MARKET INTEGRATION IN ASEAN-5: EVIDENCE OF ISLAMIC AND CONVENTIONAL STOCK MARKETS

Abdul Karim B., Abdul-Rahman A.*

Abstract: This paper examines the stock markets integration for both Islamic and conventional stock markets in ASEAN-5. Time series techniques of cointegration, VECM Granger causality, GARCH (1,1) model and daily data covering the period from October 2009 to October 2019 are used in this study. We found evidence of no cointegration among the Islamic stock markets in ASEAN-5 however there exists cointegration relationship among the conventional stock markets and also among Islamic and conventional stock markets in ASEAN-5. Islamic stock markets are found to be strongly linked with their conventional counterparts. A portfolio comprising both Islamic and conventional stock markets shall hinder portfolio managers and market participants from diversification benefit. Thus, the Islamic stock markets in ASEAN-5 provide opportunities for international portfolio diversification and hedging strategies. Indeed, the findings shall motivate international investors and fund managers to restructure their investment in Islamic financial markets in this region. This study contributes to the limited existing empirical evidence of diversification based on Islamic stock markets.

Key words: Islamic and Conventional Stock Markets; Market Integration; ASEAN-5; Cross-border investment; Foreign Portfolio Investment; Portfolio Diversification.

DOI: 10.17512/pjms.2020.21.1.14

Article history:
Received October 14, 2019; *Revised* January 15, 2020*; Accepted* January 28, 2020

Introduction

Islamic finance has attracted academics, governments, investors and others worldwide as Islamic financial industry has shown an incredible growth and innovations. In addition, the demand for Islamic financial products has been growing rapidly in both Islamic and non-Islamic countries. According to Reuters Islamic Finance Development Report 2018, total global Islamic finance assets was USD2.4 trillion in 2017 with Islamic banking contribute to 71%, sukuk (17%), Islamic fund (4%), takaful (2%) and other Islamic financial institution (6%).

Another area of Islamic finance that also has gained interest among investors worldwide is Islamic stock market. For example, the size of the Islamic capital market in Malaysia has increased at 14% per annum between 2000-2010. In 2012, the size of Malaysian Islamic capital market reached RM1.42 trillion (Malaysia

* **Bakri Abdul Karim**, Faculty of Economics and Business, Universiti Malaysia Sarawak (UNIMAS) **Aisyah Abdul-Rahman** Assoc. Prof. Dr, Faculty of Economics and Management & Institute of Islam Hadhari, Universiti Kebangsaan Malaysia (UKM)
✉ corresponding author: eychah@ukm.edu.my
✉ akbakri@unimas.my

International Islamic Financial Centre). There are two fundamental principles in an Islamic financial system which are Islamic financial system is driven by trade and production not by interest and secondly Islamic financial system based on trade will be immune to instability (Askari et al. 2010). In addition, Islam promotes sustainable development, enhancing social justice and capacity building in individual and society (Mohd Nor, 2016).

Islamic stocks are rigorous screened and filtered both business activities and financial ratios. Business activities such as gambling, alcohol, tobacco, pork-related products, conventional financial services, defense/weapons and adult entertainment are totally prohibited. Excessive leverage (interest bearings debt) and also interest-based investment are also not allowed. The Islamic financial markets are believed to be relatively more stable as compared to the conventional financial markets (Abdul-Rahim et al., 2019; Mohd et al, 2018). However, literature has found that the management of conventional banks is more efficient (Khalib et al., 2016) than Islamic banks due to advanced technology adopted by conventional banks (Sukmana & Febriyati, 2016). *Riba* (interest, and usury) and *maysir* (gambling, and speculative activities similar to gambling) are the major factors leading to the current financial crisis (Ahmed, 2010; Abdul-Rahman et al., 2014; Othman et al., 2018).

