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CEO, CFO, and board attributes' effect on fair value agriculture disclosure

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Abstract: This study analyzed the current practice of Malaysian agricultural companies in disclosing their biological assets by examining the effect of chief executive officer (CEO), chief financial officer (CFO), and board attributes on fair value agriculture disclosure (FVAD), consequently proposing a standardized fair value disclosure model that could help agricultural companies to improve their FVAD. Based on disclosure paragraphs in MFRS 141 Agriculture, a comprehensive FVAD index was developed using the content analysis technique. Utilizing data from 84 firm-year observations for agricultural companies listed on the Bursa Malaysia from 2017 to 2019, regression analysis was performed to test the relationship of FVAD with the attributes of the CEO and CFO, and board characteristics. The regression results provided evidence of positive associations between FVAD and CEO educational background, CFO tenure, board size, and board independence. These results constitute important empirical inputs of a positive association between top executives' management attributes and accounting disclosure. Both CEO and CFO age were found to associate negatively with FVAD, and CEO tenure was found not to significantly affect FVAD. The findings from this study could shed some light on implementation in terms of corporate governance on the appointment of top management. To the best of our knowledge, this is one of the first studies to investigate the impact of CEO, CFO, and board characteristics on FVAD, particularly in Malaysia. It has also established a comprehensive index for measuring FVAD.

Subjects: Economics; Finance; Business, Management and Accounting;

Keywords: biological assets; disclosure; fair value; emerging market; upper echelons theory; corporate governance

1. Introduction

The financial statement is a crucial report for all stakeholders, including potential investors, providing insights into the current financial performance and position of a company. It plays a vital role in stakeholders' decision-making processes, which, in turn, influences the future direction of the company. Notably, the financial reporting quality and transparency are relevant to all users of financial statements. The quality of financial reporting and its impact on companies are widely discussed in academic literature. Financial reporting has received great deal of attention resulting from accounting standard convergence, harmonization of accounting standards,

economic crises, increased disclosure obligations, and other issues (Herath & Albarqi, 2017). However, there is limited research specifically examining industries to assess the reporting quality and transparency of accounting information in terms of the presentation and disclosures of accounting transactions, recording, and measurement. This gap is particularly notable in relation to adherence to accounting standards established by regulators, with a specific focus on the agriculture sector. Moreover, the agriculture sector follows specialized accounting standards for recording and measuring biological assets. This aspect is of interest to financial statement users, as it sheds light on the reporting quality of companies and the role played by those in governance in ensuring high-quality financial reporting for the benefit of the company and all relevant stakeholders. One of the most significant roles that corporate governance plays is to warrant financial reporting process quality (Cohen et al., 2004). Corporate governance involvement, particularly the chief executive officer (CEO), chief financial officer (CFO), and board of directors (BOD), is essential for improving the financial reporting quality of agricultural companies.

As one of the major industries generating the country's income and attracting potential investors, agriculture is a crucial sector of the Malaysian economy. It is therefore important that accounting information of biological assets be disclosed precisely and meaningfully. Agricultural companies need to disclose the value of their biological assets in accordance with the accepted accounting standard. In Malaysia, the standard used to guide the accounting treatment for biological assets by public listed companies (PLCs) is Malaysian Accounting Standards Board (MFRS) 141 Agriculture (Malaysian Accounting Standards Board, 2011). MFRS 141 is equivalent to IAS 41 Agriculture as issued and amended by the International Accounting Standard Board (IASB), including the effective and issuance dates. Entities that comply with MFRS 141 will simultaneously comply with IAS 41. MFRS 141 requires biological assets and agricultural produce to be measured at fair value through profit and loss. Fair value is defined under MFRS 13 Fair Value Measurement, and the standard has set out the framework for measuring fair value (Malaysian Accounting Standards Board, 2013). However, measuring fair value poses significant challenges due to the inherent risk in using judgement that can be construed as providing subjective rather than objective financial information (Hsu & Lin, 2016) which could jeopardize the reliability of the accounting information. Nevertheless, fair value-based valuation is gaining acceptance in recent years since it reflects the economic and financial truth of entities and increases the value relevance of accounting information (Barth et al., 2008). Fair value agriculture disclosures (FVAD) are considered vital to reducing accounting information asymmetry where this information will be relevant and transparent to all stakeholders on the nature of accounting information prepared by the agriculture companies. Nonetheless, extensive disclosures of fair value are imperative to help users of financial statements assess the valuation technique and inputs used in accordance with the standards MFRS 141 implemented by the regulators. This also raises a question on the role of top management of these companies in strengthening the quality of FVAD. There are still many uncertainties about how to value biological assets and comply with the disclosure requirements set by MFRS141 with the involvement of the top management particularly the corporate governance.

In the literature, there are controversies over mechanisms for measuring biological assets (Cavalheiro et al., 2017), and, to our knowledge, only scant attention has been given to the practical and empirical approaches to determining FVAD for biological assets, and to the measurement and reporting issues thereof (for example, Burritt & Cummings, 2002; Cavalheiro et al., 2017; Daly & Skaife, 2016; Dékán & Kiss, 2015; Gonçalves & Lopes, 2015; Jana & Marta, 2014). While numerous studies have been conducted to study factors affecting accounting choices in a company (Plöckinger et al., 2016), agricultural companies have received less attention (Cavalheiro et al., 2017). Discussion on the link between accounting information (accounting choice) and a company's value, corporate decisions, cost capital reduction, and contract efficiency has long been in review from multiple facets (for example, Bushman & Smith, 2001; Donatella & Tagesson, 2021; Healy & Palepu, 2001). Searching the literature, most of the existing studies have found that the extent of reporting and disclosure in a company depends on the final decisions

made by the top executives at the management level. The studies that have examined this issue were done at multiple levels such as the company level as well as the market level (Muttakin et al., 2019). This paper is no exception, but the focus is inclined to the top management level of the corporate governance, where specific-manager level factors were scrutinized to understand the influence of top key management on accounting decisions in a company, specifically for FVAD. According to Plöckinger et al. (2016), based on 60 studies, top management executives consistently have a considerable influence on financial reporting decisions, particularly disclosure quality. The results, however, are sometimes contradictory and ambiguous.

Within top management, besides the BOD, the monitoring mechanism intended to align the interests of the company and the shareholders as stipulated in agency theory, there are two key roles in an organization that can have an impactful influence on the company's direction, namely CEO and CFO. In most companies, the CFO is second in command to the CEO, and both frequently appear in public together to comment on corporate developments beyond the necessary financial performance reporting (Hoitash et al., 2016). The CEO is chosen by the BOD and the company's shareholders. The responsibilities of the CEO vary depending on the size, culture, and corporate structure of the organization. The CEO of a large corporation is involved in very high-level key decisions, while the CFO oversees the company's finances. Given their significant roles in the company's direction, the CEO, CFO and BOD are important in the company's financial reporting, especially in determining the accounting choices such as disclosure requirements. According to Soriya and Rastogi (2021) and Qaderi et al. (2023), legitimacy and stakeholder theories are widely applied to explain disclosure practices by top management. However, to strengthen the findings, upper echelons theory (UET) was chosen as a lens to comprehend the results of this paper. This theory is of paramount importance as the characteristics of top management (CEO and CFO) are widely accepted in empirical studies as the most influential factors affecting a company's financial information provided to external stakeholders (Hoitash et al., 2016; Plöckinger et al., 2016). Many studies have applied UET to understand top management characteristics (for example, Ali et al., 2022; Jeong et al., 2021) however, the studies do not appear to have examined specific issues faced by agricultural companies. Furthermore, Malaysia is the setting for this study and is a unique environment; agriculture is one of the crucial sectors of Malaysia's economy, contributing 12 per cent of the national Gross Domestic Product (GDP) and providing employment for 16 per cent of the population. However, there is scant attention in the existing literature to the issue of FVAD in the Malaysian setting. Most of the studies have been done in developed countries such as Australia (for instance, Burritt & Cummings, 2002). Therefore, given the huge impact of the agriculture sector on the Malaysian economy, our paper is worth exploring. This study filled a research gap by analyzing the quality of FVAD and examining the link between top management characteristics in corporate governance and accounting choices in agricultural companies in determining quality FVAD. Thus, we identified the following research questions: firstly, to examine reporting quality of FVAD and, secondly, to investigate the roles of the CEO, CFO, and BOD in enhancing the quality of FVAD.

This paper consequently contributes to the literature in several ways. First, practically, this study contributes to the FVAD development for agricultural companies, which could help increase the confidence of users of financial statements in companies' reporting. An increase in stakeholders' or even public confidence would increase investment in this field and income for the country. Indirectly, this would help the government to secure citizens' well-being. Second, the findings could also be used by the standard-setters for regulating and preparing a set of guidelines for the disclosure of fair value for biological assets. This paper sought to help the standard-setters to better understand the practice of FVAD among agricultural companies and its drivers and constraints, given the current discussion under MFRS 141. Based on the findings, it could emphasize the need to explicitly consider the legal and institutional setting prevailing in each context (Khlif et al., 2015), especially in Malaysia. Third, while much of the literature has focused on the disclosure of financial reporting for companies in general, this study looked at companies from the agriculture sector, furthering the understanding of the practice of FVAD. This contributes to the

quality of FVAD by agricultural companies in accordance with accounting standards. Fourth, the current study used UET and agency theory to comprehend the justifications behind the actions of top management (CEO, CFO, and BOD) those charged with governance contribution on the role played to enhance the quality of FVAD for the benefit of firms and all stakeholders, adding to the growing body of evidence in the literature.

