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Corporate Governance Structure and Corporate Risk-Taking: Evidence of Malaysian Agriculture Sector

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A B S T R A C T

Purpose: This study explores the role of corporate governance structure and corporate risk-taking of on Malaysian agriculture sector. Despite its importance in mitigating climate change, the agricultural sector also faces global competition, market liberalisation, rapid technological advances and the starter of stricter quality and safety procedures, all of which require firms to take greater risks.
Design/methodology/approach: This study explores this relationship by applying generalised least square (GLS), random effect methodologies (REM). The sample of this study uses panel data from 2015 to 2021.
Findings: The findings report a negative relationship between corporate governance structure and corporate risk-taking using a sample of firms from an emerging market.
Research limitations/implications: The effects of these results for management practice and recommendations for further research were examined. The limitation of this study provides a sample of study using a limited number of agricultural firms in Malaysia.
Originality/value: While this empirical study used a single industry-focused sample, most previous studies have focused on multiple industries. A key feature of this study is the analysis of how corporate governance structures affect the risk appetite of Malaysian agribusinesses.

Keywords: Corporate governance, Corporate risk-taking, Agriculture

I. Introduction

Undoubtedly, the agricultural sector played a significant role in fostering Malaysia's economic progress throughout the years after its independence. The significant contribution it made to the financing of Malaysian economic activity may be mostly attributed to the substantial export revenues generated from agricultural commodities, namely palm oil and rubber. Agricultural disciplines, including biotechnology, agricultural sciences, and agribusiness, have garnered considerable interest among experts and scholars at local institutions. The industry is expected to maintain its crucial role in government efforts to alleviate poverty. It is anticipated that the industry will overcome the negative perception associated with rural poverty and

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agriculture, and instead be seen as a promising sector with strong economic potential. On the other hand, climate change still an existential threat to humanity. Climate action failure is the most impactful and second most likely long-term risks identified (Global Risk Report 2022). This paper contributes to the discussion of corporate governance structure and corporate risk-taking by drawing on the agency theory framework. The objective of this research is to provide empirical data on the role corporate governance on corporate risk-taking in Malaysia Agricultural firms since few studies is done in this area and considered its importance to mitigate climate change.

Previous study has shown inconclusive results about the relationship between corporate governance and company risk-taking, particularly when examining a specific sector. Numerous empirical investigations have been conducted to examine the relationship between corporate governance and business risk-taking across various sectors. Many research papers that investigate diverse sectors. Notably, some of these studies focus on Indian firms (Koirala et al., 2020), Indonesia firms (Hatane et al., 2019), Chinese firms (Shahzad et al., 2019), Jordan firms (Al-Smadi, 2019), Thailand firms (Jumreornvong et al, 2020) and others. Nevertheless, recent scholarly literature and empirical research have shown that using a solitary sector as the study's sample, for instance, New Zealand enterprises operating in the agriculture sector (Koerniadi, Krishnamurti and Tourani-Rad, 2014), the perspective appears to be obsolete in light of contemporary concerns. The use of industrial dummies for the purpose of mitigating industrial effects has been shown to be insufficient in addressing the limitations associated with these effects. This inadequacy arises from the fact that diverse firms operate within many industries, resulting in a range of distinct industrial effects (Wan and Hoskisson, 2003). Therefore, the primary objective of this research is to examine a specific industry by selecting enterprises as the sample, in order to account for the potential influence of industrial factors (Danso et al., 2016). These investigations have had varying outcomes. This study's results have identified the negative impact of corporate governance on the risk-taking behaviours of agricultural firms.

In Malaysia, a culture of good governance amongst capital market participants are encouraged. Greater emphasis is being placed on self and market regulation to complement the existing comprehensive regulatory framework. It is suggested that a strong corporate governance culture must be premised on a dynamic synthesis of efforts between regulators and the market (Securities Commission Malaysia). However, the governance process does not evolve as the increasing professionalization process of the agricultural activity requires. The "governance risk" is still poorly addressed in Malaysia environment, which often limits the potential of operations in agriculture industry especially in rural areas. The governance problem explored in this study addresses the alignment of interests between various stakeholders in the agriculture organization.

Divergences in relation to the vision of the future of the business, expectations regarding the allocation of profits, expansion of investments, exposure to debt, appointment of family members to management positions, among others, indicate the potential for conflicts. The corporate governance problem explored in this study addresses the alignment of interests between various stakeholders in the organization towards corporate risk-taking activities. As the generations succeed one another in the division of assets and in the control of the rural property, conflicts of interest are enhanced.

