on the fact that, if the stock price follows a random walk, then the variance of the return of k period is k times the variance of the stock return of one period.

If r_t is an asset return at time t, where t=1, 2, …, T. The variance ratio for r_t with the holding period of k is defined as:

$$VR(k) \equiv \frac{\sigma_k^2}{k\sigma_1^2}$$

where $\sigma_k^2 \equiv Var(r_t + r_{t-1} + \ldots + r_{t-k+1})$ is a variance of stock market return of k period. Thus, it can be rewritten as

$$VR(k) = 1 + 2\sum_{i=1}^{k-1}\left(1 - \frac{i}{k}\right)\rho(i)$$

Where ρ(i) is the autocorrelation of r_t of order i. That is, the variance ratio is one plus a weighted sum of the autocorrelation coefficients for the asset return with positive and declining weights.

The hypothesis of random walk is VR(k)=1 for all k periods, because all returns have no serial correlation relationships for the period of k, while VR(k)>1 shows a positive serial correlation. The decision of the period used is to use the Chow and Denning (1993) using the joint test; this is in accordance with Charles and Darne (2009) to optimize the testing result. Because the more efficient price would show lower autocorrelation, either positive or negative, we will use the absolute deviation of variance ratio statistic as the inverse measure of stock market efficiency.

Market Volatility and Trading Volume towards Stock Market Efficiency

Table 1. Statistic Descriptive Joint Data

	$\|VR_{it}-1\|$	DFTO	DJTO	DFCAOT	DFCAOI	DJCAO	MV	VOL
Obs.	75	75	75	75	75	75	75	75
Mean	0.188337	0.710419	0.769320	4.593858	2.243456	0.531422	0.011593	0.150218
Median	0.152330	0.556958	0.762000	1.359507	0.890337	0.448994	0.011920	0.127794
Max	0.778820	1.839055	0.900000	19.11247	8.394014	1	0.023794	0.307154
Min	0.034420	0.198028	0.646000	0.635387	0.462847	0.164809	0.004240	0.043556
StaDev	0.140802	0.475690	0.065136	6.191797	2.636771	0.285288	0.004170	0.073013

The existing literature provides a number of theoretical models that predict the determinants of stock return autocorrelations. According to these models, our control variables include the volatility of market returns (Sentana and Wadhwani, 1992) and trading volume (Campbell et al., 1993). Both of these control variables are predicted to be negatively related to return autocorrelations, thus having a positive effect on stock market efficiency. In our empirical analysis, return volatility is measured as the sample standard deviation of daily stock returns computed for each country during each year. Following the previous literature, the proxy for trading volume is the logarithm of one plus the turnover ratio, where turnover is computed as the total value of shares traded scaled by the total stock market capitalization (Levine and Schmukler, 2006, 2007).

Research Methods

The data used in this paper is from five ASEAN countries: Indonesia, Malaysia, Singapore, Thailand, and Philippines, arranged in a panel data to understand the relationship between international trade and stock market efficiency. The panel data combines with the time series model and cross section model. The period for this research is from 2000 to 2014, adjusting for the availability of data.

The source for the data used is the International Financial Statistics (IFS) by the International Monetary fund (IMF) to gain data on international trade as a proxy proposed by Lane and Milesi-Feretti (2007), calculated as the ratio of export and import to Gross Domestic Product (GDP) for every year of each country and the data of capital account through Balance of Payment and International Investment Positions (IIP), World Bank to get the data of stock turnover (www.worldbank.org), Portland State University website (pdx.edu) to get the data of KAOPEN by Chinn-Ito (2006) as the original reference of Lim and Kim (2011), World Heritage Foundation website (http://www.heritage.org/Index/) for trade freedom data, and Thomson Reuters DataStream for daily country index, which will then be calculated to get the variance ratio and market volatility.