It is well documented that the global financial markets are integrated due to financial globalization, removal of investment barriers, economic integration, financial innovation and technological advancement. Abdul Majid et al. (2008) and Abdul Karim and Abdul Karim (2012) reveal that the ASEAN stock markets are going towards a greater integration among themselves particularly in the post-1997 financial crisis. Recently, using 64 countries in the world, Gkillas et al. (2019) find that the stock markets tend to show greater degree of integration during the US subprime crisis. Chien et al. (2015) show that regional financial integration between China and ASEAN-5 has gradually increased. A recent study, Vo and Tran (2019) document a significant volatility spillover from the US to ASEAN equity markets. The financial market integration has major implication on both international portfolio diversification and financial stability. The vast-growing economies activities and the growing investment opportunities in Asian emerging markets have attracted investors to diversify their investment in the region. Notwithstanding there have been many studies investigating market integration among developed and emerging markets, studies on the Islamic stock markets integration versus conventional stock markets worldwide are still limited.

In addition, there exists many conflicting findings reported in the previous studies. For examples, Abdul Karim et al. (2010) show Islamic stock markets of US, UK, Japan, Malaysia and Indonesia has no cointegration while using 32 Islamic and 32 conventional stock markets, Abu-Alkheil et al. (2017) show lacking of integration among the stock markets. Thus they conclude that Islamic stock markets can provide potential benefits of international portfolio diversification. However,

Abdul Majid et al. (2007) and Kassim (2013) found that the Islamic stock markets are cointegrated. While Abdul Majid and Kassim (2010) finds that Islamic stock markets of Malaysia, Indonesia, Japan, the US and the UK provide benefit of portfolio diversification across economic grouping but not within the same economic groupings. The results are not in line with Abbes and Trichilli (2015) where they find that the Islamic stock markets of similar economic grouping are cointegrated while different economic grouping are partially segmented. Alaoui et al. (2014) examine the dynamic market co-movement between Dubai Financial Market and regional Islamic indices of GCC, ASEAN, Developing Countries, Emerging Countries and Global Sukuk at different time horizons. The results show that closer markets tend to have higher interdependence and contagion.

Ajmi et al. (2014) provide evidence of significant linear and nonlinear causality between the Islamic and conventional stock markets with more strongly from the Islamic stock markets to the other markets. This result leads to the rejection of the hypothesis of decoupling of the Islamic markets from their conventional counterparts. Another study of Dania and Malhotra (2013) also find evidence of a positive and significant return spillover from conventional market indices in North America, European Union, Far East, and Pacific markets to their corresponding Islamic index returns. They also find similar evidence for asymmetric volatility spillover. However, utilizing countries of Turkey, Indonesia, Pakistan, Qatar, Malaysia and the US, Majdoub and Mansor (2014) found evidence of low dynamic correlation of Islamic stock markets. The transmission of demand shock across financial market is alleviated when they are compliant to the maxim of Islamic law. In addition, Rizvi et al. (2015) document the Islamic stock markets in the US and Asia-Pacific show lesser exposure of financial crisis as they have lower leverage effects thus this proves that Islamic stock markets provide a buffer and cushion against the crises. Recent study of Tee and Kew (2019) discovers that the risk of Islamic stock is lower compared to those of conventional during the economic contraction and financial crises. These results are also in line with Abdul Karim et al. (2010) that provide evidence that the US subprime crisis did not give significant impact on the Islamic stock market integration.

We note that the results of Islamic stock markets integration reported in the previous studies were mixed. Thus, this issue is still open for further empirical examination. Unlike previous studies, we examine the stock markets integration for both Islamic stock markets and conventional stock markets in ASEAN-5. With a nominal GDP more than USD2.5 trillion and more than 600 million population, ASEAN is fast becoming a major economic force in Asia and an attractive destination for investment. In addition, we also examine the impact of volatility of conventional stock markets on the Islamic stock markets. This study attempts to fill the gap in the subject matter and to provide recent empirical evidence on the issue by comparing both Islamic and conventional stock markets. The findings of this study shall have implications for international investors and policy makers.

The rest of the paper is structured as follows. Section 2 describes some facts and figures of the ASEAN-5 stock markets. Section 3 provides empirical framework and data. Section 4 offers empirical results and discussion while last Section 5 presents some concluding remarks.