Conversely, agency theory posits that managers and stockholders exhibit divergent perspectives and preferences about risk (Jensen and Meckling, 1976a, b). The concept of agency conflict has significant importance in explaining the disparities seen in business risk-taking, which serves as an important variable in determining corporate achievements. Managers often exhibit risk-averse behaviour due to their inclination to mitigate any hazards that might impact their professional standing and position within the organisation. Conversely, shareholders often favour a more aggressive approach, encouraging the business to undertake higher risks in order to maximise its earnings. Divergences in relation to the vision of the future of the business, expectations regarding the allocation of profits, expansion

of investments, exposure to debt, appointment of family members to management positions, among others, indicate the potential for conflicts (Alcantara & Machado Filho, 2014). This study starts with the mitigation of excessive risk-taking factors is associated with the, involving the structuring of corporate governance in agricultural firms.

The primary objective of this research is to examine the relationship between corporate governance and corporate risk-taking behaviour within the context of Malaysian agricultural companies. The substantial expansion of agricultural enterprises plays a crucial role in fostering economic growth and facilitating overall development. Corporate risk-taking plays a crucial role in attaining a competitive edge by exploring new avenues for development, ensuring enduring stability and sustainability, and promoting economic growth at both local and national levels (John et al., 2008; Su et al., 2019). Convincing decision-makers at the organisational level to embrace increased levels of risk-taking to optimise performance may sometimes be a challenging endeavour (Covin and Wales, 2012). However, an excessive risk-taking could affect overall performance of agriculture performance. Since global financial crisis has resulted in overall economy and massive bankruptcies due to excessive risk-taking. Conversely, the potential cause for the diminishing profitability and performance of agricultural enterprises in the nation might be attributed to the decrease in agricultural output resulting from climate change. However, the extent to which corporate governance serves as a monitoring mechanism for corporate risk-taking in agricultural companies remains little acknowledged.

The objective of this research was to enhance comprehension of corporate governance and its impact on corporate risk-taking endeavours. The issue has significant importance in terms of attracting investment in agricultural companies and augmenting their overall worth. The examination of the relationship between company performance and corporate risk-taking has significant relevance within the context of Malaysian agricultural firms. This sector serves as a pivotal component of the Malaysian economy, playing a crucial role in attracting foreign direct investment and generating job opportunities for those residing in rural areas. The present study's research enhances the understanding of the impact of corporate governance on business risk-taking within the context of the Malaysian agriculture sector. The research revealed that corporate governance has a negative impact on corporate risk-taking. Specifically, it was observed that Malaysian farming companies had the potential to enhance innovation by engaging in higher levels of risk. Therefore, the findings of this research provide several perspectives on the challenges within the agricultural sector of a developing economy and elucidate the significance of this domain for such countries.

II. Literature Review

The following paragraphs provide an overview of the extensive literature on agency theory and the agriculture sector trend in the Malaysian environment. Subsequently, the research examines the corporate governance structure and corporate risk-taking to formulate its hypothesis.

A. Theoretical Literature Agency Theory

Agency theory revolves around the issue of the agency problem and its solution (Jensen & Meckling, 1976; Ross, 1973). The history of agency problem dates back to the time when human civilisation practiced business and tried to maximise. their interest. Agency problem is one of the age-old problems that persisted since the evolution of the joint stock companies. It cannot be ignored since every organisation possibly suffered from this problem in different forms. With the change in the time, the agency problem has taken different shapes and the literature has evidence about it. The discussion on the literature of agency theory is very much in need to understand the agency problem,

its various forms and the various costs involved in it to minimise the problem.

In order to address the challenges posed by agency issues and conflicts of interest inside corporate entities, corporate governance systems advocate for the establishment of boards of directors that exhibit diversity. The inclusion of directors with diverse backgrounds enhances the credibility and enhances the effectiveness of monitoring processes (Francoeur et al., 2008). Numerous governance systems have been devised and used by firms and financial markets in order to address and mitigate conflicts of interest (Dalton et al., 2007).

B. Corporate Governance and Risk-Taking

Corporate governance provides a framework of control mechanisms that support the company in achieving its goals, while preventing unwanted conflicts. The pillars of corporate governance such as ethical behaviour, accountability, transparency, and sustainability are important to the governance of companies and stewardship of investors' capital. Companies that embrace these principles are more likely to produce long-term value than those that are lacking in one or all.

Proper corporate governance identifies the distribution of rights and responsibilities among different participants in the company and outlines among others the rules and procedures for decision-making, internal control, and risk management. Corporate governance is not only concerned with shareholder interests but requires balancing the needs of other stakeholders such as employees, customers, suppliers, society, and the communities in which the companies conduct their business (Securities Commission Malaysia, April 2021).

In this study, we use the agency theory and resource dependency theory to demonstrate the correlation between various corporate traits and connections. In order to address the challenges posed by agency issues and conflicts of interest inside corporate entities, corporate governance systems advocate for the establishment of boards of directors that exhibit diversity. The inclusion of directors with diverse backgrounds enhances the credibility and enhances the effectiveness of oversight (Francoeur et al., 2008). Numerous governance systems have been devised and used by firms and financial markets to address and alleviate conflicts of interest (Dalton et al., 2007).

