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MODERATING ROLE OF FINANCIAL MARKET DEVELOPMENT ON THE RELATIONSHIP BETWEEN STOCK LIQUIDITY AND DIVIDEND

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ABSTRACT

This article aims to investigate the relationship between stock liquidity and dividend across emerging market countries as well as examined the moderating role of financial market development on the relationship between stock liquidity and dividend. Data were obtained from the World Bank and DataStream databases. The study examined 3,258 listed firms from 22 emerging markets to be extrapolated in the emerging market context. To analyse the data, this article used the panel data Tobit model and panel logistic regression, both with random effects. The analysis revealed that financial market development has a positive moderating effect on the relationship between stock liquidity and dividend by improving local market liquidity and mitigating information asymmetry. The study findings provide information for managers to devise investment strategy in the emerging markets. This article provides new insights into the financial market development moderating role on the relationship between stock liquidity and dividend.

Keywords: Financial market development, stock liquidity, dividend, information asymmetry, emerging market

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INTRODUCTION

Over the past decade, the investors use strategies to earn capital gain via stock buying or selling versus income from dividend, and this has been the primary concern by both investors and researchers. This issue has been addressed in the form of relationship between stock liquidity and dividend. One of the studies on the relationship suggests that stock liquidity and dividend are substitutable. This is derived from the Miller-Modigliani irrelevance theory of dividend. One of the assumptions highlighted by Banerjee, Gatchev and Spindt (2007) in this theory is regarding market frictionless. Frictionless allows homemade dividend to be created at no cost. Although frictionless does not exist in the real market, the rational investors will demand dividend over homemade dividend if the friction is high and vice versa. Based on the study results, they suggested that stock liquidity and dividend are substitutes.

However, a decade later, Jiang, Ma and Shi (2017) discovered that stock liquidity and dividend have a positive relationship. This finding is inconsistent with the earlier finding by Banerjee et al. (2007). Jiang et al. (2017) highlighted that the substitution effect argument neglects that stock liquidity has an informational effect that increases firm transparency. According to the market microstructure theory, as market liquidity increases, the information asymmetry decreases (Kanagaretnam, Lobo, & Whalen, 2007). The reduction in information asymmetry is equivalent to the increase in the firm transparency level. Under high transparency condition, tunnelling incentive tends to be more difficult and riskier (Li & Zhao, 2008; Petrasek, 2012).

Furthermore, keeping too much retained earnings will damage outsider's perception due to the lack of incentive to minimise tunnelling incentive, thus results in poor access to the external financial sources (Gomes, 2000). Therefore, such condition (higher transparency) renders the net benefit to pay a dividend to be positively associated with stock liquidity (Jiang et al., 2017). This is supported by the China stock market, where the country's market enables a positive relationship between stock liquidity and dividend, unlike in past studies.

The differences between past and recent findings suggest that there are moderating factors that may contribute to the mixed findings.This article suggests that financial market development is one of the factors that moderates the relationship between stock liquidity and dividend. According to Bokpin (2010), market imperfections such as lack of financial system development may restrict a firm's ability to finance or fund investment. Emerging markets rely more on the financial market development to enhance the local market and help

firms to finance their operation. This is because the equity market development catalyse sustainable development via an increase in financing options (Bokpin, 2010). In other words, the selection of fund variability helps a firm to have better sustainable growth. Since lack of financial development restricts a firm's ability to finance its investment, the firm will have higher financial constraints. Past studies found that dividend policy is affected by financial constraints. Aivazian, Booth and Cleary (2003) revealed that dividend payout in emerging and developed markets are affected by financial constraints. Although both markets are affected, the emerging markets are more sensitive to financial constraint, thus resulting in lower dividend payout.

In the literature, financial market development is shown to influence stock liquidity besides affecting dividend policy. Financial market development enhances liquidity by promoting financial market openness (Barnor & Wiafe, 2015). The openness encourages investors to invest in the stock market, thus enhances the number of stocks being traded. As more stocks are traded, stock liquidity also increases. Also, financial liberalisation gives positive impact to the stock market liquidity (Lee & Wong, 2012). In short, the relationship between these three factors, namely stock liquidity, financial market development, and dividend payout suggest that there is an interrelationship between these three. The inconsistent relationships between stock liquidity and dividend suggest that a moderating factor may drive this issue. Therefore, it is necessary to focus on the relationship between these three variables. Thus, this paper aims to ascertain the moderating effect of financial market development on the relationship between stock liquidity and dividend relationship in emerging market countries as the main contribution.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Financial market development refers to the institution, factors and policies that lead to the effectiveness of financial markets and efficient financial intermediate (Alomari, Marashdeh, & Bashayreh, 2019). These elements are significant in influencing foreign direct investment (FDI), economic growth and financial literacy of a country's investors. In general, the countries with greater financial market development are associated with an active economy, which is categorised as high-income countries. Countries with a good financial market that meet the needs and requirements are often categorised as a developed market. To meet the requirement, some of the highly recognised and reliable institutions have set a standard. One of the most recognised and widely used standards is developed by the World Bank. According to the World Bank, countries are categorised as

