DOI: 10.1002/jsc.2293

RESEARCH ARTICLE

WILEY

Comparative study on finance-growth nexus in Malaysia and Indonesia: Role of institutional quality

Kazi Sohag[1,3] | S. M. Riad Shams[2] | Normah Omar[3] | Grahita Chandrarin[4]

[1]Graduate School of Economics and Management, Ural Federal University, Ekaterinburg, Russia, Russia

[2]Newcastle Business School, Northumbria University, UK

[3]Accounting Research Institute, Universiti Teknologi MARA, Shah Alam, Malaysia

[4]Graduate School, University of Merdeka Malang, East Java - Indonesia

Correspondence
Graduate School of Economics and Management, Ural Federal University, Kazi Sohag, Room 209A, Gogolya St. 25, Ekaterinbourg 620075, Russian Federation.
Email: sohagkaziewu@gmail.com

Abstract

The impact of financial development (FD) on economic growth in the context of Malaysia and Indonesia has been examined in this study regarding the role of the financial crisis and strategic changes in the institutional setup. Autoregressive distributed lags and threshold regression were applied, and time series data were analyzed for the period between 1984 and 2017 revealing that FD promoted the economic growth in both economies during this period. A nonlinear analysis also revealed that FD and economic growth follow an inverted U-shape relation in the case of Malaysia whereas, in Indonesia, it followed a U-shape relation. It was discovered that not all measures of FD promote economic growth. For instance, market capitalization was profound in the Malaysian economy while credit to the private sector and money supply was conducive for the Indonesian economy. The analysis demonstrated that the Asian and global financial crisis adversely affected economic growth in the case of Indonesia due to poor institutional quality (IQ), whereas in Malaysia it was relatively safe from the adversity brought about by the financial crisis due to the presence of IQ and good corporate governance. However, a positive change in IQ was found to have a much greater impact on augmenting economic growth rather than playing a mediating role in connection with FD and economic growth in Malaysia. In the context of Indonesia however, IQ was found to impede economic growth but played a positive and significant mediating role in the nexus of FD and economic growth. The spill-over analysis revealed that Malaysian FD is positively associated with Indonesian economic growth while Indonesian FD is negatively associated with the Malaysian economy. This study provided all economic and anecdotal explanations in supporting the results of this study.

1 | INTRODUCTION

While the nexus between financial development (FD) and economic growth has been extensively studied during the last few decades, the results are comparatively inconclusive. There are four strands of literature that focus on finance-growth nexus. The first strand mainly states the critical functioning of finance in accelerating growth introduced by Schumpeter (1934). This view was later supported by Gurley and Shaw (1955), McKinnon (1973), and Shaw (1973). Whereas, Levine (1998) argued that the primary role of FD is to allocate resources into the most productive sector and Goodhart (2004) argued that financial market development reduces frictions in the market. For instance, decreasing transaction and information costs contribute to financial investment and economic growth.

The functional role of FD is to promote investment and economic growth by facilitating the most productive allocation of resources (Levine, 1998). Recent studies document the positive role of FD in promoting economic growth (Christopoulos & Tsionas, ; Dawson, 2008; Fink, Haiss, & Vuksic, 2006; Levine, 1999; Menyah, Nazlioglu, & Wolde-Rufael, 2014;

JEL classification codes: B22, B26, C50, C22.

Wachtel, 2001). The literature also posits the insignificant role of FD in promoting economic growth (Lucas Jr, 1988; Stern, 1989). Here, Xu (2000) argues that the absence of FD is merely an appearance of the absence of demand for financial services. Additionally, the demand for FD is merely the proportionate pace of real sector development. Therefore, this notion merely implies that FD follows economic growth.

The second strand of literature posits that the relationship between FD and economic growth follows a nonmonotonic shape. Cecchetti and Kharroubi (2012) document that finance can be detrimental toward economic growth when bank credit to the private sector exceeds 90% of GDP. The downward relation between finance and growth can also be explained by the fact that the financial sector competes for resources with the rest of the economy (Samargandi, Fidrmuc, & Ghosh, 2015). An inverted U-shaped relation has also been reported by Arcand et al. (2012), observing that once the ratio of private credit to GDP exceeds a threshold of around 110%, finance becomes a burden on economic growth for high-income countries. Whereas, Samargandi et al. (2015) observed an inverted U-shaped relation between finance and growth in the long-run for middle-income countries. Similarly, Soedarmono, Hasan, and Arsyad (2017) reported that too much disbursement of consumption credit from the financial sector is detrimental to economic growth.

The third strand of literature contends that the impact of financial market development on economic growth is conditional with institutional quality (IQ; Bonnal & Yaya, 2015; Hall & Jones, 1999; Klomp & de Haan, 2014; Knack & Keefer, 1995; Kutan, Samargandi, & Sohag, 2017; Rodrik, Subramanian, & Trebbi, 2002; Shams, 2016a, 2016b, 2016c). On the other hand, Kutan et al. (2017) contend that FD along with sound IQ facilitates to gaining a reasonably safe rate of return. Likewise, well-functioning financial institutions reduce agency problems through careful monitoring (Aghion, Blundell, Griffith, Howitt, & Prantl, 2009). Further, some studies have documented that the potential outcome from FD is primarily determined by the quality of financial regulation and the rule of law (Arestis & Demetriades, 1997; Demetriades & Andrianova, 2003). Thus, it is important to contextualize the governance or IQ in FD and the assessment of economic growth. However, FD fails to promote economic growth given the degree of malpractice in the banking sector and often political intrusion, which may distract credit to unproductive or even wasteful activities (Kutan et al., 2017).

Similarly, IQ is more crucial in the context of Malaysia and Indonesia as some studies argue that the Asian financial crisis occurred from the weakness of legal institutions regarding governance (Johnson et al., 2000). It is also argued that by ensuring an effective mechanism, it reduces agency conflicts involving managers by emphasizing the legal mechanism that protects the minority of shareholders (Shleifer & Vishny, 1997). Although, in this case, it was predominantly in the depreciation of the exchange rate and stock market decline in Malaysia and Indonesia between 1997 and 1998. Previous studies also contend that the Asian financial crisis occurred because of macroeconomic and banking issues. Although, the standard Washington view attributes the Asian crisis to inappropriate macroeconomic policy during the 1990s, which made worse by the inept management of the initial depreciation in 1997 (Corsetti, Pesenti, & Roubini, 1999; Greenspan, 1998). Thus, IQ or proper management would possibly have mitigated the adversity of the financial crisis.

The fourth strand of literature which is a relatively new area of thought, argues that FD has a spill-over effect with financial and trade integration (Samargandi & Kutan, 2016). Also, with the rapid pace of globalization, the banking and financial sector has subsequently become interconnected across most countries. In this case, financial integration would eliminate the restrictions on cross-border capital flows and improve the access of foreign investors to the domestic financial system. However, the dark side of financial integration is that it could cause a spill-over of the financial crisis among partner countries (Samargandi & Kutan, 2016).

The focus of this study on Malaysia and Indonesia because of several reasons. First, during the past few decades, Malaysia and Indonesia have experienced a notable reformation concerning liberalization in the financial sector (see, among others, Ben Naceur, Ghazouani, & Omran, 2008). Malaysia has evolved as a leading country in the developing world coupled with significant improvement in FD (Ang, 2009). The reforms in Malaysia include different aspects, for example, lifting government restrictions on the banking system regarding interest rate ceilings, launching credit programs, and high reserve requirements; those aspects improve FD and in turn economic growth. In addition, the decline in the lending rate from 12.95 in 2011 to 11.3% in 2012 by the commercial banking sector increased domestic credit to the private sector. Subsequently, the reforms in the financial sector increased the confidence of foreigners and foreign direct investment increasing from $40.47 billion in 2011 to $48.57 billion in 2012.

