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Integrating agency and resource dependency theories: the moderating effect of board size on the relationship between dividends and firm value in Malaysia

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Abstract

Purpose This paper aims to examine the moderating effects of board size on the relationship between dividends and firm value in Malaysian settings. The theoretical foundations of this research were the integration between agency and resources dependency theories.

Design/methodology/approach Panel data are extracted from DataStream and the annual report for the period of 2012 to 2021, and pooled OLS, random effects, and fixed effects analyses were employed to examine the relationship. Breusch–Pagan Lagrange multiplier (LM) test and the Hausman test used to determine the most appropriate between these three analyses (OLS, random effects, and fixed effects). The results are valid even after calculating the robust standard error to mitigate the potential heteroskedasticity and serial correlation.

Findings The empirical results show that board size positively moderates the relationship between dividends and firm value in all the models tested. The results indicate that a larger board of size can minimize the agency problem (agency theory) because a larger board size can more effectively monitor and control management's opportunistic behavior due to more set of skilled and talented individuals included in the boardroom (resources dependency theory). Additionally, effective monitoring can also lead to the increase in dividend payout to maintain a good reputation among investors and simultaneously increase firm value.

Practical implication This study contributes to helping the regulators and industry players in Malaysia to improve existing guidelines for determining dividend and board size to increase firm value. The findings may also provide inputs to the policymakers in recommending the optimum dividend and board size that resulting an increase in valuation.

Originality/value By incorporating agency and resources dependency theory, authors investigate the moderating effect of board size on dividend and firm value relationships in Malaysian markets.

Keywords Dividend, Firm value, Board size, Agency theory, Resources dependency

Introduction

The dividend puzzles concept remains one of the most debated topics over the past several decades to date. The concept of the dividend puzzle emerged when the influential works of Gordon [17], Lintner [31, 32], and Miller and Modigliani [34] proposed some concepts related to dividends. Gordon, for example, introduced

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the Gordon growth model to determine the intrinsic value of a stock based on future dividend series. On the other hand, Lintner introduced an economic formula to determine the optimal dividend policy of a firm. Perhaps one of the most influential papers that led to the controversy over the dividend puzzle was presented by Miller and Modigliani [34]. The influential work of Miller and Modigliani [34] was the catalyst for the development of dividend irrelevance theory. The theory states that in a perfect capital market, the dividend is not related to the value of the firm and there is no conflict between shareholders and managers (no agency costs). The theory also assumes that all investors have equal access to all information (no information asymmetry) and that no costs are incurred when selling and buying shares (no trading frictions). However, this assumption falls short due to the existence of agency costs, information asymmetry, and trading costs. For example, frictions exist as part of the trading process and frictions such as information asymmetry and agency costs influence the amount and timing of the dividend and affect the value of the firm [26]. The opposite argument posited dividend is related to the value of the firm, and this is known as the dividend relevance theory.

The relevance theory of dividends suggests that an increase in dividends positively influences a firm position in the stock market and vice versa. The pioneers of dividend relevance theory, Lintner and Gordon [31], posited that shareholders prefer dividends to capital gains. This argument suggests that investors are risk averse and prefer to reduce uncertainty causing firms to discount firm earnings at a lower rate and thus all things being equal place better value on firms. However, some other researchers later argue that it should not really matter whether a company pays a dividend or not. As a result, the motive of paying dividends to increase firm value remains controversial to this day. One of the earliest theories to support this claim is the dividend signal theory. The concept of dividend signals is supported by Woolridge (1983), who states that changes or signals about changes in dividends are one of the main drivers of changes in stock prices. Fama and French [15] later documented that dividends can convey information that reinforces a positive relationship between dividends and firm value. Motivated by this inconsistency the study aims to provide an insight into the relationship between dividends and firm value and bridging the gaps by discovering whether board size can moderate the relationship. Additionally, the study is also motivated by real issues namely the increased concern for competitiveness of firms to increase firm value.