Stock Markets Development of ASEAN-5, 2010-2018

Table 1 shows some facts and figures of the stock markets development of ASEAN-5. In 2010, total market capitalization of ASEAN-5 stood at USD1.8151 trillion and its value increased to USD2.331 trillion in 2018. Singapore has the highest value of market capitalization in the region while the Philippines is the lowest. Malaysia had the highest listed firms in the region at 912 firms in 2018 while the Philippines is the lowest at 267 firms. In terms of new listing IPO, Malaysia recorded the highest IPO in 2010 at 135 IPOs however in 2018, Indonesia has the highest IPO listing at 57 while Malaysia ranked number 2 at 22 new IPOs. With the exception of Singapore, all markets experienced increasing of Market Index from 2010 to 2018. The Philippines recorded the highest growth rate of index returns at 77% or equivalent to 8.6% per annum over 9 years period.

Table 1: Stock Markets Development of ASEAN-5, 2010-2018

Year	Indicator	Mal	Ina	Phil	Sing	Thai
2010	Index	1518.91	3703.51	4201.14	3190.04	1032.76
	MCAP*	408.69	360.39	157320.50	647.23	277.73
	Firms	956	420	253	778	541
	IPOs	135	23	5	31	11
2014	Index	1761.25	5226.95	7230.57	3365.15	1497.67
	MCAP*	459.00	422.13	261.84	752.83	430.43
	Firms	905	506	263	775	613
	IPOs	14	23	6	32	36
2018	Index	1690.58	6194.5	7466.02	3068.76	1563.88
	MCAP*	398.02	486.77	258.16	687.26	500.74
	Firms	912	619	267	741	704
	IPOs	22	57	1	17	19

Source: World Federation Exchange. Note: * in USD billion

Empirical Framework and Data

This study uses the maximum likelihood approach of Johansen (1988) and Johansen and Juselius (1990), VECM Granger causality and GARCH (1,1) model. The JJ cointegration is based on a vector autoregression (VAR) model as follows:

$$\Delta Y_t = \mu + \Gamma_i \Delta Y_{t-1} + \ldots\ldots + \Gamma_k \Delta Y_{t-k} + \Pi Y_{t-k} + \varepsilon_t \quad (1)$$

where Δ is first difference, Y_t is an *n x 1* vector of variables and μ is an *n x 1* vector of constant, respectively. Γ is an *n x n* matrix (short-run dynamics), Π = αβ′ where α is an *n x 1* column vector that represents the speed of short-run adjustment to disequilibrium and β′ is an *1 x n* cointegrating row vector that represents the matrix of long-run coefficients such that Y_t converge in their long-run equilibrium. Finally, ε_t is an *n x 1* vector of error term and k is the order of autoregression.

Johansen developed two statistics to test for cointegrating relations which are maximum likelihood and trace. We specify the lag length using AIC information criterion. In addition, prior to the JJ test, the standard Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests are conducted to determine the order of integration for each stock market.

VECM procedure allows us to make a difference between the short- and long-run forms of Granger-causality. In precise, if the variables are non-stationary and are not cointegrated suggest the use of Granger causality of VAR model in first differences. However, if they are cointegrated, a vector error correction model (VECM) or a level VAR can be used (Engle and Granger, 1987). Thus, after implemented cointegration tests, we proceed to specification and estimation of Granger causality. According to Granger representation theorem, for any cointegrated series, error correction term must be included in the model. Engle and Granger (1987) indicates that omitting this error correction term (ECT) in the model, leads to model misspecification. Masih and Masih (1999) indicate that the VECM opens up an additional channel for Granger-causality to emerge that is completely ignored by the standard Granger and Sims tests. The short-run causality is determined by the significance of the chi-square statistics of the differenced independent variables. The long-run causality is determined by the significance of *t*-test of the lagged ECT.

GARCH model proposed by Bollerslev (1986) has become popular to measure volatility in financial time series. The GARCH model allows the conditional mean and variance to be dependent upon previous own lags. General form of the GARCH(p,q) is as follows:

$$y_t = \lambda_0 + \sum_{i=1}^{k} \lambda_i \, y_{t-i} + \varepsilon_t \qquad (2)$$

where ε_t=N $(0,\sigma_t^2)$

$$\sigma_t^2 = \varphi + \sum_{i=1}^{q} \alpha_i \, \varepsilon_{t-i}^2 + \sum_{j=1}^{p} \beta_j \, \sigma_{t-j}^2 \qquad (3)$$

Equation (2) is a conditional mean equation, is an autoregressive of order k. While Equation (3) is the conditional variance equation where σ_t^2 is conditional variance. α_i is the lagged squared residuals coefficient based on conditional mean and β_j is lagged conditional variance coefficient. In this study, we use GARCH (1,1). For the mean equation, we use both Islamic stock and conventional stock prices each

country. From the mean equation, we extract the residuals and run GARCH (1,1) estimation.

