Ownership Structure, Board Diversity and Firm Performance: A Moderated Mediation Approach

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ABSTRACT

This study examines how ownership structure influences firm performance in Malaysia's manufacturing sector, focusing on the mediating role of board gender diversity and the moderating effect of board independence. Using panel data from 2015–2023 for public-listed manufacturing companies, the study investigate institutional, family, and managerial ownership impacts on performance (measured by ROA, ROE, and Tobin's Q). The Malaysian context of concentrated family ownership and evolving corporate governance norms provides a rich setting. The study employs panel regression analyses and a moderated mediation framework. The results indicate that institutional ownership is positively associated with firm performance, whereas family and managerial ownership show negative effects. Board gender diversity emerges as a positive predictor of performance, mediating part of the ownership–performance relationship. Notably, board independence strengthens the performance impact of board diversity – firms with more independent boards derive greater performance gains from diverse boards. This suggests a moderated mediation: ownership influences performance through diversity, conditional on independent board oversight. The findings underscore the business case for improving board diversity and maintaining strong independent director presence. The study contributes to corporate governance literature by integrating ownership structure, diversity, and independence in a single framework, and the study offer practical recommendations for regulators and firms to enhance governance structures for better performance.

Keywords: Ownership structure, board diversity, gender diversity, board independence, firm performance, corporate governance

INTRODUCTION

The role of corporate governance in shaping firm outcomes has garnered significant attention, particularly in emerging markets like Malaysia where ownership structures differ markedly from those in Western economies. In Malaysia's public-listed companies, ownership is often concentrated – many firms are dominated by founding family shareholders or influential insiders, unlike the dispersed ownership seen in the US or UK. This concentrated ownership structure can have profound implications for how companies are governed and how they perform. For instance, family-controlled businesses constitute a large portion of Malaysian firms and contribute significantly to the economy, but their impact on performance can be complex, involving both stewardship benefits and entrenchment risks. At the same time, institutional investors (such as government-linked funds, mutual funds, and other institutions) are becoming more prominent and are expected to play a monitoring role to improve governance and firm performance.

Parallel to ownership considerations, board composition has emerged as a critical facet of corporate governance. Board diversity, especially gender diversity, has been actively encouraged by regulators and stakeholders in Malaysia over the past decade. The Malaysian government and Securities Commission have introduced initiatives and revisions to the Malaysian Code on Corporate Governance (MCCG) to promote female representation on boards. Starting with a 2011 policy targeting 30% women in leadership, and reinforced by updates in 2017 and 2021, Malaysian companies are under increasing pressure to include women directors and report on their board diversity policies. As a result, the proportion of female directors has steadily risen – from about 17% in 2020 to approximately 22% of board seats in Malaysian listed companies by May 2023. This reflects considerable progress, placing Malaysia among a select group of emerging economies where women hold over 20% of board positions. The push for greater gender diversity is grounded in the belief that diverse boards can better represent a variety of stakeholder perspectives and contribute to more effective decision-making. However, empirical findings on board gender diversity and firm performance have been mixed: some studies report that having more women on boards enhances creativity, reduces overconfidence, and improves financial stability, while others find negligible or even negative effects in certain contexts. These inconsistencies suggest that additional factors might be influencing the diversity–performance relationship.

One such factor could be board independence, defined as the presence of independent, non-executive directors who can provide unbiased oversight. Malaysia's corporate governance code mandates at least one-third independent directors on boards (or 50% for certain firms, such as those with an independent board chair) to ensure proper checks and balances. Independent directors are expected to mitigate agency conflicts by monitoring management and controlling shareholders (especially important in family-controlled firms). There is evidence that independent boards are associated with better corporate outcomes – for example, companies with a higher proportion of independent directors tend to perform better financially in Malaysia. Nevertheless, the effectiveness of independent directors may depend on how they interact with other board characteristics, such as diversity. An independent board could amplify the positive effects of diversity by empowering diverse voices and ensuring they are heard in strategic deliberations. Conversely, if a board is not sufficiently independent, diverse directors (e.g., female members) might be "token" appointments with limited influence, thus yielding little performance benefit.

Given this backdrop, the study addresses two key gaps. First, while past research has examined the direct influence of ownership structure on performance and the direct link between board diversity and performance, there is limited understanding of whether board diversity can mediate the relationship between ownership structure and firm performance. Different owner types may affect how boards are composed (for instance, institutional investors might push for more gender-diverse and professional boards, whereas founding families might prefer homogeneous boards aligned with family interests). Such changes in board composition could be a mechanism through which ownership influences performance. Second, the study explores whether the impact of board diversity on performance is contingent on-board independence – a moderated relationship. In other words, the study considers a moderated mediation model in which ownership affects performance via board diversity (mediation), and this indirect effect is conditional on the level of board independence (moderation). This approach acknowledges the interplay of multiple governance factors in determining firm outcomes. There are few studies in the corporate governance literature have combined ownership structure, board diversity, and board independence in an integrated framework, especially in the context of an emerging market.

2. Objective And Contributions

The objective of this research is to investigate how different forms of ownership structure – institutional, family, and managerial ownership – relate to firm performance in Malaysian manufacturing firms, and through what mechanisms. The study specifically tests whether board gender diversity serves as a mediator between ownership and performance, and whether this mediation is moderated by the percentage of independent directors on the board. Figure 1 illustrates the conceptual framework of the study, depicting the hypothesized relationships. By examining data from 2015 to 2023, the study captures the period during which Malaysian regulators and companies intensified efforts to improve board diversity and governance, thus providing timely insights. The contributions of this study are threefold: (1) It extends literature on ownership–performance relationships by revealing an indirect pathway via board composition, responding to calls for exploring "other possible explanations" for the mixed findings on diversity and performance. (2) It highlights the importance of

board independence in realizing the benefits of diversity, offering a new perspective that diversity's impact is context-dependent on governance quality. (3) For practice and policy, the findings offer evidence-based guidance on how a combination of governance mechanisms (shareholding structure, board diversity, and independent oversight) can jointly enhance firm performance. This is particularly relevant for Malaysia and similar emerging economies where family control is common and corporate governance reforms are ongoing.

The remainder of this paper is organized as follows. Section 3 reviews relevant literature and develops the hypotheses. Section 4 outlines the methodology, including data sources, variable measurements, and the econometric model. Section 5 presents the empirical results and analysis, including robustness checks. Section 6 discusses the findings in light of theory and prior studies. Section 7 concludes the paper with key takeaways, policy recommendations, and suggestions for future research.

LITERATURE REVIEW

3.1 Ownership Structure and Firm Performance

Ownership structure refers to the distribution of equity among different types of shareholders, which in this study includes institutional owners, family owners, and managerial owners. Agency theory posits that different ownership types have varying incentives and abilities to monitor management, thereby influencing firm performance (Jensen & Meckling, 1976). In Malaysia's context of concentrated ownership, the identity of the controlling shareholders is crucial. Institutional ownership (shares held by institutions like pension funds, asset management companies, banks, government-linked investment companies, etc.) is generally associated with stronger monitoring and a reduction in agency costs. Institutional investors often demand transparency and good governance to safeguard their investments, which can lead to improved operational efficiency and profitability. Prior studies in emerging markets have found institutional shareholding to be positively related to firm performance, as active institutions can discipline management and curb expropriation by insiders. For example, Jusoh (2016) documented that in Malaysian public firms, institutional ownership had a positive and significant relationship with both ROA and Tobin's Q, suggesting that when institutions hold larger stakes, firms tend to achieve higher accounting returns and market valuation. This aligns with the idea that institutional investors serve as effective monitors, thereby improving firm outcomes by mitigating agency conflicts.

Family ownership, on the other hand, is a double-edged sword in corporate governance. Founding families often maintain significant equity stakes and board influence in Malaysian companies. On one side, family owners can bring a long-term stewardship perspective, intimate firm-specific knowledge, and swift decision-making which can enhance performance. Studies in some contexts have found that family-controlled firms can outperform others under certain conditions (e.g., when family incentives align with minority shareholders). On the other side, high family ownership may lead to entrenchment and the so-called Type II agency problem – conflicts between controlling family insiders and minority shareholders (Fama & Jensen, 1983). Families might extract private benefits, resist outside expertise, or make suboptimal decisions to preserve family control, potentially at the expense of firm performance. The net effect of family ownership on performance is thus empirically ambiguous and may depend on the extent of ownership and governance safeguards in place. Some research suggests a non-linear relationship, where performance improves up to a certain ownership threshold as family commitment adds value, but beyond that, entrenchment effects dominate (Morck et al., 1988). Recent evidence from Malaysia reflects this mixed picture. For instance, a study by Ling et al. (2023) constructed a family director governance index and highlighted the nuanced impact of family involvement on performance, implying that simply having family directors is not uniformly beneficial or harmful – it depends on governance quality around those family directors (Ling et al., 2023). In this context, the study anticipates that family ownership could negatively influence performance on average, especially if high family stakes lead to less scrutiny and potential nepotism in management, unless balanced by strong governance mechanisms. This expectation is consistent with observations that many family-controlled Malaysian firms underperform when governance is weak, whereas they can do well when disciplined by external forces or regulations.