The subsequent sections of this paper are organized as follows. Section 2 provides a comprehensive background to the study, covering aspects such as the agricultural background in Malaysia and regulations. Section 3 presents a review of theoretical literature, while Section 4 encompasses an empirical literature review and explains the development of the hypotheses. Moving forward, Section 5 details the research design, followed by Section 6, which presents empirical results and discussion. Finally, Section 7 draws conclusions, highlights limitations, and proposes future directions for research.

2. Background of study

2.1. Agricultural background in Malaysia

Historically, agriculture in Malaysia has been shaped significantly by large-scale commercial crops introduced by the British, including rubber in 1876, oil palm in 1917, and cocoa in the 1950s, which have remained the dominant agricultural exports. In addition, Malaysian farmers produce several fruits and vegetables for the domestic market, including bananas, coconuts, durian, pineapples, rice, and rambutan. The Malaysian tropical climate is very favorable for the production of various crops. Peninsular Malaysia's location prevents it from experiencing dire hurricanes or droughts, supporting the sustenance of agriculture. In addition, Malaysia also produces rice and is involved in massive logging activities; these generate essential export revenue in East Malaysia and the northern states of Peninsular Malaysia.

The agriculture sector in Malaysia is a pivotal driver of the nation's economic vitality, consistently contributing approximately 12 percent to its GDP and providing employment to roughly 16 percent of the population. This sector not only bolsters the economy but also ensures food security, supports rural development, and preserves cultural and environmental heritage. Furthermore, it fuels Malaysia's foreign exchange earnings through agricultural exports. These contributions collectively underscore the sector's paramount importance, emphasizing the necessity for precise and meaningful accounting and reporting practices for biological assets, as meticulously examined in this research, to fortify Malaysia's overall well-being.

In the mid-1980s, Malaysian agriculture experienced a period of diminishing importance; policymakers, academics, and analysts attributed its decline to economic growth and low global prices for basic agricultural products (Selamat & Nasir, 2013). This downturn persisted for nearly two decades. However, in the early 2000s, there was a significant revival of interest in the agriculture sector, aligning with the national development agenda. The Malaysian government has prioritized agriculture and agro-based industries, recognizing their potential to significantly contribute to economic growth and food self-sufficiency. This renewed focus stems from the realization that a thriving agriculture sector plays a pivotal role in overall economic development, including economic growth, foreign exchange earnings, employment generation, and the supply of raw materials for agro-based and resource-based industries.

Biological assets exhibit distinct characteristics that set them apart from other asset types such as buildings, land, and equipment. The unique attributes of these biological assets (plants and animals), including their capacity to grow, reproduce, generate products, and undergo natural degeneration, necessitate specialized accounting treatment. Consequently, addressing the financial aspects of these assets requires adherence to specific accounting standards tailored to their particular nature and behaviors.

Precise reporting of the valuations of biological assets is of paramount importance due to its substantial contribution to national revenue. Agricultural enterprises are mandated to divulge the assessments of their biological assets in accordance with the prescribed accounting framework. In the context of Malaysia, PLCs follow MFRS 141 Agriculture which governs the accounting treatment of biological assets. As stipulated by this standard, agricultural firms are compelled to record their biological assets at a fair value less the cost to sell.

2.2. Disclosure background and regulations in Malaysia

MFRS 141 Agriculture was issued by the MASB, comprising standards issued by the IASB. This standard was made effective on 1 January 2012. In Malaysia, for public listed companies, MFRS 141 Agriculture applies to accounting for biological assets (with the exception of bearer plants), agricultural produce (at the point of harvest), and government grants particularly in situations where the entity's core business activities pertain to agricultural operations. An entity manages agricultural activity by transforming biological assets (living animals or plants) into agricultural produce (e.g., tea leaves to picked tea leaves), or into additional biological assets (e.g., a cow gives birth to a calf), or for sale.

MFRS 141 Agriculture covers the definition, recognition, measurement, and disclosure of biological assets and agricultural produce. MFRS 141 explains how to measure biological assets and agricultural produce at initial recognition and how to measure the change in value of biological assets. A biological asset shall be measured on initial recognition and at the end of each reporting period at its fair value less costs to sell (FVLCS), except for the case described in paragraph 30 where the fair value cannot be measured reliably. Agricultural produce harvested from an entity's biological assets shall be measured at its FVLCS at the point of harvest (paragraph 13). Such measurement is the cost at that date when applying MFRS 102 Inventories or another applicable standard.

In order to apply the requirement in paragraph 13, one should first establish what exactly "fair value" is, and second what costs are included within "costs to sell". According to MFRS 13, fair value refers to the price that would be received from selling an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Further, in MFRS 141, FVLCS is defined as "the amount obtainable from the sale of an asset or cash-generating unit in an arm's length transaction between knowledgeable, willing parties, less the costs of disposal." Understanding these definitions is crucial when assessing the fair value of biological assets as, indisputably, one of the most challenging aspects of accounting for biological assets is the measurement thereof (Gonçalves & Lopes, 2015).

Considering the guidance provided by MFRS, the most significant challenge in measuring biological assets lies in the high degree of subjectivity involved in ascertaining their fair value and the associated costs of selling. The determination of fair value can be a formidable task due to the absence of an active market for various types of biological assets. In response, agricultural companies may resort to estimating fair values as a viable alternative. It is worth noting that there is a dearth of comprehensive studies that empirically and practically address the issue of determining fair values for biological assets, as highlighted in the work of Cavalheiro et al. (2017).

In accordance with MFRS regulations, determining fair value less costs to sell involves making various calculations which rely on individual judgment. This highlights that the concept of "fairness" depends on how each person perceives it during the evaluation. Empirical research has raised concerns about the reliability of fair value, emphasizing the need for thorough examination. Furthermore, there are claims that fair value accounting alone cannot adequately assess stewardship, and that the inclusion of historical cost is required. For instance, Palea (2014) suggested adopting a dual measurement financial reporting system, which shows promise in providing financial statement users with more comprehensive and valuable information.

Given the current emphasis on transparency, improved data quality, and efficient systems in government regulations, it is crucial that agricultural businesses establish a robust and standardized framework for assessing and disclosing the fair value of their biological assets. This effort is expected to positively impact corporate performance. The study's findings may provide valuable insights for regulators and policymakers seeking to enhance accounting standards, with a specific focus on increasing transparency in financial reports, presentations, and disclosures, especially within the agriculture sector, regarding fair value measurement.

The Malaysian Code on Corporate Governance (MCCG) plays a pivotal role in safeguarding the quality of financial reporting and reinforcing transparency in corporate governance within Malaysia. Enacted in 2000 and subsequently revised in 2007, 2012, 2017, and 2021, the MCCG serves as a critical tool for corporate governance reform, significantly impacting governance standards (Securities Commission Malaysia [SCM], 2021)

Central to the MCCG's objectives is the emphasis on board leadership in upholding transparency and accountability. It underscores the importance of an effective board that can exercise independent judgment while maintaining a harmonious balance between executive and non-executive directors. This provision ensures that the board remains steadfast in safeguarding stakeholders' interests and maintaining diligent oversight of financial reporting and corporate operations.

Furthermore, the MCCG addresses key facets of corporate governance, including risk-management practices, board composition, and ethical behavior. It mandates the board's responsibility for comprehensively assessing the company's risk profile, particularly in relation to financial risks, to proactively mitigate potential adverse impacts on financial performance and disclosures. The MCCG also places significant focus on the inclusion of independent directors, underscoring their pivotal role in furnishing unbiased oversight, thus augmenting transparency in decision-making processes. Additionally, the MCCG upholds ethical conduct and integrity as cornerstones within both the board and management. This provision ensures that key personnel adhere to the highest ethical standards in financial matters. By adhering to these principles, companies in Malaysia can elevate their financial reporting practices, ultimately enhancing transparency and accountability (SCM, 2021)

In accordance with MCCG 2021, the BOD includes the CEO or executive directors. The CEO is responsible for the company's business and day-to-day operations. According to the listing requirements, the board, CEO, and CFO must have the "character, experience, integrity, competence, and time to efficiently fulfil their roles" (SCM, 2021). Also, according to MCCG 2021, there is no specified number of directors on a BOD. The maximum number is 10, but it can reach 12 with proper justification. However, the BOD must assess the impact of its size on its effectiveness (SCM, 2021). Another requirement under the MCCG is that at least half of the BOD shall comprise independent directors. It is also recommended that the maximum tenure of an independent director is limited to nine years to ensure they remain independent and objective in giving their opinion on management proposals and decisions, including the disclosure level of financial information.

3. Theoretical literature review

The present study delved into the intricate dynamics of organizational decision-making, particularly focusing on the interplay between top management characteristics and strategic choices. To illuminate this relationship, we employed two prominent theoretical frameworks: Upper Echelon Theory (UET) and agency theory. UET, initially proposed by Hambrick and Mason in 1984, offers a lens through which the background traits of top management are seen as critical predictors of organizational outcomes, planned choices, and performance levels. This study built on the foundational insights of UET to investigate how the personal characteristics of decision-makers, such as age, tenure, and education, impact complex strategic decisions, aligning with seminal works in the field.

Complementing UET, we integrated agency theory into our analytical framework. Agency theory, a well-established concept in organizational literature, explores the principal—agent relationship within a firm, emphasizing the divergent interests of management and shareholders. By incorporating agency theory, we aimed to unravel the complexities of decision-making within the organizational hierarchy, particularly within the context of financial reporting decisions. This dual-theory approach enhanced the depth and comprehensiveness of our study, offering a nuanced understanding of how top management characteristics and agency dynamics contribute to strategic choices. Through the application of these two theoretical lenses, our research endeavored to contribute novel insights to the broader discourse on organizational behavior and decision-making.