In Malaysia, the relationship between dividends and firm value has been studied by academics for more than a decade. The increase in competitiveness becomes one of the driving factors for the emergence of this topic. In particular, increasing globalization, economic development, emphasis on sustainability, and information technology are becoming driving factors for corporate competitiveness. For instance, the Malaysian economy records an increase of 3.3% in the third quarter of 2023 and an increase of 2.9% in the second quarter of 2023, leading to an overall growth of 3.9% in 2023 [9]. As a result, the increase in firm value becomes a critical factor to be considered by shareholders and investors. To significantly increase firm value, paying out dividends is known to be one of the great strategies.

The study was motivated not only by the real issue of the need to enhance firm value in Malaysian firms but also by the unclear discovery of the relationship between dividends and firm value in the Malaysian context. Much recent empirical evidence supports a positive relationship between dividends and firm value in Malaysia [4]. Despite ample empirical evidence to support these claims, the signaling theory has been refuted with empirical evidence that dividends are irrelevant to firm value (Chen et al., 2002, Irum et al., 2012). Additionally, Bakri [5] also discovered a negative association between dividends and firm value, where audit quality becomes a moderator for the study. Using dividend yield as a proxy for dividend, dividend and firm value relationship is rather inconsistent compared to the existing empirical evidence in the Malaysian context [4] and relevant theories of dividends. This inconsistency contributes to the need for further research into the dividend puzzle.

Our study specifically posited that this inconsistency may be due to the size of the board, which could potentially strengthen the relationship. Board size's relationship with firm performance is considered to be a fundamental issue in corporate governance [10]. Agency theory describes the board size relationship with corporate performance in two different ways. The firstview, the economics perspective, perceived that the smaller board size increases monitoring and control and thus enhancesoverall corporate financial performance [20]. However, past empirical evidence neglects to incorporate the resources dependency theory with agency theory to better explain the association between dividends, board size, and firm value. As pointed out, the idea of integrating agency theory with resourcedependency extends the former's gamut. In line with the suggestion, integrate the two theories and explain that the increases in board size also means better monitoring and mitigating the agency cost (agency theory) because a bigger board size improves advisory capacity,

deliberation, and external relations (resources dependency) and thereby enhance corporate financial performance [40].

Empirically, board size is often shown negative association with firm performance in the Malaysia context. As found in many previous studies [6, 30, 33], board size is associated with a negative impact on firm performance. However, many previous studies neglect the concept of agency theory in relation to resources dependency theory in reducing the agency problem as well. For example, increasing the size of the board of directors also means increasing monitoring and control mechanisms providing a larger size of talent and skills, which reduces the agency problem and the likelihood of management misconduct (e.g., tunneling incentives or investing in unprofitable projects).

In addition to the theoretical aspect, we also discuss the empirical aspect or the discovery of this relationship. To get a better insight into the relationship between board size and dividend as well as firm value, the study first looks at the previous empirical relationship between board size and dividend. Previous empirical studies have found that board size positively influences dividend payout. For instance, Elmagrhi et al. [14] found a positive relationship between board size and dividend payout among small and medium-sized companies in the UK for the period from 2010 to 2013. Similarly, Khan [25] and García-Meca, E et al. [16] in a recent empirical study found that board size is positively associated with dividends. The results suggest that not only the strong positive association between board size and dividend was found in much earlier studies, but also in most of the more recent studies. This also suggests a strong and consistent positive relationship between board size and dividends.

Second, and finally, we discuss the empirical evidence for the relationship between board size and firm value. The empirical evidence for this relationship is quite abundant. For example, Mak and Kusnadi [33] found a negative relationship between board size and firm value in Malaysia and Singapore, suggesting that the larger the board, the lower the firm value. A much earlier empirical study in small companies also found a negative correlation between board size and enterprise value in Finnish companies [13]. A study in Australian companies has also found a strong negative correlation between board size and enterprise value, and the result also shows that this correlation is stronger in small companies [35]. A recent empirical study also found a negative relationship between board size and firm value [6, 30]. Despite the negative relationship between board size and firm value, our studies suggest that the property of board size would increase firm value in mitigating the agency problem by controlling and monitoring dividend payouts. In other words, the positive effect of board size on ensuring better dividend payout would outweigh the negative effect of board size on firm value.