Data Preliminaries

This study uses daily closing data of the market indices, covering the period of October 2009 to October 2019. All these indices are denominated in local currency units, extracted from the Datastream International. For Islamic stock markets, we use MSCI Islamic Index for Malaysia (IMAS), Singapore (ISING), Indonesia (INAS), Philippines (IPHIL) and Thailand (ITHAI). For conventional markets, we use Kuala Lumpur Composite Index for Malaysia (MAL); Jakarta Stock Exchange Composite Index for Indonesia (INAC); the Bangkok Stock Exchange Trade Index for Thailand (THAI); the Philippines Stock Exchange Index for the Philippines (PHIL); and the Singapore Straight Time Index for Singapore (SING). All series are transformed into natural logarithm.

Table 2 reports the descriptive statistics of the variables, including sample mean, maximum, minimum, standard deviations, skewness and kurtosis. All Islamic and conventional stock markets in ASEAN-5 recorded positive average daily returns. Both Islamic stock markets of Indonesia and Philippines have the highest mean daily return at 0.03% compared to other Islamic stock markets while the conventional stock markets of Indonesia and Philippines earned the highest average daily return at 0.04% compared to other stock markets in the region. In terms of standard deviations, Islamic stock markets of Thailand and Indonesia are found more volatile than the others markets. All daily market returns, have excess kurtosis (greater than 3) thus have a thicker tail and a higher peak than a normal distribution.

The results from standard correlation of coefficient tests show that majority of the correlations among various stock markets returns are positive. The highest correlation is between the Islamic stock market of Philippines (IPHIL) and its conventional stock market (PHIL). Among the Islamic stock markets, the pair IMAL-ISING has the highest coefficient (to conserve space the results are not reported here but available upon request).

Table 2: Descriptive Statistics of Market Returns

	Mean	Max	Min	SD	Skew.	Kurt.	*p*-JB
IMAL	0.01	3.67	-3.77	0.61	-0.14	6.49	0.00
INAS	0.03	6.75	-10.87	1.39	-0.57	7.8	0.00
IPHIL	0.03	8.53	-7.39	1.43	-0.08	6.41	0.00
ISING	0.004	4.14	-6.15	0.86	-0.3	5.82	0.00
ITHAI	0.02	7.59	-8.37	1.4	-0.07	6.21	0.00
MAL	0.04	7.01	-9.3	1.05	-0.59	9.03	0.00
INA	0.01	3.32	-3.24	0.57	-0.36	5.72	0.00

PHIL	0.04	5.54	-6.99	1.05	-0.47	6.53	0.00
SING	0.02	19.95	-19.32	0.96	0.16	148	0.00
THAI	0.03	6.04	-5.87	0.94	-0.32	8.02	0.00

Empirical Results

The ADF and PP unit root tests conclude that all stock market prices are *I*(1) process (to conserve space the results are not reported here but available upon request). The results of JJ multivariate cointegration test are reported in Table 3. For Islamic stock markets, both trace and max statistics suggest no cointegration among these five markets. However, we find two cointegrating vectors for the case of conventional stock markets and for the combination of Islamic and conventional stock markets, trace statistics suggests three cointegrating vectors while max suggest two. Thus, the conventional stock markets and combination of both Islamic and conventional stock markets are tied together in the long-run and their deviations from the long-run equilibrium path will not be corrected.