3.1. Upper Echelons Theory (UET)

Employing UET as our overarching theoretical framework was imperative for comprehensively understanding the intricate relationship between top executives' characteristics and financial outcomes. The UET posits that managerial background traits play a pivotal role in estimating organizational outcomes, planned choices, and performance levels (Hambrick & Mason, 1984). This perspective becomes particularly significant in the face of complex decisions, such as strategic measures, where the personal characteristics of decision-makers—age, tenure, and specialization—gain heightened importance (Nielsen, 2010). Drawing on these seminal concepts, Ting et al. (2015) study took a pioneering step by classifying CEO characteristics into groups, specifically focusing on age and educational levels, to explore their impact on financial leverage.

In alignment with recent studies, our research emphasized the relevance of UET in scrutinizing the top-level management team, consisting of CEO and CFO. As argued by Chithambo et al. (2020) and Shahab et al. (2020), the strategic decisions of a company are profoundly influenced by the attributes of its top executives, due to differences in values, personalities, and experiences. Jeong et al. (2021) further underscored the inevitable influence of top executives' personal lenses in interpreting the company's situation, affecting their choices, particularly in complex processes such as financial reporting decisions (Plöckinger et al., 2016). Thus, by integrating insights from both seminal and recent studies, we decided that UET is the most appropriate theoretical basis for investigating the relationship between top executives' characteristics and FVAD, as argued by Alrazi et al. (2021). The structuring of roles within top management significantly influences collaborative efforts among its members to direct the organization and shape its strategy, as recently emphasized by upper-echelons scholars exploring its formation and impact (Ma et al., 2022).

3.2. Agency theory

In the context of corporate governance, agency theory, as outlined by Jensen and Meckling (1976), provides insights into the principal—agent relationship, commonly known as the principal—agent problem. This theory revolves around the delegation of authority from the company owner (the principal) to a manager (the agent), creating the potential for conflicts due to differing perspectives on shared assets. The formalization of power transfer occurs through an economic contract, which is examined within the context of a "contract" framework.

The historical context introduced by Berle and Means in 1932, describing the "modern corporation," has significantly contributed to our understanding of agency theory. The era of the 1930s witnessed a shift where single-owner control became challenging, with large corporations relying on public markets for capital, resulting in widespread ownership. This aligns with the growth of modern corporations, involving multiple owners. To manage the challenges posed by dispersed ownership, Jensen and Meckling (1976) emphasized the intentional separation of ownership and control as a key factor in the emergence of the agency problem. Managers are entrusted with specific powers to operate the business and maximize shareholder wealth, leading to potential conflicts in overseeing management. This separation, however, according to Berle and Means (1932), diminishes owners' control.

Extending the discussion to shareholder—manager dynamics, agency theory posits that shareholders, acting as principals, appoint managers as agents to oversee investments (Jensen & Meckling, 1976). While the expectation is aligned interests for wealth creation, conflicts may arise, resulting in agency costs. To address this, shareholders appoint a BOD tasked with governance and strategic decision-making. The BOD, guided by fiduciary duties, plays a crucial role in ensuring company performance and wealth creation. The effectiveness of the BOD is underscored by specific attributes, with size and independence being essential.

In summary, agency theory provides a lens through which to examine corporate governance dynamics. It sheds light on the challenges posed by the separation of ownership and control, emphasizing the importance of oversight structures such as the BOD. The interplay between principals and agents, shareholders and managers shapes the governance landscape, with implications for conflict and wealth creation in modern corporations.

4. Empirical literature review and development of hypotheses

Limited studies have documented the practical and empirical approach to determining fair value for biological assets (Cavalheiro et al., 2017). Lefter and Roman (2007) discussed the application of the accounting standard (IAS) 41 on agricultural products while da Costa Marques (2021) studied its application in the Portuguese market. Elad (2004) highlighted several issues that cause difficulty in achieving harmonization in accounting practice using IAS 41. Furthermore, Cavalheiro et al. (2017) discussed the difficulty of adopting IAS 41 which focuses on fair value agricultural disclosure especially in non-active markets. The paper provided a discounted cash flow model as an example model for fair value measurement.

In Malaysia, Kadri et al. (2023) measured the value relevance of fair value biological assets of public listed companies in Malaysia between 2018 and 2020. Norizan and Kadri (2022) examined the application of FVAD to three plantation companies in Malaysia. Our study is different from previous studies because it examined the application of FVAD on agricultural companies using a larger sample size (all the plantation companies in Malaysia) and went on to introduce the significant effect of CEO, CFO, and BOD attributes on FVAD.

4.1. CEO Age and fair value agriculture disclosure

Age has a significant impact on a person's thinking and consciousness; thus, a CEO's age will have an impact on his/her decision-making process when facing environmental challenges (Sumarta et al., 2021). According to UET, decision-making is considered inherently an interpretive activity; hence, senior executives' personal perspectives are key to their decision-making and impact their choices (Jeong et al., 2021). Applying UET, the age of the CEO may essentially influence decision-making for business effectiveness and disclosure of quality information in reporting.

To the best of our knowledge, no previous studies have investigated the link between CEO and CFO characteristics and FVAD. Nonetheless, there are existing studies that examined CEO age with disclosure studies. For instance, Sannino et al. (2020) examined CEO demographic characteristics with sustainable business model implementation in Fintech sector firms. The authors identified that CEO age has a positive impact on promoting the transition of financial institutions to more sustainable business models. According to the findings of Li et al. (2020), the CEO's age is positively related to the firm's growth and corporate social responsibility (CSR) activity. In addition, a younger CEO has a negative association with a firm's sustainability performance (Shahab et al., 2020). This reflects that CEO seniority in age enhances the sustainability performance of firms and supports the fact that a senior-in-age director is a valuable asset to a firm because of his/her knowledge and expertise (Chandren et al., 2021). Likewise, Mardini and Lahyani (2020) discovered that CEO age positively and significantly affected the quantity of intellectual capitals disclosure provided in the CEO statement among French non-financial listed companies. Moreover, Malik et al. (2020) found a similar association between CEO age and CSR disclosure from a dataset of 1,790 firm-year observations of Pakistani listed firms from 2009 to 2018.

McCarthy et al. (2017) discovered a significant and negative relationship between CEO age and CSR. As millennials become increasingly aware of trends that influence the environment and their future, the pressure on businesses to operate sustainably is growing (Valente & Atkinson, 2019). Bantel and Jackson (1989) explain the recruitment of younger and better-educated executives by the perception that they will be more effective in pursuing initiatives that necessitate innovative responses to changing circumstances. However, Sumarta et al. (2021) found that CEO age has no significant influence on environmental issues. There is no statistically significant link between CEO age and information disclosure on the environment (Li et al., 2019). Similarly, Oware and Awunyo-Vitor (2021) report a non-significant association with the disclosure of environmental information of Indian listed firms. We extend the existing studies by arguing that CEO age can significantly affect the way corporations disclose their FVAD. Based on previous studies' findings and UET, we formulated the following hypothesis:

H1: CEO age has a relationship with fair value agriculture disclosure.

4.2. CEO Tenure and fair value agriculture disclosure

Tenure is a motivation for executives to settle problems for the firm (Li et al., 2019). During an executive's tenure, some observable phases or seasons lead to various patterns of executive attention, conduct, and, ultimately, firm performance (Hambrick & Fukutomi, 1991). UET explains that executive decision-making occurs via the lens of executives' values and experiences (Jeong et al., 2021). Thus, with the assumption of UET, CEO tenure may be recognized as one of the central factors influencing decision-making within a firm. Two perspectives on CEO tenure have been presented in prior work (Bsoul et al., 2022). On one hand, freshly appointed CEOs work hard to keep their jobs and, in order to do so, they try to improve company performance and win the board members' confidence. As a result, they frequently make more cautious choices (Loukil & Yousfi, 2022). Others counter that CEOs with short tenures tend to adopt new ideas and innovations in order to establish themselves (Bsoul et al., 2022).

Prior studies have identified the relationship between CEO tenure and disclosure of information for business reporting, e.g., environmental disclosure and CSR reporting. Specifically, a Saudi Arabian study on CEO—CSR relationship with the moderating effect of family ownership opines a significant positive relationship between CSR reporting and CEO tenure (Al-Duais et al., 2021). A study in Thailand reported that long-tenured CEOs have the intention to disclose firms' environmental information (Li et al., 2019). Similarly, a US study investigating the relationship between CEO confidence and CSR stated that the relationship of CEO tenure with CSR is positive and significant (McCarthy et al., 2017), while Huang's (2013) investigation of the characteristics of CEO demographics and consistency in CSR performance reveals that CEO tenure has an impact on CSR performance.

Lewis et al. (2014) identified a significant positive relationship between new CEOs and environmental disclosure of voluntary information, revealing that environmental disclosure is more likely to be encouraged by CEOs who are newly appointed. However, Chen et al. (2019) study reported a significant negative relationship between CSR performance and CEO tenure, finding that CSR performance was better in the early years of a CEO's employment and reduced in the later years. Further, Jeong et al. (2021) found the relationship between CEO tenure life cycle and CSR to be an inverted U-shape where, as a CEO's career progresses, enthusiasm for CSR wanes because the CEO will no longer be there to reap the benefits of CSR activity. Finding a significant negative relationship between CEO tenure and environmental disclosure, Razali et al. (2016) believe that the long-tenured CEO is unwilling to revise the organization's practice and so has less inclination to disclose the firm's environmental information. The impact of CEO tenure on corporate social and environmental disclosures of all listed Chinese non-financial enterprises from 2008 to 2016 was empirically demonstrated by Khan et al. (2021). Findings from a fixed-effect panel data regression model indicated that CEO tenure has a detrimental impact on company social and environmental

disclosures. Their study provided evidence that corporate social and environmental disclosures are higher earlier in a CEO's tenure than in later service periods. The early increase followed by a decline in disclosure practices suggest the presence of a non-linear inverted U-shaped association between CEO tenure and disclosure practices.