The rest of this chapter is as follows: The next section deals with the literature review, followed by the methodology, the results, the discussion and finally the conclusion based on the discovery of the results.

Literature review and hypothesis development

The topic of dividends and firm value is still relevant today because of its significant contribution in the field of corporate finance. The dividend decision is of great importance to firms as it indicates their performance and future growth potential [2, 43]. Leary and Michaely [28] documented that managers place a premium on the stock of a company that pays a stable dividend and that managers behave in such a way that the dividend matters for firm value. While there is ample empirical evidence and theory to support the relevance of dividends to firm value, early theory on the relationship between dividends and firm value established their irrelevance. In general, the dividend and firm value relationship can be divided into two schools of thought. The first school of thought was pioneered by the relevance theory of dividend, and this theory posited that dividend poses an impact on firm value. On the contrary, the second school of thought provides the opposite claim where dividend is irrelevance on firm value.

Dividend irrelevance theory

Dividend irrelevance theory is considered to be one of the most remarkable theories in the world of corporate finance, first put forward by Nobel Prize winners Miller and Modigliani [34]. The theory assumes that in a perfect capital market, the dividend payout is not related to the value of the firm. The theory also assumes that in an ideal business world, there are no conflicts between shareholders and managers and that investors have equal access to all information. Furthermore, according to this theory, there are no costs for buying and selling shares and no difference is seen between the tax rates for dividends and capital gains. Furthermore, the theory suggests that the dividend policy follows the investment decision made, which then becomes the residual dividend policy and thus results in the dividend having no impact on the value of the firm.

Dividend relevance theory

In contrast to the theory of dividend irrelevance, the theory of dividend relevance comprises several theories that

underpin the relevance of dividends for firm value. In this study, we discuss the most important and influential theories of dividend relevance.

Bird in hand theory

This theory states that in a world of economic uncertainty, investors prefer dividends (i.e., a bird in the hand) and capital gains (i.e., two in the hand). The latter may be correlated with the future of the company, which is much riskier than the current dividend. Therefore, they are willing to pay a higher price for companies with dividend payments, which leads to a higher company value [18, 45].

Signaling theory

In general, information asymmetry arises when one party has more information than another. In the context of corporate governance, a company is likely to have more information about current and future company performance than an outsider. Therefore, managers can use the dividend as a tool to give signals to the financial market about current and future company growth [23]. In addition, Lintner [31] has highlighted managers' concerns about the signal of the company's earnings distribution over time. Accordingly, Bhattacharya's [7] proposition describes how the dividend serves as a function of the firm's financial health, which is indicated by the dividend payout reflecting future firm performance. Theoretically, a higher dividend signals a higher valuation of the firm.

Agency theory and free cash flow hypothesis

In addition, agency theory and free cash flow hypothesis are also used to prove the relevance of dividends to firm value. Agency theory suggests that the interests of shareholders and managers are not the same, and thus, dividends can act as a control mechanism to better control cash flow (monitor). Additionally, the free cash flow hypothesis implies that dividends are paid to shareholders to prevent the manager from misusing capital. Jensen [21] argues that free cash flow at the managerial level may lead to investment in unprofitable investment opportunities. Therefore, investors prefer a firm that minimizes agency costs by paying higher dividends. As a result, investors invest more in such a firm than in a firm that pays little or no dividends [42].

Empirical evidence on dividend relevance

The importance of the dividend for the value of the company is not only discussed in the theories but also empirically examined. Empirical evidence shows a positive relationship between dividends and firm value, but it is controversial how dividends affect firm value. For example, Fama and French [15] found a positive relationship between dividends and firm value and argued that this is because dividends pick up information about the firm's future business prospects. Pinkowitz et al. [42], on the other hand, argue that investors value a firm that pays dividends better because they appreciate the firm's efforts to mitigate the agency problem (better corporate governance). A mixed argument has been put forward by Baker and Wugler (2004) who claim that the relationship between dividends and firm value depends on the premium that could lead to a positive or negative association.