developed and emerging markets. Most of the developed markets are located at Central Europe, United States, and some Asian countries. On the other hand, countries with moderate financial market development known as emerging markets are located in Central Asia, South America and the Middle East. Countries categorised as emerging markets have active and financial system higher than average, however, they often lack in terms of size and efficiency. There is another category classified as a frontier market, which includes the third world countries such as Zimbabwe, Rwanda and Kenya. However, this study only focusses on the emerging markets. Besides reviewing the financial market development in the literature, the study will also review past studies on stock liquidity and dividend within the emerging markets.

Stock Liquidity and Dividend in Emerging Markets

The substitution effect and informational effect emphasised in the recent literature raise an issue of what condition these factors become more dominant. The negative relationship between stock liquidity and the dividend was known as substitute effects. This relationship derived by questioning the underlying assumption behind Miller and Modigliani (1961) seminal work on the frictionless market. Although frictionless does not exist in the real world, however, a rational investor would demand dividend over homemade dividend if the friction is high and vice versa. Thus, Banerjee et al. (2007) conclude that stock liquidity and dividend are substitutes. However, recent empirical evidence by Jiang et al. (2017) argues the substitute effect neglect that stock liquidity provides the informational effect that might mitigate the tunnelling incentive and increase firm incentives to pay a dividend. Additionally, Hu, Huang and Chen (2019) discover that stock liquidity and the dividend has a positive relationship which potential channels come from outcome hypothesis and creditors substitute hypothesis where stock liquidity could increase dividend payout. The earlier research recorded a positive relationship in the developed markets, the recent empirical evidence that focuses on China as the emerging market recorded negative a positive relationship. This may be attributed to the differences between emerging and developed markets. Glen, Karmokolias, Miller and Shah (1995) found that dividend policy in emerging and developed markets are significantly different. In their studies, the dividend paid in emerging markets is only two-third of the amount paid in the developed markets. This finding is consistent with Ramcharran (2001), in which low dividend is recorded in the emerging markets. The method to determine dividend policy in emerging market firms is different from the practice in developed markets (Glen et al., 1995). It was found that the dividend payout ratio is more important in emerging markets, whereas in developed markets, the level of dividend paid is the main concern. Thus, dividend payout tends to be more volatile in emerging markets than the

developed markets (Glen et al., 1995). Furthermore, less concern over dividend volatility causes dividend smoothing to be less important in emerging markets (Glen et al., 1995).

Aivazian et al. (2003) found that the U.S. and emerging markets rely on the profitability, which is proxied by return on earnings (ROE) in paying a dividend. In other words, the higher the ROE, the higher the dividend payout will be. On the contrary, the debt ratio has an inverse effect on both the U.S. and emerging markets. This shows that financial constraints affect the dividend policy of a firm. This supports the cash flow theory of dividend. They also found that the market-to-book ratio affects dividend payout. However, there is limited evidence in the study that shows the significance of risk and size towards dividend policy. In fact, they find that emerging markets have an inverse relationship with firm asset tangibility. This relationship is resulting from the corresponding decrease in short term assets available for short term bank debt collateral, which may reduce the borrowing capacity from the bank. In general, the same attribute is also important in the U.S. market. However, emerging markets are more sensitive towards some of the variables, suggesting that emerging markets have higher financial constraints than the developed market country such as the U.S., this tends to limit their resources to finance investment opportunities. According to Kumar and Testsekos (1999), emerging markets have higher financial constraints and volatility, lesser information efficiency and smaller size than those in developed countries. This leads to reliance on retained earnings to invest in their project, thus causing lower dividend payout.

Not only dividend in emerging and developed markets show significance difference, but this pattern is also recorded in terms of stock. Stock in emerging markets is characterised by higher trading cost and greater volatility (Domowitz, Glen, & Madhavan, 2001). The stock in emerging markets is also thinly traded (Annuar, Ariff, & Shamsher, 1994; Yilmaz & Gulay, 2006). In contrast to the stock in developed markets, stock in emerging markets is less liquid due to the lack of volume being traded annually. Therefore, the emerging market is characterised by higher information asymmetry due to higher volatility and lesser information efficiency. Thus, under such condition of high information asymmetry in the emerging markets, investors tend to rely on other attributes to mitigate the information asymmetry level. In the case of stock liquidity and dividend relationship, investors tend to rely on stock liquidity specific attributes to mitigate information asymmetry. According to Kanagaretnam et al. (2007), microstructure literature posits that greater liquidity reduces information asymmetry. Furthermore, Jiang et al. (2017) posit that stock liquidity has an informational effect that improves firm transparency and mitigates information

asymmetry. Therefore, in emerging markets with high information asymmetry, informational effect by stock liquidity is crucial to mitigate information asymmetry as compared to the developed markets with lower information asymmetry. Hence, this study proposes that stock liquidity has a positive effect on dividend policy within emerging markets. Thus, this study hypothesises that:

H1: There is a positive relationship between stock liquidity and dividend within emerging markets.