The findings of no cointegration among the Islamic stock markets indicate that the Islamic stock markets provide opportunity for the potential benefits from international portfolio diversification in this ASEAN-5. The results are consistent with Karim et al. (2010), Majdoub and Mansor (2014) and Abu-Alkheil et al. (2017). However, the benefits are reduced in the context of conventional stock markets and also the combination of both Islamic and conventional stock markets. In term of conventional stock markets and combination of Islamic and conventional stock markets, we can conclude that ASEAN stock markets are moving towards greater integration. The results are consistent with Abdul Majid et al. (2008), Abdul Karim and Abdul Karim (2012) and Chien et al. (2015).

Table 3: Johansen Cointegration Tests

	Islamic Stock Markets		Conventional Stock Markets		Combination of Islamic and Conventional	
H_0:	Trace	Max	Trace	Max	Trace	Max
r = 0	63.12	26.11	91.43***	36.55**	364.33**	98.14**
r ≤ 1	37.01	19.10	54.87***	28.29**	266.18**	96.05**
r ≤ 2	17.90	9.96	26.58	13.90	170.12**	46.33
r ≤ 3	7.93	4.38	12.67	9.09	123.79	32.22
r ≤ 4	3.55	3.55	3.58	3.57	91.56	24.58
r ≤ 5					66.98	23.20
r ≤ 6					43.78	21.23
r ≤ 7					22.5	15.17
r ≤ 8					7.37	5.01
r ≤ 9					2.35	2.35

Note: ** and *** indicate significant at 5% and 1% level respectively.

For VECM model, we use the combination of Islamic and conventional stock markets as they are cointegrated. Table 4 shows the VECM Granger causality results. Several interesting dynamic causal relationships exists in among stock markets. There are many short-run bidirectional causalities running among the Islamic stock markets (DIMAL-DITHAI; DITHAI-DIPHIL; DINAS-DITHAI; DINAS-DIPHIL; DITHAI-DSING). Unidirectional causalities are running from DITHAI to DISING; DIMAL to DIPHIL; DISING TO DINAS). Conventional stock market of Indonesia (DINAC) is significantly influence DIMAL and DINAS while conventional stock market of Thailand (DTHAI) is significantly influence the DIMAL and DIPHIL. In addition, both DMAL and DPHIL are found significant influencing the DITHAI. With the exception of Indonesia, we note that no causality running from the conventional stock markets of ASEAN-5 to their Islamic stock market counterpart. Among the conventional, the results show unidirectional causalities running from DMAL to DSING and from DPHIL to DINAC. The estimated coefficients for the error correction terms are ranging from –0.01 to –0.04, suggesting that the last period disequilibrium is corrected by 1% to 4% on the following day.

Table 5 presents the parameter estimates and their corresponding p-value from mean equation, variance equation and diagnostic checks in the GARCH (1,1) model for each country. From the table, the parameter of mean equation shows that only conventional stock market in Malaysia, Indonesia and Philippines are significant influencing their Islamic stock market. From the estimated variance equation of GARCH, it can clearly be seen that the return volatility of conventional stock markets significantly influencing the return volatility of Islamic stock markets.

Table 4: VECM Causality Tests

	INDEPENDENT VARIABLES (Chi-Square Statistics)										
DEP. V.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**ECT**
DIMAL[1]		3	2	54***	3	2	6	3	6*	9**	-0.01***
DIPHIL[2]	43***		28***	34***	10**	0.7	1	4	10**	0	0.01
DISING[3]	5	0.6		99***	4	2	0.2	0	0.3	6	-0.02***
DITHAI[4]	11**	8*	7*		7*	10**	9**	4	0.2	3	0
DINAS[5]	67***	2	93***	35***		7*	5	4	3	7*	0.01
DMAL[6]	52***	0.3	2	11**	7*		2	2	3	3	0
DPHIL[7]	72***	2	74***	44***	35***	1		1	4	4	0.01
DSING[8]	6	0.7	3	3	4	7*	0.8		1	2	-0.01
DTHAI[9]	3	6	4	2	0.3	3	3	2		2	0
DINAC[10]	5	18***	2	0.8	3	3	45***	5	3		-0.04***