Up to a decade later, the inconsistency between dividends and enterprise value persists. For example, Dang et al. [11] and Bakri [5] discover a positive relationship between dividend and firm value in Vietnam and Malaysia, respectively. However, Bakri [4] and Sondakh [44] also found a negative relationship between dividends and firm value. For example, Bakri [4] demonstrated that dividends have a negative impact on firm value when dividend yield is used as a proxy for dividends. In terms of distributable net income, the dividend policy shows how successful the company is in increasing shareholder wealth [19]. In terms of a company's financial performance, dividend policy is also a factor that determines the success of the firm. Previous research has examined the impact of the dividend payout ratio on firm value in detail [1] and found that the dividend payout ratio has a positive effect on share price, which reflects the value of the firm.

However, Dennis and Smith [12] claim that dividend policy has a detrimental effect on firm value. Setting an artificial dividend can lower the value of the company as it diverts capital from investment to consumption of luxury goods. Dennis and Smith [12] also found in a separate analysis that dividend policy has no impact on firm value. The inconsistency of the relationship between dividends and firm value suggests that a possible moderating factor could influence this relationship. We therefore suspect that board size may contribute to this inconsistency and could be an important moderating factor. Past empirical evidence has shown that board size positively affects dividends [14, 16, 25] and, on the contrary, negatively affects firm value [6, 13, 30, 33, 35]. After considering the empirical aspect of the relationship, the next section discusses and develops the hypothesis based on the theoretical aspect supported by the empirical aspects discussed in this section.

Agency theory, dividend and firm value

Agency theory was originally developed by Jensen and Meckling in 1976 [22]. This theory states that the governance mechanism of a firm or organization is based on the conflicts of interest between the company owner

(shareholder), the manager and the provider of capital in the form of outside capital. According to this theory, the agency problem is something inevitable and the only way to control it is through the use of regulation, instruments, or mechanisms. One of the most popular instruments used or proposed by scholars to potentially mitigate the agency problem is the dividend. This idea is supported by the free cash flow hypothesis developed by Jensen in 1986, which states that dividends are paid to shareholders to prevent the manager from investing in unprofitable projects and, in the worst case, in his own personal interest (tunneling incentives). Based on this theory, we have thus established that dividends should reduce the agency problem.

Agency theory, board size and firm value

When it comes to the relationship between board size and firm performance, agency theory also plays an essential role in explaining the basis of this relationship. Agency theory posits that having a larger board grants efficient monitoring by mitigating the CEO denomination inside the board and simultaneously protecting the interest of the shareholder [3]. Additionally, the improved monitoring would then lead to uncertainty avoidance, as suggested by Li and Harrison [29], and the reduction in agency costs would eventually lead to better firm performance [24]. However, substantial amount of empirical studies on the relationship between board size and firm performance argues against the agency cost theory. For example, Mak and Kusnadi [33] discover a negative relationship between board size and firm performance in Malaysia and Singapore. Liao et al. [30] and Ben and Chouaibi [6] also find a negative relationship between board size and firm performance. The result of this empirical evidence points to the stewardship theory. Stewardship theory states that a manager left to his own devices acts as a steward of the assets he controls [24].

However, despite the empirical results pointing more to the stewardship theory than to the agency cost theory, we believe that agency costs and resources dependency theories play a more important role when it comes to the relationship between dividends and firm value, at least in the Malaysian context. This is because a larger board ensures better control and monitoring of dividend payments to shareholders. Also, a larger board can have more diversity in the board background, e.g., more professionals from different fields, who in turn make better decisions for overall performance without compromising the minority (provide dividend payout). In other words, agency theory would potentially outweigh stewardship theory in the relationship between dividend and firm value when board size acts as a moderator.

Resources dependency theory, board size and firm value

Resources dependency theory was introduced by Pfeffer in Salancik in 1978 [41]. The principle of the theory is that an organization such as a firm or profit-oriented organization required to engage with other actors and organizations within its environment to acquire the resources. Concerning board size and firm performance, resource dependency theory suggests that board size is considered to be a bank of resources [3]. This is because the board size provides the necessary resources, skills, knowledge, and expertise to invest in innovative projects (Chen, 2012). Based on the argument in Sects. "Agency theory, dividend and firm value," "Agency theory, board size and firm value," and "Resources dependency theory, board size and firm value," we thus hypothesize that:

Hypothesis 1 Board size moderates the relationship between dividend and firm value in Malaysia.