Therefore, founded on the above discussion, the researcher is motivated toward examining the impact of FD on growth by considering all four train-of-thoughts regarding the FD-growth nexus in the context of Malaysia and Indonesia. As the initial step, the dynamic impact of overall FD on economic growth is assessed followed secondly by assessing whether FD and economic growth follow any nonmonotonic relation or not. Third, assessing whether the quality of governance plays any moderating role in FD and economic growth nexus and fourth, structural break analysis is used to capture the two main financial crisis periods. That is the Asian financial crisis in 1997 and 1998 and the global financial crisis that occurred in 2007. Lastly, the spill-over effect of FD on economic growth is assessed between Malaysia and Indonesian.

This study further contributes to the empirical literature on FD and economic growth by contextualizing three aspects. First, it considers the role of IQ in explaining the FD-economic growth relationship in the context of Malaysia and Indonesia. Second, it highlights the potential role of FDI in determining the FD-growth nexus and third, the study applies an advanced technique for investigating the issue. Further, the Asian and global financial crisis in the analysis is contextualized as an alternative measure of FD. More specifically, it considers autoregressive distributed lags (ARDL) and structural break-based co-integration frameworks, which can address the potential serial correlation and other estimation biasedness. Notably, this

method has not been used before in analyzing the relationship between FD and economic growth in Malaysia and Indonesia.

2 | METHODOLOGY

2.1 | Data and sources

The impact of FD and economic growth is examined by incorporating several control variables, namely GDP per capita (GDPC), general government expenditure share of GDP (GOV), fixed capital formation (FCF), and trade openness (TO) comes from the World Development Indicator (WDI). All series were then converted into the natural logarithm format. As for the FD measures, the most common indicators found in the literature that were used included domestic credit to the private sector by banks and other financial institutions as a percentage of GDP (Credit), the liquid liabilities of the financial sector as a percentage of GDP (M2), and market capitalization (MC). Finally, an FD development index was constructed from three ingredients; Credit, M2 and MC by using principal component analysis. The financial crisis dummy (FC), was generated where 1 indicated a crisis period and 0 indicated a noncrisis period.

The Asian financial crisis between 1997 and 1998 and the global financial crisis between 2007 and 2008 were mainly captured employing the above approach. All data were obtained from the WDI, and the IQ data from an international country risk guide was also considered. The IQ index consisted of three indicators, namely corruption, law and order, and bureaucracy quality (Charron et al., 2010). IQ in this context can be defined as impartial government institutions, implying that public officials who execute policies do not take anything concerning the citizen/case into consideration that has not already been stipulated in the policy or the law (Teorell et al., 2016).

TABLE 1 Order of integration under Dickey-Fuller Generalized Least Squared (DF-GLS)

	Malaysia		Indonesia	
Variable	Level	1st difference	Level	1st difference
LGDPC	−1.985	−4.189[a]	−2.080	−3.390[b]
FCF	−1.984	−3.631[b]	−2.026	−3.770[a]
GOV	−1.131	−4.408[a]	−0.944	−3.321[c]
TO	−0.460	−3.852[a]	−1.543	−5.374[a]
FD	−1.553	−6.227[a]	−1.322	−3.628[a]
CRD	−1.383	−5.807[a]	−1.653	−3.414[a]
M2	−4.602[a]	−9.583[a]	−1.062	−3.418[b]
MC	−1.575	−5.884[a]	−3.537[b]	−4.407[a]
QOG	−2.611	−4.115[a]	−2.456	−3.282[b]

Note: a, b, and c indicate 1%, 5%, and 10% significance level, respectively. Abbreviations: CRD = credit to private sector; FCF = fixed capital formation; FD = financial development; GOV = government expenditure; LGDPC = Log GDP per capita; MC = market capitalization; M2 = money supply; QOG = quality of governance; TO = trade openness.

2.2 | Estimation techniques

The ARDL bounds testing approach of Pesaran, Shin, and Smith (2001) was employed in this study to co-integration that overcomes the limitations of the Ganger causality test of Engle and Granger (1987), and the co-integration test of Johansen (1988, 1991) regarding the order of integration of variables and the inability to provide both short and long-run dynamics. Furthermore, Pesaran et al.'s (2001) process allowed for the examination of the long-run co-integrating relations and dynamic interactions among the variables which provided important leverage in the estimation process. This included (a) estimating the co-integration relation using the Ordinary Least Squared (OLS) method after choosing the lag order of the model; (b) in contrast to Johansen and Jesulius (1990) procedure, this test procedure is deemed appropriate irrespective of the order of integration, (i.e., *I*(0) or *I*(1) or mutual co-integration); and (c) the test is competent in the small and finite data size.

TABLE 2 Finance and economic growth: Linear analysis

	Malaysia		Indonesia	
Regressor	Coefficient	Standard error	Coefficient	Standard error
LFCF	0.1434[a]	(0.033)	−0.047	(0.196)
LGOV	−0.059	(0.113)	−0.184	(0.165)
TO	0.145[b]	(0.057)	−0.521[b]	(0.202)
FD	0.129[b]	(0.055)	0.353[a]	(0.139)
C	6.451[a]	(0.630)	8.593[a]	(1.078)
T	0.0326[a]	(0.001)	0.028[a]	(0.001)
Short-run estimation				
ΔLFCF	0.159[a]	(0.032)	0.209[a]	(0.065)
ΔLGOV	−0.132[c]	(0.069)	0.039	(0.070)
ΔTO	−0.068	(0.081)	−0.156[a]	(0.036)
ΔFD	0.0094	(0.029)	−0.029	(0.029)
ΔC	4.522[a]	(1.225)	2.570[a]	(0.008)
ΔT	0.022[a]	(0.005)	0.716[a]	(0.002)
ECM(−1)	−0.700[a]	(0.147)	−0.299[a]	(0.101)
Bound test *F*-Stat = 4.534[a]; ARDL (1,1,0,0,1) χ^2_{SC}: $\chi^2(1) = 0.781$, $F(1, 21) = 0.0495$; χ^2_{ff}: $\chi^2(1) = 1.259$, $F(1, 21) = 0.848$; $\chi^2_n : \chi^2(1) = 0.626$; $\chi^2_{hc} : \chi^2(1) = 2.9166$, $F(5, 19) = 15.121$; $R^2 = 0.816$; $\bar{R}^2 = 0.740$			[xx]Bound test *F*-Stat = 4.027[a]; ARDL (1,0,0,0,0)χ^2_{SC}: $\chi^2(1) = 1.677$, $F(1, 28) = 1.382$; χ^2_{ff}: $\chi^2(1) = 3.325$, $F(1, 28) = 2.899$; $\chi^2_n : \chi^2(1) = 1.984$; $\chi^2_{hc} : \chi^2(1) = 3.097$, $F(1, 33) = 3.405$; $R^2 = 0.995$; $\bar{R}^2 = 0.994$	

Note: a, b, and c indicate 1%, 5%, and 10% significance level, respectively. Abbreviations: ECM = error correction coefficient; FD = financial development; LFCF = Log Fixed Capital Formation; LGOV = Log Government Expenditure; TO = trade openness.

$$\Delta \mathrm{LGDPC}_t = \beta_0 + B_1 \mathrm{LGDPC}_{t-1} + B_2 \mathrm{FCF}_{t-1} + B_3 \mathrm{GOV}_{t-1} + \beta_4 \mathrm{TO}_{t-1} + \beta_5 \mathrm{FD}_{t-1} + \sum_{i=1}^{p} \gamma_i \mathrm{LGDPC}_{t-i} + \sum_{j=1}^{p} \delta_i \mathrm{FCF}_{t-j} + \sum_{l=1}^{p} \zeta_i \mathrm{GOV}_{t-l} + \sum_{m=1}^{p} \zeta_i \mathrm{TO}_{t-m} + \sum_{n=1}^{p} \zeta_i \mathrm{FD}_{t-n} + \varepsilon_t \quad (1)$$

At first, Equation (1) under the OLS approach was estimated, followed by testing the null hypothesis of no co-integration among the variables (H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$), against the alternative hypothesis of co-integration among the variables (H_a: $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$). The computed *F*-statistics were next evaluated regarding the critical value (upper and lower bound) of Pesaran et al. (2001). Accordingly, if the *F*-statistic is found to be greater than the upper critical value, it indicates the existence of co-integration and vice versa. While *F*-statistic within the upper and lower bounds indicates an inconclusive co-integrating decision.