Table 5: Estimation Results of GARCH (1, 1) Model and Diagnostics

	IMAL	INAS	IPHIL	ISING	ITHAI
MEAN EQUATION					
C	0.00**	0.00	-0.00	0.00	0.00*
$DCONV_j$	0.07***	0.03**	0.94***	0.01	-0.01
VARIANCE EQUATION					
C	0.00***	0.00***	-0.00***	0.00***	0.00***
RESID (-1)^2	0.08***	0.06***	0.09***	0.07***	0.07***
GARCH (-1)	0.89***	0.92***	0.90***	0.91***	0.91***
DIAGNOSTIC					
Q(20)	32.09**	55.82***	37.25**	11.83	12.11
$Q^2(20)$	31.61**	9.93	28.54*	11.99	17.34
LM	3.16*	0.61	10.30**	0.48	0.01

Notes: *, ** and *** denotes significant at 10%, 5% and 1% levels respectively.
DCONVj is DMAL, DINAC, DPHIIL, DSING and DTHAI respectively.

In line with Majdoub et al. (2016), Islamic stock markets are found to be strongly linked with its conventional counterparts. A portfolio containing both Islamic and conventional stock markets shall hinder portfolio managers and market participants from diversification benefit. Indeed, the findings shall motivate international investors and fund managers to restructure and diversify their investment across Islamic stocks particularly in this region. Knowledge on this market integration, allow international investors and fund managers to enlarge their portfolio frontier and establish investment strategies. Majdoub et al. (2016) note that the Islamic financial intermediation mode plays a protective shield role alleviating the transmission of shocks and reduce potential losses from unexpected financial crisis. Therefore, the Islamic stock markets in ASEAN-5 provide opportunities for international portfolio diversification and hedging strategies.

Summary

In this paper we examine the stock markets integration and dynamic linkages of Islamic stock markets and conventional stock markets in ASEAN-5 using cointegration, VECM granger causality and GARCH (1,1) over the period from October 2009 to October 2019. We found evidence of no cointegration among the Islamic stock markets in the region. However, the result show cointegration among the conventional stock markets and the combination of both Islamic and conventional stock markets. The results from VECM Granger causalities show many short-run causalities running among the Islamic stock markets. Only conventional stock market of Indonesia significantly influences its Islamic stock

market counterpart. The GARCH model also indicate that the return volatility of conventional stock markets is significantly influencing the return volatility of the Islamic stock markets.

The findings of no cointegration among the Islamic stock markets indicate that the Islamic stock markets in ASEAN-5 can provide opportunity for the potential benefits from international portfolio diversification and hedging strategies. Thus, the Islamic stock markets significantly extended the variety of investment and risk management strategies available to investors. To some extent, the findings that the five Islamic stock markets are not cointegrated suggest that each stock price series does not contain information on the common stochastic trends, thus the predictability of one country's stock prices cannot be enhanced considerably through utilizing information on the other countries' stock prices. Thus, this means that the Islamic stock markets are efficient. Combining Islamic stock markets and conventional stock markets shall reduce the potential benefits from diversification. However, the evidence of cointegration among these markets implies that each national stock prices contains information on the common stochastic trends, thus investors can explore arbitrage profits by utilizing information on other countries' stock prices.

This study explicitly focuses on the ASEAN-5 countries and both Islamic and conventional stock markets. Future study could use more advanced estimation methods (nonlinear model etc) and use more countries with different regions and other driving forces that leading to market integration.

References

Abdul-Rahman, A., Latif, R. A., Muda, R., & Abdullah, M. A. (2014). Failure and potential of profit-loss sharing contracts: A perspective of New Institutional, Economic (NIE) Theory. *Pacific-Basin Finance Journal*, 28, 136-151.

Abdul-Rahim, R., Abdul-Rahman, A., & Ling, P. S. (2019). Performance of shariah versus conventional funds: Lessons from emerging markets. *Journal of Nusantara Studies (JONUS)*, 4(2), 193-218.

Abdul Karim, B. & Abdul Karim, Z. (2012). Integration of ASEAN-5 stock markets: A revisit. *Asian Academy of Management Journal of Accounting and Finance*, 8(2), 21-41.

Abdul Karim, B., Akila Mohd. Kassim, N. & Affendy Arip, M. (2010). The subprime crisis and Islamic stock markets integration. *International Journal of Islamic and Middle Eastern Finance and Management*, 3(4), 363-371.