The study thus aims to unravel this mystery by examining the relationship between these variables, with board size included as a moderator. (Fig. 1) The following research framework used as a visual representation of the moderating effect of board size on the relationship between dividend and firm value:

Methodology

Empirical model

The following model specification used to examine the moderating effect of board size on dividend and firm value relationship:

$$\begin{aligned} Tobin's\ Q_{i,t} =& \alpha + \beta_1 DPS_{i,t} + \beta_2 Board\ size_{i,t} \\ &+ \beta_3 DPS * Board_{i,t} + \beta_4 Log(size)_{i,t} \\ &+ \beta_5 TLTA_{i,t} + \beta_6 Blockholder_{i,t} \\ &+ \beta_7 Cash\ holding_{i,t} + \varepsilon_t \end{aligned} \tag{1}$$

Tobin's q is the firm value, DPS is the dividend per share, board size is the total number of board members in the firm, DPS*board is the interaction term between DPS, and board size used as moderator. In addition to moderator variables, we also add control variables that

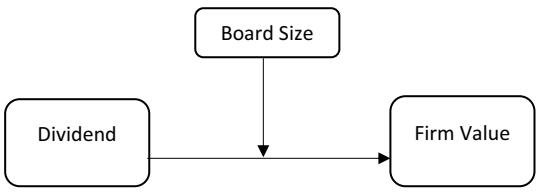

Fig. 1 Research framework (integrating agency and resources dependency theories)

can potentially influence firm value. These variables include TLTA, representing total liabilities relative to total assets, blockholder, representing the percentage of strategic ownership of 5% or more, cash holdings, representing cash and cash equivalents divided by total assets, and ε_t is the error term. The sources of the data collected are from DataStream and annual report, the range period is between 2012 to 2021. The process of collecting data through various filtering processes, for instance, we exclude banks and financial sectors in the sample due to this sector being heavily regulated (Dewasiri et al., 2016). Additionally, all individual data were winsorized at 1 and 99 percent percentile to mitigate the potential outlier. We used Stata, specifically version 17.0, to perform the analysis.

Results

Table 1 presents the descriptive statistics of the variables tested for the moderating effect of dividend on firm value in Malaysia. As shown in Table 1, the number of observations is unbalanced due to some incomplete financial data. The highest mean value is reported by blockholder at 50.20, followed by log (size) and board size at 12.87 and 7.38, respectively. The mean values of the remaining variables are less than 2 at 1.35, 0.41, 0.36, 0.17, and 0.04 respectively. Blockholder variable has the highest standard deviation at 17.61, followed by board size and log(size) at 1.97 and 1.72, respectively. Table 1 also shows the minimum and maximum value for each variable tested in the study. Tobin's Q ranges from 0 to 7.67, DPS from 0 to 0.57, board size from 4 to 13, DPS*Board size from 0 to 25.30, log(size) from 2.30 to 19.02, TLTA from 0.02 to 0.99, Blockholder from 0 to 85 and finally Cash balance from 0.003 to 0.66.

Table 1 Descriptive statistics

Variables	Observation	Mean	Standard deviation	Min	Max
Tobin's Q	5123	1.3492	1.2271	0.0000	7.6676
DPS	5140	0.0404	0.0945	0.0000	0.5700
Board size	5151	7.3871	1.9663	4.0000	13.0000
DPS*Board	5129	0.4127	1.5526	0.0000	25.2900
Log (size)	5167	12.8763	1.7199	2.3026	19.0206
TLTA	5166	0.3651	0.2043	0.0177	0.9463
Blockholder	5096	50.2000	17.6135	0.0000	85.0000
Cash holding	5167	0.1686	0.1437	0.0028	0.6664