The negative association between CEO tenure and disclosure of information in business reporting supports the UET-based assumption that senior executives' personal perspectives play an essential role in choices and decision-making. Baatwah et al. (2015) study on Oman listed firms between 2007 and 2011 identified that CEO tenure is negatively associated with audit report timeliness. This implies that younger CEOs are more concerned with producing timely audit reports. However, a recent study on the sustainability reporting formats of 80 Indian firms from 2010 to 2019, including the relationship between environmental disclosure and CEO characteristics, identified a non-significant association between CEO tenure and environmental disclosure (Oware & Awunyo-Vitor, 2021). Using the assumption of UET and the findings of prior studies, we predicted an association between CEO tenure and the quality of FVAD. Therefore, we formulated the following hypothesis:

H2: CEO tenure has a relationship with fair value agriculture disclosure.

4.3. CEO Education and fair value agriculture disclosure

According to UET, "the decision-maker brings a cognitive base and values to a decision, which creates a screen between the situation and his/her eventual perception of it" (Hambrick & Mason, 1984, p. 195). Thus, the CEO's education level affects their encouragement of quality disclosure of information. CEOs should continue to increase their professional knowledge and skills, as well as their professional ethics, to improve the quality of information disclosure (Lin et al., 2020). According to a number of studies, highly educated CEOs are better able to adapt to new ideas and technology as well as to understand complex situations. As a result, they favor innovative projects and investment opportunities with an open mind to new challenges (Bsoul et al., 2022).

Bantel and Jackson (1989) elaborated that banks with better-educated executives from various functional backgrounds are more innovative. A study on 94 listed companies on the Dhaka Stock Exchange reported a significant positive relationship between CEO education and voluntary disclosure (Akhtaruddin & Rouf, 2012). Educated management perceives things from a better and broader perspective, so educational background can be a major determinant of disclosure (Akhtaruddin & Rouf, 2012). Sumarta et al. (2021) found that the greater the CEO's education level, the better the environmental performance of Indonesian listed banks. Higher education levels should raise the CEO's understanding of environmental challenges, allowing them to develop more effective environmental strategies (Sumarta et al., 2021). Li et al. (2019) discovered that the environmental information disclosure of a firm is improved if the CEO has a high level of education. Indeed, firms whose CEOs have been awarded MBA degrees are much more likely to respond to the carbon disclosure project than other firms (Lewis et al., 2014).

On the other hand, Lin et al. (2020) study on Shenzhen Stock Exchange firms between 2012 and 2017 identified a significant and negative relationship between CEO education level and the quality of information disclosure. Barker and Mueller (2002) opine on the effect of the type of CEO's higher education, finding that CEOs with technical degrees are positively related to research and development (R&D) spending. Thus, the CEO's degree specialty may have an impact on the disclosure of information. We extend the existing research by arguing that the influence of CEO tenure on FVAD can shed light on the dynamics of corporate transparency and reporting practices in the agriculture sector. Using UET and prior empirical findings, it is possible that a highly educated CEO who has specialized in agriculture will make better decisions to influence the quality of FVAD. Thus, we hypothesized that:

H3: CEO education has a relationship with fair value agriculture disclosure.

4.4. CFO Age and fair value agriculture disclosure

UET posits that age of top leaders may affect the decision-making process in a company's strategic direction (Hambrick & Mason, 1984). Numerous studies have examined the potential implications of age-based behavioral differences on corporate decisions, for example Gibbons and Murphy (1992), Bertrand and Schoar (2003), Davidson et al. (2007) and Serfling (2014). Age may reflect overall business experience and older age may allow executives to demonstrate maturity in leading the company (Hafsi & Turgut, 2013) as well as influencing thinking and consciousness (Sumarta et al., 2021). According to Kets de Vries and Miller (1984), with maturity, one tends to be more sensitive to society at large and pleased to act more for its welfare. This could be interpreted that as people age, they become more ethical and cautious. Therefore, older company leaders are less likely to participate in aggressive earnings management as they are more conservative (Vroom & Pahl, 1971) and, as a result, are more likely to be linked with higher-quality financial reporting (Huang et al., 2012). The existing studies also report that older professionals exhibit a higher standard of ethical belief than their younger counterparts (Peterson et al., 2001).

In making a company's important decisions, the CFO views and interprets the company's situation through their personal lens (Jeong et al., 2021), which closely relates to their accumulated experience in the industry and to their particular expertise. Older CFOs are documented as risk-averse in the literature (Peltomäki et al., 2015), will therefore tend to avoid risky transactions that will result in harmful effects on the company, and are prone to provide more disclosure. This is consistent with Mather et al. (2012) who found that older people have a stronger preference for certain benefits and a stronger avoidance of certain losses than younger people, implying that ageing influences how uncertain outcomes are weighted. Specifically, Peltomäki et al. (2015) indicate that firms with older CFOs are associated with fewer risky transactions, which suggests that with increasing age, top management become more risk-averse and avoid excessive risk-taking by the firm. Previous studies have emphasized the relationship between CFO age and CSR or environmental disclosure; our study extends previous work by looking at the effect of CFO age on FVAD. Based on UET justification and prior empirical findings, the following hypothesis was formulated:

H4: CFO age has a positive relationship with fair value agriculture disclosure.

4.5. CFO Tenure and fair value agriculture disclosure

According to UET (Jeong et al., 2021) executive decision-making takes place via the prism of executives' values and experiences. The premise of UET allows for the recognition of executive tenure as one of the primary elements impacting decision-making inside a corporation. According to Muttakin et al. (2019), long-tenured CFOs can gain particular knowledge and expertise about the company and its environment, which will help them to better grasp the company's financial reporting systems and effectively communicate financial information to external stakeholders. A long-tenured CFO will have greater experience, and thus should be more familiar with how the company's internal accounting system collects, gathers, and presents accounting data. In addition, CFOs with more experience and interaction with the company's stakeholders are more likely to be aware of the information needs of creditors, analysts, and institutional shareholders, which makes them more conscious of the need for better accounting and greater disclosure quality.

Longer-serving CFOs have a vested interest in protecting shareholders and maintaining their status as top executives (Muttakin et al., 2019). Ali and Zhang (2015) argue that the talents of top executives in their early years of service will be viewed skeptically by market participants. This is in line with the idea that new executives have less experience than those who have been in their

positions for a longer time, implying that longer tenure will result in a variety of favorable outcomes including reporting disclosure, and help to solve the company's problems (Li et al., 2019). Given this, long-tenured CFOs should have more internal credibility than short-tenured CFOs, and hence should be better able to withstand political pressure to make opportunistic accounting decisions. According to Matsunaga et al. (2013), tenure duration is shortened when executives are unable to serve the financial markets due to a lack of experience and an inability to create higher-quality accounting disclosures. Various viewpoints on the function of tenure in financial-information disclosure can be found in the literature (for example Donatella & Tagesson, 2021). However, scholars are prone to conclude that CFOs with more experience have stronger incentives to ensure that financial statements are accurate. This is consistent with the assumption of UET that CFO tenure and associated values and experiences may be recognized as a central influence on the firm's decision-making processes and choices. As a result, it is expected that long-tenured CFOs will be more aware of the negative effects of earnings manipulation and the need for high-quality financial information, whereas short-tenured CFOs may not have accumulated enough knowledge and expertise and may thus be less aware of it.

Despite that, according to Geiger and North (2006), accounting disclosure quality is inversely associated with CFO tenure since the CFO's influence increases over the course of their tenure. It is argued that CFOs with more entrenchment and influence have more flexibility to employ more aggressive accounting techniques that do not necessitate a higher level of verification for the acknowledgement of good news in financial statements (Muttakin et al., 2019). In the same vein, based on empirical research, organizations with short-tenured CFOs have higher-quality accruals (Geiger & North, 2006). This is because these new CFOs are motivated to cut discretionary accruals to make a better impression on the market and maintain their position. However, a later study by Ali and Zhang (2015) claims otherwise. They state that longer tenure of top executives is linked to higher accruals quality, suggesting that the market perceives them as more capable and skilled than shorter-tenured top executives because they are more concerned with safeguarding their reputation, and hence are less likely to engage in opportunistic behavior through accruals management.

Our study extends previous research by looking at the interplay of CFO tenure and FVAD. Based on the UET and findings from the literature that the tenure of top executives such as CFOs influences the quality of financial reporting, we believe CFO tenure is linked to FVAD. However, given that CFO tenure has been found to have both positive and negative effects on financial reporting quality, we stated the argument in a non-directional hypothesis as follows:

H5: CFO tenure has a relationship with fair value agriculture disclosure.

4.6. BOD Size and fair value agriculture disclosure

According to agency theory, the BOD monitors how managers discharge their duties to align with stakeholders' interests. Quality reporting of accounting information can reduce information asymmetry between managers and stakeholders. Thus, the role of the BOD is critical, especially in financial oversight (Hashim & Devi, 2008). It is expected that the BOD will be more effective if it is comprised of a large pool of knowledge, skills, and experience in business-related activities. Board members can discuss and share ideas on how to make the best decisions for the company and its stakeholders.