Interaction between Financial Market Development and Stock Liquidity

Over the past decades, researchers have focused on the relationship between stock liquidity and financial market development. Financial market development is related to stock liquidity that it provides greater facilities, variability and access to financial resources. Barnor and Wiafe (2015) posit that financial market development enhances liquidity by promoting financial market openness. The greater the financial market openness, the greater the increase in the domestic market potential investment. According to Lee and Chou (2016), greater market openness can facilitate the domestic financial institution process, thereby facilitates capital cost reduction and attracts more investment. Demirgüç-Kunt and Levine (1996) identify that a highly liquid stock market reduces the vagueness linked to stock market investment and enhances the attractiveness to invest. The increase in investors' participation leads to greater liquidity due to a higher number of stocks being traded in the market. Furthermore, stock liquidity is identified to be crucial in stock market development (Yartey, 2008).

Financial market development does not only correlate with stock liquidity by enhancing financial market openness but also through the attributes in mitigating information asymmetry. In the literature, stock liquidity is found to have a positive effect on dividend policy. According to Jiang et al. (2017), liquidity provides the informational effect that can mitigate tunnelling incentives and increases a firm's incentive to pay out a dividend. Microstructure literature posits that the greater the market liquidity, the lesser the information asymmetry is (Kanagaretnam et al., 2007). This is in line with the supply-led school of thought that predicts information asymmetry reduction via financial market development by achieving a greater resource allocation (Ahmad, Etudaiye-Muhtar, Matemilola, & Bany-Ariffin, 2016). According to Asongu, Nwachukwu and Tchamyou (2016), information asymmetry reduction through a financial institution is achieved via information sharing between banks to reduce moral hazard and adverse selection. Therefore, the greater the financial market development, the greater the liquidity (information asymmetry reduction). Since financial market development improves

stock market liquidity and mitigates information asymmetry, this study posits that financial market development positively moderates the relationship between stock liquidity and dividend by enhancing informational effect of stock liquidity, thus improves stock liquidity. Thus, this study hypothesises that:

H2: There is a positive moderating effect of financial market development on the relationship between stock liquidity and dividend.

METHODOLOGY

Data

The analysis was conducted on emerging markets such as Argentina, Bulgaria, Brazil, Bangladesh, Colombia, Chile, Hungary, Indonesia, India, Mexico, Malaysia, Peru, Poland, Pakistan, Philippines, Romania, Russia, South Africa, Thailand, Turkey, Ukraine and Venezuela. This study includes a 10-year observation between 2006 and 2015. All firms in these countries were included except firms with incomplete financial data or firms with less than 30 trading days. Following the literature, this article excludes the firms with incomplete financial data and firms within the financial sector. In addition, Jiang et al. (2017) also exclude firms with a negative dividend to earnings and cash flow ratio. In this case, firms that pay a dividend, although the earnings and cash flow are negative. Since negative dividend does not exist in the real world, the study excludes negative dividend as a proxy for the dividend. The data were extracted from DataStream and World Bank databases. The independent variable and control variables were obtained from DataStream. Meanwhile, the data for moderating factors were obtained from the World Bank database.

Variables

Dependent variable

The study uses three dependent variables following Jiang et al. (2017) to proxy for the dividend payout. The first dependent variable is dividend scales by cash flow (DC), whereas the second proxy for the dividend is dividend scales by earning (DE). Both variables are examined using the Tobit model. The third variable is a propensity to pay a dividend (DP), that takes the value of one if the firm pays a dividend and zero if the firm does not pay any dividend. The third dependent variable is examined using logistic regression.

Independent variable

To measure liquidity, this article uses the Amihud illiquidity ratio (Amihud, 2002). According to the market microstructure literature, the relationship between liquidity and dividend revolves around price informativeness and price impact, and the information is in fact properly captured by the Amihud illiquidity ratio (Jiang et al., 2017). Since the greater proxy value indicates low liquidity level, this article follows Jiang et al. (2017) and multiplies the Amihud illiquidity ratio by –1 for ease of interpretation. To calculate liquidity, the study uses adjusted closing price to calculate return because the adjusted closing price takes into account both dividend and stock split. The article calculates the Amihud illiquidity ratio as the average ratio of daily stock return in the form of each firm absolute return over daily volume in the fiscal year:

$$Amihud_{it} = 1/\mathrm{D}_{i,t} \times \Sigma_{d=1}^{n} Ret_{i,t,d}|/Volume_{i,t,d}$$

where *Ret* is the daily stock return multiplies by 100, and *Volume* is the trading volume on a day, *d* for the firm, whereas *D* is the number of trading days in a year *t* for the firm.