After establishing the co-integrating relation among the variables, the long-run coefficient of the ARDL framework was estimated using Equation (2). Here Schwarz Bayesian criterion was used to select the appropriate lag length of the ARDL model for all variables. Finally, Equation (3) was estimated for short-run or error correction coefficients.

$$\ln \mathrm{GDPC}_t = \beta_0 + \sum_{i=1}^{p} \gamma_i \ln \mathrm{GDPC}_{t-i} + \sum_{j=0}^{q1} \delta_j \mathrm{FCF}_{t-j} + \sum_{l=0}^{q2} \varphi_l \mathrm{GOV}_{2t-l} + \sum_{m=0}^{q3} \eta_m \mathrm{TO}_{t-m} + \sum_{r=0}^{q4} \psi_r \ln \mathrm{FD}_{t-r} + \varepsilon_t \quad (2)$$

$$\Delta \ln GDPC_t = \beta_0 + \sum_{i=1}^{p} \gamma_i \Delta \ln \mathrm{GDPC}_{2t-i} \sum_{j=1}^{q} \delta_j \Delta \mathrm{FCF}_{t-j} + \sum_{l=1}^{q} \varphi_l \Delta \mathrm{GOV}_{2t-l} + \sum_{m=1}^{q} \eta_m \Delta \mathrm{TO}_{t-m} + \sum_{r=1}^{q} \psi_r \Delta \ln \mathrm{FD}_{t-r} + \vartheta \mathrm{EMC}_{t-1} + \varepsilon_t \quad (3)$$

Additionally, the cumulative sum of recursive residuals (*CUSUM*) was executed, and the cumulative sum of squares of recursive residuals (*CUSUMSQ*) was executed to check the stability of the estimated parameters in the spirit of Pesaran and Shin (1998).

3 | RESULT AND DISCUSSIONS

3.1 | Order of integration

Before the primary analysis was performed, the order of integration of the variables under consideration was examined. Identifying the order of integration of each series is important in selecting the estimation approach. Table 1 depicts the results displaying the GDP per capita (LGDPC), fixed capital formation (FCF), government expenditure (GOV), trade openness (TO), financial development (FD), and credit to private sector (CRD) are nonstationary at the level for both Malaysia and Indonesia. Here, all the variables are found to be stationary after taking the 1st difference. Money supply (M2) is shown to be stationary at level but stationary following the 1st difference for Malaysia but nonstationary for Indonesia at level. Market capitalization (MC) nonstationary at the level for Malaysia but is stationary at level for Indonesia. Lastly, quality of governance (QOG) is

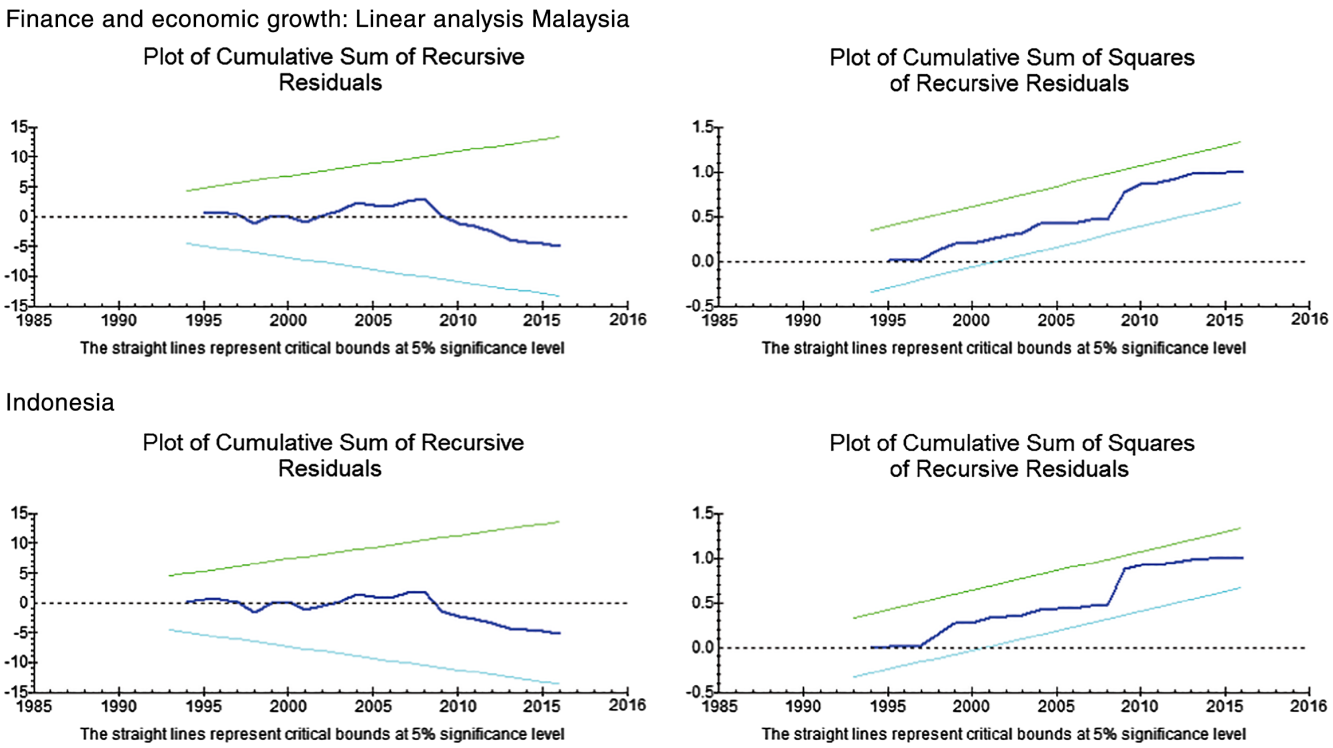

FIGURE 1 Stability test: Linear analysis [Color figure can be viewed at wileyonlinelibrary.com]

nonstationary at level but stationary after considering the 1st difference for both countries. Therefore, the analysis of the order of integration endorses the application of ARDL approach.

3.2 | Finance and economic growth: Linear analysis

At this stage, the dynamic impact of FD on economic growth is analyzed incorporating the role of several core control variables in which Table 2 depicts the result. The coefficient of error correction coefficient (ECM) is negative and significant for both countries. Precisely it indicates that after an economic shock the adjustment takes place; 70% for Malaysia and 29.9% for Indonesia toward long-run equilibrium. The positive and significant coefficient of FD indicates that FD can significantly promote economic growth in both the Malaysian and Indonesian economy. The coefficient of FD is found to be insignificant in the short-run for both countries. Regarding the control variables, FCF positively and significantly spurs the economic growth of Malaysia where FCF is insignificant in explaining the economic growth in Indonesia. Interestingly, FCF plays a key role in promoting economic growth in the short-run for both economies. Likewise, TO appears to be a driving factor in promoting economic growth for Malaysia but is detrimental for Indonesia in the long-run for the economy. Therefore, the diagnostic test confirms that the proposed model is robust concerning serial correlation, heteroscedasticity, and autocorrelation and model specification. Our model is also consistent as per *CUSUM* and *CUSUMSQ* figures (see Figure 1).

Nevertheless, economists continue to hold diverse opinions and views on the relationship between FD and economic growth. During the past few decades, FD and economic growth nexus have been significantly re-evaluated, yet it remains a controversial issue. In fact, the importance of FD can be dated back to Schumpeter (1911), who argued that financial intermediaries are essential to spur economic development. Indeed, this was endorsed by Goodhart (2004), who stated that a deepening financial infrastructure reduces frictions in the market by lessening the transaction and information costs. Consequently, it promotes investment, which leads to augmented economic growth.