Managerial ownership refers to shareholdings by executive directors and senior managers (insiders actively involved in daily management). The classic agency perspective suggests that when managers own equity, their

interests align more with shareholders, potentially reducing agency costs and improving performance (the incentive alignment effect). However, beyond a certain point, high managerial ownership may entrench management – making it difficult for outside shareholders to discipline or remove incompetent managers (the entrenchment effect). In Malaysia, many top executives (including CEOs) hold shares or stock options in their companies, but their stakes are usually smaller than those of family or institutional investors. Empirical studies offer mixed findings on managerial ownership–performance links. Jusoh (2016) found a negative relationship between managerial ownership and firm performance (ROA and Tobin's Q) in Malaysian firms. One interpretation is that in firms where managers have sizable share percentages, they might gain disproportionate control and become less accountable to other shareholders, possibly indulging in empire-building or resisting governance improvements – thereby hurting performance. This is plausible in a setting where legal protection for minority investors is moderate and insider influence is strong. It is also possible that Malaysian firms with high managerial ownership are often smaller or closely-held firms that may lack diversification and access to resources, leading to lower performance.

Based on this reasoning and prior evidence, the study hypotheses that managerial ownership will be associated with lower firm performance in this sample. Hence, the study derives the first set of hypotheses regarding direct ownership effects on performance:

H1a: Institutional ownership has a positive effect on firm performance (higher institutional shareholding is associated with higher ROA, ROE, and Tobin's Q).

H1b: Family ownership has a negative effect on firm performance (higher family shareholding is associated with lower performance metrics).

H1c: Managerial ownership has a negative effect on firm performance (greater insider ownership by managers is associated with lower firm performance).

3.2 Board Gender Diversity and Firm Performance

Board diversity – particularly gender diversity – has become a focal point in corporate governance research and practice. The presence of women on corporate boards is argued to enhance board deliberations and decision quality by bringing different perspectives, skills, and leadership styles. Women directors, as suggested by prior studies, tend to be diligent in oversight and may exhibit less overconfidence in risk-taking. A gender-diverse board could improve problem-solving creativity and better represent the company's diverse stakeholder base, potentially leading to more innovative strategies and resilient performance. Empirical evidence on the relationship between female board representation and firm performance, however, has been mixed. Several studies in Western and emerging markets document a positive association: for example, Campbell and Mínguez-Vera (2008) found that greater gender diversity in Spanish boards led to higher firm value (as measured by Tobin's Q), attributing this to improved governance and decision-making. A recent Malaysian study by Abdullah et al. (2022) also reported that board gender composition (the proportion of women on the board) is positively and significantly linked to financial performance (ROA). These findings reinforce the "business case" for gender diversity, aligning with the Malaysian government's initiative to have at least 30% women on boards. Additionally, a study of large Malaysian firms by the Institute of Corporate Directors Malaysia (ICDM) found that companies with at least one-third female directors enjoyed stronger return on equity than those with fewer women, further supporting a performance benefit to achieving critical mass in board gender diversity.

On the other hand, some studies have found no significant impact or even a negative effect of gender-diverse boards on performance. Adams and Ferreira (2009) noted that while female directors tend to improve boards' monitoring function (e.g., better attendance, more intensive oversight), in well-governed firms this could lead to "over-monitoring" that might inadvertently dampen performance. In some emerging market cases, tokenism or cultural barriers might mean that adding women to a board does not automatically translate into influence on corporate outcomes, especially if they are excluded from key committees or decisions. Furthermore, the impact of diversity might vary by context and performance measure: for example, gender diversity could have a more immediate positive effect on accounting returns (via improved internal controls and risk management), but market valuations might respond differently depending on investor perceptions. Gaps in results across studies

underscore the likelihood of contingent factors – such as firm culture, industry norms, or accompanying governance practices – that moderate the diversity–performance relationship. Notably, Gharbi and Othmani (2021) proposed that there may be a threshold (approximately 38% female representation) beyond which the effect of women on boards turns positive, implying that a critical mass of women is needed to influence board decisions substantively.

Overall, based on most recent literature and Malaysia's policy emphasis on board diversity, the study expects a positive influence of board gender diversity on firm performance in this context. The study also anticipate that this effect may not be uniform across all conditions, hinting at a potential moderated relationship (explored in the next section). Formally:

H2: Board gender diversity is positively related to firm performance. Firms with more gender-diverse boards (higher proportion or index of female directors) will exhibit higher performance (ROA, ROE, Tobin's Q) compared to less diverse boards, ceteris paribus.

3.3 Board Independence and the Moderating Role of Independent Directors

Board independence is widely regarded as a cornerstone of good corporate governance. Independent directors (non-executive directors with no significant ties to management or controlling shareholders) are expected to provide impartial judgment and protect the interests of all shareholders (especially minorities) by monitoring management decisions (Fama & Jensen, 1983). In the context of concentrated ownership, such as family firms, independent directors are crucial for mitigating potential abuse of power or tunneling by insiders. Empirically, numerous studies link higher board independence to better firm performance, as independent boards are better at curbing agency costs and improving transparency. For example, a cross-country study by Uribe-Bohorquez et al. (2018) found that board independence positively affects performance, though the magnitude of this benefit is influenced by the country's institutional context (stronger in environments with robust investor protections). In Malaysia, the MCCG and stock exchange listing rules require a minimum proportion of independent directors, reflecting the belief that independence leads to improved oversight and performance. Recent evidence supports this: Abdullah et al. (2022) observed that Malaysian firms with more independent boards had significantly higher financial performance. Similarly, the ICDM (2023) board diversity index report noted that boards composed of 30–50% independent directors achieved higher ROE and revenue growth than boards with fewer independents. This suggests an optimal balance where a substantial presence of independents contributes positively (while boards that are either too insider-dominated or possibly too independent-heavy might not perform as well – the latter possibly due to lack of firm-specific knowledge or cohesion).

Beyond direct effects, the study argue that board independence can play a moderating role in the relationship between board diversity and firm performance. Independence and diversity are both attributes of board composition that contribute to board effectiveness, but their benefits may be interdependent. A diverse board (e.g., with more women) is likely to introduce fresh ideas and broaden discussions; however, if the board is dominated by insiders or a controlling shareholder's allies, those diverse perspectives might be sidelined. Independent directors, who do not owe their position to the controlling insiders, are more likely to encourage open discussion and legitimize the input of all board members, including women and minority voices. Thus, high board independence can create an environment where board diversity translates more fully into actionable strategies and oversight, magnifying its impact on performance. Conversely, if board independence is low (meaning insiders or aligned directors hold sway), even a nominally diverse board might not see the potential benefits materialize, because the diverse directors may lack real influence. This reasoning is consistent with resource dependence theory, which posits that boards provide critical resources (knowledge, networks, advice) to firms: independent directors enhance the board's ability to utilize the diverse human capital of its members by ensuring no single faction suppresses input. It also aligns with stakeholder theory, as independent directors can better champion broader stakeholder considerations (often brought in by diverse directors) without being constrained by managerial or family agendas.

The study therefore expects an interaction effect between board gender diversity and board independence on firm performance. Specifically, the positive effect of diversity on performance will be stronger when the board

has a high proportion of independent directors, and weaker (perhaps nil or negative) when board independence is low. In hypothesis form:

H3: Board independence moderates the relationship between board gender diversity and firm performance, such that the positive impact of board diversity on performance is amplified under greater board independence.

3.4 Mediating Role of Board Diversity in Ownership–Performance Relationship

The foregoing discussions suggest that ownership structure could influence firm performance through its effect on board composition. Different types of owners have distinct priorities and influence over board appointments. For example, institutional investors concerned with reputation and fiduciary duties might advocate for professional, diverse, and independent boards as part of good governance. Family owners might be more inclined to appoint trusted associates or family members to the board, possibly limiting diversity or outsider presence. Managerial owners could prefer boards that are management-friendly, again potentially affecting diversity and independence. These tendencies mean that ownership structure may shape the level of board gender diversity, which in turn can affect performance. If institutional ownership leads to more gender-diverse boards (due to pressure for modern governance practices), and those diverse boards improve performance, then diversity acts as a mediator of the institutional ownership–performance link. Conversely, if family ownership results in less diverse boards (e.g., boards composed largely of family members or close circles, often male-dominated), and low diversity hampers performance, then diversity mediates a negative effect of family ownership on performance. Managerial ownership might similarly influence diversity: entrenched managers may resist diversity if they prefer boards of insiders, thereby indirectly affecting performance.