Moderator variable

The study uses one measurement to proxy for the moderator and the second measurement for the alternative measure. The study follows Ahmad et al. (2016) that uses stock market turnover (SMT) ratio and stock market capitalisation (SMC) as a proxy for financial market development. The reason to use an alternative measure is to enhance the robustness of the results.

Control variable

The study has control variables used in the literature. The variables include firm size, profitability, growth opportunities, and leverage (Banerjee at al., 2007; Griffin, 2010; Gul, Lai, Saffar, & Zhu, 2014; Lee & Yoon, 2017; Jiang et al., 2017). The article also adds dummies for control such as industry, country and year fixed effects to reduce the potential variable bias.

Analytical strategy

This article follows the Jiang et al. (2017) framework to examine the link between stock liquidity and dividend. Unlike the previous studies, financial market development was added as the moderating variable, and the control variables commonly used in the literature were maintained. To examine the link between

stock liquidity and dividend, panel data Tobit model with random effects was used to examine the first and second dependent variables, namely DC and DE. This is because the dependent variables in this study are left censored. Therefore, the linear method will not be appropriated for data analysis. Furthermore, the use of ordinary least squares (OLS) to estimate the left censoring data will result in estimated bias due to violation of the linearity assumption (Buck, Liu, Wei, & Liu, 2007; D'Angelo, 2012). As for the third dependent variable, DP, this variable is in binary form, which takes the value of one if the firm pays out dividend and zero if the firm does not pay any dividend. Thus, the random effects panel logistic regression was used to investigate the moderating role of financial market development on the relationship between stock liquidity and dividend. In addition, the log transformation (one plus) of Amihud and dividend used by Jiang et al. (2017) as well as Edmans, Fang and Zur (2013) was adopted due to high data skewness.

The dependent variables in this study were examined separately. In other words, the DC, DE and DP proxies have different analysis to be presented. In fact, the article specifies the model as follows:

$$\text{Dividend Payout}_{i,t} = \alpha_{i,t} + \beta_2 \text{Liquidity}_{i,t} + \beta_3 \text{Size}_{i,t} + \beta_4 \text{ROA}_{i,t} + \beta_5 \text{Growth}_{i,t} + \beta_6 \text{Leverage}_{i,t} + \theta i_{i,t} + \delta i_{i,t} + \lambda t_{i,t} + \varepsilon_{i,t} \quad (1)$$

where dividend payout is denoted as the firm's cash dividend over cash flow (DC), cash dividend over earnings (DE), and the firm propensity to pay a dividend (DP). β_2 represents liquidity ratio while β_3, β_4, β_5 and β_6 are the coefficients for control variables, namely firm size, profitability, growth opportunities (Tobin's Q), and leverage. Meanwhile, θi represents the country fixed effect, δi represents the industry fixed effect, λt represent the year fixed effects, whereas $\varepsilon_{i,t}$ represents the error term.

The second hypothesis will be examined using two models. The first Model (2a) is used to examine the main analysis, whereas the second Model (2b) is used to examine the alternative analysis. The models are presented as follows:

$$\text{Dividend Payout}_{i,t} = \alpha_{i,t} + \beta_2 \text{Liquidity}_{i,t} + \beta_3 \text{Liquidity}_{i,t} \times \text{SMT}_{i,t} + \beta_4 \text{Size}_{i,t} + \beta_5 \text{ROA}_{i,t} + \beta_6 \text{Growth}_{i,t} + \beta_7 \text{Leverage}_{i,t} + \theta_{i,t} + \delta_{i,t} + \lambda_{i,t} + \varepsilon_{i,t} \quad (2a)$$

H2a: SMT moderates the relationship between stock liquidity and dividend policy.

$$\text{Dividend Payout}_{i,t} = \alpha_{i,t} + \beta_2 \text{ Liquidity}_{i,t} + \beta_3 \text{ Liquidity}_{i,t} \times \text{SMC}_{i,t} + \beta_4 \text{ Size}_{i,t} + \beta_5 \text{ ROA}_{i,t} + \beta_6 \text{ Growth}_{i,t} + \beta_7 \text{ Leverage}_{i,t} + \theta_{i,t} + \delta_{i,t} + \lambda_{i,t} + \varepsilon_{i,t} \quad (2b)$$

H2b: SMC moderates the relationship between stock liquidity and dividend policy.

where dividend payout is denoted as the firm's cash dividend over cash flow (DC), cash dividend over earnings (DE), and firm propensity to pay a dividend (DP). β_2 represents the liquidity ratio. β_3 is the moderating variable coefficient, known as financial market development which is proxied by SMT ratio with SMT as the alternative measurement. β_4, β_5, β_6 and β_7 are the coefficients for control variables, namely firm size, profitability, growth opportunities (Tobin's Q), and leverage. Meanwhile, θ_i represents the country fixed effect, δ_i represents the industry fixed effects, λ_t represents the year fixed effects, whereas $\varepsilon_{i,t}$ represents the error term.