Abdul Majid, M.S. and Kassim, S.H. (2010). Potential diversification benefits across global Islamic equity markets. *Journal of Economic Cooperation and Development*, 31(4): 103-126.

Abdul Majid, M.S., Meera, A.K.M., & Omar, M.A. (2008). Interdependence of ASEAN-5 stock markets from the US and Japan. *Global Economic Review*, 37(2), 201-225.

Abdul Majid, M.S., Mohd. Yusof, R., and Razali, A.N. (2007). Dynamic financial linkages among selected OIC Countries. *Journal of Economic Cooperation among Muslim countries*, 28(2): 25-56.

Abbes, M.B. & Trichilli, Y. (2015). Islamic stock markets and potential diversification benefits. *Borsa Instanbul Review*, 15(2), 93-105.

Abu-Alkheil, A., Khan, W. A., Parikh, B., & Mohanty, S. K. (2017). Dynamic co-integration and portfolio diversification of Islamic and conventional indices: Global evidence. *The Quarterly Review of Economics and Finance*, 66, 212–224

Ahmed, A. (2010). Global financial crisis: An Islamic finance perspective. *International Journal of Islamic and Middle Eastern Finance and Management*, 3(4): 306-320.

Ajmi, A. N., Hammoudeh, S., Nguyen, D.K., & Sarafrazi, S. (2014). How strong are the causal relationships between Islamic and conventional finance system? *Journal of International Financial Markets, Institutions and Money*, 28, 213-227.

Alaoui, A.K.O., Diwandaru, G., Azhar, S.A., & Masih, M. (2014). Linkages and Co-movement between international stock market returns: Case of Dow Jones Islamic Dubai Financial Market Index, Journal of International Financial Markets, Institutions and Money, 36, 53-70.

Askari, H., Iqbal, Z., Krichene, N., & Mirakhor, A. (2010). The Stability of Islamic Finance: Creating a Resilient Financial Environment for a Secure Future. John Wiley & Sons (Asia).

Bollerslev, T. (1986). Generalized autoregressive conditional heteroscedasticity. *Journal of Econometrics*, 31, 307-327.

Chien, M.-S., Lee, C.-C., Hu, T.-C., & Hu, H.-T. (2015). Dynamic Asian stock market convergence: Evidence from dynamic cointegration analysis among China and ASEAN-5. *Economic Modelling*, 51, 84–98.

Dania, A., & Malhotra, D.K. (2013). An empirical examination of the dynamic linkages of faith-based socially responsible investing. *Journal of Wealth Management*, 16 (1), 65–79.

Engle, R.F., & Granger, C.W.J. (1987). Cointegration and error correction: representation, estimation, and testing. *Econometrica*, 55, 251-276.

Gkillas, K., Tsagkanos, A., & Vortelinos, D. I. (2019). Integration and risk contagion in financial crises: Evidence from international stock markets. *Journal of Business Research*, 104, 350–365.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52, 169– 210.

Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economics Dynamic and Control*, 12, 231-254.

Kassim, S.H. (2013). The global financial crisis and the integration of Islamic stock markets in developed and developing countries. *Asian Academy of Management Journal of Accounting and Finance*, 9(2), 75-94.

Khalib, M., Abdul-Rahman, A., & Janor, H. (2016). Impak kecekapan kos terhadap risiko kecairan dalam institusi perbankan di Malaysia. *Jurnal Pengurusan*, 47, 67-79.

Majdoub, J. & Mansour, W. (2014). Islamic equity market integration and volatility spillover between emerging and US stock markets. *The North American Journal of Economics and Finance*, 29, 452-470.

Majdoub, J., Mansour, W., & Jouini, J. (2016). Market integration between conventional and Islamic stock prices. *The North American Journal of Economics and Finance*, 37, 436-457.

Masih, A.M.M., & Masih, R. (1999). Are Asian stock market fluctuations due mainly to intra-regional contagion effects? Evidence based on Asian emerging stock markets. *Pacific- Basin Finance Journal*, 7, 251–82.

Mohd, N. A., Rahman, A. A., & Yaacob, M. H. (2018). The Impact of Asymmetric Information on Foreign Portfolio Investment Flows. *International Journal of Business & Management Science*, 8(2), 475-494.