In this research, we refer to the model used by Lim and Kim (2011) as follows:

$$|VR_{it}-1|=\beta_1 TO_{it}+\beta_2 Vol_{it}+\beta_3 MV_{it}+\mu_t+\delta_i+\varepsilon_{it} \quad (1)$$

Then, we examine the effect of trade openness when interacting with financial openness using a model as:

$$|VR_{it}-1|=\beta_1 CAO_{it}+\beta_2 TO_{it}+\beta_3 Vol_{it}+\beta_4 MV_{it}+\varepsilon_{it} \quad (2)$$

For further analysis, the effect of financial trade without taking into account trade openness uses the following model:

$$|VR_{it}-1|=\beta_1 CAO_{it}+\beta_2 Vol_{it}+\beta_3 MV_{it}+\varepsilon_{it} \quad (3)$$

where $|VR_{it}-1|$ is the inverse measure of information efficiency for country *i* on year *t*, written as the absolute value of variance ratio minus one, TO_{it} is *proxy* for trade openness, and CAO_{it} is proxy for capital account openness, followed by control variables (VOL_{it}) and stock return volatility (MV_{it}). μ_t is vector *dummy* variable for year, δ_i represents the country-*fixed effect*, and ε_{it} is the *error term*.

Overview of the Data

From statistic descriptive analysis shown on Tables 1 and 2, we can see the difference in the market structure, as Singapore is shown to be

Table 2 Statistic Descriptive Singapore

Singapore	$\|VR_{it}-1\|$	DFTO	DJTO	DFCAOT	DFCAOI	DJCAO	MV	VOL
Obs.	15	15	15	15	15	15	15	15
Mean	0.216852	1.528805	0.872667	16.76243	7.418129	1	0.010977	0.18412
Max	0.09527	1.486386	0.9	16.92798	7.447802	1	0.011204	0.178831
Min	0.77882	1.839055	0.9	19.11247	8.394014	1	0.021223	0.291128
StaDev	0.0351	1.323038	0.83	12.97038	6.136433	1	0.005343	0.102595
	0.233983	0.18001	0.031045	1.487636	0.537033	0	0.004475	0.046184

more open compared to the overall sample. To accommodate this difference in the market, following Zhang et al. (2015), we decided to run two difference analyses with and without Singapore.

Regression Model in Equation (1) with Singapore

After testing for proper panel data model, Equation (1) can be rewritten as follows:

$$LOG|VR_{it}-1| = \beta_1 LOGDFTO_{it}+\beta_2 Vol_{it} +\beta_3 MV_{it}+\varepsilon_{it} \quad (1a)$$

for *de facto* testing, and

$$LOG|VR_{it}-1| = \beta_1 DJTO_{it}+\beta_2 Vol_{it}+\beta_3 MV_{it}+\varepsilon_{it} \quad (1b)$$

for *de jure* testing

The regression of these models can be seen in Table 3. In these models, we can see that variable *de facto trade openness* (DFTO) and *de jure trade openness* (DJTO) are not significant when Singapore is included in the sample.

Regression Model in Equation (1) without Singapore

After testing for proper panel data model, Equation (1) can be rewritten as follows:

$$|VR_{it}-1|=\beta_1 DJTO_{it}+\beta_2 LOGVol_{it}+\beta_3 MV_{it}+\varepsilon_{it} \quad (1c)$$

for *de facto* testing, and

$$|VR_{it}-1| = \beta_1 LOGDJTO_{it}+\beta_2 LOGVol_{it}+\beta_3 MV_{it} +\delta_i+\varepsilon_{it} \quad (1d)$$

for *de jure* testing

The regression of these models can be seen in the Table 4. We see that variable *de facto trade openness* (DFTO) becomes significant and has a negative effect on information efficiency, while *de jure trade openness* (DJTO) is not significant, even when Singapore is excluded from the sample.

Regression Model in Equation (2) with Singapore.

After testing for proper panel data model, Equation (2) can be rewritten as follows:

$$LOG|VR_{it}-1| = \beta_1 LOGDFCAOT_{it} +\beta_2 LOGDFTO_{it}+\beta_3 Vol_{it} +\beta_4 MV_{it}+\varepsilon_{it} \quad (2a)$$

for *de facto* financial total and *de facto* trade,

$$LOG|VR_{it}-1| = \beta_1 LOGDFCAOT_{it} +\beta_2 LOGDFTO_{it}+\beta_3 Vol_{it} +\beta_4 MV_{it}+\varepsilon_{it} \quad (2b)$$

for *de facto* financial inflow and *de facto* trade, and

$$LOG|VR_{it}-1| = \beta_1 DJCAO_{it} +\beta_2 LOGDFTO_{it}+\beta_3 Vol_{it} +\beta_4 MV_{it}+\varepsilon_{it} \quad (2c)$$

for *de jure* financial and *de facto* trade.