RESULTS

Descriptive Statistics

Table 1 presents the descriptive statistics of the study variables for emerging markets. Based on Table 1, the highest mean among the variables is leverage with a value of 46.46 while the lowest is liquidity with a value of –5.37. On the other hand, the variable with the highest standard deviation is leverage with a value of 25.81, and the lowest is DP with a value of 0.49.

Table 1
Descriptive statistics

Variables	Observation	Mean	SD	Min	Max
DC	16759	1.790693	1.785469	0	7.566362
DE	16759	1.975119	1.904907	0	7.106087
DP	16759	0.5620264	0.4961526	0	1
Liquidity	16759	–5.37E-10	1	–9.764058	0.3115452
SMC	16759	–3.01E-09	1	–1.759294	2.862065
SMT	16759	6.94E-09	1	–1.307472	5.517698
Log (size)	16759	14.62627	2.837649	6.390241	23.35011
ROA	16759	4.561875	7.966178	–35.38245	31.84387
Growth (Tobin's Q)	16759	1.406707	1.863837	–0.055832	163.5459
Leverage	16759	46.46387	25.81017	–19.84641	245.2571

Correlation Analysis

To ensure data robustness, the study adopted several diagnostic tests. Firstly, the study identifies outlier using spike plot and then remove any unusual data from the plot. Then, the study conducts a correlation analysis. Based on Table 2, the correlation analysis shows that the degrees of association between the independent variables are minimal. According to Hair, Black, Babin and Anderson (2010), any correlation above 0.60 is considered high. Therefore, based on Table 2, there are no variables (excluding dependent variables) have a higher correlation than 0.60, which means there is no risk of multicollinearity.

Variance Inflation Factor

To ensure that the correlation test is robust, the alternative measure of correlation, namely the variance inflation factor (VIF) was used in the study, as shown in Table 3. According to Hair et al. (2010), any VIF score higher than 4.0 indicates high correlation. Based on Table 3, the highest VIF score is 2.14. In addition, there is minimal correlation between the variables. The low correlation between the variables shows that the variables are distinctive, and there is no multicollinearity issue.

To identify the suitability of either random or fixed effects, this study adopted the Hausman test. This test is used to choose either a fixed or random effect model. The results of Hausman suggest that the fixed effect model is appropriate. However, the analysis using fixed effect is inappropriate in this study because there is little variation over time. Since the function of fixed-effect analysis is to remove time-invariant characteristics, the fixed-effect analysis dropped variables that do not change over time, resulting in a significant number of observation reduction which may lead to potential bias. Furthermore, if the independent variable does not change across time, the fixed effect is not a good estimator (Allison, 2009). In addition, if the predictor variable is different across individuals and have minimal variation over time, fixed effect regression will have huge standard errors and become less precise (Allison, 2009). Thus, the random effect was selected instead. The study applied robust standard errors (Huber/White/Sandwich estimator) in examining the third dependent variable (DP) to solve both potential autocorrelation and heteroscedasticity issues.

Table 2
Correlation analysis

	DC	DE	DP	Liquidity	SMC	SMT	Log (Size)	ROA	Growth	Leverage
DC	1									
DE	0.9315	1								
DP	0.884	0.9153	1							
Liquidity	0.1222	0.1201	0.1197	1						
SMC	0.1149	0.1051	0.0936	0.1289	1					
SMT	–0.0474	–0.0547	–0.0568	0.0169	–0.3462	1				
Log (size)	0.2211	0.2524	0.2912	0.1033	–0.2436	–0.1227	1			
ROA	0.4723	0.42	0.4802	0.0428	0.0377	0.0095	0.1197	1		
Growth	0.128	0.1105	0.1076	0.0367	–0.0488	0.0137	0.0638	0.1925	1	
Leverage	–0.2388	–0.2122	–0.203	–0.1074	–0.1583	0.0779	0.1805	–0.2784	0.0094	1

Table 3
Variance inflation factor

Variables	VIF	1/VIF
Liquidity	2.14	0.466888
SMC	1.49	0.669332
SMT	1.32	0.759502
Log (Size)	1.25	0.802689
Leverage	1.18	0.845282
ROA	1.18	0.850151
Growth	1.05	0.954313

Stock Liquidity and Dividend

Since the dependent variables were left-censored, the study applies the random effect panel Tobit regression (DC and DE) in data analysis (Hu, Li, & Jin, 2018; Duso, Pennings, & Seldeslachts, 2010; 2006) and panel logistic regression for dummy dependent variable (DP). Based on Table 4, the findings support H1, in which there is a positive relationship between stock liquidity and dividend, where all *p*-value is smaller than 0.05. However, in Table 5, where the study control for industry, country and year fixed effect, the findings do not support H1, except when DC as the dependent variable and the SMC as the proxy of financial market development. This indicates that although the results are positive, the relationship between stock liquidity and the dividend is not significant.