BOD size is determined by the number of BOD members. Usually, a BOD has between two and ten members, depending on the size and complexity of the business operation. The larger the size of the company or the more complex the business operation, the larger a BOD is required. A larger BOD enables more effective monitoring of the management due to a large pool of expertise and experience.

Therefore, a larger BOD will help to monitor managers' reporting practices and compliance levels. The board's role is an important determinant of International Financial Reporting Standards (IFRS) compliance (Nalukenge, 2020). However, it can also be argued that too many board members may not be able to discharge their duties effectively because it is difficult to agree at the table. For example, Halme and Huse (1997) examined the relationship between BOD size and the information disclosed in the environmental reports of the 40 biggest firms from Scandinavian nations, including Finland, Norway, and Sweden. The results demonstrated that BOD size had no bearing on how much environmental information was reported. In addition, Sufian and Zahan (2013) found no association between BOD size and the information disclosed in CSR reporting by 70 Bangladeshi listed companies. Similar results were obtained by Nguyen et al. (2023), who found no connection between BOD size and the propensity of Vietnamese businesses to report on their CSR efforts during the COVID-19 pandemic.

Previous studies have examined the relationship between BOD size and voluntary disclosure level. Most studies have found that BOD size influences voluntary disclosure of CSR information (Jizi, 2017; Jizi et al., 2014; Ruguera-Alvarado & Bravo-Urquiza, 2021). In addition, a study by Tran et al. (2021) found that BOD size positively influences sustainability disclosure among companies in Southeast Asia, while a study by Gerged (2021) found that BOD size has a positive relationship with environmental disclosure. BOD size influences not only voluntary disclosure, but also mandatory disclosure. A study by Alfaraih (2016) discovered a positive influence of BOD size on IFRS mandatory disclosure among companies in Kuwait, while research by Almaqtari et al. (2021) found that BOD size influenced the level of compliance with Indian Accounting Standards after convergence into IFRS in 2016. Further, Elamer et al. (2021) found that larger BOD size increased the informativeness of risk disclosure on bank credit rating among Middle East and Africa (MENA) countries over the period from 2006 to 2013. Likewise, Al-Bassam et al. (2018) found that companies with large BOD size generally disclosed better corporate governance practice based on 80 listed Saudi corporations between 2004 and 2010. The findings suggest that a large pool of directors can improve the level of reporting and disclosure, both voluntary and mandatory. We extend the previous research by looking at the interplay between BOD size and disclosure practices in the agriculture industry. Based on agency theory and empirical findings, we hypothesized that:

H6: BOD size has a relationship with fair value agriculture disclosure.

4.7. BOD Independence and fair value agriculture disclosure

Agency theory posits that an independent board of directors acts as a mechanism to advance the interests of other stakeholders, such as employees and communities, in addition to being a key internal control mechanism for managing managers and mitigating agency issues between managers and shareholders (Alnabsha et al., 2018; Chen & Roberts, 2010). Independent BOD members are BOD members who have no connection with the management, other directors, and major shareholders of the company. They are considered independent because there is no conflict of interest between the management and major shareholders. Usually, they are appointed from outside the company due to their expertise in business-related activities. They provide objective opinions and challenge management decisions in the best interests of all stakeholders. This attribute ensures that BOD duties are discharged effectively in the decision-making process, including in determining the information to be disclosed. Thus, independent board members are less likely to withhold information and prefer to disclose more information. This improves financial reporting practices and increases compliance. This is aligned with agency theory which expects that the BOD will reduce agency costs by disclosing more information.

Empirically, there is mixed evidence on the relationship between BOD independence and corporate disclosures. Several studies have found evidence of a positive relationship between BOD

independence and voluntary disclosure level, including CSR information (Arayssi et al., 2019; Jizi, 2017; Jizi et al., 2014) and environmental information (Gerged, 2021). A study by Abdelqader et al. (2021) found that BOD independence was positively significant in influencing mandatory IFRS disclosure in Gulf Cooperation Council (GCC) countries. Similarly, Almaqtari et al. (2021) found that BOD independence positively influenced mandatory disclosure among Indian companies. Furthermore, Nguyen et al. (2023) examined the relationship between BOD independence and CSR disclosure among the top 100 listed enterprises on the Vietnam Stock Exchange. The results showed that listed companies with a higher proportion of BOD independence disclosed more information in their CSR reporting. The findings suggest that BOD independence attributes lead to an effective monitoring role and improve information delivery.

However, a study by Ruguera-Alvarado and Bravo-Urquiza (2021) found a negative association between BOD independence and CSR disclosure. Likewise, the association between BOD independence and CSR disclosure in a global sample of 29 nations from 2006 to 2014 was examined by Bansal et al. (2018). According to panel Tobit estimation results, BOD independence was negatively related to CSR disclosure. Similarly, Said et al. (2009) found no evidence of a substantial association between independent directors and CSR disclosure among Malaysian firms. We extend the existing research by looking at the relationship between BOD independence and FVAD. Based on agency theory and mixed empirical evidence, we hypothesized that:

H7: BOD independence has a relationship with fair value agriculture disclosure.

5. Research design

5.1. Sample and data collection

The study's population comprised publicly listed companies in the Malaysian agriculture sector. Agriculture firms were selected due to their obligation to adhere to MFRS 141 Agriculture. This accounting standard mandates the comprehensive disclosure of fair value information pertaining to biological assets in the agriculture sector, aligning with the principles set forth in MFRS 13 Fair Value Measurement. MFRS 141 (with amendment) became effective on 1 January 2016, with an optional deferment adoption date of 1 January 2018 (Malaysian Accounting Standards Board, 2014). Consequently, this study focused on companies listed in 2017 and 2019, allowing for a comparative analysis of fair value disclosure in the years preceding and following the adoption year. Within this context, 44 companies listed in the year 2019 served as the sampling frame for this study. However, two companies were excluded from the sample; one due to the absence of a published annual report, and the other because it was newly listed in 2018. To facilitate precise comparisons, we elected to limit the sample size to 42 companies, thus harmonizing the data for paired comparisons. Table 1 shows the breakdown of companies sampled by year.

This study employed a quantitative approach to collect and analyze data. Data about the level of FVAD were manually collected from the annual reports of the sample companies, specifically from the notes to the financial statements where the disclosures about biological assets were made. Meanwhile, data about CEO attributes, CFO attributes, and BOD characteristics were obtained from the corporate governance statements, also available in the annual reports. For data analysis, the study employed descriptive analysis, correlation analysis, diagnostic tests, and panel regression analysis to answer the research questions.

5.2. Measurement of variables

In this study, the dependent variable was the level of disclosure of fair value for biological assets. The independent variables were CEO attributes (age, tenure, and education in agriculture), CFO attributes (age and tenure), and BOD characteristics (size and independence). The control variables

Table 1. Breakdown of sample companies by year

	Year 2017	Year 2019	Total observations
No. of agriculture companies	42	44	86
Less: Missing data	0	2	(2)
Final sample	42	42	84

were firm characteristics (firm size, leverage, firm age, profitability, and size of audit firm). The following subsections discuss the measurement of these variables in detail.

5.2.1. Fair Value Agriculture Disclosure (FVAD) index

Most disclosure studies employed content analysis to examine the extent of disclosure practices (Md Zaini et al., 2018). Thus, to construct the FVAD index, the content analysis method was applied to analyze the disclosure information in the companies' annual reports as compared to specific sections in the accounting standard for disclosure items. There are two methods of content analysis: the manual and automated content analysis method. For this study, we employed the manual content analysis method to codify the agricultural disclosure in the companies' annual reports. This method is suitable for the size of our collected data as the latter method is better suited to a large data set (De Graaf & van der Vossen, 2013).

Although a word count is more objective and has a higher degree of accuracy, this study used the sentence as a unit of analysis because "[words] cannot be coded without reference to the underlying sentence" (Ntim et al., 2013, p. 370). The FVAD index was constructed by first identifying the disclosure items based on the MFRS 141 from paragraph 40 to paragraph 57. Second, we identified items from each paragraph and characterized each item into a few sub-items with a similar theme. Third, we read a sample of companies' annual report to identify the disclosures that each had made. The index measurement method is frequently criticized for being inherently subjective (Marston & Shrives, 1991), so we followed the following procedures to ensure the index's dependability and reduce subjectivity. First, four independent researchers coded a sample of two companies' Annual Reports independently and then, their results were compared. The non uniformity of the index formed was not tolerated and discussions were continued until all members agreed on the same system. The final coding was based on the agreement of all researchers. Table 2 displays the descriptions of the disclosure paragraphs.

Each item was scored from 0 to 3, where 0 is without any disclosure, 1 is for figures provided without any explanation, 2 is for disclosure with descriptions, and 3 is for disclosure sufficiently detailed with figures and descriptions. Next, the sub-index and total index values were computed. The index was finalized out of a maximum total value of 120 (i.e., 40 items X maximum score 3).

5.2.2. Measurement of independent variables and control variables

In this study, CEO age (CEO_AGE) was measured by the absolute number of the CEO's age, while CEO tenure (CEO_TEN) was measured by the number of years the CEO had served in the company as the CEO (Sumarta et al., 2021). The CEO's educational background in an agricultural program (CEO_EDUA) was measured using a dummy variable with value "1" if the CEO has a degree in agriculture, or otherwise value "0", following the measurement used by Al-Duais et al. (2021). As for CFO attributes, CFO age (CFO_AGE) was measured by the absolute number of the CFO's age (Serfling, 2014), and CFO tenure (CFO_TEN) was measured by the number of years the CFO had been in office in the company (Sumarta et al., 2021). Meanwhile, BOD size (BOD_SIZE) was calculated as the absolute number of members on the board, and BOD independence (BIND) was calculated as the percentage of independent BOD members out of the total BOD members, similar to measurement used by Al-Duais et al. (2021).