Table 2 Pearson correlation matrix

	Panel A							
	Tobin's Q	**DPS**	**Board size**	**DPS*Boardsize**	**Log (size)**	**TLTA**	**blockholder**	**Cash holding**
Tobin's Q	1							
DPS	0.3747***	1						
Board size	0.0648***	0.1836***	1					
DPS*Boardsize	0.3996***	0.7971***	0.1742***	1				
Log (size)	−0.0639***	0.3678***	0.3956***	0.2431***	1			
TLTA	0.1136***	0.0197	0.1115***	0.0653***	0.2622***	1		
Blockholder	0.0653***	0.2660***	0.1595***	0.2030***	0.2790***	−0.0274*	1	
Cash holding	0.2003***	0.1126***	−0.023*8	−0.0478***	−0.1533***	−0.3832***	0.0053	1

	Panel B						
	DPS	**Board size**	**DPS* Boardsize**	**lnsize**	**TLTA**	**blockholder**	**Cash holding**
VIF	3.19	1.20	2.83	1.52	1.28	1.12	1.23
1/VIF	0.3133	0.8357	0.3532	0.6567	0.7800	0.8905	0.8153
Mean VIF	1.77						

***, **, and* denote statistical significance at the 1%, 5%, and 10% levels, respectively

Panel A in Table 2 shows the Pearson correlation matrix between dividends and firm value relationship moderated by board size. As can be seen, the interaction term "DPS*board size" correlates positively with firm value, which is represented by Tobin's Q. Panel A in Table 2 also shows an early signs of multicollinearity as one value above 0.50 (0.7971). However, in deterministic analysis of true multicollinearity, variance inflation factor (VIF) in Panel B demonstrates no sign of multicollinearity. The results show that no mean VIF value is above 4 and the average value is only 1.77. Thus, we conclude that there is no risk of multicollinearity based on the VIF analysis.

Table 3 presents a main analysis of the study. The study uses pooled ordinary least squares (OLSs), random effects (REs), and fixed effects (FEs) for the period from 2012 to 2021. The study uses a two-stage analysis to determine the most appropriate model for the study. First, we conduct the Breusch–Pagan LM test to determine which model is a better fit between OLS and RE. The results of the Breusch–Pagan LM test are less than 0.05, indicating that the random effect is a better fit. In the next phase, we used the Hausman test to determine which of RE and FE is more appropriate. The results of the Hausman test are less than 0.05, indicating that FE is more appropriate. However, for comparison purposes, we still show all the results (pooled OLS, RE and FE) as shown in Table 3.

Panel A and B in Table 3 show the results of the pooled OLS and the random effect. Dividend has a significant and positive relationship with firm value with a coefficient of 3.1194 and 2.3900, significant at the one percent level. Board size also shows a significant and positive relationship with firm value at the one percent level in both pooled OLS and random effect analysis (coefficient 0.0297 and 0.0497). The interaction terms DPS*board size shows a positive relationship with firm value at the one percent level (0.1654 and 0.1312 coefficient) in both the pooled OLS analysis and the random effects analysis, suggesting that board size significantly moderates the relationship between dividend and firm value. The control variables used in this study are differently related to dividend. For example, firm size has a negative and significant relationship with dividend (−0.1836 and –0.3186 coefficient) at the one percent level in both the pooled OLS analysis and the random effect analysis. In contrast, leverage (TLTA) and cash holding have a positive and significant relationship with firm value with coefficients of 1.3941 and 1.5102, respectively, at one percent significant level in the pooled OLS. On the other hand, the coefficients for the control variables in the random effect are significant at the one percent and five percent levels with 1.2514 and 1.3723, respectively, as shown in the table. On the other hand, blockholders demonstrate an insignificant relationship with firm value in both models.

Panel C in Table 3 shows that a fixed effect is the best-fitting model after being tested by the Breusch–Pagan test LM and the Hausman test. The result of Panel C, Table 3, shows a consistent significant result from Panel A and B, except for a few variables such as board size and blockholders. In Panel C, dividend and board size have a significant positive correlation with firm value with a coefficient of 1.5506 and 0.0487, respectively, which is significant at the one percent level. The interaction term