Notably, the functional role of FD is to promote investment and economic growth by facilitating the most productive allocation of resources (Levine, 1998). In this process, FD works in a supportive role to provide liquidity to firms by efficiently exploring new capacities. Therefore, FD promotes the establishment and expansion of the institutions, financial instruments and markets that enhance investment and the growth process. However, despite the plausible role of FD, the overall outcome from FD cannot be generalized across all countries given country-specific economic structures and IQ (Al-Yousif, 2002; Law et al., 2013).

3.3 | Finance and economic growth: Nonlinear analysis

At this stage, the model is re-estimated corroborating the nonlinearity issue (refer to Table 3). Here, the quadratic term of FD is incorporated into the model to examine whether FD and economic growth follow any nonmonotonic relationship in both countries; Malaysia and Indonesia. As anticipated, the coefficient of ECM is found to be negative and significant for both countries. Interesting, Table 3 depicts that the coefficient of FD is negative and significant while the quadratic term of FD (FD^2) is positive and significant in explaining economic growth indicating a U-shaped relationship between FD and economic growth in Malaysia and Indonesia. The U-shape between FD and economic growth holds in short for Indonesia. However, the coefficients of FD and FD^2 are insignificant in the short-run in the case of Malaysia. Therefore, the model is consistent concerning serial correlation, heteroscedasticity, and autocorrelation and model specification. Our model is also consistent as per *CUSUM* and *CUSUMSQ* figures (see Figure 2).

TABLE 3 Finance and economic growth: Nonlinear analysis

	Malaysia		Indonesia	
Regressor	Coefficient	Standard error	Coefficient	Standard error
Long-run analysis				
LFCF	0.130[a]	(0.031)	0.077	(0.095)
LGOV	−0.056	(0.092)	−0.192[c]	(0.100)
TO	0.143[a]	(0.046)	−0.360[a]	(0.100)
FD	−3.163[a]	(1.062)	−2.451[a]	(0.599)
FD^2	0.345[a]	(0.113)	0.376[a]	(0.090)
C	14.318[a]	(2.682)	12.685[a]	(1.478)
T	0.033[a]	(0.895)	0.028[a]	(0.001)
Short-run analysis				
ΔFCF	0.102[a]	(0.024)	0.159[a]	(0.055)
ΔGOV	−0.137[b]	(0.064)	−0.092[c]	(0.055)
ΔTO	−0.104	(0.079)	−0.173[a]	(0.036)
ΔFD	−1.131	(0.753)	−1.177[a]	(0.296)
ΔFD^2	0.119	(0.079)	0.163[a]	(0.043)
ΔC	11.311[a]	(2.723)	6.094[a]	(1.123)
ΔT	0.026[a]	(0.003)	0.014[a]	(0.003)
ECM (−1)	−0.789[a]	(0.106)	−0.480[a]	(0.105)
[x]Bound test *F*-Stat = 4.610[a]; ARDL (1,0,0,0,0,1) χ^2_{SC}: $\chi^2(1) = 3.386$, $F(1, 21) = 2.484$; χ^2_{ff}: $\chi^2(1) = 0.169$, $F(1, 21) = 2.190$; $\chi^2_n : \chi^2(1) = 1.193$; $\chi^2_{hc} : \chi^2(1) = 2.798$, $F(1, 30) = 3.040$; $R^2 = 0.995$; $\bar{R}^2 = 0.994$			[xxx]Bound test *F*-Stat = 5.612[a]; ARDL (1,0,0,0,0) χ^2_{SC}: $\chi^2(1) = 2.539$, $F(1, 21) = 1.788$; χ^2_{ff}: $\chi^2(1) = 0.066$, $F(1, 21) = 0.041$; $\chi^2_n : \chi^2(1) = 0.024$; $\chi^2_{hc} : \chi^2(1) = 2.791$, $F(5, 19) = 3.185$; $R^2 = 0.997$; $\bar{R}^2 = 0.995$	

Note: a, b, and c indicate 1%, 5%, and 10% significance level, respectively. Abbreviations: ECM = error correction coefficient; FD = financial development; LFCF = Log Fixed Capital Formation; LGOV = Log Government Expenditure; TO = trade openness.

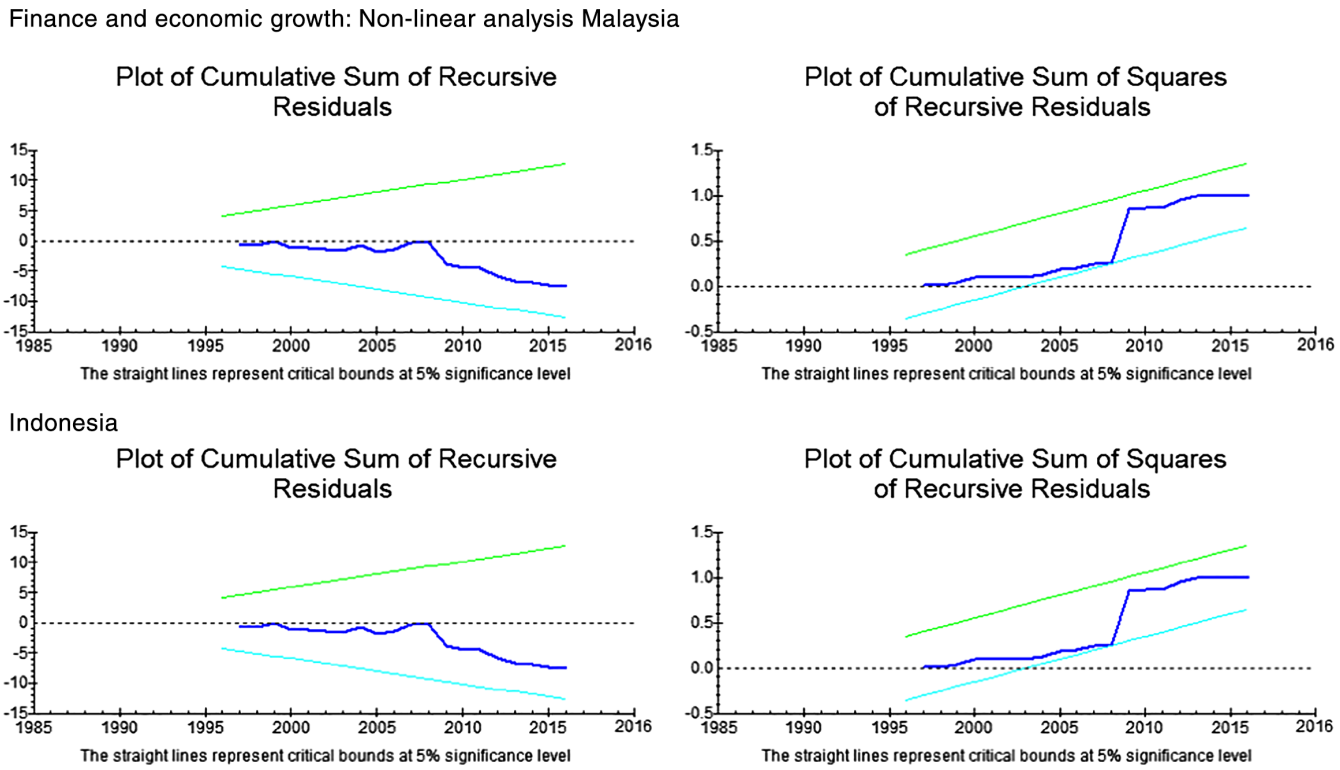

FIGURE 2 Stability test: Nonlinear analysis [Color figure can be viewed at wileyonlinelibrary.com]

3.4 | Decomposed indicators of FD and economic growth

The model is further re-estimated by considering every single indicator of FD as seen in Table 4. Here, the negative and insignificant coefficient of domestic credit to the private sector indicates that it significantly influences economic growth in Malaysia in both the long- and short-run. Similarly, money supply is found to be insignificant in order to explain economic growth in the long- and short-run in the context of the Malaysian economy.