Moderating Effect of Financial Market Development – Stock Market Turnover and Stock Market Capitalisation

Although the result for H1 is not consistent when including and excluding industry, country and year fixed effect, however, H2a, in which there is the positive moderating effect of financial market development on the relationship between stock liquidity and dividend are supported and consistent using both types estimation. Based on Tables 4 and 5, the findings suggest that the financial market development proxied by SMT positively moderates the relationship between stock liquidity and dividend.

Table 4
Panel data tobit/logistic regression with random effects

Stock Market Turnover (SMT) ratio									Stock Market Capitalisation (SMC)						
Models	DC(1) *p*-value	*z*-value	DE(2) *p*-value	*z*-value	DP(3) *p*-value	*z*-value	DP(4) *p*-value (RSE)	*z*-value (RSE)	Models	DC(5) *p*-value	*z*-value	DE(6) *p*-value	*z*-value	DP(7) *p*-value	*z*-value
Liquidity	0.000	4.61	0.000	3.99	0.000	3.69	0.000	3.57	Liquidity	0.00	4.89	0.000	4.10	0.000	4.07
SMT	0.074	–1.79	0.123	–1.54	0.322	–0.99	0.379	–0.88	SMC	0.00	8.19	0.000	7.07	0.000	8.00
Liquidity*SMT	0.002	3.03	0.004	2.86	0.001	3.18	0.011	2.55	Liquidity*SMC	0.00	4.18	0.001	3.43	0.000	3.96
Log (size)	0.000	23.09	0.000	24.08	0.000	23.06	0.000	20.30	Log (Size)	0.00	24.7	0.000	25.44	0.000	23.85
ROA	0.000	31.73	0.000	21.11	0.000	26.47	0.000	19.41	ROA	0.00	31.67	0.000	21.05	0.000	26.63
Growth	0.442	0.77	0.363	0.91	0.001	3.31	0.006	2.73	Growth	0.55	0.60	0.465	0.73	0.002	3.11
Leverage	0.000	–18.73	0.000	–18.50	0.000	–15.90	0.000	–13.44	Leverage	0.00	–18.5	0.000	–18.3	0.000	–15.30
Constant	0.000	–16.88	0.000	–17.10	0.000	–20.90	0.000	–19.32	Constant	0.00	–18.4	0.000	–18.4	0.000	–21.90

Note: RSE = robust standard error

Table 5
Panel data tobit/logistic regression with random effects (with industry, country and year fixed effect)

Stock Market Turnover (SMT) ratio									Stock Market Capitalisation (SMC)						
Models	DC(1) *p*-value	*z*-value	DE(2) *p*-value	*z*-value	DP(3) *p*-value	*z*-value	DP(4) *p*-value (RSE)	*z*-value (RSE)	Models	DC(5) *p*-value	*z*-value	DE(6) *p*-value	*z*-value	DP(7) *p*-value	*z*-value
Liquidity	0.405	0.83	0.583	0.55	0.905	0.12	0.904	0.12	Liquidity	0.036	2.09	0.149	1.46	0.292	1.05
SMT	0.749	0.32	0.736	–0.34	0.516	0.65	0.612	0.51	SMC	0.311	1.01	0.925	0.09	0.417	0.81
Liquidity*SMT	0.011	2.54	0.022	2.29	0.012	2.52	0.035	2.10	Liquidity*SMC	0.005	2.81	0.035	2.11	0.050	1.96
Log (Size)	0.000	27.53	0.000	28.31	0.000	25.8	0.000	23.22	Log (Size)	0.000	27.35	0.000	28.15	0.000	25.68
ROA	0.000	30.74	0.000	20.36	0.000	25.3	0.000	19.04	ROA	0.000	30.70	0.000	20.37	0.000	25.34
Growth	0.094	1.68	0.058	1.90	0.000	5.37	0.000	4.14	Growth	0.111	1.60	0.061	1.87	0.000	5.29
Leverage	0.000	–20.80	0.000	–20.60	0.000	–18.30	0.000	–15.66	Leverage	0.000	–20.70	0.000	–20.60	0.000	–18.3
Constant	0.000	–17.20	0.000	–17.20	0.000	–20.60	0.000	–19.99	Constant	0.000	–19.90	0.000	–16.80	0.000	–16.6
Country	Fixed effect included														
Industry	Fixed effect included														
Year	Fixed effect included														