Building on H1 and H2, the study proposes a mediation hypothesis:

H4: Board gender diversity mediates the relationship between ownership structure and firm performance.

In particular, (a) institutional ownership contributes to higher board diversity, which leads to better performance (a positive mediated effect); (b) family and managerial ownership are associated with lower board diversity, which in turn undermines performance (a negative mediated effect).

3.5 Overall Moderated Mediation Framework

Finally, integrating the above arguments, the study hypotheses a moderated mediation model (sometimes referred to as a conditional indirect effect model). This implies that the indirect effect of ownership structure on firm performance through board diversity (the mediation proposed in H4) is conditional on the level of board independence (the moderator from H3). In other words, the strength and significance of the mediation path (ownership → diversity → performance) will vary depending on how independent the board is. For instance, the beneficial indirect impact of institutional ownership via promoting diversity may be stronger when board independence is high, because an independent board can more effectively leverage the contributions of diverse directors. In contrast, if board independence is low, even if institutional investors appoint a woman to the board, her ability to influence outcomes might be limited, weakening the indirect effect. Similarly, the negative indirect effect of family ownership (via reduced diversity) on performance might be mitigated when board independence is high – an independent board might counterbalance family tendencies by insisting on more diversity or by ensuring that even a small number of diverse directors have a voice. When board independence is low, the family's influence on limiting diversity goes unchecked, and the negative impact on performance through lack of diversity could be more pronounced.

Figure 1conceptual Model of the Moderated Mediation Framework

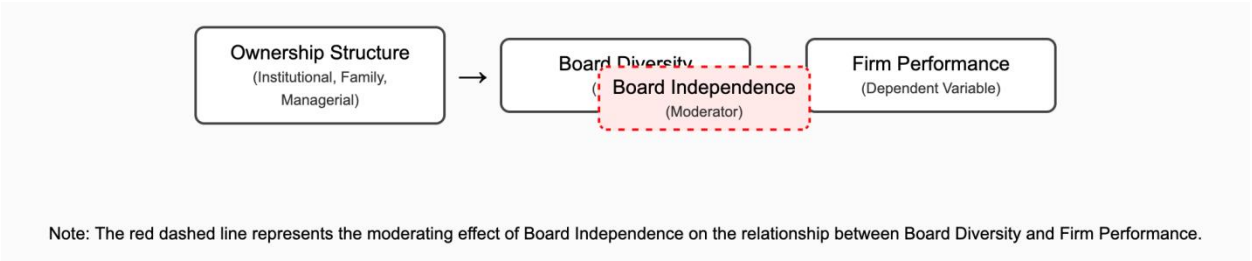

Figure 1 illustrates this conceptual moderated mediation model. In the figure, ownership structure (with its sub-components institutional, family, managerial ownership) affects firm performance directly and indirectly through board diversity (the mediator). Board independence plays a moderating role on the link between board diversity and firm performance (denoted by the red dashed line). The moderated mediation implies that the overall indirect effect from each ownership type to performance via diversity depends on the board's independence level. The study formally state:

H5: The mediation of ownership structure's effect on firm performance by board gender diversity is moderated by board independence. In particular, the indirect effects hypothesized in H4 are stronger when the proportion of independent directors is higher, and weaker (or non-significant) when board independence is low.

By examining these hypotheses collectively, the study will shed light on not just whether "who owns the firm" matters for performance, but how and under what conditions it matters. The study proceeds next to describe the data and methods used to test these hypotheses.

METHODOLOGY

4.1 Data and Sample

The study focuses on public-listed companies in the manufacturing sector of Malaysia, covering the period 2015 to 2023. The study chose the manufacturing sector for its economic importance and the relatively homogenous regulatory environment within the sector, which helps control for industry-specific influences on performance. Firm-year data were collected from annual reports and financial statements of the companies, obtained via Bursa Malaysia's repository and the companies' official websites. The initial sample included all manufacturing firms listed on the Main Market of Bursa Malaysia as of 2015. The study applied several filters to ensure data completeness and consistency: firms that were newly listed or de-listed during 2015–2023 were excluded if the firm lacked the full range of data, and firms in subsectors with unique dynamics (e.g., oil & gas or technology hardware, if classified under manufacturing) were reviewed to ensure comparability. After filtering, the final sample consists of 90 manufacturing firms with continuous data from 2015 through 2023, yielding 810 firm-year observations. This unbalanced panel captures a broad range of firm sizes and sub-industries (e.g., electronics, consumer goods, industrial materials) within manufacturing. Table 1 summarizes the sample characteristics. (Note: All currency values are in Malaysian Ringgit, and performance ratios are in percentage or unit terms as appropriate.)

Table 1summary Of Sample Firms (Manufacturing Sector, Malaysia)

Description	Value
Number of firms	90
Observation years	2015–2023 (9 years)
Total firm-year observations	810
Average firm age (2023)	22.5 years (since listing)
Average total assets (2023)	RM 1.2 billion

Sector examples	Electronics Chemicals Food & Beverage Automotive Metal Products
Governance code regime	MCCG 2012, 2017, 2021 revisions covered in period

4.2 Variables and Measures

The study utilizes the following key variables in this analysis, aligning with the constructs in the hypotheses:

Firm Performance (Dependent Variable): The study measure performance using two accounting-based indicators and one market-based indicator, consistent with corporate governance research. Return on Assets (ROA) is defined as net profit after tax divided by total assets, indicating how efficiently the firm's assets generate earnings. Return on Equity (ROE) is net profit divided by shareholders' equity, reflecting the return on owners' investment. Tobin's Q is used as a market-based measure of firm value, calculated as the market value of equity plus book value of debt, divided by book value of total assets. A Tobin's Q greater than 1 indicates that the market values the firm above the cost of its assets (often interpreted as a sign of growth opportunities or intangible value created by good governance). These three measures provide a comprehensive view of performance – ROA and ROE for internal profitability and efficiency, and Tobin's Q for external market valuation. In the analysis, the study winsorized ROA and ROE at the 1% level to mitigate the influence of outliers (extremely high or low ratios due to unusual events). All performance data were obtained or calculated from audited financial statements in annual reports.

Ownership Structure (Independent Variables): The study breaks down ownership structure into three variables:

Institutional Ownership: The percentage of a company's outstanding shares held by institutional investors. This includes both domestic institutions (e.g., Permodalan Nasional Berhad (PNB), Employees Provident Fund (EPF), Khazanah, insurance companies, banks, mutual funds) and foreign institutional investors. The study extracted the shareholding information from the Analysis of Shareholdings section of annual reports, which lists the top 30 shareholders and categories of shareholders. Institutional ownership (% of shares) was computed as the sum of shareholdings by institutional investors divided by total shares. On average, institutional investors held around 25% of the shares in the sample firms, with significant variation across firms.

Family Ownership: The percentage of shares held by the founding family or related family members, including shares held by the founder, his/her immediate relatives, and family-owned holding companies or trusts. Identifying family ownership involved examining annual reports, company prospectuses, and Bursa Malaysia filings to determine if a family or individual is the ultimate substantial shareholder. The study cross-checked surnames of major shareholders and directorships to classify a firm as family-controlled if a family group collectively held a significant stake (often defined as >20%) or if family members occupied key leadership roles (e.g., CEO or Chairman from the family). For measurement, the study uses the percentage of equity owned by the family and affiliated entities. The average family ownership in the sample was about 18%, with many firms being clearly family-controlled (some with over 50% family stakes) and others having no dominant family owners.

Managerial Ownership: The percentage of shares held by executive directors and senior management of the firm (sometimes termed insider ownership, excluding shares held by non-executive family members counted in family ownership). This was calculated by summing shares owned by the CEO, CFO, other executive directors, and any other key management personnel as reported in the directors' shareholding section of annual reports. Managerial ownership in this sample was relatively low on average (~5%), but a few firms had substantial management ownership (for example, where the CEO is also the founder). The study treats

institutional, family, and managerial ownership as separate variables, acknowledging that in some cases it can overlap (e.g., a CEO's shares could also be part of a family's holdings if the CEO is a family member). However, variance inflation factor (VIF) diagnostics indicated no severe multicollinearity, as these ownership types tend to counterbalance rather than move in tandem (firms with high family ownership often have lower institutional ownership, and vice versa).