Interestingly the positive and significant coefficient of MC implies that it fosters economic growth in the long-run economy. However, the impact of MC is inconclusive in influencing economic growth in Malaysia. Also, as shown, in the context of Indonesia, concerning credit to the private sector and money supply, both coefficients are shown to be positive and significant. This finding indicates credit to the private sector, and money supply is driving factors in accelerating economic growth in Indonesia in the long-run. Although, MC appears to be insignificant toward the economic growth in the long-run economy of Indonesia. Also, MC is detrimental to economic growth in the short-run economy of Indonesia. In all models, the coefficients of error correction are negative and significant. Although, our models are consistent in the case of heteroskedastic autocorrelation and serial correlation in which our model is a specification.

3.5 | FD-economic growth nexus: Role of IQ

At this stage, the role of FD and economic growth nexus is examined by incorporating the role of IQ. In the prior section, it was argued that IQ plays an important role in the linkage of FD and economic growth in which Table 5 depicts the result. The negative and significant coefficient of error correction confirms the long-run co-integrating relationship between the dependent variable and independent variables. The coefficient of FD is also shown to be insignificant in the long-run in the Malaysian economy, whereas the coefficient of FD is negative and significant toward economic growth. Interestingly, the coefficient of IQ is found to be highly positive and is therefore significant in explaining the economic growth of Malaysia in the long-run. Although, the negative and significant coefficient of IQ indicates that it is detrimental to economic growth in the long-run of the Indonesian economy. Besides, the interactive effect of FD and IQ is found to be positive and significant in accelerating the economic growth of Malaysia in the long-run.

3.6 | FD spill-over effect

The spill-over effect was then measured from one country to another country. It is argued that Malaysia and Indonesia are integrated through financial and trade integration. Therefore, it is anticipated that any fiscal policy within one country can have a spill-over effect on another country. In doing, the FD of Indonesia is incorporated into the Malaysian model and vice versa. Interestingly, in this case, the coefficient of FD is found to be negative toward Malaysian economic growth. This finding implies that if FD occurs in Indonesia it which is negatively associated with economic growth in Malaysia. In contrast, if FD occurs in Malaysia, it is positively associated with Indonesian economic growth in the long-run. These findings can be explained in that a considerable amount of labor from Indonesia is employed in Malaysia. Therefore, one can argue that any FD in Malaysia

TABLE 4 Decomposed indicators of financial development and economics growth

Regressor	Malaysia			Indonesia		
Long-run						
LDCP	−0.004			0.109[a]		
	(0.040)			0.0374		
LM2		0.0334			0.3047[a]	
		0.0408			0.0831	
LMC			0.092[a]			0.101
			0.030			0.083
LGOV	−0.149	0.0067	−0.036	−0.170[c]	−0.031	0.727
	(0.089)	0.1417	0.099	0.089	0.132	0.636
LFCF	0.190[a]	0.2265[a]	0.080[c]	0.109	0.233[a]	−0.008
	(0.031)	0.0388	0.045	0.097	0.069	0.252
TO	0.155[a]	0.2285[a]	0.123[b]	−0.205[c]	−0.403[a]	−0.470 [b]
	(0.046)	0.0712	0.055	0.087	0.108	00.198
C	7.064[a]	5.996[a]	6.891[a]	7.549[a]	6.968[a]	7.8048[a]
	(0.508)	(0.794)	(0.548)	(0.589)	(0.699)	(0.881)
T	0.034[a]	0.034[a]	0.032[a]	0.029[a]	0.026[a]	0.008
	(0.837)	(0.985)	(0.975)	(0.001)	(0.001)	0.010
Short-run						
ΔLDCP	−0.003			0.015		
	(0.032)			(0.058)		
ΔLM2		0.022			0.041	
		(0.028)			(0.087)	
ΔLMC			0.008			−0.020[b]
			(0.011)			(0.009)
ΔLGOV	−0.120	−0.1358[c]	−0.160[a]	−0.111[c]	−0.016	0.203[b]
	(0.078)	(0.074)	(0.055)	(0.063)	(0.068)	(0.092)
ΔLFCF	0.1541[a]	0.209[a]	0.096[b]	0.072	0.119[b]	−0.002
	(0.023)	(0.036)	(0.037)	(0.062)	(0.046)	(0.069)
ΔTO	−0.014	0.008	−0.082	−0.228[a]	−0.206[a]	−0.131[a]
	(0.088)	(0.082)	(0.063)	(0.045)	(0.043)	(0.036)
ΔC	5.707[a]	4.035[a]	5.157[a]	4.950[a]	3.560[a]	2.179[b]
	(1.080)	(1.335)	(1.034)	(1.171)	(0.793)	(1.003)
ΔT	0.0279[a]	0.0234[a]	0.023[a]	0.0193[a]	0.013[a]	0.002
	(0.0043)	(0.005)	(0.004)	(0.004)	(0.003)	(0.004)
ECM(−1)	−0.807[a]	−0.672[a]	−0.748[a]	−0.655[a]	−0.511[a]	−0.279[b]
	(0.1315)	(0.1629)	(0.1260)	(0.1410)	(0.1080)	(0.1340)

Note: a, b, and c indicate 1%, 5%, and 10% significance level, respectively.
Abbreviations: ECM = error correction coefficient; LDCP = Log Domestic Credit to Private Sector; LM2 = Log Money Supply; LMC = Log Market Capitalization; LGOV = Log Government Expenditure; LFCF = Log Fixed Capital Formation; TO = trade openness.

creates more job opportunities for foreign labor including Indonesia labor. Whereas, if FD occurs in Indonesia that can enhance the investment, in Indonesia it will eventually create more job opportunities for the local labor market which may be detrimental to the economic growth of Malaysia. The coefficient of error correction also appears to the negative in this case, and is significant for both models; confirming the long-run co-integrating relationship between the dependent and independent variables (Table 6).

3.7 | Asian and global financial crisis and economic growth

In the previous section, it was argued that the financial crisis is obstructing economic growth. In this section, this argument is empirically tested in order to verify this argument. A financial crisis dummy (FC) is generated, where 1 indicates the crisis period and 0 indicates the noncrisis period. The Asian financial crisis between 1997 and 1998 and

TABLE 5 Role of institutional quality in Financial Market Development (FMD) and growth nexus

	Malaysia		Indonesia	
Regressor	Coefficient	Standard error	Coefficient	Standard error
Long-run				
FD	0.004	(0.020)	−0.983[a]	(0.271)
IQ	0.216[a]	(0.057)	−8.269[b]	(2.005)
FD[c]IQ	−0.022	(0.034)	2.432[a]	(0.590)
GOV	−0.136[b]	(0.046)	0.208	(0.217)
FCF	0.161[a]	(0.016)	0.067	(0.147)
TO	0.208[a]	(0.025)	−0.067	(0.059)
C	6.628[a]	(0.277)	10.088[a]	(0.852)
T	0.036[a]	(0.484)	0.028[a]	(0.002)
Short-run				
ΔFD	0.066[c]	(0.037)	−0.408[a]	(0.118)
ΔIQ	−0.138	(0.148)	−2.680[a]	(0.807)
ΔFD[c]IQ	−0.113[c]	(0.061)	0.783[a]	(0.225)
ΔGOV	−0.073	(0.090)	0.121	(0.100)
ΔFCF	0.253[a]	(0.051)	0.039	(0.091)
ΔTO	0.192[a]	(0.068)	−0.039	(0.035)
ΔC	12.005[a]	(1.8320	5.885[a]	(1.441)
ΔT	0.009[b]	(0.003)	0.016[a]	(0.005)
ECM(−1)	−0.239[a]	(0.085)	−0.583[a]	(0.162)
[×××]Bound test F-Stat = 4.651[a]; ARDL(1,1,0,0,1)χ^2_{SC}: $\chi^2(1) = 0.781$, $F(1, 21) = 0.0495$; χ^2_{ff}: $\chi^2(1) = 1.259$, $F(1, 21) = 0.848$; $\chi^2_n : \chi^2(1) = 0.626$; $\chi^2_{hc} : \chi^2(1) = 2.9166$, $F(1, 21) = 3.121$; $R^2 = 0.816$; $\bar{R}^2 = 0.740$			[××]Bound test F-Stat = 4.734[a]; ARDL (1,0,0,0,0,1)χ^2_{SC}: $\chi^2(1) = 2.551$, $F(1, 21) = 1.659$; χ^2_{ff}: $\chi^2(1) = 0.048$, $F(1, 21) = 0.870$; $\chi^2_n : \chi^2(1) = 0.018$; $\chi^2_{hc} : \chi^2(1) = 2.942$, $F1 = 3.391$; $R^2 = 0.995$; $\bar{R}^2 = 0.995$	

Note: a, b, and c indicate 1%, 5%, and 10% significance level, respectively.
Abbreviations: FCF = fixed capital formation; FD = financial development; GOV = government expenditure; IQ = institutional quality; TO = trade openness.

the global financial crisis between 2007 and 2008 are predominantly captured. The negative and insignificant coefficient is where the FC indicates that the Malaysian long-run economic growth was not obstructed by the Asian and global financial crisis (refer to Table 7).