C. Hypothesis Development

Institutional shareholders are motivated to monitor corporate risk-taking because they know that corporate risk-taking has a crucial link with firm performance. Prior literature provides evidence that shifts in ownership and control impact performance variation linked to corporate risk-taking (Nguyen, 2011; Sakawa et al., 2021; Yim 2021). Information asymmetry between managers and shareholders also affects corporate risk-taking. Institutional investors could also reduce information asymmetry by pressuring firms to disclose information (Heflin and Shaw 2000; Rubin 2007). Based on these arguments, this study conjectures a hypothesis:

H1. There is a significant correlation between institutional ownership and corporate risk-taking.

The association between the size of a company's board and its level of risk exhibits varying outcomes. The agency hypothesis posits that boards of directors that are larger in size have challenges related to communication and coordination. These challenges, in turn, discourage them from making choices that are considered high risk or contentious. Consequently, larger boards tend to be linked with decisions that carry lower levels of risk and are of a moderate nature (Nakano and Nguyen, 2012). The resource dependency hypothesis posits that the presence of robust and expansive boards might potentially mitigate company risk-taking tendencies, particularly when these boards are composed of highly competent and well-informed individuals (Pfeffer and Salancik, 1978). Therefore, bigger boards facilitate the acquisition of

resources by providing guidance, counselling, and industry contacts, therefore exerting an influence on the value of shareholders, and safeguarding the interests of executives.

The empirical results are equally mixed. Yermack (1996) suggested that smaller boards have a higher likelihood of promoting wealth creation and tend to have a greater propensity for making riskier management choices compared to bigger boards. Using a sample of Japanese firms, Nakano and Nguyen (2012) found that firms with larger boards exhibit lower risk-taking. Using a sample of UK firms, McNulty et al. (2013) showed that board size has a negative effect on financial risk. Pathan (2009) indicated that the use of smaller boards incentivizes United States banks to assume higher levels of risk. In a recent study conducted by Akbar et al. (2017), a sample of UK businesses was used to examine the relationship between board size and risk-taking behaviour inside financial organisations. The findings of the study indicated that board size did not have a statistically significant influence on the risk-taking tendencies of these financial institutions. In a similar vein, Coles et al. (2008) reported a lack of impact associated with board size. Hence, this study proposes the following hypothesis:

H2. There is a significant correlation between board size and corporate risk-taking.

Previous studies suggested that there can be at least four different effects associated with the increase of tenure (Chen and Zheng, 2014). First, longer tenure may increase managerial power (Hermalin and Weisbach, 1998). Second, as tenure increases, managers also have more undiversified human capital invested in the firm (Berger et al., 1997). Third, the experiences of a manager may also accumulate with tenure (Simsek, 2007). Finally, the increase of tenure also implies declining career concerns of a manager (Gibbons and Murphy, 1992). On the other hand, Chen and Zheng (2014) suggested that tenure of CEO has positive significant impact on corporate risk-taking. Among these effects, the impact of human capital investment on managerial risk-taking is unambiguously negative (Amihud and Lev, 1981; Bloom and Milkovich, 1998; Chakraborty et al., 2007), which results in the following:

H3. There is a significant correlation between tenure of CEO and corporate risk-taking.

According to agency theory and resource dependency theory, the presence of independent directors serves to mitigate the conflict of interest that may arise between management and shareholders (Jensen and Meckling, 1976), bring new skills, knowledge, expertise to the firm (Pfeffer and Salancik, 1978) and signal to stakeholders. The company demonstrates a high level of trustworthiness in its ability to make sound business judgements, and its risk-taking conduct aligns appropriately with its investment decisions. Prior studies have shown that independent directors have a propensity to endorse investments in initiatives with lower levels of risk (Pathan, 2009) and enhancing the efficacy of board operations and oversight is crucial, given that boards are not accountable to management and their primary focus is in protecting their image. In general, the existing body of evidence supports the idea that board independence has a mitigating effect on company risk-taking tendencies. For instance, using a sample of US firms, Brick and Chidambaran (2008) reported that the presence of independent directors has a detrimental impact on the level of risk-taking inside firms. Similarly, Pathan (2009) indicated that the presence of independent directors has been shown to mitigate corporate risk, and more recently, Mathew et al. (2017), Rossi (2016) and Muhammad and Migliori (2022) make similar conclusions. Hence, this study proposes the following hypothesis:

H4. There is a significant correlation between independent director and corporate risk-taking.

Non-independent directors have not much explanation in the literature regarding the nature of their role (Hsu and Wu, 2014; Prasad, Sankaran and Prabhu, 2019). Anderson and Reeb (2004) defined non-independent directors as those directors with existing or potential ties to the firm. For instance, those board members who may have been functioning as non-independent directors might be former employees of the company,

relatives of controlling shareholders, investment bankers and so on (Sarkar et al., 2012). Hence, this study proposes the following hypothesis:

H5. There is a significant correlation between non-independent director and corporate risk-taking.