Table 2. Descriptions of the disclosure paragraphs

Paragraphs Code	Descriptions	No. of items
P40_AGL	Para 40: The disclosure on the aggregate gain or loss arising during the current period on initial recognition of BA and AP and from the change in FVLCTS of BA.	4
P51_P&P	Para 51: The disclosure on the production cycle	4
P50_RECON_FV	Para 50: The presentation of reconciliation of changes in the carrying amount of BA between the beginning and the end of the current period.	
P41_DESCR	Para 41: The description of each group of BA.	1
P43_QTYDESCR	Para 43: The quantified description of each group of BA, distinguishing between consumable and bearer BA or between mature and immature BA, as appropriate.	2
P49_FINRISK	Para 49: The disclosure of: (a) the existence and carrying amounts of BA whose title is restricted, and the carrying amounts of BA pledged as security for liabilities; (b) the amount of commitments for the development or acquisition of BA; and (c) financial risk management strategies related to agricultural activity.	3
P53_NATRISK	Para 53: The disclosure of exposure to climatic, disease and other natural risks.	1
P54_ATCOST	Para 54: The entity disclosure for such BA if an entity measures BA at their cost less any accumulated depreciation and any accumulated impairment losses at the end of the period.	6
P55_ATCOST_RECON	Para 55: An entity disclosure on any gain or loss recognised on disposal of such BA and the reconciliation required if an entity measures BA at their cost less any accumulated.	3
P56_COST~V	Para 56: An entity disclosure for those BA if the fair value of BA previously measured at their cost less any accumulated depreciation and any accumulated impairment losses becomes reliably measurable during the current period.	3
P57_GOVGRANT	Para 57: An entity disclosure of government grant related to agricultural activity.	6
Total items		40

Notes: Biological Assets (BA), Agricultural produces (AP), fair value less costs to sell (FVLCTS).

Previous studies have found that larger and older firms with higher profits are associated with higher levels of voluntary disclosure due to their capability and resources (Al-Shammari et al., 2008; Appiah et al., 2015). Meanwhile, firms with low leverage tend to utilize their resources on voluntary disclosures (Al-Duais et al., 2021). Similarly, firms that use prominent audit firms have better quality in corporate reporting (Fernandez-Feijoo et al., 2016). Therefore, this study controls for firm size, firm age, leverage level, profitability, and audit firm. Firm's size (SIZE) was measured by natural log of total assets of the company, and firm's age (FIRM_AGE) was determined by the number of years since the company had first been listed at Bursa Malaysia. Leverage level (LEV) was measured by the ratio of total debt over total assets, while profitability level (ROA) was measured by the ratio of profit over total assets. Audit firm (BIG4) was determined by a dummy variable with value "1" if the company was being audited by one of the Big Four auditing firms in Malaysia (EY, PwC, KPMG, or Deloitte), or otherwise value "0". Table 3 provides a summary of all variables' measurement methods.

5.3. Model specifications

The regression model aims to test the impact that CEO attributes (age, tenure, and education in agriculture), CFO attributes (age and tenure), and BOD characteristics (size and independence) has on FVAD. Our hypotheses will be tested by running the following model:

$$\mathrm{FVAD}_{i,t} = \alpha_0 + \sum_{k=1}^{3} \beta_k \mathrm{CEO\_Attributes}_{i,t} + \sum_{j=1}^{2} \beta_j \mathit{CFO}\_\mathrm{attributes}_{i,t} + \sum_{n=1}^{2} \beta_n \mathrm{BOD\_Characteristics}_{i,t} + \sum_{m=1}^{5} \beta_m \mathit{Controlvaribles}_{i,t} + \varepsilon_{i,t} \quad \text{(Equation1)}$$

where subscripts i and t refer to firm and year, respectively and $\varepsilon_{i,t}$ is the composite error term.

6. Empirical results and discussion

6.1. Descriptive characteristics

The following Table 4 shows the descriptive analysis of variables used in the study. The mean for FVAD is 0.183. Based on the sample observations, the minimum CEO age (CEO_AGE) is 31, the maximum is 78, and the mean is 58.43. This shows that most CEO is in their late fifties. The average CEO tenure (CEO_TEN) is 10.6 years, with a minimum service of 1 year and a maximum of 42 years. For CEO education (CEO_EDUA), 17.86 per cent of the CEOs have attained a degree in agriculture, which indicates that not many CEOs have a formal education in agriculture. The average CFO age (CFO_AGE) is 52.96, with a minimum of 34 and a maximum of 80. The average CFO tenure (CFO_TEN) is 9.238 years, with a minimum of 1 year and a maximum of 41 years. The average board size (BOD_SIZE) is 7 members, with a minimum of 4 and a maximum of 12 members. Meanwhile, the mean value of board independence proportion (BIND) is 45 per cent with a standard deviation of 16 per cent. This indicates a balanced proportion of independent—dependent directors in agricultural companies in Malaysia. However, some companies do not meet the MCCG requirement of having at least 50 per cent independent directors on their BOD.

The average firm size as measured by the natural log of total assets (SIZE) is 20.68, with minimum and maximum values of 9.71 and 23.80. The leverage level (LEV) has an average value of 31 per cent. The minimum age of the sampled firms is 10 years, while the maximum age is 110 years, with an average age of 46 years, which shows that many of the firms are mature companies. For profitability, the average return on assets (ROA) for the sample is 1.81, with a minimum value of −10.04 and a maximum value of 22.63. On average, 64.28 per cent of the companies are audited by Big Four auditing firms. A further diagnostic test of variance inflation factors (VIFs) which shows a value of less than 10 indicates that the variables used in the study are not facing a multicollinearity problem.

Table 3. Variable measurements

Code	Variables	Measurement
Dependent variable		
FVAD	Fair Value Agriculture Disclosure	The score of fair value agriculture disclosure computed into an index
Independent variables		
CEO_AGE	CEO Age	The CEO's age at the start of each financial year
CEO_TEN	CEO Tenure	The number of years in the CEO position
CEO_EDUA	CEO Education	Dummy variable, which equals "1" if CEO has an agriculture-related degree, or "0" otherwise
CFO_AGE	CFO Age	The CFO's age at the start of each financial year
CFO_TEN	CFO Tenure	The number of years in the CFO position
BOD_SIZE	Board size	Number of members on the BOD
BIND	Board independence	Percentage of independent board members over total members on the BOD
Control variables		
SIZE	Firm size	Natural log of the firm's total assets
LEV	Leverage	The ratio of total debt to total assets
FIRM_AGE	Firm age	The age of the firm from listing
ROA	Profitability	Returns to assets ratio
BIG4	Audit firm	Dummy variable, which equals "1" if audited by Big Four auditing firms, or "0" otherwise

Table 4. Descriptive analysis of variables

Variable	Mean	Std. Dev.	Min	Median	Max	VIF
FVAD	0.183	0.080	0	0.192	0.4	-
CEO_AGE	58.429	10.088	31	60	78	1.51
CEO_TEN	10.655	8.847	1	8	42	1.66
CEO_EDUA	0.179	0.385	0	0	1	1.41
CFO_AGE	52.976	9.915	34	52	80	1.95
CFO_TEN	9.238	8.956	1	7	41	2.22
BOD_SIZE	7.821	2.037	4	7	12	1.94
BIND	0.457	0.164	0.167	0.429	1	1.86
SIZE	20.690	2.082	9.711	20.819	23.806	1.45
LEV	0.310	0.208	0.012	0.275	0.846	1.17
FIRM_AGE	46.238	26.220	10	42	110	1.60
ROA	1.811	4.699	−10.04	1.39	22.63	1.49
BIG4	0.643	0.482	0	1	1	1.51

Notes: Number of observations=84. All variables are defined in Table 3.

6.2. Fair Value Agriculture Disclosure (FVAD) score

The following Table 5 shows the differences between the FVAD total scores and sub-scores between 2017 and 2019, based on items in Table 2. There is a significant difference (at the 5% level) between total scores in 2017 and 2019, which indicates a significant improvement in FVAD disclosure level between the two years. Similarly, the mean value of FVAD index in 2019 is significantly higher compared to its value in 2017. Paragraphs 40, 51 and 56 disclosure scores in 2019 are significantly higher compared to their values in 2017 (at the 1% significance level). The increase in disclosure scores is also significant for paragraph 41 and paragraph 43 between 2017 and 2019 (at 5% significance level). There is no significant difference in the values of the disclosure scores related to paragraph 49, paragraph 50, paragraph 53, and paragraph 57 between 2017 and 2019. On the other hand, disclosure scores related to paragraphs 54 and 55 are significantly lower in 2019 compared to 2017 (at 1% significance level). Based on the disclosure analysis, the highest score recorded by a company is 40% for the year 2019, and the lowest score is 1% for the year 2017.

6.3. Correlation analysis

Table 6 presents the results from Pearson correlation of the variables used in the study. The correlation coefficients are all below 0.80, indicating that there is no serious correlation issue between variables used in the study (Hair et al., 2010).

6.4. Regression analysis

Pooled ordinary least regression (OLS) was performed to test the relationship of FVAD with CEO and CFO attributes and BOD characteristics. A Hausman specification test indicated that the fixed-effect model would be more appropriate than the random-effect model in this regression model (reject the null if $p < 0.05$). Therefore, a pooled regression analysis with fixed effect model and robust test was performed on the research model.