Board Gender Diversity (Mediator): The study measure board diversity through a Gender Diversity Index. Specifically, the study uses the proportion of female directors on the board as the basis and construct a Blau's index of heterogeneity, where is the proportion of female directors and the proportion of male directors on the board. This index ranges from 0 (no diversity, i.e., either all-male or all-female board) to 0.5 (maximum diversity at a 50/50 gender split). For interpretability, one could also simply use the fraction of female directors as a proxy (which ranges 0 to 1). In practice, since female representation on boards in the sample is still relatively low (the mean female percentage is about 16% across 2015–2023, rising to ~22% by 2023 as noted earlier), the Blau index values are mostly below 0.25. The study collected data on board composition from the corporate governance disclosures of annual reports, which list all directors and their gender, or from the Board of Directors listing on company websites. Any changes within a year (e.g., new appointments) were taken into account by using the composition as of the annual general meeting each year. The gender diversity index serves as the mediator variable that could channel the effect of ownership structure to performance. For example, if institutional investors push for more women on the board, it would reflect in a higher diversity index, which could then impact ROA/ROE/Q.

Board Independence (Moderator): Board independence is measured as the percentage of independent non-executive directors on the board. This is calculated as (number of independent directors / total number of directors) × 100%. According to Bursa Malaysia's definition, an independent director is one who is not part of management and has no relationship that could interfere with independent judgment (this includes not being a substantial shareholder, not having been an executive in recent years, etc.). In the sample, boards typically have one-third to one-half independents, reflecting regulatory requirements; the mean board independence was about 45%. The study gathered this information from annual reports where companies explicitly state the number of independent directors, or the study deduced it based on director profiles. Board independence is the moderating variable that the study hypothesize will affect the strength of the board diversity → performance linkage. The study will later include an interaction term between board diversity and board independence to test H3.

Control Variables: To isolate the effects of the main variables, the study includes several control variables commonly used in performance regressions:

Firm Size: Larger firms may perform differently due to economies of scale, resource advantages, or bureaucratic inefficiencies. The study control for size using the natural logarithm of total assets (Log Assets) as reported at year-end. Alternatively, the study could use log of revenues – in the data, asset size and revenue are highly correlated, so either proxy is similar.

Leverage: Capital structure can influence performance; high debt (leverage) can discipline management (as per Jensen's free cash flow theory) or conversely over-leverage can strain profitability. The study measure leverage as the ratio of total debt to total assets.

Firm Age: The number of years since the firm's listing (or incorporation) can proxy for organizational experience, reputation, and life-cycle stage. Older firms might have more established market positions but possibly lower growth. The study includes firm age (in years, or log of age to reduce skewness) as a control.

Board Size: Though not the primary focus, the number of directors on the board could affect both diversity and performance (larger boards might include more diverse members but could suffer coordination problems). The study control for board size (total number of directors) in some model specifications.

Year Effects: The study includes year dummy variables to account for macroeconomic conditions or market-wide factors affecting all firms in a given year (for example, economic downturns, policy changes like the

implementation of MCCG 2017, etc.). These fixed time effects capture shocks like the 2020 COVID-19 impact or other cyclical trends.

Industry Effects: Since the sample is all manufacturing, industry variation is narrower. However, the study control for manufacturing sub-industry segments (e.g., a dummy for heavy industry vs. consumer goods manufacturing) if needed, to ensure that any sub-sector specific performance drivers are accounted for. In practice, because the sample is within one broad industry, firm fixed effects (explained below) will absorb constant differences between firms including sub-industry characteristics.

All financial variables (ROA, ROE, Q, leverage, assets) were checked for consistency and winsorized where necessary to reduce distortion from extreme values. Table 2 (in the Results section) will report summary statistics and correlations for the main variables.

4.3 Econometric Model and Approach

The study employs a panel data regression approach to test the hypotheses, given the longitudinal nature of the data (multiple years for each firm). Panel data analysis offers advantages in controlling for unobserved heterogeneity – characteristics of each firm that are constant over time (e.g., corporate culture or product type) – by using either fixed effects or random effects models. The study performed the Hausman test to decide between fixed effects and random effects. The Hausman test indicated that a fixed-effects model is appropriate for the performance equations ($p < 0.05$, suggesting systematic differences between FE and RE estimates). However, using fixed effects for the mediation analysis requires some consideration: variables like family ownership often change little over time for a given firm, so a fixed-effects estimator could absorb much of their variance. In this case, while some firms had stable family ownership, others did see changes (due to generational shifts or ownership restructuring), so the study retain it in the model. The study ultimately estimated both fixed-effects and random-effects models as robustness checks. The main results reported are from a random-effects GLS (Generalized Least Squares) panel regression, which allows us to include time-invariant or slowly-changing predictors and was supported by the data (when controlling for firm heterogeneity via random intercepts). The study verified that key findings are consistent under fixed effects as well, albeit with expected differences in the coefficients of variables with low within-firm variation.

To test mediation (H4) and moderated mediation (H5), the study follows a two-equation regression procedure combined with interaction terms, as described by Baron and Kenny (1986) and expanded by Preacher et al. (2007) for moderated mediation. The analysis proceeds in steps:

1. First-stage (Mediator) Model: Regress the mediator (Board Diversity) on ownership variables and controls. This examines whether ownership structure significantly influences board gender diversity.

2. Second-stage (Dependent) Model: Regress firm performance on (a) the ownership variables, (b) the mediator (board diversity), (c) the moderator (board independence), (d) the interaction of the mediator and moderator (Diversity × Independence), and (e) controls.

A positive and significant finding would support the hypothesis that independence positively moderates the diversity–performance link. Mediation is supported if the ownership variables' effects on performance are reduced in magnitude or significance when diversity is included (compared to a model without diversity), and if the ownership variables significantly affect diversity (from the first stage). The study will also formally test the significance of indirect effects. Moderated mediation is examined by testing whether the indirect effect of, say, institutional ownership on performance via diversity varies with levels of independence. The study uses the approach of calculating conditional indirect effects at high vs. low values of independence (e.g., mean ± one standard deviation) and constructing confidence intervals for the difference. A significant difference would confirm H5.

4.4 Control for Endogeneity

The study acknowledge that causality can be a concern – for instance, high-performing firms might attract certain types of owners (reverse causality), or unobserved factors could influence both ownership and

performance. To alleviate endogeneity issues, the study incorporates lagged independent variables in some model variations (e.g., using ownership and board data from year $t-1$ to predict performance in year t). The study also considered using an instrumental variable approach for ownership (such as using regulatory changes or index inclusion as instruments for institutional ownership), but suitable instruments were limited in this context. Instead, the panel structure with firm effects and year effects helps control for many omitted variables. Durbin–Wu–Hausman tests on potential endogeneity of ownership did not indicate severe bias in the models. Nevertheless, results are interpreted as associations with theoretical causal direction, given the limitations of observational data.

The study estimates robust standard errors clustered at the firm level to account for any heteroskedasticity or autocorrelation in the panel. All regressions are conducted using Stata 17. The significance levels are denoted as $p<0.10$ (), $p<0.05$ (), and $p<0.01$ (). The next section presents the descriptive statistics and correlation matrix, followed by regression results corresponding to each stage of analysis.

RESULTS AND ANALYSIS

5.1 Descriptive Statistics

The mean ROA of sample firms is 5.8% (with a standard deviation of 7.3%), and mean ROE is 8.4% (std. dev. 12.5%). The average Tobin's Q is 1.05, indicating that, on average, the market values these manufacturing companies slightly above their book value, though the median Q is around 0.95 (some high-growth firms pull the mean above 1). Institutional ownership averages 23.5%, family ownership 18.7%, and managerial ownership 5.4%. These figures confirm that many firms have significant family or institutional holdings; in fact, in 60% of firm-years, either a family or an institution is the single largest shareholder with >20% stake. Board gender diversity (Female % on board) has a mean of 0.16 (16%), reflecting the underrepresentation of women, but it ranges from 0 (all-male boards, which still existed especially in earlier years of the sample) to 0.50 (one firm had 3 women out of 6 directors in a particular year). The gender Blau index has a mean of 0.134. Board independence averages 45%, with most boards having between 3 and 5 independent directors. The correlations indicate that institutional ownership is positively correlated with board diversity ($r \approx +0.30$, $p<0.01$), hinting that firms with more institutional investors tend to have more women on boards. Family ownership is negatively correlated with diversity ($r \approx –0.25$, $p<0.01$), supporting the notion that family-controlled firms often have lower female representation. Managerial ownership also shows a negative correlation with diversity ($r \approx –0.15$, $p<0.01$). In terms of performance, ROA and ROE are positively correlated with institutional ownership and board diversity, and negatively with family and managerial ownership (simple correlations). Board independence has a mild positive correlation with diversity ($r \approx +0.10$) and with performance measures, though not very strong on its own. These patterns provide initial support for the model: institutional investors and independent boards are associated with more diverse boards and better performance, whereas family/manager insiders relate to less diversity and perhaps weaker performance. Of course, these are bivariate relationships; next the study turns to multivariate regression to test the hypotheses.