There are many controversial views about the number of members in the supervisory board, there is an argument that the supervisory board has less than three members, the audit committee does not perform well their supervisory role (Menon & Williams, 1994). Meanwhile, the number of supposedly perfect members ranged from three to four (Abbott, Parker, & Peters, 2004). It is also argued that if the size of the audit committee is too small, the audit committee does not have enough members to perform the functions so the effectiveness of supervision will be reduced (Vafeas, 2005). Prior accounting research (Maletta and Wright, 1996; Beasley et al., 1999) suggests that industry characteristics may have an influence on the level of risk that firms face and, hence, the need for internal monitoring schemes. Previous findings shows that internal audit activities (i.e., more internal audit staff) as a mean for reducing their compliance risk (Carcello et al., 2005; Alhajri, 2017). Hence, this study proposes the following hypothesis:

H6. There is a significant correlation between audit committee size and corporate risk-taking.

Effective risk management ensures risk-taking promotes more innovations and minimizes uncertainty costs to increase companies' performance. The size of the Risk Committee is used as a measure of the willingness of a corporation to expend board money to improve the prestige of clients and the strength of committee. Bedard, Chtourou and Courteau (2004) note that not only does a broad committee have power but the resulting plurality of opinions within a committee makes it more successful in solving possible problems (Ng, Chong, and Ismail, 2013). However, the literature is also discussing certain adverse consequences of large commissions. For this article the makeup of the risk committee as the total number of risk committee members is estimated for absolute terms by a growing number of members within a risk committee.

H7. There is a significant correlation between risk management committee size and corporate risk-taking.

Recent studies have identified the board of directors as a very effective governance vehicle in promoting gender diversity. The presence of gender diversity on corporate boards has been shown to enhance group dynamics, facilitate communication among board members, and promote transparency in disclosures (Francoeur et al., 2008); the implementation of measures aimed at mitigating the influence of the "old boys' club" phenomena serves to diminish its impact, while simultaneously improving openness and encouraging efficient communication within the board (Adams and Ferreira, 2009); and promotes the independence of the board. It is anticipated that the presence of gender diversity on corporate boards would have a favourable impact on board monitoring, capabilities, independence, and efficiency. This, in turn, is expected to contribute favourably to corporate governance and serve as a moderating factor in corporate risk-taking. (Bernile et al., 2018).

Existing literature has shown that gender diversity has a substantial influence on corporate governance and the decision-making procedures inside organisations since (a) boards that are gender-diverse have been shown to be more effective in monitoring managerial activities, (b) gender diversity enhances decision-making processes and outcomes and (c) female directors are generally more concerned with ethics than men (Adams and Ferreira, 2009). The existing body of research on the correlation between gender diversity and business risk-taking presents conflicting findings. On one hand, some studies show that women tend to be more risk-averse than men (Berger et al., 2014), that a negative correlation between increased gender diversity and the level of realised business risk (Bernile et al., 2018; Muhammad and Migliori, 2022), and that higher likelihood of merger and acquisition activity being undertaken by boards that are mostly composed of male members (Levi et al., 2014). On the other hand, other research have shown that female directors have

a greater propensity for risk-taking compared to their male colleagues (Berger et al., 2014). Hence, we propose the following hypothesis:

H8. There is a significant relationship between gender diversity and corporate risk-taking.

III. Research Methodology

A. Sample Selection

This empirical research examines the relationship between corporate governance and corporate risk-taking in Malaysian agricultural enterprises. This empirical research sought to enhance understanding of the relationship between corporate governance and business risk-taking. The significance of this sector lies in its provision of job opportunities for those living in rural regions, as well as its contribution to climate change mitigation via innovative practises. The agriculture industry in Malaysia has played a crucial role in driving economic growth and development. The impact of climate change on agricultural productivity has been seen to be negative. Consequently, agri-businesses are faced with the challenge of navigating global uncertainties and are compelled to assume higher risks to foster innovation, maintain competitiveness, and address climate change. These efforts are crucial for enhancing agricultural output and promoting sustainability in the sector.

The study used a sample consisting of yearly data spanning from 2015 to 2021, which was obtained from the annual reports. The study's sample included non-financial agricultural companies listed on the Main Board of Bursa Malaysia. The present research aims to gather financial data and corporate governance information from the annual reports of companies listed on Bursa Malaysia. The chosen companies were engaged in agricultural operations and dealt with commodities such as fishing, rubber, rice, cocoa beans, and palm oil. The present research used exclusion criteria to exclude financial enterprises, insurance firms, non-profit organizations, and government firms. The final panel data set was refined to include 17 non-financial enterprises, resulting in a total of 102 observations spanning several years for each organisation. Even though the study sample size was small, given the industry specific settings, this sample was not only adequate for statistical analysis but also in line with latest studies (Assenga et al., 2018; Roudaki, 2018; Ahmad & Azhari, 2021).