A test for heteroskedasticity in the fixed-effect model, the xttest3 command in Stata, was applied (Baum, 2001). The result (prob>chi^2 = 0.000) suggests that the robust option is appropriate to overcome the heteroskedasticity in the model. Therefore, the regression was run with the robust option. The following Table 7 below shows the results from regression analysis between CEO attributes (age, tenure, and education in agriculture), CFO attributes (age and tenure), BOD attributes (size and independence) and control variables (firm size, leverage, firm age, profitability, and audit firm) on FVAD level.

Table 5. Differences in disclosure scores between 2017 and 2019

	2017	2019	t-test
TOTAL SCORE	19.310	24.6667	2.6600**
FVAD	0.1609	0.2056	2.6600**
P40_AGL	0.7619	6.2142	12.1868***
P51_P&P	0.2857	2.0238	6.8290***
P50_RECON_FV	5.6190	5.7619	0.1712
P41_DESCR	1.7857	2.3809	2.4341**
P43_QTYDESCR	1.8095	2.4286	2.6115**
P49_FINRISK	2.8571	2.3095	1.2988
P53_NATRISK	1.1905	1.0238	0.8299
P54_ATCOST	2.3095	0.1667	4.9492***
P55_ATCOST_R	1.4047	0.0476	5.0570***
P56_COST_T~V	0.0238	0.9256	3.2708***
P57_GOVGRANT	1.2619	1.3100	−0.1734

Notes: ***, ** and * indicate significant at 0.01, 0.05 and 0.10 level respectively.

We found significant but negative results between CEO_AGE and FVAD (β = −0.006, t-value= −1.83, p-value = 0.074) which supports hypothesis of this study (H1). Interestingly, the results demonstrate that younger CEOs are more willing to enhance the information on FVAD in their firms' business reports. This is in line with McCarthy et al. (2017) study and UET's assumption on cognitive base and values for decision-making (Hambrick & Mason, 1984). Younger CEOs are more willing to make risky investments to demonstrate their competence (Shahab et al., 2020) and are more effective at adapting to change (Bantel & Jackson, 1989). Essentially, this outcome suggests that younger CEOs venture into presenting more detailed information on FVAD to demonstrate their competence and to inspire users' confidence in reports.

The results show that CEO tenure is non-significantly associated with FVAD (β = −0.007, t-value= −1.65, p-value = 0.106), suggesting that CEO tenure is not related to the level of FVAD information. The result does not support the hypothesis (H2) and the UET assumption which expected an influence of CEO tenure on disclosure level. It is a CEO's duty to adapt to current changes in regulations and the business environment, irrespective of his/her tenure. The finding is consistent with Oware and Awunyo-Vitor's (2021) finding of a non-significant relationship between CEO tenure and environmental disclosure. This study provides evidence that CEO tenure does not play a major role in encouraging detailed information on FVAD in the firm's business report.

CEO education was found to have a significant and positive relationship with FVAD (β = 0.179, t-value = 2.02, p-value = 0.05), supporting the hypothesis (H3). The finding shows that a CEO with a degree in agriculture plays a key role in encouraging the firm to report more details on FVAD. Agricultural knowledge helps CEOs to understand the importance of fair value disclosure of assets. Consistently, the findings are in line with those of Akhtaruddin and Rouf's (2012) and Li et al. (2019) studies, that the CEO's education level is vital in enhancing the firm's FVAD information. Thus, as discussed in UET (Hambrick & Mason, 1984), the cognitive base is essential for the CEO's decision-making in disclosing information that is deemed relevant to the business.

The results for CFO attributes show that there is a significant but negative relationship between CFO age and FVAD (β = −0.004, t-value= −2.11, p-value = 0.041). This result indicates that companies led by younger CFOs are more motivated to engage in a better level of agricultural disclosure, which is inconsistent with hypothesis (H4) which predicted a positive relationship. Even though a significant relationship is proven, this evidence does not align with UET, which emphasizes that older leaders perform better and are more knowledgeable and mature in the disclosure decision-making process (Hambrick & Mason, 1984; Shahab et al., 2020). However, this empirical finding is in line with the work of Chithambo et al. (2020) who also found a significant negative association between top management age and disclosure.

The result also indicates that CFO tenure has a significant positive relationship with FVAD (β = 0.003, t-value = 1.86, p-value = 0.071). This implies that companies with long-tenured CFOs have higher motivation to increase FVAD. Thus, our hypothesis (H5) is accepted. This supports the assumptions of UET which posits that CFO tenure based on values and experiences may be recognized as a central dominance affecting the firm's decision-making process, and positively expects that long-tenured CFOs will be more aware of the need for high-quality financial information. The result is also in line with Li et al. (2019) idea that the long tenure of executives will result in a favorable outcome in many forms, including reporting disclosure and solving the company's problems.

The result also shows that BOD size is positively significant at a five per cent level. The positive coefficient for BOD size indicates that the larger the BOD, the better the FVAD level. The finding suggests that a higher number of BOD members can help to monitor the management's duty to provide relevant information to stakeholders, in line with agency theory. A large pool of BOD members leads to diversity in expertise and experience in the monitoring role, thus helping improve the quality of disclosure. This finding is similar to those of Alfaraih (2016) and Almaqtari

Table 6. Pairwise correlation analysis

Variables	FVAD	CEO_ AGE	CEO_ TEN	CEO_ EDUA	CFO_ AGE	CFO_ TEN	BOD_ SIZE	BIND-	SIZE	LEV	FIRM_ AGE	ROA	BIG4
FVAD	1.000												
CEO_AGE	0.121	1.000											
CEO_TEN	0.092	0.531*	1.000										
CEO_EDUA	−0.009	0.107	0.149	1.000									
CFO_AGE	−0.145	−0.060	−0.098	0.263*	1.000								
CFO_TEN	−0.023	0.037	−0.066	−0.075	0.561*	1.000							
BOD_SIZE	0.104	0.137	0.108	0.087	−0.210	−0.276*	1.000						
BIND	−0.098	−0.093	−0.050	−0.046	−0.110	−0.185	−0.487*	1.000					
SIZE	0.127	0.132	0.202	0.265*	−0.088	−0.008	0.110	0.039	1.000				
LEV	0.275*	0.042	0.015	−0.054	−0.018	0.210	−0.025	−0.057	0.057	1.000			
FIRM_AGE	−0.058	−0.220*	−0.236*	0.131	−0.066	−0.267*	−0.308*	0.440*	−0.033	−0.173	1.000		
ROA	0.040	−0.067	0.106	0.166	0.068	−0.227*	0.193	−0.237*	0.048	−0.306*	0.083	1.000	
BIG4	0.122	0.081	−0.05	0.088	−0.019	−0.075	0.327*	−0.092	0.410*	−0.026	−0.026	0.238*	1.000

Note: * indicates significant at 0.05. All variables are defined in Table 3.

Table 7. Regression results

Variables	Coefficient	Robust Std. Error	t	P>|t|
Constant	−1.794	1.983	−0.90	0.371
CEO_AGE	−0.006	0.003	−1.83	0.074*
CEO_TEN	−0.007	0.004	−1.65	0.106
CEO_EDUA	0.179	0.089	2.02	0.050**
CFO_AGE	−0.004	0.002	−2.11	0.041**
CFO_TEN	0.003	0.002	1.86	0.071*
BOD_SIZE	0.032	0.015	2.13	0.039**
BIND	0.179	0.105	1.71	0.095*
SIZE	0.016	0.078	0.20	0.840
LEV	−0.124	0.248	−0.50	0.619
FIRM_AGE	0.043	0.013	3.24	0.002***
ROA	0.004	0.006	0.78	0.439
BIG4	−0.088	0.032	−2.74	0.009***

Notes: ***, ** and * indicate significant at 0.01, 0.05 and 0.10 level respectively. All variables are defined in Table 3. R-squared = 0.4089.

et al. (2021), who also identified a significant positive effect of BOD size on mandatory disclosure levels based on IFRS requirements.

Additionally, the results show that BOD independence proportion is positively significant at a 10 per cent level in the regression model. The results indicate that the independence of BOD members has an impact on the fair value disclosure level. The result suggests that the higher the proportion of independent directors, the better the fair value disclosure level, due to the ability of independent directors to provide objective opinions and advice to the management in the financial reporting process. This is parallel with agency theory, which states that BOD independence could help to reduce information asymmetry between the management and the shareholders. The findings are consistent with those of Abdelqader et al. (2021) and Almaqtari et al. (2021).

In terms of control variables, the result on firm size is positive but not significant, which indicates that firm size does not affect the level of FVAD in Malaysia. This contradicts previous studies which document that firm size positively affects IFRS compliance level (Al-Shammari et al., 2008; Appiah et al., 2015; Jaafar & McLeay, 2007). This could be due to the small sample size, as this study only employs 84 firm-year observations. The result on leverage is negative and non-significant which means that leverage level does not have any significant effect on FVAD. This result is consistent with the finding of Bepari and Mollik (2015), who found that leverage does not significantly affect the IFRS disclosure level for goodwill impairment testing among Australian companies.

The regression results confirm that firm age positively and significantly affects FVAD. This can be explained in that the more mature a company is, the more experience it has and the better it can correctly disclose the required fair value agriculture information. This could also be due to the fact that these mature firms have the ability to recruit professional and competent staff to report financial statements in accordance with IFRS requirements. The result on profitability is positive but non-significant to affect the disclosure level, in line with the findings of Appiah et al. (2015) and Ahmed and Khan (2016), who also found no significant relationship between profitability and IFRS disclosure requirements.