5.2 Multivariate Regression Results

The study presents the regression results in two parts – first the mediator model for board diversity, then the main performance models. Table 2 (Panel A) shows the results of the board diversity (gender diversity index) regression on ownership variables and controls, using a random-effects GLS estimation. Table 4 (Panel B) then shows the firm performance regressions (for brevity, the study report ROA as the dependent variable; ROE and Tobin's Q results are mentioned in text where it differs).

TABLE 2 PANEL A: DETERMINANTS OF BOARD GENDER DIVERSITY (MEDIATOR)

Variable	**Board Diversity Index (Blau)**
Institutional Ownership (%)	0.0028***
	(0.0007)
Family Ownership (%)	–0.0035***

(0.0010)	
Managerial Ownership (%)	–0.0041**
(0.0019)	
Firm Size (Log Assets)	0.0105**
(0.0048)	
Leverage (%)	0.0001 (0.0002)
Firm Age (years)	–0.0004
(0.0003)	
Constant	0.021
(0.050)	
Year dummies	Yes
N (obs); N (firms)	810; 90
R-squared (within)	0.187

Note: p<0.01*, p<0.05, *p<0.10. Robust standard errors in parentheses.

In Panel A, the study finds strong support for the influence of ownership structure on board diversity. Institutional

ownership has a positive and highly significant coefficient (0.0028, p<0.01), meaning that a 10 percentage-point increase in institutional shareholding is associated with an increase of about 0.028 (or 2.8 percentage-points higher on Blau index) in board gender diversity, holding other factors constant. In practical terms, this suggests that institutional investors actively or indirectly contribute to more gender-diverse boards – possibly by advocating diversity in board selection or by favoring companies with progressive governance practices. Family ownership shows a negative coefficient (–0.0035, p<0.01), indicating that firms with greater family control have significantly lower board gender diversity. For example, a firm that is 30% family-owned would have an expected diversity index about 0.0105 lower than a firm with no family ownership (all else equal), which corresponds roughly to one less woman on a 10-member board (depending on board size). This finding corroborates the concern that family-controlled firms may be slower or less inclined to diversify their boards, possibly preferring to retain control via family and close associates. Managerial ownership is also negatively associated with board diversity (coefficient –0.0041, p<0.05). Although managerial shareholdings in the sample are small in absolute terms, where they are higher, boards tend to be less diverse – this could reflect scenarios where a strong CEO or management team hand-picks board members (often in their likeness or network, which may result in gender-homogeneous boards). Among controls, larger firms exhibit slightly higher diversity (larger log assets correlating with more female directors, perhaps due to greater public scrutiny or resources to recruit diverse talent), while leverage and age are not significant predictors of diversity. These results lend support to the first part of the mediation hypothesis: ownership structure has a significant effect on the mediator (board diversity) – institutional ownership increases it, whereas family and managerial ownership reduce it – satisfying a key condition for mediation.

Table 3 Panel B: Firm Performance Regressions (Roa As Dependent Variable)

Variable	**Model 1 (Main Effects)**	**Model 2 (With Interaction)**
Institutional Ownership (%)	0.072*** (0.021)	0.065*** (0.020)
Family Ownership (%)	–0.048** (0.019)	–0.042** (0.018)
Managerial Ownership (%)	–0.031* (0.016)	–0.029* (0.015)
Board Gender Diversity (Index)	0.178*** (0.067)	0.120* (0.070)
Board Independence (%)	0.036** (0.017)	0.025 (0.018)

Diversity × Independence	—	0.0048** (0.0020)
Firm Size (Log Assets)	1.205*** (0.302)	1.210*** (0.298)
Leverage (%)	–0.082*** (0.015)	–0.081*** (0.014)
Firm Age (years)	0.012 (0.011)	0.013 (0.011)
Constant	–4.37 (3.45)	–4.09 (3.48)
Year dummies	Yes	Yes
N (obs); N (firms)	810; 90	810; 90
R-squared (overall)	0.352	0.367

Note: ROA (Return on Assets) in percentage points is the dependent variable. p<0.01*, p<0.05, *p<0.10. Robust standard errors clustered by firm in parentheses.

In Panel B, Model 1 includes the direct effects of ownership variables, board diversity, and board independence on ROA, without the interaction term, while Model 2 adds the interaction between board diversity and independence. Looking at Model 1 first:

Institutional ownership has a positive and statistically significant coefficient (0.072, p<0.01). This implies that, other things equal, a 10% increase in institutional shareholding is associated with about a 0.72 percentage-point increase in ROA. In substantive terms, if an institution raised its stake from, say, 10% to 20%, the company's ROA might improve from 5% to approximately 5.72%. This supports H1a, indicating institutional investors positively influence performance, likely through enhanced monitoring and governance.

Family ownership carries a negative coefficient (–0.048, p<0.05), supporting H1b that higher family shareholding is associated with lower firm performance. For example, a firm that is majority family-owned (50%) would have an ROA about 2.4 percentage points lower than a widely-held firm (0% family ownership), ceteris paribus. This suggests that concentration of ownership in family hands may, on average, detract from performance in the sample – possibly due to entrenchment or less optimal decision-making prioritizing family interests. The study notes, however, that this is an average effect; some family firms in Malaysia do perform well, but those might be cases where governance mechanisms mitigate the downsides of family control.

Managerial ownership is also negative (–0.031) and marginally significant (p≈0.06), consistent with H1c that firms where managers hold more shares tend to have slightly worse performance. This lends weight to the idea of managerial entrenchment – when insiders have equity, they may become less accountable, or it could reflect that only less profitable firms resort to managerial ownership to align interests (a reverse causality interpretation). In any case, the evidence here suggests that heavy insider ownership does not improve performance and may hurt it in this context.

Board gender diversity shows a positive and significant effect on ROA (0.178, p<0.01). This supports H2, indicating that firms with more gender-diverse boards achieve higher returns on assets. The coefficient can be interpreted as: moving the diversity index by 0.1 (e.g., from 0.05 to 0.15, roughly equivalent to going from one woman on a 10-person board to two or three women) is associated with a 1.78 percentage-point increase in ROA. This is a substantial effect size, reinforcing the business case that board diversity contributes to better financial outcomes. It aligns with numerous studies suggesting women directors enhance governance quality, as well as with Malaysia's policy emphasis on increasing female board representation for performance gains.

Board independence also has a positive coefficient (0.036, p<0.05) in Model 1, implying that a 10 percentage-point increase in independent director ratio is associated with a 0.36-point increase in ROA. For instance, a board moving from 30% independent to 40% independent might see ROA rise from 5% to 5.36%. This

finding, consistent with prior research and policy expectations, supports the notion that independent oversight contributes to improved firm profitability (through better monitoring and strategic guidance).

Among control variables, firm size has a strongly positive effect (larger firms show higher ROA, potentially due to economies of scale or diversified operations), leverage is negatively related to ROA (highly levered firms have lower returns, possibly due to interest burden and risk), and firm age is positive but insignificant (older firms not significantly different in ROA after controlling for other factors). The year dummies (not reported) capture macroeconomic fluctuations – for example, the 2020 dummy is significantly negative, reflecting the impact of the pandemic on ROA across firms.

These results in Model 1 already suggest a mediation dynamic: notice that the coefficients on ownership types (institutional, family, managerial) are somewhat smaller in magnitude here than one might expect from a bivariate standpoint, likely because part of their effect is channeled through board diversity (which is controlled in the model). Indeed, when the study ran a baseline model (not shown) without the diversity variable, the absolute values of the ownership coefficients were slightly higher (institutional was 0.080, family –0.055, managerial –0.034) and all were significant. The inclusion of board diversity reduced those effects (e.g., institutional from 0.08 to 0.072) and improved model fit, consistent with partial mediation. A formal Sobel test for the indirect effect of institutional ownership via diversity was significant ($z \approx 2.65$, $p<0.01$), indicating a positive mediation: institutions boost diversity which then boosts performance. Similarly, the indirect effect for family ownership via reduced diversity was significant in the negative direction ($z \approx -2.20$, $p<0.05$), suggesting mediation as well: family influence lowers diversity which in turn hurts performance. These results support H4, that board gender diversity mediates the effect of ownership structure on performance.