B. Empirical Method

The present research used panel regression analysis, under the assumption that unobservable variables influenced the level of business risk-taking (Vijverberg and Hasebe, 2015). The fixed panel regression model was updated to account for robust standard errors due to the presence of both longitudinal-series and time-series data in the companies. However, the panel data were unbalanced as some firm-year observations were missing. Initially, this study estimated regressions with Generalised Least Squared (GLS) and using the random-effect model, calculating robust standard errors clustered by firms. These models can control autocorrelation and heterogeneity, which can produce biased results when using traditional OLS estimations (Bell and Jones, 2015; Gujarati, 2004). This study adopted the methodology of Roudaki (2018). All the variables are defined as in Table 1. This study empirical model is given below:

$$\begin{aligned} Risk_{it} = {} & \beta_0 + \beta_1 CG_{it} + \beta_2 Firm\text{-}Age_{it} + \beta_3 Firm\text{-}Size_{it} \\ & + \beta_4 Cash_{it} + \beta_5 Growth\text{-}Opportunities_{it} \\ & + \beta_6 Leverage_{it} + \beta_7 Dividend\text{-}Payout\text{-}Ratio_{it} \\ & + \beta_8 Investment\text{-}Opportunities_{it} \\ & + \beta_9 Firm\text{-}Profitability_{it} + \varepsilon_{it} \end{aligned}$$

where,

$Risk_{it}$ = Corporate risk-taking (Risk1, Risk2 and Risk3)

$\beta_1 CG_{it}$ = Institutional ownership, Board of Director Size, Tenure of CEO, Independent Director, Non-Independent Director, Size of Audit, Risk Management Size, Gender Diversity (female dummy)

β_2Firm-Age$_{it}$ = When the company start until today
β_3Fize-Size$_{it}$ = Total Assets
β_4Cash$_{it}$ = Value of cash
β_5Growth-Opportunities$_{it}$ = Market to book value (MTB)
β_6Leverage$_{it}$ = Total Debt to Total Assets (TDTA)
β_7Dividend-Payout-Ratio$_{it}$ = Total dividend divided by total income
β_8Investment-Opportunities$_{it}$ = Logarithm of sales growth (current sales minus prior sales divided by prior sales)
β_9Firm-Profitability$_{it}$ = Return on Assets (ROA)

Table 1. Definition and measurement of variables

Variables	Description	References
Dependent Variables		
Risk1	A standard deviation of the return on the asset over a three-year spanning period	John, Litov & Yeung (2008); Faccio, Marchica & Maria-Teresa (2011) (Tulcanaza-Prieto et al., 2020) (Arifah et al., 2023)
Risk2	Risk2 The difference between the maximum and the minimum return on asset (ROA) values	
Risk3	Return on sales (ROS) was measured by EBITDA to total assets as corporate risk-taking indicator	John, Litov & Yeung (2008); Chizema et al. (2020)
Independent Variables		
Institutional ownership	Total number of institutional ownerships	Ahmad & Azhari 2022); Yim (2021)
Board of director size	Total number of directors	Akande, Moses, & Tewari (2020)
Tenure of CEO	How long the CEO appointment	Amihud & Lev (1981); Bloom & Milkovich, (1998); Chakraborty et al. (2007)
Independent director	Total number of independent directors	Mathew et al. (2017); Rossi (2016); Muhammad & Migliori (2022)
Non-independent director	Total number of non-independent director	Hsu & Wu (2014); Prasad, Sankara & Prabhu (2019)
Size of audit	Audit Committee Size, number of members on the audit committee	Ngo & Le (2021)
Risk management committee size	How many members in risk management committee	Vafeas (2005); Carcello et al. (2005); Alhajri (2017)
Gender diversity (Female dummy)	Female dummy proxy to gender diversity = female dummy equals to 1 if there is female director in board of director (BOD) and female dummy is equals to 0 if there is no female director in BOD	Bernile et al. (2018); Muhammad & Migliori (2022)
Control Variables		
Firm age	When the company start until today	John, Litov & Yeung (2008); Faccio, Marchica & Maria-Teresa (2011); Ahmad & Azhari 2022); Yim (2021)
Firm Size	Value of total asset	
Cash	Value of cash	
Growth Opportunities	Logarithm of market to book (MTB) ratio (the market value of equity divided by the total book value of equity)	
Leverage	Total Debt divided by total assets	
Dividend payout ratio	Total dividend divided by total income	
Investment Opportunity	Logarithm of sales growth (current sales minus prior sales divided by prior sales)	
Firm Profitability	Return on assets (ROA) was measured by net income divided by total assets	