Regression Model in Equation (2) without Singapore

After testing for proper panel data model, Equation (2) can be rewritten as follows:

$$|VR_{it}-1| = \beta_1 LOGDFCAOT_{it}+\beta_2 DFTO_{it} +\beta_3 LOGVol_{it}+\beta_4 MV_{it}+\delta_i+\varepsilon_{it} \quad (2d)$$

for *de facto* financial total flow and *de facto* trade,

$$|VR_{it}-1| = \beta_1 LOGDFCAOI_{it}+\beta_2 DFTO_{it} +\beta_3 LOGVol_{it}+\beta_4 MV_{it}+\varepsilon_{it} \quad (2e)$$

for *de facto* financial inflow and *de facto* trade, and

Table 3. Results of Regression Model in Equations (1a) and (1b) with Singapore

		DJTO	DFTO
LOGDFTO	Prob.		0.4854
	Coeff.		0.103756
DJTO	Prob.	0.703	
	Coeff.	-0.50123	
MV	Prob.	0.089	0.2427
	Coeff.	-38.1971	-28.6924
Vol	Prob.	0.3977	0.2594
	Coeff.	-1.06254	-1.6369
Number of Country		5	5
Number of Observation		75	75
R-square		0.075645	0.080108
Prob F-stat		0.131426	0.113095

Table 4 Results of Regression Model in Equations (1c) and (1d) without Singapore

		DJTO	DFTO
DFTO	Prob.		0.0198*
	Coeff.		0.152377
LOGDJTO	Prob.	0.52	
	Coeff.	0.160604	
MV	Prob.	0.5547	0.897
	Coeff.	2.969209	-0.51646
LOGVol	Prob.	0.4693	0.249
	Coeff.	-0.05098	-0.03288
Number of Country		4	4
Number of Observation		60	60
R-square		0.173358	0.135557
Prob F-stat		0.106552	0.04151

$$|VR_{it}-1| = \beta_1 DJCAO_{it}+\beta_2 DFTO_{it} +\beta_3 LOGVol_{it}+\beta_4 MV_{it}+\varepsilon_{it} \quad (2f)$$

for *de jure* financial and *de facto* trade.

Regression Model in Equation (3) with Singapore

After testing for proper panel data model, Equation 3 can be rewritten as follows:

$$LOG|VR_{it}-1| = \beta_1 LOGDFCAOT_{it}+\beta_2 Vol_{it} +\beta_3 MV_{it}+\delta_i+\varepsilon_{it} \quad (3a)$$

for investigating *de facto* financial openness individually,

$$LOG|VR_{it}-1| = \beta_1 LOGDFCAOI_{it}+\beta_2 Vol_{it} +\beta_3 MV_{it}+\delta_i+\varepsilon_{it} \quad (3b)$$

for investigating *de facto* financial openness inflow individually, and

$$LOG|VR_{it}-1| = \beta_1 DJCAO_{it}+\beta_2 Vol_{it}+\beta_3 MV_{it} +\varepsilon_{it} \quad (3c)$$

for investigating *de jure* financial openness individually

Regression Model in Equation (3) without Singapore

After testing for proper panel data model, Equation (3) can be rewritten as follows:

$$|VR_{it}-1| = \beta_1 LOGDFCAOT_{it}+\beta_2 LOGVol_{it} +\beta_3 MV_{it}+\delta_i+\varepsilon_{it} \quad (3d)$$

for investigating *de facto* financial openness of total flow individually,

$$|VR_{it}-1| = \beta_1 LOGDFCAOI_{it}+\beta_2 LOGVol_{it} +\beta_3 MV_{it}+\delta_i+\varepsilon_{it} \quad (3e)$$

for investigating *de facto* financial openness of inflow individually, and

$$|VR_{it}-1| = \beta_1 DJCAO_{it}+\beta_2 LOGVol_{it}+\beta_3 MV_{it} +\varepsilon_{it_{iW}} \quad (3f)$$

for investigating *de jure* financial openness individually

Table 5. Results of Regression Model in Equations (2a), (2b), and (2c) with Singapore