Table 3 Main Result-Pooled OLS, Random Effect and Fixed Effect

Variables	Panel A: Pooled OLS	Panel B: Random Effect	Panel C: Fixed Effect
DPS	3.1194*** (0.2745)	2.3900*** (0.3113)	1.5506*** (0.3420)
Board size	0.0297*** (0.0078)	0.0497*** (0.0088)	0.0487*** (0.0096)
DPS*board size	0.1654*** (0.0166)	0.1312*** (0.0188)	0.1125*** (0.0205)
Log(size)	−0.1836*** (0.0110)	−0.3186*** (0.0172)	−0.3819*** (0.0216)
TLTA	1.3941*** (0.0792)	1.2514*** (0.0912)	1.1400*** (0.1000)
Blockholder	0.0011 (0.0009)	0.0008 (0.0011)	−0.0032** (0.0012)
Cash holding	1.5102*** (0.1113)	1.3723*** (0.1138)	1.3862*** (0.1205)
Constant	2.4878*** (0.3360)	4.1711*** (0.8500)	5.3156*** (0.2936)
Observations	5057		
Industry dummy	Included	Included	Excluded
Year dummy	Included	Included	Excluded
Breusch–Pagan LM test	7404.57 (0)		
Hausman test	105.78 (0)		

This table presents the Pooled OLS, RE and FE for Eqs. (1). Standard errors are reported in parentheses. P values for the Breusch–Pagan LM test and Hausman test are reported in squared brackets

***,**, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively

between dividend and board size (DPS*board size) shows a positive and significant relationship between dividend and enterprise value, suggesting that board size does indeed have a significant and positive impact on the relationship between dividend and firm value. The remaining effects of the control variables are similar to those in panels A and B, but blockholders have a significant impact on firm value.

Our result, presented in Table 3, might suffer from heteroskedasticity and serial correlation due to the nature of panel data. To mitigate this problem, following Ofori Sasu, Abor and Osei [39], we used a robust standard error calculation in the additional analysis. The result of the analysis is shown in Table 4, Panel A, B and C. Using the result in Table 4, we note that the results presented in Table 3 remain consistent even after weakening the potential heteroskedasticity and serial correlation. The persistent and consistent significant relationship of the variables tested in Table 4, especially the interaction terms, indicates that board size does indeed positively and significantly moderate the relationship between dividend and firm value, even after weakening the potential heteroskedasticity and serial correlation problems.

Robustness check

The document results, as illustrated in Table 3, may not be robust to the heteroskedasticity and serial correlation issue. Thus, we follow Law et al. [27] in using robust standard error for robustness check of our result.

Discussion

Although a considerable number of studies have examined the relationship between dividends and firm value, the existing evidence remains inconclusive due to inconsistency of results and theory suggesting a contradictory relationship. Therefore, we re-examine the relationship between dividend and firm value by adding board size as a moderator and re-examine on whether the outcome supports the proposed integrated theories of agency and resources dependency.

In the first part of the analysis, we used pooled OLS, random effects, and fixed effects to identify the role of board size as a moderator between dividends and firm value. In Table 3, Panel A, B and C, we find a strong relationship between dividend and firm value and a strong positive moderating effect of board size on the relationship between dividend and firm value. The results are consistent with the earlier findings of Bakri [4], Dang et al. [11], Fama and French [15]. The results suggest that firms that pay higher dividends are likely to have better firm valuation and that board size has a significant impact on dividend payout, thus contributing to better firm valuation. A notable discovery of the study, based on agency theory, highlights the very important key aspect of board size on the relationship between dividend and firm value. The discovery suggests that a larger board is more effective in controlling and monitoring opportunistic behavior (agency cost) by management. Since a larger board is associated with more expertise and experience (resources dependency), it can mitigate the agency problem while improving firm performance, including dividend payout [36–38]. Consequently, the relationship

Table 4 Pooled OLS, Random Effect and Fixed Effect (Robust Standard Error)