Note: RSE = robust standard error

Based on Tables 4 and 5, the interaction via Liquidity*SMT has a significant positive moderating effect on those three dependent variables, DC, DE and DP. For the first dependent variable which is dividend scale by cash flow to proxy for the dividend (DC), the results show that SMT (Liquidity*SMT) has significant positive moderating effects with a *p*-value of 0.002 and *z*-value of 3.03 as shown in Table 4 (*p*-value of 0.011 and *z*-value of 2.54 as shown in Table 5). For the second dependent variable (DE), the article found that the SMT ratio has significant positive moderating effect with a *p*-value of 0.004 and *z*-value of 2.86 as shown in Table 4 (*p*-value of 0.022 and *z*-value 2.29 as shown in Table 5). The third dependent variable is the propensity to pay a dividend (DP). As mentioned before, logistic regression was used in the analysis due to the nature of the data. The results show that the SMT ratio has significant positive moderating effect with a *p*-value of 0.001 and *z*-value of 3.18, as shown in Table 4 (0.012 and *z*-value of 2.52 as shown in Table 5). In short, the three measurements of dividend proxy (Models 1 to 4) show that SMT significantly moderates the relationship between stock liquidity and dividend. However, the results may be driven by potential heteroscedasticity and autocorrelation, as shown in the Wooldridge test. The attempt to solve both potential heteroscedasticity and autocorrelation issues was made by adopting the robust standard error (Huber/White/sandwich estimator), in which the results are still positively significant with a *p*-value of 0.01 and *z*-value of 2.55 as shown in Table 4 (0.035 and *z*-value of 2.1 as shown in Table 5). This shows that the results are indeed robust.

The positive moderating effect of financial market development proxied by SMT is consistent with the H2a. As stated before, the market microstructure theory posits that the stock liquidity informational effect reduces information asymmetry. Jiang et al. (2017) used this argument and posit that the informational effect increases a firm's incentive to pay a dividend by lowering tunnelling incentives. Since stock market development improves market liquidity by promoting financial market openness (Barnor & Wiafe, 2015), higher financial market openness will enhance potential investment. Furthermore, Lee and Chou (2016) state that greater market openness can facilitate domestic financial institution in reducing capital cost and attracting more investment. Thus, the increase in the number of investors via financial market development will lead to higher liquidity and lower information asymmetry.

The positive moderating effect of financial market development is driven by choice of financial market development measurement. Therefore, SMC was used as an alternative measure for financial market development.

The second research hypothesis for the first alternative (H2b) remains supported using SMC as a proxy for financial market development. Tables 4 and 5 show the alternative measure of financial market development proxy, which is indicated by the interaction term (Liquidity*SMC). In short, the three measurements of dividend proxy (Models 5 to 7) show that SMC moderates the relationship between stock liquidity and dividend. For the first dependent variable, DC, the results show that SMC (Liquidity*SMC) has significant positive moderating effect with a *p*-value of 0.000 and *z*-value of 4.8 as shown in Table 4 (0.005 and *z*-value of 2.81 as shown in Table 5). The significant positive moderating effect is consistent with the other two dependent variables, namely DE and DP with *p*-values of 0.001 and 0.000, respectively as shown in Table 4 (0.035 and 0.05, respectively as shown in Table 5). The remaining control variables, such as size, profitability and growth opportunities, are positively associated with a dividend. However, leverage has a significant negative effect on the three dividend measures in all models. The results also take into account variations attributed to year, country and industry by acting as dummies for control variables for the year fixed effects, industry fixed effects, and country fixed effects.

Additional Analysis

The significant moderating effect of financial market development on stock liquidity and dividend relationship might be derived by the selection of our proxy. Therefore, besides examining the financial market development in term of the financial market, the study added financial market development proxy in term of financial institution. Based on Table 6, the study chooses private credit over gross domestic product (GDP) as an additional proxy for financial market development. The results using three different proxies of dividend consistently demonstrate the insignificant moderating effect of financial market development, which shown through p-value larger than 0.05. The insignificant moderating effect of financial market development proxy by private credit over GDP may be derived by certain factors; for example, this proxy only represents by a financial institution and not financial market as categorised by World Bank.

As a comparison, stock market development (proxy by SMT and SMC) is more appropriate to proxy the moderating effect of financial market development relative to banking sector development (proxy by private credit over GDP) in investigating the stock liquidity and dividend relationship.

This is because, unlike banking sector development, stock market development directly affects stock liquidity via promoting financial market openness and increase number stock traded in the markets. Therefore, the main independent variables, which is stock liquidity, may less be affected by proxy that represents financial institution (banking sector development).