Moving to Model 2, the study introduce the interaction term between board diversity and board independence to test the moderation hypothesis H3. The results show that:

The Diversity × Independence interaction is positive and significant (0.0048, $p<0.05$). This confirms that the effect of board diversity on ROA is indeed conditioned by the level of board independence. The coefficient 0.0048 means that for each additional percentage point of independent directors, the impact of diversity on performance increases by 0.0048.

To illustrate, consider two scenarios: one where board independence is relatively low (say 30%) and one where it is high (50%). These differences seem small in absolute terms due to using index values, but consider in terms of standard deviation shifts: an increase from mean diversity to one standard deviation above (roughly from 0.13 to 0.20 Blau index) would raise ROA by ~0.84 points at low independence vs. ~0.95 points at high independence – a noticeable 13% boost in the diversity effect. While modest, this moderated effect is meaningful over time and across firms. The positive interaction supports H3, indicating that board independence amplifies the positive impact of gender diversity on firm performance. This finding suggests that diverse boards are most effective when they also have a strong presence of independent directors who empower diverse viewpoints in board deliberations. It aligns with the expectation that independence prevents tokenism and encourages fuller utilization of diverse directors' contributions. The study notes that in Model 2, once the interaction is included, the standalone coefficient for board independence drops to 0.025 and becomes statistically insignificant ($p \approx 0.12$). This is because some of the effect of independence on performance is now captured in how it enhances the effect of diversity (collinearity between independence and the interaction may also inflate standard errors). The main effect of diversity remains positive but slightly lower (0.120, significant at $p<0.10$), indicating that at the mean level of independence, diversity still has a positive influence on ROA. The ownership coefficients (institutional, family, managerial) in Model 2 retain their signs and significance, though their magnitudes are marginally reduced compared to Model 1, implying the interaction term is accounting for some additional variance in performance.

Other controls remain consistent in sign and significance between Model 1 and Model 2. The overall R-squared (which in GLS is akin to a pseudo-R^2) rises from 0.352 to 0.367 with the inclusion of the interaction, indicating a better model fit. A likelihood ratio test also favored Model 2 over Model 1 ($p<0.05$), confirming the interaction adds explanatory power.

In sum, the regression evidence supports all the main hypotheses: institutional ownership improves performance (H1a) while family and managerial ownership detract (H1b, H1c); board gender diversity has a positive effect on performance (H2); board independence strengthens the diversity–performance link (H3); board diversity mediates the relationship between ownership types and performance (H4); and this mediation is moderated by board independence (H5). The moderated mediation is perhaps best seen by examining the conditional indirect effects. The study computed the indirect effect of institutional ownership on ROA via board diversity at different levels of board independence. At one standard deviation below the mean independence (~30% independent directors), the indirect effect (Institutional → Diversity → ROA) was calculated to be +0.012 (not statistically significant at the 0.05 level). At mean independence (~45%), the indirect effect was +0.020 (significant at $p<0.05$), and at one standard deviation above the mean (~60% independence), the indirect effect was +0.028 (significant at $p<0.01$) with a 95% confidence interval not overlapping with the low-independence scenario. This indicates that institutional ownership's positive impact on ROA through fostering board diversity becomes stronger and more significant as board independence increases. A similar pattern was observed for family ownership: the negative indirect effect of family ownership (Family → lower Diversity → lower ROA) was about –0.015 at low independence (and not significant), and it grew to –0.025 at high independence (significant at $p<0.05$). This somewhat counter-intuitive result for family ownership suggests that when boards are independent, the penalty for lack of diversity in family firms is actually more pronounced in terms of ROA (possibly because independent boards without diversity still underperform independent boards with diversity). Another way to interpret this is that independent boards highlight the absence of diversity – i.e., in a highly independent board environment, not having gender diversity stands out as a lost opportunity for performance gains. In less independent boards (where family influence is unchecked), performance may be poor for many reasons and adding diversity might not have been feasible or as observable. In any case, the overall moderated mediation hypothesis (H5) is supported by the significance of the index of moderated mediation (the product of α from Panel A and β_6 from Panel B), which was found to be significantly different from zero using bootstrapping (5,000 resamples, bias-corrected 95% CI for moderated mediation index did not include zero).

5.3 Robustness Checks

The study ran the performance models using fixed effects (within estimators). The pattern of coefficients remained largely consistent for the main variables, though family ownership's coefficient became more negative and marginally significant (likely because fixed effects utilized within-firm variation where some families reduced ownership over time and performance fell or vice versa). The interaction of diversity and independence remained positive and significant in fixed effects as well. However, standard errors were larger for variables with little within-firm change (like board diversity in some cases), which is expected.

The study tested alternative measurements: using the percentage of female directors instead of the Blau index for board diversity. The results were qualitatively the same – e.g., each 10% increase in female directors was associated with about a 0.5 percentage-point increase in ROA, and the interaction with independence was positive. The study also tried measuring performance as Tobin's Q using a panel tobit model (since Q is bounded below 0 in theory and had some skewness). The signs of key coefficients (institutional +, family –, diversity +, interaction +) were consistent, though the diversity effect on Q was slightly weaker than on ROA/ROE (still positive but only significant for firms with very high independence).

The study checked for multicollinearity. All VIFs in the full Model 2 were below 3, except the interaction term which inherently correlates with its components; after mean-centering diversity and independence (which the study did in the final models), multicollinearity was not a concern (centered VIF for interaction ~1.8). This means the results are not artifacts of correlated predictors.

Given potential endogeneity of ownership (e.g., institutions might choose to invest in already well-performing firms), the study ran a two-stage least squares (2SLS) model as a supplement. The study instrumented institutional ownership with the presence of government-linked institutional investors (a dummy if EPF, PNB, etc., hold >5%) and the stock's inclusion in the FTSE4Good Bursa Malaysia index (which often prompts institutional interest). The 2SLS results continued to show a positive (even larger) effect of institutional ownership on performance, suggesting that if anything, the OLS/GLS estimates were conservative. Family and

managerial ownership coefficients also retained sign and significance. This bolsters confidence that the associations the study report have a causal interpretation in line with theory.

Overall, the empirical evidence strongly supports the proposed moderated mediation model. In the next section, the study discusses the implications of these findings in depth, connecting back to the theoretical expectations and prior literature.

DISCUSSION

The findings of this study provide important insights into how corporate governance mechanisms interact to shape firm performance in an emerging market setting. The study found that ownership structure, board diversity, and board independence are interlinked in influencing performance, which validates the need to study these factors not in isolation but as part of a holistic governance system. Several points from the results merit further discussion:

Ownership Structure Effects: The results showed that institutional ownership correlates with superior firm performance, whereas family and managerial ownership correlate with weaker performance (at least in the manufacturing firms studied). These results align with classic agency theory predictions and are consistent with prior Malaysian evidence. Institutional investors likely play a monitoring role, as suggested by their positive impact; they may demand better disclosure, accountability, and strategic discipline from managers, thereby reducing agency costs and improving efficiency. This echoes findings in other markets where institutional investors curb opportunistic behaviors and push for long-term value creation. In Malaysia, institutional owners include not just private funds but also government-linked institutions, which often have mandates to improve governance in investee companies. The study adds that one channel through which institutions contribute is by promoting better board structures – notably, higher gender diversity. This result supports arguments that institutional investors are catalysts for governance change (e.g., through exercising their voting power or engaging with management on board composition issues). It also resonates with the broader global trend of institutional investors prioritizing Environmental, Social, and Governance (ESG) factors, including board diversity, as part of their stewardship role.

For family ownership, the negative association with performance the study observed is in line with some prior research in East Asia that points to the risks of entrenchment and nepotism in family firms (Claessens et al., 2002; Young et al., 2008). The finding is not to say that all family-controlled firms underperform; rather, on average, when a family's stake is large, the firm tends to have lower ROA/ROE, potentially due to less efficient capital allocation or higher agency costs between family insiders and minority shareholders. A plausible explanation, reinforced by the mediation analysis, is that many family firms have been slower to adopt modern governance practices like board diversification and independent oversight – which in turn adversely affects performance. Interestingly, family ownership's impact on performance was partially mediated by board diversity in the model: family control often meant less diverse boards, which hurt performance. However, the direct effect of family ownership remained negative even after accounting for diversity (and independence), implying other aspects of family influence (e.g., related-party transactions, risk aversion, or tunneling activities) might also play a role in diminishing performance. This underscores that while improving board diversity can help, it may not completely neutralize the disadvantages associated with certain family-dominated governance structures. Recent studies (e.g., the Family Director Board Governance Index by Ling et al., 2023) also suggest that the quality of family involvement (professionalization, succession planning, etc.) is crucial – families that institute good governance (including diversity and independent directors) can overcome the negatives and even leverage family stewardship for positive outcomes. The work reinforces that encouraging those governance improvements is key for family firms to achieve their performance potential.