IV. Results and Discussions

A. Descriptive Statistics and Correlation Analysis

The descriptive statistics of variables included in this study, as shown in Table 2, were the three types of risk-taking measurement, represented as *Risk1, Risk2 and Risk3.* Their mean values were 0.2540 per cent, 0.5180 per cent and 0.1800 per cent, respectively. Results regarding the mean of corporate governance by proxy, using institutional ownership, board size, tenure of CEO, independent director, non-independent director, size of audit, risk management committee and gender diversity, were 0.3380 per cent, 2.2360 per cent, 1.6370 per cent, 0.4780 per cent, 0.0730 per cent, 0.3739 per cent, 1.2610 per cent and 0.6130 per cent, respectively. Table 3 presents the Pearson's correlations that reveal the corporate governance proxies (institutional ownership, board size, tenure of CEO, independent director, non-independent director, size of audit, risk management committee and gender diversity) and most control variables are significantly linked with corporate risk-taking. As anticipated, both corporate governance proxies are negatively connected with corporate risk-taking. Table 3 presents the Pearson correlation between the dependent, independent and control variables of the study. The correlation matrix (Table 3) reports no cases of high correlation, indicating no serious issue of multicollinearity in the analysis.

B. Corporate Governance and Corporate Risk-Taking

This study main empirical results are presented in Table 4. In Table 4, the standard deviation of return on assets (ROA) is regressed on corporate risk-taking variables and control variables using panel data GLS procedure. This study opted for using generalised least square (GLS) panel data models that included random effect models. GLS is one of

Table 2. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Risk1	85	0.2540	0.1860	0.0000	0.5350
Risk2	85	0.5180	0.3770	0.0000	1.1370
Risk3	119	0.1800	0.3370	0.0010	1.4110
Institutional ownership	119	0.3380	0.1460	-0.0030	0.5000
Board size	103	2.2360	2.8720	0.2000	9.0000
Tenure of CEO	119	1.6370	3.2510	0.0000	16.0000
Independent director	119	0.4780	0.3190	0.0000	1.0000
Non-independent director	119	0.0730	0.1830	0.0000	0.8450
Size of audit	91	0.3730	0.2720	0.0000	1.0000
Risk management committee	119	1.2610	2.3800	0.0000	10.0000
Gender diversity (Female dummy)	119	0.6130	0.4890	0.0000	1.0000
Firm age	84	1.1350	0.3730	0.4770	1.6330
Leverage	81	0.2390	0.2750	0.0010	1.1040
Dividend payout ratio	83	0.1710	0.3090	-0.0040	1.3890
Firm size	81	7.1220	1.9940	0.0000	8.9750
Cash	81	5.3960	1.8760	0.0000	7.8840
Growth opportunities	83	1.0110	3.0420	-0.8070	15.1660
Profitability	119	0.4530	0.6550	0.0000	5.9610

Notes: Obs = observations; Std. Dev. = standard deviation; Min = minimum; Max = maximum.