However, the coefficient of FC appears to be negative and significant in the case of Indonesia. This finding indicates that the Asian and global financial crisis impedes economic growth in the long- and short-run in Indonesia. The results can be explained because the IQ and corporate governance is relatively strong in Malaysia compared to Indonesia, which may protect the Malaysian economy from the adversity resulting from the financial crisis. Moreover, the percentage of institutional shares in the stock market of Malaysia is seen to be higher compared to individual shareholders, which also functions as a defensive measure in projecting the financial crisis.

Robustness check: Given the fact that there were a number of structural breaks over the period between 1984 and 2017 (e.g., the Asian financial crisis in 1997, and the global financial crisis in 2007). Accordingly, a unit root test was applied with a structural break as suggested by Zivot and Andrews (2002). The test is appropriate if the series shows a potential structural break. The test was conducted under three possible alternatives as modeled below:

$$\Delta X_t = a + ax_{t-1} + bt + c\mathrm{DU}_t + \sum_{j=1}^{k} d_j \Delta X_{t-j} + \mu_t \quad (4)$$

$$\Delta X_t = b + bx_{t-1} + ct + b\mathrm{DT}_t + \sum_{j=1}^{k} d_j \Delta X_{t-j} + \mu_t \quad (5)$$

$$\Delta X_t = c + cx_{t-1} + ct + d\mathrm{DU}_t + d\mathrm{DT}_t + \sum_{j=1}^{k} d_j \Delta X_{t-j} + \mu_t \quad (6)$$

where the dummy variables indicated by DU_t show a mean shift at each point with a time break, while DT_t shows the time break for each variable. So, DU_t = 1…if t > TB or 0…if t < TB. Moreover, DU_t = t-TB…if t > TB or 0…if t < TB. The null hypothesis of unit root break date c = 0 indicates that the series is not stationary with a drift or having information about the structural breakpoint. While c < 0 hypothesis implies that the variable is found to be stationary with one unknown time break.

Zivot and Andrews (2002) unit root test considers all potential break points and estimates them successively and finally selects the break

TABLE 6 Spill-over impact

Regressor	Malaysia		Indonesia	
	Coefficient	Standard error	Coefficient	Standard error
Long-run				
FCF	0.245[a]	0.028	−0.266	0.163
GOV	−0.163[b]	0.071	−0.001	0.125
TO	0.129[a]	0.038	−0.337[a]	0.107
FD	−0.081[a]	0.020	0.607[a]	0.149
C	7.288[a]	0.400	7.332[a]	0.624
T	0.035[a]	0.678	0.038[a]	0.002
Short-run				
ΔFCF	0.204[a]	0.031	−0.012[b]	0.005
ΔGOV	−0.136[b]	0.068	−0.786	0.006
ΔTO	0.108[a]	0.031	−0.016[a]	0.004
ΔFD	−0.067[a]	0.021	0.029[a]	0.429
ΔC	6.073[a]	1.060	0.353[a]	0.087
ΔT	0.029[a]	0.004	0.001[a]	0.322
ECM(−1)	−0.833[a]	0.121	−0.048[a]	0.011
Bound test *F*-Stat = 4.534[a]; ARDL (1,1,0,0,1)χ^2_{SC}: $\chi^2(1) = 0.781$, $F(1, 21) = 0.0495$; χ^2_{ff}: $\chi^2(1) = 1.259$, $F(1, 21) = 0.848$; $\chi^2_n : \chi^2(1) = 0.626$; $\chi^2_{hc} : \chi^2(1) = 2.9166$, $F(5, 19) = 15.121$; $R^2 = 0.816$; $\bar{R}^2 = 0.740$			Bound test *F*-Stat = 4.912[a]; ARDL (1,1,0,0,1)χ^2_{SC}: $\chi^2(1) = 1.766$, $F(1, 21) = 1.285$; χ^2_{ff}: $\chi^2(1) = 0.167$, $F(1, 21) = 0.113$; $\chi^2_n : \chi^2(1) = 1.193$; $\chi^2_{hc} : \chi^2(1) = 0.938$, $F(1, 21) = 0.88$; $R^2 = 0.995$; $\bar{R}^2 = 0.993$	

Note: a, b, and c indicate 1%, 5%, and 10% significance level, respectively. Abbreviations: ECM = error correction coefficient; FCF = fixed capital formation; FD = financial development; GOV = government expenditure; TO = trade openness.

TABLE 7 Financial crisis and economic growth

Regressor	Malaysia		Indonesia	
	Coefficient	Standard error	Coefficient	Standard error
Long-run				
FCF	0.207[a]	0.0446	0.611[a]	0.1492
GOV	−0.036	0.1223	−0.263[a]	0.1394
TO	0.177[a]	0.0663	0.087	0.1668
FC	−0.025	0.0450	−0.180[a]	0.0863
C	6.612[a]	0.6662	5.512[a]	1.1171
T	0.034[a]	0.0010	0.026[a]	0.0016
Short-run				
ΔFCF	0.113[a]	0.029	0.302[a]	0.0663
ΔGOV	−0.019	0.067	−0.077[b]	0.0415
ΔTO	0.096[a]	0.036	0.015	0.0143
ΔFC	0.018	0.017	−0.141[a]	0.0372
ΔC	6.073[a]	1.060	0.007[a]	0.0028
ΔT	0.018[a]	0.004	−0.294[a]	0.1010
ECM(−1)	−0.547[a]	0.128	0.302[a]	0.0663
Bound test *F*-Stat = 4.656[a]; ARDL (1,1,0,0,1)χ^2_{SC}: $\chi^2(1) = 0.481$, $F(1, 21) = 0.0555$; χ^2_{ff}: $\chi^2(1) = 1.419$, $F(1, 21) = 0.848$; $\chi^2_n : \chi^2(1) = 0.636$; $\chi^2_{hc} : \chi^2(1) = 2.9166$, $F(5, 19) = 13.161$; $R^2 = 0.806$; $\bar{R}^2 = 0.750$			Bound test *F*-Stat = 4.812[a]; ARDL (1,1,0,0,1)χ^2_{SC}: $\chi^2(1) = 1.866$, $F(1, 21) = 1.485$; χ^2_{ff}: $\chi^2(1) = 0.157$, $F(1, 21) = 0.133$; $\chi^2_n : \chi^2(1) = 1.183$; $\chi^2_{hc} : \chi^2(1) = 0.928$, $F(1, 21) = 0.88$; $R^2 = 0.985$; $\bar{R}^2 = 0.953$	

Note: a, b, and c indicate 1%, 5%, and 10% significance level, respectively. Abbreviations: ECM = error correction coefficient; FCF = fixed capital formation; FD = financial development; GOV = government expenditure; TO = trade openness.

when $\bar{c}(=c-1)=1$ from the region where the end points of the sample period are excluded. Importantly, the Gregory and Hansen (1996a, 1996b) framework is applied for co-integration which considers the single endogenous structural breaks. Gregory and Hansen (1996a, 1996b) propose three different models with variant assumptions.