Mohd Nor, S. (2016). Islamic Social Bank: an adaption of Islamic Banking. *Jurnal Pengurusan*, 46, 43-52.

Othman, N., Abdul-Majid, M., & Abdul-Rahman, A. (2018). Determinants of Banking Crises in ASEAN Countries. *Journal of International Commerce, Economics and Policy*, 9(03), 1850009.

Rizvi, S.A.R., Arshad,S., & Alam, N. (2015). Crises and contagion in Asia Pacific Islamic v/s conventional markets. *Pacific-Basin Finance Journal*, 34, 315–326.

Sukmana, R. & Febriyati, N.A. (2016). Islamic banks vs conventional banks in Indonesia: an analysis on financial performance. *Jurnal Pengurusan*, 47, 81-90.

Tee, L.Z. & Kew, S.R. (2019). Risk, business cycle and financial crisis: evidence from Islamic and conventional stocks. *Jurnal Pengurusan*, 56, 39-46.

Vo, X. V., & Tran, T. T. A. (2019). Modelling volatility spillovers from the US equity market to ASEAN stock markets. *Pacific-Basin Finance Journal*, 10124

INTEGRACJA RYNKU W ASEAN-5: NA PRZYKŁADZIE RYNKÓW GIEŁDOWYCH ISLAMSKICH I KONWENCJONALNYCH

Streszczenie: Niniejszy artykuł analizuje integrację rynków giełdowych dla rynków islamskich i konwencjonalnych w ASEAN-5. W niniejszym badaniu wykorzystano techniki kointegracji szeregów czasowych, związek przyczynowy VECM Granger, model GARCH (1,1) i dane dzienne obejmujące okres od października 2009 r. Do października 2019 r. Znaleźliśmy dowody braku kointegracji między islamskimi rynkami giełdowymi w ASEAN-5, jednak istnieją relacje kointegracyjne między tradycyjnymi rynkami giełdowymi, a także między islamskimi i konwencjonalnymi rynkami giełdowymi w ASEAN-5. Islamskie rynki akcji są silnie powiązane z ich konwencjonalnymi odpowiednikami. Portfel obejmujący zarówno islamskie, jak i konwencjonalne rynki akcji utrudnia zarządzającym portfelem i uczestnikom rynku czerpanie korzyści z dywersyfikacji. Tak więc islamskie rynki akcji w ASEAN-5 zapewniają możliwości międzynarodowej dywersyfikacji portfela i strategii zabezpieczających. Rzeczywiście ustalenia te motywują międzynarodowych inwestorów i zarządzających funduszami do restrukturyzacji ich inwestycji na islamskich rynkach finansowych w tym regionie. Badanie to przyczynia się do ograniczonego istniejącego empirycznego dowodu na dywersyfikację opartą na islamskich rynkach akcji.

Słowa kluczowe: islamskie i konwencjonalne rynki akcji; Integracja rynku; ASEAN-5; Inwestycje transgraniczne; Zagraniczne inwestycje portfelowe; Dywersyfikacja portfela.

东盟五国的市场整合:伊斯兰和传统证券市场的证据

摘要:本文研究了ASEAN-
5中伊斯兰和传统股票市场的股票市场整合。本研究使用协整时间序列技术，VECM Granger因果关系，GARCH(1,1)模型以及涵盖2009年10月至2019年10月的每日数据。我们发现没有证据表明东盟五国的伊斯兰股票市场之间存在协整关系，但是在常规股票市场之间以及东盟五国的伊斯兰和常规股票市场之间存在协整关系。发现伊斯兰股票市场与传统股票市场紧密相关。既有伊斯兰市场又有传统股票市场的投资组合将阻碍投资组合经理和市场参与者获得多元化收益。因此，东盟五国的伊斯兰股票市场为国际投资组合多元化和对冲策略提供了机会。确实，这些发现将激励国际投资者和基金经理重组其对该地区伊斯兰金融市场的投资。这项研究有助于基于伊斯兰股票市场进行多元化经营的有限的现有经验证据。

关键词:伊斯兰和常规股市市场整合;东盟5;跨境投资;外国证券投资;投资组合多元化