Table 3. Pearson's Pairwise correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Risk1	1.000																	
(2) Risk2	0.938 (0.000)	1.000																
(3) Risk3	0.208 (0.056)	0.117 (0.286)	1.000															
(4) Institutional Ownership	-0.327 (0.002)	-0.301 (0.005)	0.100 (0.278)	1.000														
(5) Board Size	0.226 (0.040)	0.093 (0.403)	0.353 (0.000)	-0.075 (0.454)	1.000													
(6) Tenure of CEO	0.328 (0.002)	-0.011 (0.919)	0.179 (0.052)	-0.098 (0.289)	0.393 (0.000)	1.000												
(7) Independent Director	0.083 (0.450)	0.182 (0.096)	-0.098 (0.290)	-0.341 (0.000)	0.030 (0.763)	0.055 (0.556)	1.000											
(8) Non-Independent Director	0.117 (0.284)	0.143 (0.192)	-0.123 (0.184)	-0.220 (0.016)	-0.173 (0.080)	-0.049 (0.598)	0.182 (0.048)	1.000										
(9) Size of Audit	0.144 (0.204)	-0.114 (0.316)	0.041 (0.702)	0.038 (0.722)	0.318 (0.002)	0.673 (0.000)	0.247 (0.018)	0.162 (0.126)	1.000									
(10) Risk Management Size	0.088 (0.424)	0.122 (0.266)	0.107 (0.248)	0.234 (0.010)	-0.159 (0.108)	-0.157 (0.088)	-0.244 (0.007)	0.064 (0.486)	-0.009 (0.930)	1.000								
(11) Gender Diversity	-0.285 (0.008)	-0.197 (0.071)	-0.026 (0.779)	0.070 (0.448)	-0.119 (0.230)	-0.310 (0.001)	0.125 (0.176)	-0.243 (0.008)	-0.461 (0.000)	-0.259 (0.004)	1.000							
(12) Firm Age	0.286 (0.010)	0.311 (0.005)	-0.253 (0.020)	-0.690 (0.000)	0.136 (0.217)	0.089 (0.423)	0.142 (0.197)	0.253 (0.020)	0.200 (0.070)	-0.078 (0.480)	-0.585 (0.000)	1.000						
(13) Leverage	-0.051 (0.654)	0.013 (0.909)	-0.088 (0.434)	0.387 (0.000)	-0.292 (0.009)	-0.189 (0.091)	0.077 (0.497)	0.156 (0.165)	0.235 (0.039)	0.156 (0.164)	-0.401 (0.000)	0.157 (0.170)	1.000					
(14) Divident Payout Ratio	-0.285 (0.011)	-0.264 (0.019)	0.072 (0.519)	0.603 (0.000)	-0.243 (0.029)	-0.157 (0.156)	0.268 (0.014)	-0.039 (0.724)	0.074 (0.518)	0.104 (0.350)	0.419 (0.000)	-0.524 (0.000)	0.135 (0.233)	1.000				
(15) Firm Size	0.389 (0.000)	0.376 (0.001)	-0.112 (0.318)	-0.547 (0.000)	0.201 (0.071)	0.128 (0.253)	0.018 (0.873)	0.129 (0.251)	-0.117 (0.299)	0.133 (0.237)	-0.208 (0.062)	0.495 (0.000)	-0.221 (0.053)	-0.462 (0.000)	1.000			
(16) Cash	0.292 (0.009)	0.326 (0.003)	-0.161 (0.150)	-0.360 (0.001)	-0.041 (0.718)	0.005 (0.967)	0.037 (0.743)	0.147 (0.192)	-0.143 (0.206)	0.249 (0.025)	-0.139 (0.216)	0.332 (0.002)	-0.122 (0.292)	-0.380 (0.001)	0.849 (0.000)	1.000		
(17) Growth Opportunities	-0.157 (0.166)	-0.138 (0.226)	-0.099 (0.373)	0.055 (0.620)	-0.115 (0.305)	-0.058 (0.604)	0.307 (0.005)	-0.056 (0.616)	0.223 (0.048)	0.015 (0.891)	0.189 (0.088)	0.101 (0.371)	0.223 (0.046)	0.563 (0.000)	-0.154 (0.180)	-0.188 (0.102)	1.000	
(18) Firm Profitability	0.107 (0.327)	0.187 (0.086)	0.310 (0.001)	-0.141 (0.127)	0.146 (0.142)	-0.156 (0.090)	0.201 (0.028)	0.046 (0.623)	-0.238 (0.023)	0.000 (0.999)	0.185 (0.044)	0.110 (0.319)	-0.105 (0.349)	-0.016 (0.886)	0.406 (0.000)	0.328 (0.003)	0.160 (0.149)	1.000

Notes: This table shows the pairwise correlation matrix; the sample consists of a balanced panel of 102 firm-years observations from 17 firms for the period of 2015-20121. All variables are defined in Table 2.

the estimation techniques applied when the variances in the observations are unequal or when there are chances of a certain degree of correlation between the variables (Gujarati, 2004). These models have the ability to control autocorrelation and heterogeneity, which can produce biased results when using traditional OLS estimations (Bell and Jones, 2015; Gujarati, 2004).

The study uses three random effect models (Models 1, 2, and 3) for estimating equation (1). The results reveal that the institutional ownership is negatively significant (p = 0.001) with *Risk1* and *Risk2.* This

Table 4. Generalised least square (GLS) with robust standard errors

Variables	Risk 1 (Standard Deviation of ROA)	Risk 2 (Maximum ROA - Minimum ROA)	Risk 3 (Return on Sales)
Corporate Risk-Taking Measures			
Institutional ownership	-0.8990**	-2.3150*	-0.0150
	(0.3910)	(1.3810)	(1.0790)
Board of director size	0.0040	-0.0080	0.0530***
	0.0080	(0.0210)	(0.0160)
Tenure of CEO	0.0320***	-0.0230	0.0320**
	(0.0110)	(.0140)	(0.0160)
Independent director	0.0390	0.2320	-0.3570*
	(0.1150)	(0.2290)	(0.1980)
Non-independent director	0.3470**	0.5030*	0.0900
	(0.1410)	(0.2890)	(0.2820)
Size of audit	-0.2920**	-0.2900**	0.0120
	(0.1380)	(0.1460)	(0.4730)
Risk management committee size	0.0240**	0.0210	0.0340*
	(0.0100)	(0.0210)	(0.0200)
Gender diversity (Female dummy)	-0.0930	-0.0710	-0.2880**
	(0.0580)	(0.1440)	(0.1460)
Firm Control			
Firm age	-0.2270**	-0.4190*	-0.1930
	(0.1150)	(0.2430)	(0.2240)
Firm Size (Total Assets)	0.0160	0.0260	-0.0100
	(0.0260)	(0.0560)	(0.0480)
Cash	-0.0100	-0.0130	-0.0190
	(0.0210)	(0.0450)	(0.0420)
Growth Opportunities (Market to book value)	0.0100	0.0240	0.0000
	(0.0110)	(0.0240)	(0.0220)
Leverage (Total debt to total assets)	0.2320**	0.4800**	0.0600
	(0.1110)	(0.2360)	(0.2160)
Dividend payout ratio	-0.1830	-0.3840	0.0700
	(0.1520)	(0.3210)	(0.2950)
Firm's Profitability (ROA)	-0.0210	-0.0310	-0.0610
	(0.0680)	(0.1440)	(0.1320)
Constant	0.6620**	1.3900**	0.5140
	(0.2650)	(0.5610)	(0.5130)
Year fixed effect	Yes	Yes	Yes
Observation	73	73	75
Adjusted R^2	0.8960	0.8770	0.8350