Model: level shift with a trend

$$Y_t = \mu_1 + \mu_2 f_{tk} + \beta_1 t + \alpha_1 X_t + \varepsilon_t \quad (7)$$

Model: regime shift where intercept and the slope coefficients change

$$Y_t = \mu_1 + \mu_2 f_{tk} + \beta_1 t + \alpha_1 X_t + \alpha_2 X_t f_{tk} + \varepsilon_t \quad (8)$$

Model: regime shift where intercept, slope coefficients and trend change

$$Y_t = \mu_1 + \mu_2 f_{tk} + \beta_1 t + \beta_2 t f_{tk} + \alpha_1 X_t + \alpha_2 X_t f_{tk} + \varepsilon_t \quad (9)$$

In the above equations, Y is the dependent variable, while X represents the independent variables. Moreover, k is the break date while ϕ is the dummy variable such that

$$f_{tk} = 0 \text{ if } t < k \text{ and } f_{tk} = 1 \text{ if } t > k.$$

The above frameworks endogenously determine a single break and provide the predicted time of break within the sample. The framework selects the break date where the test statistic is the least vis-à-vis, and the absolute Augmented Dickey-Fuller (ADF) test statistic is the highest. Finally, the calculated value of this approach is compared with the MacKinnon (1991) critical value to ensure breaks.

The analysis in Table 8 suggests that GDPC, FCF, and CRD are nonstationary at the level, but are stationary at the 1st difference, where the breakpoint appears in the years 1996 and 1997 for GDPC for both countries. The FD is found to be nonstationary at level but stationary after taking the first difference. The breakpoint is recorded

TABLE 8 Robustness check: Structural break-based unit-root

	Malaysia				Indonesia			
	Level		1st difference		Level		1st difference	
Variable	Test stat.	Year	Test stat.	Year	Test stat.	Year	Test stat.	Year
LGDPC	−2.700	1996	−5.091[a]	1997	−2.414	2007	−4.584[b]	1996
FCF	−2.743	1994	−4.423[b]	1999	−2.883	2003	−4.566[b]	1999
GOV	−4.331[c]	1998	−5.263[b]	2002	−4.420[b]	1999	−6.061[a]	1998
TO	−1.833	1988	−5.126[b]	1987	−4.513[b]	2001	−8.587[a]	1991
FD	−3.316	1996	−6.489[a]	2003	−2.676	1997	−7.223[a]	1996
CRD	−2.864	1997	−3.350[c]	1999	−2.560	1990	−5.173[a]	2000
M2	−5.184[b]	1990	−8.068[a]	1992	−3.646	1991	−4.497[b]	2006
MC	−5.963[a]	1997	−9.296[a]	1996	−4.969[b]	1998	−6.397[a]	2007
QOG	−4.959[a]	1989	−4.124[c]	1995	−4.098	1993	−5.025[c]	1994

Note: a, b, and c indicate 1%, 5%, and 10% significance level, respectively.
Abbreviations: CRD = credit to private sector; FCF = fixed capital formation; FD = financial development; GOV = government expenditure; LGDPC = Log GDP per capita; QOG = quality of governance; MC = market capitalization; M2 = money supply; TO = trade openness.

TABLE 9 Co-integration under structural break assumption

	Level change			Asymptotic critical values		
Level	Test stat.	Breakpoint	Date	1%	5%	10%
Malaysia						
ADF	−6.07[a]	16	1995	−5.44	−4.92	−4.69
Z_t	−6.49[a]	17	1996	−5.44	−4.92	−4.69
Z_a	−39.53	17	1996	−57.01	−46.98	−42.49
Regime						
ADF	−3.68	21	2000	−5.97	−5.50	−5.23
Z_t	−6.57[a]	17	1996	−5.97	−5.50	−5.23
Z_a	−39.93	17	1996	−68.21	−58.33	−52.85
Level and regime						
ADF	−6.56[a]	17	1996	−6.45	−5.96	−5.72
Z_t	−6.62[a]	17	1996	−6.45	−5.96	−5.72
Z_a	−40.20	17	1996	−79.65	−68.43	−63.10
Indonesia						
ADF	−4.27	16	1995	−6.05	−5.56	−5.31
Z_t	−4.33	16	1995	−6.05	−5.56	−5.31
Z_a	−25.70	16	1995	−70.18	−59.40	−54.38
Regime						
ADF	−3.97	19	1998	−6.92	−6.41	−6.17
Z_t	−4.14	16	1995	−6.92	−6.41	−6.17
Z_a	−24.40	16	1995	−90.35	−78.52	−75.56
Level and regime						
ADF	−7.02[b]	19	1998	−7.31	−6.84	−6.58
Z_t	−5.70	15	1994	−7.31	−6.84	−6.58
Z_a	−29.34	15	1994	−100.69	−88.47	−82.30

Note: a, b, and c indicate 1%, 5%, and 10% significance level, respectively.

as the years 1996 and 1997 for Malaysia and Indonesia, respectively. The MC is found to be stationary at level for both countries where the structural break occurred in the years 1997 and 2007 for Malaysia and Indonesia, respectively. Accordingly, the analysis confirms that Malaysia was affected more by the Asian financial crisis in 1997 while Indonesia was affected more by the global financial crisis that occurred in 2007.

The sample years comprised of the change in both the political regime and significant economic policies in Malaysia and Indonesia as both countries significantly transformed their economies toward financial and trade liberalization and privatization. Thus, this study examined the co-integration relation among the variables of interest by considering the assumption of a structural break.

The result is consistent regarding the long-run relation under the assumption of level change. For instance, the ADF and Z_t test consistently confirmed the existence of co-integration between the FD and economic growth under the assumption of a level change in the case of Malaysia (refer to Table 9). Table 9 depicts the year of the breaks, which mainly occurred in 1996. Lastly, Table 9 also shows the co-integration relation between FD and GDPC under the assumption of trends and regime change, where the breakpoint is the year 1998 in the case of Indonesia.

4 | CONCLUSION

This article presents the role of FD in explaining economic growth in the context of Malaysia and Indonesia by incorporating the financial crisis (structural break) and strategic change in the institutional setup. Utilizing ARDL and the structural break framework, the time series data between the year 1984 and 2016 were analyzed. The analysis demonstrated that FD promotes economic growth in both economies in the long-run. Similarly, the nonlinear analysis also showed that FD and economic growth follow an inverted U-shape relation in the case of Malaysia whereas, for Indonesia, it followed a U-shape relation. The investigation in this study revealed that not all measures of FD promote economic growth. For example, MC appears to be profound for the Malaysian economy while credit to the private sector and money supply is conducive to the Indonesian economy.

Lastly, the research found that several structural breaks occurred throughout the FD and economic growth relationship. Although, a positive change in IQ was found to have a greater impact on augmenting economic growth rather than playing a mediating role in the linkage of FD and growth in Malaysia. In the context of Indonesia, IQ was found to impede economic growth and played a positive and significant mediating role in the nexus of FD and economic growth. The spill-over analysis also revealed that Malaysian FD was positively associated with Indonesian economic growth while Indonesian FD was negatively associated with the Malaysian economy. Consequently, this study provided all the economic and anecdotal explanations in supporting the result.

In conclusion, this study found that the Asian and global financial crisis obstructed the economic growth of Indonesia in the long- and short-run whereas FD insignificantly influenced the economic growth of Malaysia. This study has also demonstrated that institution quality, corporate governance and institutional shareholder are conducive to impede the adversity of the financial crisis. Accordingly, an implication concerning policy is highlighted in this study in that both IQ and corporate governance are important strategic mechanisms in defending against the negative effect of a financial crisis.

REFERENCES

Aghion, P., Blundell, R., Griffith, R., Howitt, P., & Prantl, S. (2009). The effects of entry on incumbent innovation and productivity. *The Review of Economics and Statistics*, *91*(1), 20–32.

Ang, J. B. (2009). Private investment and financial sector policies in India and Malaysia. *World Development*, *37*(7), 1261–1273.