Table 6
Additional analysis via robustness tests (private credit over GDP as the alternative of financial development measure)

	Private credit/GDP					
Models:	DC (1) *p*-value	*z*-value	DE (2) *p*-value	*z*-value	DP (3) *p*-value	*z*-value
Liquidity	0.014	2.46	0.104	1.63	0.833	0.21
CGDP	0.000	11.16	0.000	11.27	0.000	10.85
Liquidity*CGDP	0.950	–0.06	0.447	–0.76	0.133	–1.50
Log (Size)	0.000	24.70	0.000	25.57	0.000	24.27
ROA	0.000	32.97	0.000	22.43	0.000	27.41
Growth	0.419	0.81	0.355	0.93	0.001	3.43
Leverage	0.000	–18.09	0.000	–17.84	0.000	–14.93
Constant	0.000	–18.34	0.000	–18.39	0.000	–22.34

Table 7
Robustness tests for endogeneity – omitted variables

DDP	*z*	*p* > *z*
Liquidity	–3.69	0.000
SMT	–0.99	0.322
Liquidity*SMT	3.18	0.001
Log (Size)	23.06	0.000
ROA	26.47	0.000
Growth	3.31	0.001
Leverage	–15.92	0.000

Robustness Tests for Endogeneity – Omitted Variables

To ensure the results are not influenced by the bias from the omitted variables, the study used the firm fixed-effect regression analysis. As mentioned before, the data has little variation over time. So, the firm fixed-effect analysis is inappropriate for data estimation. However, the inclusion of firm fixed-effect that controls the time-invariant attributes may eliminate the cross-sectional relationship between stock liquidity and dividend payout. This may be associated with the omitted explanatory variables (Jiang et al., 2017). Therefore, the use of firm fixed-effect regression should minimise the risk of omitted variable bias. Based on Table 7, the interaction between the Liquidity ratio and SMT has z-value of 3.18 and p-value of 0.001. The results are robust and statistically significant at 0.01% level using the fixed effect regression analysis.

CONCLUSION

This article investigates the moderating effect of financial market development on the relationship between stock liquidity and dividend in the emerging markets. Using the random effect panel Tobit model and random effect panel logistic regression among 3,258 firms in 10 years from 2006 to 2015, the results indicate that financial market development positively moderates the relationship between stock liquidity and dividend. The results for the direct relationship of stock liquidity and dividend (H1) are only accepted when the random effect is used without controlling industry, country and year fixed effect as well as when DC as the dependent variable and SMC as the moderator. Whereas, when SMT proxies as moderator, although the result is consistently positive, but the effect is not significant. Meanwhile, the results for moderating effects (H2a and H2b) are consistently positive and significant for all variables tested in this study except when using an alternate proxy of financial market development namely private credit over GDP. This indicates that financial market development has a positive moderating effect on the relationship between stock liquidity and dividend. This results also indicate that, financial market development through its mechanisms in enhancing local market liquidity and mitigate information asymmetry moderates the relationship between stock liquidity and dividend.

Stock liquidity and dividend relationship are not only important to investors, but also to managers. An investor earning through the relationship between stock liquidity and the dividend is forecasted based on the information available in the market. The existence of information asymmetry in a country with high information asymmetry level, such as in the emerging markets renders the investors to gain additional information to mitigate the concerns. The

informational effect of stock liquidity as per microstructure literature demonstrates the firm dividend policy. Realising that moderating factors can change the level of information, investors can better forecast the relationship to devise their investment strategy. Managers, on the other hand, rely on the informational effect from stock liquidity which is moderated by financial market development to convey information to the investors with regards to the firm's performance and expected investment return.

Based on the findings, this study contributes in terms of two aspects. First, it extends the literature in regards to stock liquidity and dividend in emerging markets. Prior research mostly concentrated on the developed markets instead of emerging markets. The study highlights the importance of stock liquidity and dividend relationship, especially to the managers who want to diversify their investment in the emerging markets.

Second, this study also considers the impact of financial market development in the relationship between stock liquidity and dividend. In fact, this study is the first to introduce financial market development as a moderating factor for the relationship between stock liquidity and dividend, adding to the existing body of knowledge. Thus, this article confirms the information provided in the literature regarding the link between stock liquidity and dividend besides adding the moderating effect of financial market development in emerging markets. This is helpful to explain the cause of mixed findings between past and recent literature with regards to the relationship between stock liquidity and dividend.

In conclusion, by looking insight into informational effect from financial market development, this study highlights the variable that could influence the relationship between stock liquidity and dividend. Despite the contribution, this study has some limitations. First, the data are only limited to emerging markets. Therefore, the results cannot be extrapolated in the developed markets. Second, the study only considers one moderating factor. For future research, the study recommends the interaction term to be evaluated using Brambor, Clark and Golder (2006), as this method can re-compute and evaluate the significance of the interaction term. Furthermore, future research may also combine stock market development and banking sector development under the same model and determine which variable have more significant influences on stock liquidity and dividend relationship.

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