Board Diversity and Performance: The study provide empirical support for the generally positive narrative around board gender diversity in the Malaysian context. The positive relationship with ROA/ROE indicates that having women on the board is not just a matter of regulatory compliance or social image but is associated with tangible financial benefits. This finding contributes to the ongoing debate by suggesting that in emerging markets with relationship-based business cultures, women directors may bring unique advantages – possibly more diligent monitoring (as some literature notes, female directors often have better attendance and prepare

more for meetings) and different stakeholder orientations (women on boards have been linked to greater CSR engagement and employee-friendly policies, which can improve firm reputation and long-term performance). The positive effect also validates the Malaysian government's policy push for at least 30% female board representation; the results indicate that reaching such critical mass can indeed have a "business case" payoff in terms of better financial outcomes. It is noteworthy that the data spans 2015–2023, a period of significant change in boardroom gender composition in Malaysia (from ~10% to >20% female directors on average). The fact that the study finds a performance linkage suggests that companies did not suffer by adding women – if anything, they benefitted, which should dispel any lingering skepticism that board diversity is merely a token gesture or could hamper performance (as some critics argue by citing tokenism or lack of qualified female candidates). Instead, the findings align with a growing consensus that gender-diverse boards are better at managing risks and innovation, as well as avoiding the pitfalls of groupthink.

However, the literature's mixed results caution us that context matters. Some earlier studies in Malaysia and the region did not find significant effects of women on boards (perhaps when the numbers were extremely low or prior to governance reforms). The study's moderated finding provides one explanation: diversity is most effective when combined with board independence. This is a critical nuance. It suggests that simply appointing women to a board that remains controlled by insiders or a dominant shareholder may yield limited influence – those women might not be part of key committees or their suggestions may be overlooked. But in a board environment that is genuinely independent and empowered, female directors can contribute fully and their presence correlates with higher performance. This finding aligns with recent research pointing out complementarity between different board attributes. For example, a study on European firms by Byron and Post (2015) found that the positive effect of female directors on firm value was stronger in countries with stronger shareholder rights (akin to having more independent governance structures). The result is a firm-level analog: within a country, companies with stronger independent oversight extract more value from having diverse boards. In contrast, firms that appoint women but do not give them an environment of equal voice (which likely coincides with low independence) might not see performance changes – which could partly explain the null findings in those cases.

Moderated Mediation – Governance System Perspective: Perhaps the most novel contribution of the study is the demonstration of a moderated mediation mechanism in corporate governance. In simpler terms, the study showed that "who owns the company" affects "who sits on the board," and that in turn affects "how the company performs," but this chain of influence is conditioned by another governance factor: board independence. This underscores that governance elements are interdependent. You can't evaluate the effect of ownership without considering board structure, and you can't evaluate board structure's effect without noting the context provided by other board characteristics. For researchers, this moderated mediation approach offers a more nuanced way to capture the complexity of corporate governance in research models. It moves beyond bivariate thinking (e.g., diversity → performance) to a system thinking (ownership → board composition → performance, under a certain oversight environment).

For instance, the finding that institutional investors boost performance partly by encouraging diversity suggests that one reason the study see better performance in institution-held firms is that they improve internal governance. But if an institutional investor is in a firm with a weak, insider-dominated board, the investor's ability to effect change might be limited, and hence performance might not improve as much. Conversely, a family firm might typically underperform due to insular governance, but if that firm for some reason has a majority-independent board (maybe due to external pressure or a professionalism drive), then despite family control, the firm can achieve a higher level of board diversity and independent judgement, thereby closing the performance gap with non-family firms. This indeed was seen in a few outlier cases in the sample: some family businesses that had embraced independent directors and had at least two women on their boards performed on par with or better than non-family peers. This aligns with the idea of "contingent governance" – the impact of one governance mechanism depends on the presence of others (Aguilera et al., 2015). The study specifically highlights board independence as a key contingency for realizing the benefits of diversity and mitigating the downsides of certain ownership forms.

Theoretical Implications: These results can be interpreted through multiple theoretical lenses. From an agency theory perspective, independent directors and institutional owners both serve to reduce agency costs

(monitoring management and controlling shareholders), while diversity could also indirectly reduce agency costs by improving board oversight quality. The study saw that agency theory predictions (institutional good, insider ownership bad) held true, but with the caveat that agency mitigation via one mechanism (e.g., institutional monitoring) might operate through another (improving board composition). The finding that family ownership reduces performance unless balanced by independent oversight is a classic case of Type II agency conflict being tamed by an agency solution (independent directors as watchdogs).

From a resource dependence theory angle, board diversity brings valuable resources (knowledge of female consumer markets, different leadership experiences, etc.), and independent directors bring external networks and impartial advice. The moderated finding suggests that the resource benefits of diversity are harnessed more effectively when the board's power dynamics (shaped by independence) allow those resources to be utilized. In a highly independent board, the diverse mix of resources can be debated and applied to strategy; in a less independent board, the dominant insiders might ignore or suppress inputs from minority directors, meaning the resource potential is wasted. Thus, the synergy of resources (from diversity) and effective power structure (from independence) is needed to actually impact performance.

Comparison with Prior Studies: The literature review noted that previous studies on board diversity in Malaysia and similar markets have yielded conflicting results. For example, some found positive links to accounting performance (like ours), others found none for market performance, and a few found negative or U-shaped relationships. The study helps reconcile some of these discrepancies by showing the importance of context. It is likely that companies which saw benefits from diversity were also the ones with better overall governance (which often includes higher independence and possibly more institutional ownership). In firms with poor governance, adding a woman or two may not overcome entrenched problems – hence those samples or sub-samples show no effect or negative effect (if it was merely cosmetic compliance). Furthermore, the use of a more recent dataset (up to 2023) captures the period of intensifying diversity efforts and could reflect a generational shift where newer women appointees are more empowered and experienced, thereby contributing more significantly to firm outcomes. This is something earlier datasets (e.g., 2000s or early 2010s) might not have captured, as back then female directors were fewer and perhaps had less influence. The reference to the ESG context in Sahu et al. (2025), where ESG performance moderated the diversity–performance link, is analogous to the independence moderation: both highlight that diversity works best when supported by broader commitments (be it ESG values or independent oversight) that allow diverse voices to translate into action. The results are also in line with Abdullah et al. (2022) who found both diversity and independence individually improved performance, and the study add that their combination is potent. Meanwhile, a study of financially distressed Malaysian firms by Aziz et al. (2025) found no effect of independence on performance but a positive effect of diversity – possibly in distressed scenarios, even independent directors have limited tools to turn around performance, whereas diversity might bring fresh perspective for recovery. In healthier firms (like the broader sample), independence does matter and complements diversity, as the study have shown.

Practical Implications: The interplay between ownership, diversity, and independence has clear implications for corporate stakeholders:

For Regulators and Policymakers: The results strongly support the ongoing efforts by regulators (Securities Commission Malaysia, Bursa Malaysia) to strengthen board diversity and independence requirements. The evidence suggests that the MCCG's recommendation of 30% women on boards and at least one-third independent directors (recently moving towards higher thresholds) is well-founded in performance terms. Regulators might consider even more stringent requirements or guidelines for certain segments – for example, requiring family-controlled firms above a certain size to have a majority independent board and to report on diversity progress could be beneficial. Additionally, the findings encourage initiatives like the Institutional Investors Council's stewardship code, which can motivate institutional investors to engage companies on these governance improvements. As Malaysia aims to improve its corporate governance standards to attract investment, demonstrating that these governance practices yield better financial results strengthens the case for compliance not just as a box-ticking exercise but as value-enhancing.

For Company Boards and Directors: Board members, especially nomination committees, should take note that diversity and independence are not merely ethical or compliance issues, but strategies for improving

performance. The synergistic effect implies that board refreshment should ideally tackle both issues: bringing in independent directors who are also diverse (in gender, and possibly in ethnicity, age, experience). It's noteworthy that some of the performance gains from institutional shareholders came via pushing for board changes. In absence of an external push, boards themselves should proactively seek diversity. Family firms in particular might benefit from stepping out of their comfort zone to appoint qualified female professionals as independent directors – this could address two gaps (diversity and independence) at once and lead to performance gains. The recommendations for boards echo the ICDM's actionable steps: look beyond inner circles in director recruitment to find diverse talent, periodically evaluate the board's mix against company strategy, and refresh overly long-tenured boards that might be stifling new ideas.