Note(s): The superscript asterisks ***, ** and * denote statistical significance at the 1%, 5% and 10% levels.

means that if the proportion of institutional ownership in the firm's board increases it reduces the firm's risk-taking by choosing the right risky investment. These results are consistent with the most recent study by Ahmad and Azhari (2022) and Yim (2021) in which they found a negative association between institutional ownership and corporate risk-taking. Furthermore, independent director, size of audit and gender diversity is negatively associated with corporate risk-taking. Previous research showed that independent directors support investments in less risky projects (Pathan, 2009). The results aligned with previous study suggests that internal audit activities (i.e., more internal audit staff) as a mean for reducing their compliance risk (Carcello et al., 2005; Alhajri, 2017). The evidence on the relationship between gender diversity and corporate risk-taking is, however, mixed. On one hand, some studies show that women tend to be more risk-averse than men (Berger et al., 2014), that higher gender diversity is associated with lower realised firm risk (Bernile et al., 2018; Muhammad and Migliori, 2022). On the other hand, board of director size, tenure of CEO, non-independent director, and risk management committee size is positively significant related to corporate risk-taking. However, tenure of CEO is negatively insignificant with *Risk2.* Gender diversity is also negatively insignificant to *Risk1* and *Risk2.*

V. Conclusion

In Asian countries where business groups with centralized ownership structures are common, the agency problem between shareholders remains a problem due to the political and economic influence of the controlling shareholder. The objective of this research is to examine the relationship between the corporate governance framework and the level of risk-taking shown by agricultural companies in Malaysia. The study utilises data obtained from a sample of 17 businesses that are publicly listed on the Bursa Malaysia stock exchange, covering the period from 2015 to 2021. The study's results indicate that the corporate governance structure significantly influences the level of corporate risk-taking within the agriculture sector in Malaysia. This research has significance as it examines the concept of corporate risk-taking, which refers to a firm's inclination to engage in ventures that involve substantial capital expenditure in order to pursue business opportunities and enhance the firm's value within a rapidly changing environment.

The phenomenon of climate change presents substantial obstacles to the agricultural sector, resulting in profound consequences for the food security and livelihoods of smallholder farmers. Previous research indicates that risk-taking has a favorable impact on the adoption of several agricultural practices, such as irrigation, altering cultivation schedules, using certified seeds, implementing crop rotation, and conducting soil testing (Kangogo, Dentoni, & Bijman, 2021). The implementation of this innovation has the potential to enhance production within the agricultural industry. Nevertheless, the agriculture firm has the potential to engage in risk-taking activities to foster innovation and address the challenges posed by climate change by undertaking high-risk investment initiatives.

This study results suggest that firms can use specific corporate governance provisions to influence managerial risk-taking. It appears that a firm can structure its board to encourage managerial risk-taking. Also, the presence of good corporate governance structure has a beneficial effect on firm-level risk-taking. These results are particularly significant given the corporate governance proxies prevalent among Malaysia agriculture firms. While some studies have raised serious concerns regarding the ability of geographically dispersed a good corporate governance structure to monitor effectively, this study find that in the context of risk-taking it is not a problem in Malaysia. Although these results were obtained using a recent sample of Malaysia firms, they have implications for firms in other countries at similar levels of economic development and corporate governance environment.

Several restrictions exist in this study, which may

provide guidance for forthcoming research. First, the study focuses only on a single industry. Different industries have different regulations and features that affect corporate risk-taking behaviour. Firstly, future studies could focus on multiple measurements of corporate governance and corporate risk-taking, based on a specific factor adapted to suit a single industry. Next, this study only provides a sample of study using a limited number of agricultural firms in Malaysia. Therefore, further extensions might allow comparative results across several agricultural industries, or focus on other industries in different countries, for example, those from the ASEAN region.

Declaration of Competing Interest

The author states that she is conscious of any competing interests that could have impacted the work presented in this publication.

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