Meanwhile, the result on auditing firm is negative and highly significant at the one per cent level (β= −0.088, P-value = 0.009), indicating that auditing by Big Four auditing firms in Malaysia does not guarantee firms' high FVAD compliance level. This is not surprising; Carlin et al. (2009) also

found that even if audited by Big Four auditing firms, sample companies systematically failed to conform even with essential elements of the IFRS 136 disclosure framework with regards to goodwill impairment testing. Another reason could be high compliance costs for companies to bear.

6.5. Additional analysis

We performed an additional examination using an alternative approach to quantify CEO, CFO, and BOD attributes, aiming to test the robustness of our findings. We re-evaluated our regression models by converting CEO_AGE, CEO_TEN, CFO_AGE, CFO_TEN, and BOD_SIZE into natural logarithms, as suggested by prior research (Chen et al., 2019; Cheung & Adelopo, 2022; Dang et al., 2017). The results, presented in Table 8, aligned with our primary findings, indicating that the use of alternative proxies does not significantly alter the results concerning CEO, CFO, and BOD attributes. Consequently, these results exhibit robustness across various measurements.

7. Summary and conclusion

Agricultural disclosure is important for business reporting and the benefit of stakeholders in Malaysia. However, it has received limited attention by researchers, despite its essential role in business reporting for the benefit of all stakeholders, particularly in the Malaysian setting, where agriculture is a crucial sector of the economy, generating a major part of the country's income and attracting potential investors. As such, it is important that accounting information of biological assets be disclosed precisely and accurately for the benefit of the stakeholders and national development. Quality disclosure of accounting information for biological assets requires the involvement of corporate governance, particularly the governance of the executive roles (CEO and CFO) and the mechanism of the BOD. The CEO and the CFO are the two most important persons on the management board in executive role, with major influence on strategic and operational decisions that ultimately provides impact on companies' financial reporting and disclosure quality. The BOD oversees the roles of executive directors and senior management for the benefit of the company and the stakeholders. Therefore, the roles of the CEO, CFO, and BOD are crucial for enhancing the quality of disclosure of accounting information of biological assets. Despite extensive studies investigating the effects of CEO and CFO characteristics on companies' accounting choices, research exploring their effects on agricultural disclosure is still scarce. Thus, this study seeks to examine the impact of CEO, CFO, and board attributes on FVAD.

Table 8. Additional analysis

Variables	Coefficient	Robust Std. Error	t	P>|t|
Constant	−0.020	1.549	−0.01	0.99
LNCEO_AGE	−0.320	0.173	−1.85	0.071*
LNCEO_TEN	−0.025	0.019	−1.34	0.188
CEO_EDUA	0.133	0.065	2.06	0.046**
LNCFO_AGE	−0.240	0.105	−2.28	0.028**
LNCFO_TEN	0.025	0.014	1.77	0.084*
LNBOD_SIZE	0.230	0.117	1.97	0.055*
BIND	0.141	0.083	1.69	0.099*
SIZE	0.008	0.075	0.10	0.917
LEV	−0.163	0.233	−0.70	0.488
FIRM_AGE	0.040	0.012	3.20	0.003***
ROA	0.003	0.005	0.66	0.515
BIG4	−0.084	0.026	−3.19	0.003***

Notes: ****, ** and * indicate significant at 0.01, 0.05 and 0.10 level respectively; R-squared = 0.413.*

Using a sample of 84 Malaysian company-year observations for the period of 2017 and 2019, this study provides empirical evidence that FVAD has improved significantly in accordance with the accounting standards. High-quality FVAD is relevant to all users of financial statements for their decision-making on investment, ultimately contributing to national economic development. The further development of the findings of this paper highlights the role of top management (those charged with governance: CEO, CFO, and BOD) in producing quality FVAD for the benefit of companies and stakeholders. The findings prove that younger CEOs and CFOs are more inclined to encourage FVAD which may be because younger CEOs and CFOs play an influential role in improving FVAD in Malaysian companies, which may be because they have more motivation and better skills (e.g. capacity and expertise) to deal with complex issues. Essentially, the outcome of this study suggests that younger CEOs and CFOs venture into presenting more detailed information on FVAD to demonstrate their competence and to enhance the confidence of the report-users. In addition, the study reveals that CEOs who have a degree in agriculture are key in encouraging the firm to report more FVAD, indicating that agricultural education positively encourages detailed information on FVAD. Thus, as discussed in UET, the cognitive base is essential for CEOs' decision-making in disclosing detailed information on FVAD. On the other hand, CEOs with longer tenure have no significant influence on FVAD. This study's findings, that younger CEOs and CEOs with agricultural degrees influence FVAD, confirm that the CEO role is crucial for strengthening companies' disclosure practices for transparent and detailed reporting for the benefit of all stakeholders. In line with UET, this study reports on the importance of CEO characteristics to build their values and experiences for effective decision-making in producing good-quality reporting. The findings also show that CFOs with long tenure are more likely to be associated with higher FVAD. This supports the assumptions of UET (based on values and experiences) which posits that CFO tenure may be recognized as a central influence on the firm's decision-making process, suggesting that long-tenured CFOs are more aware of the need for high-quality financial information.

With regards to BOD characteristics, the study found that both BOD size and independence level influence FVAD. A large BOD may comprise a diverse set of knowledge, skills, and experience in agriculture, and is expected to make the best decisions for the company. Besides, independent BOD members are able to make unbiased decisions and suggest strategic directions for the company. This is consistent with agency theory which proposes the crucial role of the BOD in reducing information asymmetry between managers and stakeholders, and thus the agency cost. It shows that the BOD's role is critical, especially in financial reporting and disclosure. Therefore, the findings imply that a larger number of board members and a higher proportion of independent board members can help in monitoring the management's role in providing better information through fair value disclosure.

Thus, based on the discussion and empirical findings, we would finally offer the FV disclosure model as shown in Figure 1 to improve companies' FVAD. As the link between top management and FVAD has been identified, the following suggestions are to be considered to achieve good compliance level with FVAD at the company's level:

(i) To organize formal training for the CEO, CFO, and BOD on FVAD compliance.
(ii) To prepare guidelines for the appointment process for top management, such as looking at candidates' educational background.
(iii) To increase the compliance with FVAD based on the company's experience.

In addition to the above suggestions, our results have several important practical implications that are relevant for different interested parties in Malaysia (e.g., regulators, policymakers, corporate board, investors, and researchers) in enhancing corporate governance initiatives to improve FVAD. The findings may help regulators and policymakers to enhance accounting standards in order to improve the transparency of reporting, particularly for FVAD practice in the agriculture sector. This will positively help companies to disclose relevant and standardized FVAD in their financial reports for the benefits of stakeholders. Relevant and standardized FVAD boosts users' confidence in the companies

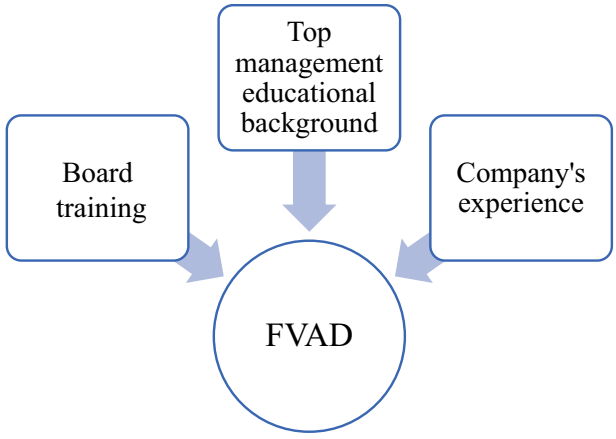

Figure 1. FV model on compliance with MFRS 141 Agriculture.

and aids comparisons between companies for analysis purposes. The findings of this study also reveal that to achieve standardized and transparent FVAD requires strong corporate governance by the CEO, CFO, and BOD. Furthermore, our empirical findings could help regulators and corporate board management to develop guidelines for the appointment of CEOs and CFOs in agricultural companies to enhance FVAD. Better FVAD can become a "signal" to investors, shareholders, and financial analysts about management quality, enhancing companies' reputation in the corporate market. Researchers who are interested in agricultural disclosure should pay attention to CEO and CFO attributes as effective determinants of corporate governance in enhancing FVAD.

Despite the valuable outcomes resulting from this study, the findings should be interpreted carefully because this work has some limitations. The first limitation is related to the sample size. This study examines data from a single emerging country, Malaysia, to examine the relationship between top management's attributes and FVAD practice. Malaysian agriculture is monopolized by huge companies. Future studies might expand by using cross-country or multinational samples including other Asian countries (e.g. Thailand and Indonesia). A second limitation is related to the subjectivity of content analysis techniques in measuring FVAD. Although our FVAD data were examined thoroughly line by line and page by page to determine the FVAD indices, future studies may employ alternative measures of FVAD (e.g. by counting the number of words, sentences, and pages). The third limitation is related to the CEO and CFO characteristics (age, tenure, and education) studied. Future research could explore the effects on FVAD of other CEO and CFO attributes, such as family relationship and gender. According to Abdullah et al. (2017), female board members are dominant in Malaysian family businesses, thus, they are regarded as "token membersism" and do not contribute to the company's financial performance or raise its value.

In sum, this paper concludes that the CEO, CFO, and BOD (top management) are crucial to heighten the quality of FVAD, ultimately emphasizing the importance of corporate governance to strengthen company financial reporting for the benefit of companies and all stakeholders. Regulators should continuously upgrade presentation and disclosure requirements in accounting standards for the agriculture industry so that those charged with governance enhance reporting quality of FVAD, to boost stakeholders' confidence in financial reporting quality.

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