Variables	Panel A: Pooled OLS	Panel B: Random Effect	Panel C: Fixed Effect
DPS	3.1194*** (0.4422)	2.3900*** (0.6018)	1.5506** (0.5895)
Board size	0.0298*** (0.0085)	0.0497*** (0.0139)	0.0487** (0.0146)
DPS*board size	0.1654*** (0.0327)	0.1312** (0.0460)	0.1125* (0.0449)
Log(size)	−0.1835*** (0.0183)	−0.3186*** (0.0620)	−0.3819*** (0.0852)
TLTA	1.3941*** (0.1117)	1.2514*** (0.2221)	1.1400*** (0.2337)
Blockholder	0.0012 (0.0009)	0.0007 (0.0021)	−0.0032 (0.0025)
Cash holding	1.5102*** (0.1547)	1.3723*** (0.2676)	1.3862*** (0.2962)
Constant	2.4878*** (0.2269)	4.1711*** (0.7092)	5.3156*** (1.0713)
Observations	5057		
Industry dummy	Included	Included	Excluded
Year dummy	Included	Included	Excluded
Breusch–Pagan LM test	7404.57 (0)		
Hausman test	105.78 (0)		

This table presents the Pooled OLS, RE and FE for Eqs. (1). Standard errors are reported in parentheses. *P* values for the Breusch–Pagan LM test and Hausman test are reported in squared brackets

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively

between dividend and firm value can be strengthened by board size as a moderator variable.

In the second part of the analysis, we also used pooled OLS, random effects, and fixed effects, but with robust standard error to mitigate potential heteroskedasticity and serial correlation. The result remains consistent as shown in Table 3. Table 4 also suggests that board size positively affects the relationship between dividend and firm value after addressing the potential concerns of heteroskedasticity and serial correlation. This also suggests that the monitoring and control effect of board members increases expertise and experience as the number of members increases, thereby reducing the likelihood of managerial misconduct (i.e., tunneling incentives). The results of the study once again are consistent with the argument of Ntim [36], Ntim et al. [37] and Ntim et al. [38] that board size could reduce the agency problem and improve dividend payout while increasing firm performance. The result of the analysis also implies that agency and resource dependency integration can be used to explain this empirical result.

Conclusions

This paper examines the moderating effect of board size on the relationship between dividend and firm value using a sample of the Malaysian market for the period 2012 to 2021 by integrating an explanation from agency and resource dependency theories. Our study contributes to the literature in several ways. First, despite numerous empirical studies examining the impact of dividend on firm value, previous studies have neglected the role of board size as a moderator and lack empirical explanation and integration between agency and resources dependency theories aspect to provide more insight into this dividend puzzle, especially in the context of Malaysian markets. Although previous empirical studies have found that board size has a negative impact on firm value, previous empirical studies have neglected the fact that larger board size is associated with more expertise and experience (resources dependency) to influence the direct negative relationship. This can mitigate the agency problem and increase dividend payout, which simultaneously increases firm value. Second, our discovery offers a number of implications for shareholders, policymakers, and regulators in other countries, particularly those with relatively similar governance environments. The results suggest that while board size can have a negative impact on firm value, as has been found in many previous studies, regulators, policymakers, and especially shareholders should not only be concerned with the direct negative impact, as board size also serves as a control and monitoring mechanism, especially in providing better dividend payout, which in turn leads to better firm valuation.

Our study, like all previous studies, is subject to some limitations. First, the data focused on the Malaysian market, so the results may not be generalizable to other regions, especially countries with a different governance environment. Future studies could test the impact of board size as a moderator with significant differences in governance environment. Second, the study tested only one moderator, which may not cover the entire mystery of the dividend puzzle. We therefore strongly recommend that future studies also examine other moderators that potentially have a strong relationship with dividends and firm value simultaneously. Furthermore, and in conclusion, the data used in this study focus on secondary data analysis. Future studies should engage in qualitative analysis through face-to-face interviews to gain a better understanding of how board size can actually contribute to mitigating agency problems while increasing dividend payout and firm value.

Abbreviations

DPS	Dividend per share
FE	Fixed effect
LM	Lagrange multiplier
LOG	Natural logarithm
OLS	Ordinary least square
RE	Random effect
TLTA	Total liability over total asset
VIF	Variance inflation factor

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Author contributions

MAB structured the research framework, analyzed and interpreted the research data, and developed the conclusion. NA and HMG developed and constructing the review of literature.

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Availability of data and materials

The dataset used or analyzed during the study is available from corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

Not Applicable.

Consent for publication

Not Applicable.

Competing interest

The authors declare that they have no competing interests.

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