		DJCAO	DFCAOT	DFCAOI
LOGDFTO	Prob.	0.4966	0.0775	0.0725
	Coeff.	0.125291	0.542411	0.548588
DJCAO	Prob.	0.8409		
	Coeff.	-0.07381		
LOGDFCAOT	Prob.		0.1025	
	Coeff.		-0.2938	
LOGDFCAOI	Prob.			0.0952
	Coeff.			-0.3447
MV	Prob.	0.3182	0.2831	0.3071
	Coeff.	-26.6596	-26.0833	-24.8477
Vol	Prob.	0.2568	0.137	0.1186
	Coeff.	-1.71363	-2.20063	-2.33964
Number of Country		5	5	5
Number of Observation		75	75	75
R-square		0.080642	0.114728	0.116238
Prob F-stat		0.201516	0.070469	0.067082

Table 6. Results of Regression Model in Equations (2d), (2e), and (2f) without Singapore

		DJCAO	DFCAOT	DFCAOI
DFTO	Prob.	0.0207*	0.2162	0.0005*
	Coeff.	0.147314	0.197273	0.437796
LOGDJCAO	Prob.	0.00478*		
	Coeff.	0.056789		
LOGDFCAOT	Prob.		0.0004*	
	Coeff.		-0.39311	
LOGDFCAOI	Prob.			0.0065*
	Coeff.			-0.25145
MV	Prob.	0.3882	0.2456	0.1612
	Coeff.	-3.61677	-5.88939	-5.98522
LOGVol	Prob.	0.4654	0.7918	0.0795
	Coeff.	-0.020672	-0.01691	-0.04856
Number of Country		4	4	4
Number of Observation		60	60	60
R-square		0.195507	0.348695	0.245316
Prob F-stat		0.016086	0.001502	0.00337

Result and Discussions

Table 3 Results of Regression Model in Equations (1a) and (1b) with Singapore

The regression of these models can be seen in Table 5. In these models, the variables *de facto capital account openness total flow* (DFCAOT), *de facto capital account openness inflow* (DFCAOI), and *de jure capital account openness* (DJCAO), when included in the model together with variable trade openness, are not significant towards information efficiency of the stock market in ASEAN countries when Singapore is included in the sample. The variable *de facto trade openness* is also not significant on market information efficiency.

The regression of these models can be seen in Table 6. We see that the variable *de facto capital account openness total flow* (DFCAOT) and *de facto capital account openness inflow* (DFCAOI) have positive significant effects towards information efficiency, and *de jure capital account openness* (DJCAO) has a significant negative effect towards information efficiency when included in the model with variable trade openness and Singapore is excluded from the sample. In this model, *de facto trade openness* has a significant negative effect on market information efficiency.

The regression of equations (3a), (3b), and (3c) is as shown in Table 7. In these models, the variable *de facto capital account openness total flow* (DFCAOT) and *de facto capital account openness inflow* (DFCAOI) have significant positive effects on information efficiency when

Table 7. Result of Regression Model in Equations (3a), (3b), and (3c) with Singapore

		DJCAO	DFCAOT	DFCAOI
DJCAO	Prob.	0.1669		
	Coeff.	1.071111		
LOGDFCAOT	Prob.		0.0058*	
	Coeff.		-1.97463	
LOGDFCAOI	Prob.			0.0235*
	Coeff.			-1.43376
MV	Prob.	0.4517	0.2221	0.4259
	Coeff.	-24.9897	-39.2994	-25.2699
Vol	Prob.	0.62	0.7492	0.5895
	Coeff.	-1.64732	-1.01851	-1.74997
Number of Country		5	5	5
Number of Observation		75	75	75
R-square		0.144713	0.185179	0.185179
Prob F-stat		0.145079	0.04743	0.04743

Table 8. Result of Regression Model in Equations (3d), (3e), and (3f) without Singapore

		DJCAO	DFCAOT	DFCAOI
LOGDJCAO	Prob.	0.0462*		
	Coeff.	0.059489		
LOGDFCAOT	Prob.		0.0007*	
	Coeff.		-0.36643	
LOGDFCAOI	Prob.			0.003*
	Coeff.			-0.27641
MV	Prob.	0.0292*	0.4342	0.8853
	Coeff.	-8.453279	-3.73082	-0.67112
LOGVol	Prob.	0.8236	0.6336	0.3465
	Coeff.	0.006015	-0.03029	-0.06137
Number of Country		4	4	4
Number of Observation		60	60	60
R-square		0.112549	0.329065	0.295868
Prob F-stat		0.080478	0.001255	0.00374

variable trade openness is excluded from the model. However, *de jure capital account openness* (DJCAO) is still not significant towards information efficiency stock market ASEAN countries when Singapore is included in the sample.