Arestis, P., & Demetriades, P. (1997). Financial development and economic growth: Assessing the evidence. *The Economic Journal*, *107*(442), 783–799.

Bonnal, M., & Yaya, M. E. (2015). Political institutions, trade openness, and economic growth: New evidence. *Emerging Markets Finance and Trade*, *51*(6), 1276–1291.

Cecchetti, S. G., & Kharroubi, E. (2012). *Reassessing the impact of finance on growth*. BIS Working Papers No. 381.

Christopoulos, D. K., & Tsionas, E. G. (2004). Financial development and economic growth: evidence from panel unit root and cointegration tests. *Journal of development Economics*, 73(1), 55–74.

Corsetti, G., Pesenti, P., & Roubini, N. (1999). Paper tigers?: A model of the Asian crisis. *European Economic Review*, *43*(7), 1211–1236.

Dawson, P. J. (2008). Financial development and economic growth in developing countries. *Progress in Development Studies*, *8*(4), 325–331.

Demetriades, P. O., & Andrianova, S. (2003). *Finance and growth: What we know and what we need to know*. University of Leicester Working Paper.

Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: Representation, estimation, and testing. *Econometrica: Journal of the Econometric Society*, *55*, 251–276.

Fink, G., Haiss, P., & Vuksic, G. (2006). Importance of financial sectors for growth in accession countries. In *Financial development, integration and stability: Evidence from central, eastern and south-eastern Europe*. (Chapter 11 (p. 154).

Goodhart, C. A. (Ed.). (2004). *Financial development and economic growth: Explaining the links*. Palgrave Macmillan, Basingstoke, United Kingdom.

Greenspan, A. (1998, January 30). *Testimony of chairman Alan Greenspan before the committee on banking and financial services*. U.S. House of Representatives.

Gregory, A. W., & Hansen, B. E. (1996a). Practitioner's corner: Tests for cointegration in models with regime and trend shifts. *Oxford Bulletin of Economics and Statistics*, *58*(3), 555–560.

Gregory, A. W., & Hansen, B. E. (1996b). Residual-based tests for cointegration in models with regime shifts. *Journal of Econometrics*, *70* (1), 99–126.

Gurley, J. G., & Shaw, E. S. (1955). Financial aspects of economic development. *The American Economic Review*, *45*(4), 515–538.

Hall, R. E., & Jones, C. I. (1999). *Why do some countries produce so much more output per worker than others?* (No. w6564). National Bureau of Economic Research.

Klomp, J., & de Haan, J. (2014). Bank regulation, the quality of institutions, and banking risk in emerging and developing countries: An empirical analysis. *Emerging Markets Finance and Trade*, *50*(6), 19–40.

Knack, S., & Keefer, P. (1995). Institutions and economic performance: Cross-country tests using alternative institutional measures. *Economics and Politics*, *7*, 207–227.

Kutan, A. M., Samargandi, N., & Sohag, K. (2017). Does institutional quality matter for financial development and growth? Further evidence from MENA countries. *Australian Economic Papers*, *56*(3), 228–248.
Levine, R. (1998). The legal environment, banks, and long-run economic growth. *Journal of Money, Credit and Banking*, *30*, 596–613.
Levine, R. (1999). Law, finance, and economic growth. *Journal of Financial Intermediation*, *8*(1–2), 8–35.
Lucas, R. E., Jr. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, *22*(1), 3–42.
MacKinnon, J. G. (1991). Critical values for cointegration tests. In *Long-run economic relationship: Readings in cointegration, Department of Economics, Queen's University, Ontario, Canada*.
McKinnon, R. I. (1973). *Money and capital in economic development*. Washington, DC: Brookings Institution.
Menyah, K., Nazlioglu, S., & Wolde-Rufael, Y. (2014). Financial development, trade openness and economic growth in African countries: New insights from a panel causality approach. *Economic Modelling*, *37*, 386–394.
Naceur, S. B., Ghazouani, S., & Omran, M. (2008). Does stock market liberalization spur financial and economic development in the MENA region? *Journal of Comparative Economics*, *36*(4), 673–693.
Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, *16*(3), 289–326.
Rodrik, D., Subramanian, A., & Trebbi, F. (2002). *Institutions rule: The primacy of institutions over integration and geography in economic development*. IMF Working Paper No. 189.
Samargandi, N., Fidrmuc, J., & Ghosh, S. (2015). Is the relationship between financial development and economic growth monotonic? Evidence from a sample of middle-income countries. *World Development*, *68*, 66–81.
Samargandi, N., & Kutan, A. M. (2016). Private credit spillovers and economic growth: Evidence from BRICS countries. *Journal of International Financial Markets, Institutions and Money*, *44*, 56–84.
Schumpeter, J. A. (1934). *The theory of economic development translated by Redvers Opie* (p. 46). Harvard: Economic Studies.
Shams, S. M. R. (2016a). Capacity building for sustained competitive advantage: A conceptual framework. *Marketing Intelligence & Planning*, *34*(5), 671–691.
Shams, S. M. R. (2016b). Branding destination image: A stakeholder causal scope analysis for internationalisation of destinations. *Tourism Planning & Development*, *13*(2), 140–153.
Shams, S. M. R. (2016c). Sustainability issues in transnational education service: A conceptual framework and empirical insights. *Journal of Global Marketing*, *29*(3), 139–155.
Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance*, *52*(2), 737–783.
Soedarmono, W., Hasan, I., & Arsyad, N. (2017). Non-linearity in the finance-growth nexus: Evidence from Indonesia. *International Economics*, *150*, 19–35.
Stern, N. (1989). The economics of development: A survey. *The Economic Journal*, *99*(397), 597–685.
Wachtel, P. (2001). Growth and finance: What do we know and how do we know it? *International Finance*, *4*(3), 335–362.
Xu, Z. (2000). Financial development, investment, and economic growth. *Economic Inquiry*, *38*(2), 331–344.
Zivot, E., & Andrews, D. W. K. (2002). Further evidence on the great crash, the oil-price shock, and the unit-root hypothesis. *Journal of Business & Economic Statistics*, *20*(1), 25–44.

AUTHOR BIOGRAPHIES

Kazi Sohag is a senior research fellow at Graduate School of Economics and Management, Ural Federal University, Russia. He is also associate research fellow at Accounting Research Institute, UiTM, Malaysia, and an adjunct research fellow at School of Commerce, Southern Queensland University, Australia, and an external researcher at Center of Research Excellence in Renewable Energy and Power Systems, King Abdulaziz University, Jeddah, Saudi Arabia.

S. M. Riad Shams is a lecturer in marketing at the Northumbria University, UK. He has worked as a research fellow at the Ural Federal University, Russia. He is a fellow at the EuroMed Academy of Business, EU. His key research areas are stakeholder relationship management, business sustainability, corporate reputation, image, and brand positioning. He has published and guest edited in various prominent journals, and is the lead-editor of the *Annals of Business Research*, and the founding editor of the *International Journal of Big Data Management*.

Normah Omar is the director of the Accounting Research Institute (ARI), a Higher Institution Centre of Excellence (HICoE), which is recognized and funded by the Ministry of Higher Education, Malaysia. She is currently the deputy chairman, past president, and founding committee member of the Asia-Pacific Management Accounting Association (APMAA), which is based in Japan. She was also a national-level operation review panel member of the Malaysian Anti-Corruption Commission.

Grahita Chandrarin is the director of Graduate School at University of Merdeka Malang. She has been actively involved in both national and international organizations, such as coordinator of Accounting Indonesian Lecturer Forum, Indonesian Accountant Institute-Compartment of Accounting Lecturer; president of Asia-Pacific Management Accounting Association in 2016; and vice president representing Indonesia (since 2010).

How to cite this article: Sohag K, Shams SMR, Omar N, Chandrarin G. Comparative study on finance-growth nexus in Malaysia and Indonesia: Role of institutional quality. *Strategic Change*. 2019;28:387–398. https://doi.org/10.1002/jsc.2293