The regression of these models can be seen in Table 8. We can see that the variables *de facto capital account openness total flow* (DFCAOT) and *de facto capital account openness inflow* (DFCAOI) has significant positive effects towards information efficiency when trade openness is excluded from the model. However, *de jure capital account openness* (DJCAO) has a significant negative effect with a relatively smaller coefficient compared to its *de facto* counterpart towards the information efficiency of the stock market of ASEAN countries when Singapore is excluded from the sample.

By comparing the results of F-stat and R-squared between models with and without Singapore, we can see that the models are statistically better when Singapore is excluded from the sample. According to Zhang et al. (2015), this can be explained by the difference in market openness between Singapore and the other ASEAN countries, which are relatively less open compared to Singapore.

From the results of regressions with Singapore, it is evident that only financial openness when regressed without *de facto* trade openness is significantly negatively impacted by the $|VR_{it}-1|$, which in turn positively impacts the information efficiency of the stock market of ASEAN countries. Trade openness, either *de jure* or *de facto*, has no significant effect on the information efficiency of the stock markets of ASEAN countries, as with variable *de jure* financial openness when Singapore is in the sample. Control variables used in this research, market volatility and trade volume, is also not significant toward stock market efficiency in

five ASEAN countries from 2000 to 2014. According to Todorova and Soucek (2014), trading volume can be insignificant toward information efficiency, because information that is intrinsic to the index value is already known by the market actors. Trading volume can become insignificant, according to Lim and Kim (2011), caused by the *noise* off the information, which could potentially interfere with the information efficiency in the market as the increase of market volatility.

Generally, the results of this research support Zhang et al. (2015), which revealed different results trade openness towards efficiency, where positive effects happen in the more open markets, while negative effects can be observed from the less open market. We see that *de facto* trade openness positively affects $|VR_{it}-1|$, which shows that trade openness in ASEAN countries except Singapore reduces the information efficiency of the stock market. The variable that most significantly positively affects the information efficiency of the stock market of ASEAN countries is *de facto* financial openness toward capital flow. From the result of this research, we can also see that *de jure trade openness*, in agreement with Lim and Kim (2011), is not significant toward information efficiency. However, even after excluding Singapore from the sample, market volatility and trading volume is still not significant toward the market efficiency of ASEAN countries.

Conclusions

This research examines the impact of trade openness and financial openness toward the information efficiency of the stock markets of ASEAN countries. From the various analysis, it can be concluded that trade openness can have a negative effect on the information efficiency of the stock markets of ASEAN countries when we use the de facto measure, and Singapore is not included in the sample. This result, despite contradicts with the finding of Lim and Kim (2011), can be explained by Zhang et al. (2015). Zhang et al. (2015) found that trade openness has different impact towards efficiency, where positive effects happens on the more open market while negative effects can be observed from the less open market. For stock markets of ASEAN countries other than Singapore, the effect of trade openness towards efficiency in the financial sector is negative.

The results also indicate the significant positive effect of financial openness toward information efficiency on the stock market. Chinn-Ito (2006) found that financial openness could lead to the development of the financial sector of a country; this argument was elaborated by Lim and Kim (2011), who asserted that foreign investors who demonstrate the intent to invest in a country would expect better information openness. Moreover, Bae (2006) found that foreign investors have a competitive advantage over local investors in processing market information globally, thus foreign investors can contribute to the information efficiency of stock markets.

The deterrent for this research is the restricted amount of data because of the yearly available data, hence the very constrained data and limited time span of this research to merely 15 years. Also, another restriction is the use of third-party data for the *de jure* proxy so as to limit the knowledge of how the data was formed.

For further research, we suggest that the scope of the research be enlarged by increasing the country as the object of the research and thus facilitate a more robust and general result. Also, later research can further differentiate countries with different levels of openness, so the analysis can cover every level of openness within the economy. Additional samples with countries of more open economies can deepen the knowledge of the different effect of openness towards information efficiency towards different levels of economic openness.

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