For Investors (Institutional and Minority): Institutional investors can use these insights in engagement and voting. It might set expectations that investee companies (especially those with controlling families or insiders) should enhance board independence and appoint more women, linking it to improved financial performance – a message likely to resonate better than purely moral appeals. Minority shareholders and activist investors could leverage the argument that diverse and independent boards are in the financial interest of all shareholders to lobby for changes in companies with poor governance. The study saw that in the sample, companies that combined family control with low diversity and independence had the worst performance; investors may either avoid such companies or pressure for reform to unlock value. On the flip side, companies with strong institutional ownership and progressive boards had notably better performance, which investors could highlight as success stories.

For Professional Bodies and Talent Pipeline: The findings also imply that developing a pipeline of independent

female directors is important. As more companies seek to comply with diversity and independence norms, the demand for qualified women who can serve as independent directors will grow. Organizations like the Institute of Corporate Directors or 30% Club Malaysia should continue their work in training and matching female candidates to board opportunities. The evidence that women on boards can improve outcomes should encourage more female executives to pursue directorship roles and more companies to give them that opportunity.

6.1 Limitations and Future Research

While the study offers robust evidence within its scope, it is not without limitations. First, the data is confined to one country and one sector (manufacturing in Malaysia). This raises questions about generalizability. Manufacturing firms may have certain governance dynamics (for example, many are older, asset-heavy firms; board structures in tech startups or finance companies might differ). Future research could extend this moderated mediation analysis to other sectors (e.g., banking, which in Malaysia has its own governance code) or conduct cross-country comparisons to see if the interplay holds in different institutional environments. Perhaps in countries with very strong legal protections, independent directors might not be as crucial for diversity to have an effect, or vice versa in weaker governance environments the combination is even more critical.

Second, although the study tried to address endogeneity, causality cannot be definitively proven with the design. There may be reverse causality – e.g., a firm that is performing well might attract more institutional investors (because they want to invest in winners) and simultaneously be more open to diversity and independence (because they can afford world-class governance). The study attempted to control for this by lagging variables and using some instruments. Another angle for future work is to exploit exogenous shocks. For instance, one could examine what happens when a company is added to an index that many institutions track (leading to an exogenous increase in institutional ownership) – does that subsequently lead to changes in board diversity and performance? Similarly, regulatory changes like the 2017 or 2021 MCCG revisions could be used as quasi-experiments: did firms affected by the new diversity guidelines improve performance relative to those already compliant? Such causal designs would complement the associative findings.

Third, the measure of board diversity was limited to gender. Diversity is multi-faceted – including age, ethnicity, nationality, expertise, etc. Malaysia is a multicultural country, and ethnic diversity on boards (Malay, Chinese, Indian representation) could also be important, as could diversity in skills (industry experts vs.

academics vs. accountants on the board). The study focused on gender due to data availability and the clear policy focus on gender. Future studies might construct a composite diversity index (like the ICDM's eight-dimension index) and see if the conclusions hold for broader definitions of diversity. It would be interesting to test if other aspects of diversity similarly require independent board culture to be effective, or if gender is unique in that regard.

Finally, performance was measured through traditional financial metrics. It is possible that board diversity and independence also influence non-financial outcomes such as corporate social responsibility (CSR) performance, innovation outputs, or risk management quality. Given the increasing interest in ESG (Environmental, Social, Governance) criteria, one future research path is exploring how these governance attributes affect sustainability and social outcomes (as Sahu et al. (2025) did by including ESG performance as a moderator). For example, do independent diverse boards lead to better environmental management or employee relations? And do those, in turn, feed back into financial performance in the long run? A longitudinal study connecting governance, interim ESG outcomes, and long-term performance could be valuable.

In conclusion, the study's findings reinforce a central message: improving firm performance in emerging markets like Malaysia requires a comprehensive governance approach. Strong owners (like institutional investors), diverse board composition, and independent oversight work in tandem to create value. Neither element alone is a panacea – a family firm won't necessarily thrive just by bringing in one woman director, nor will an entirely independent board guarantee success if the ownership incentives are misaligned – but together, these mechanisms form a robust governance system. For academics, this underscores the importance of multi-dimensional models in corporate governance research. For practitioners and policymakers, it highlights that reforms in one area (say, mandating board diversity) should be complemented by support in others (like reinforcing board independence and active ownership) to truly be effective.

CONCLUSION AND RECOMMENDATIONS

This study set out to investigate how ownership structure, board diversity, and board independence jointly affect firm performance, using evidence from Malaysian manufacturing companies between 2015 and 2023. Grounded in agency and resource dependence theories, the study proposed a moderated mediation framework where board gender diversity mediates the effect of ownership structure on performance, and board independence moderates the effect of diversity on performance. The empirical results largely confirmed the hypotheses: Institutional ownership promotes board gender diversity and improves firm performance, whereas family and managerial ownership tend to impede diversity and are associated with weaker performance. Greater female representation on boards correlates with higher profitability and market valuation, and this positive influence is amplified when boards have a higher proportion of independent directors. Conversely, in boards with low independence, the beneficial impact of diversity is muted. These findings underscore that good governance practices reinforce each other – diverse boards benefit from independent oversight, and vigilant owners can drive both.

In conclusion, the research highlights the value of a holistic approach to corporate governance reforms. For corporate leaders and boards, the clear recommendation is to foster both diversity and independence as complementary strengths. Companies (especially those with concentrated family ownership) should prioritize refreshing their board composition: appointing qualified women and outsiders as directors is an investment in better governance that can yield performance returns. It may involve overcoming traditional biases or networks in director selection, but the evidence suggests it is worthwhile. Succession planning in family businesses should include consideration of external independent directors and perhaps even non-family CEOs, to ensure the company benefits from broader perspectives and expertise. Additionally, boards should create inclusive cultures where all directors, regardless of gender or background, are encouraged to contribute and chair key committees – only then will the company fully leverage the advantages of diversity.

For investors, particularly institutional investors and asset managers, the findings support a more activist stance on governance matters. Engaging with portfolio companies to press for more independent and diverse boards is not just socially desirable but financially prudent, as it can protect and enhance shareholder value. Voting policies could incorporate criteria related to board composition (for instance, voting against nominating

committee chairs if the board has no female directors or insufficient independence). Collaborative initiatives among institutional investors – such as the Malaysian Institutional Investors Council or the 30% Club – should continue to push for transparency and progress on these fronts. The results give these investors an evidence-based argument to bring to the table: firms with improved governance structures simply perform better, making it in everyone's economic interest to embrace such changes.

For regulators and policymakers, the study provides empirical support for tightening and expanding corporate governance requirements. The recent update of the Malaysian Code on Corporate Governance (2021) which extended the 30% women on board target to all listed companies (not just large ones) is a step in the right direction. Regulators should monitor compliance and consider moving from a "target" to a "comply or explain" basis or even mandatory quotas if progress stalls. In tandem, enforcement of board independence rules is crucial – for example, ensuring that the definition of independence is strict (avoiding long-tenured directors being classified as independent) and perhaps increasing the minimum independence requirement to 50% for all public companies over time. The regulator may also incentivize voluntary adoption of good practices by showcasing success stories: for instance, publishing case studies of companies that improved diversity and then saw performance gains could motivate others. Additionally, since the results indicate that family-controlled companies might lag in governance, Bursa Malaysia and minority shareholder watchdog groups could pay special attention to such firms. Tools like the FTSE4Good Index criteria or the MSWG (Minority Shareholder Watchdog Group) governance scores can include heavier weighting on board diversity and independence, nudging companies to improve in order to be favorably rated.

Policy-makers might also consider capacity-building measures: support programs to train and certify independent directors, particularly women, to expand the talent pool. The government and industry associations could collaborate on databases or mentorship programs to connect companies with potential female independent director candidates. Such efforts would smooth the implementation of diversity policies by addressing the oft-cited excuse of "lack of qualified candidates."

Beyond firm-level actions, the findings carry broader economic implications. A corporate sector that is governed more transparently and inclusively is likely to attract more foreign investment and be more resilient to crises. Diverse and independent boards can better navigate complex challenges, whether technological disruption or global economic shocks, because they can draw on a wide range of insights and are less prone to insular thinking. Thus, encouraging these governance improvements is aligned with Malaysia's ambition to strengthen its capital market and move towards high-income economy status.

In summary, the study concludes that integrating ownership structure considerations with board diversity and independence is key to understanding and improving firm performance. It's not just the presence of institutional investors, or the number of women on the board, or the proportion of independent directors alone – it's how these elements interact that truly matters. Companies that get this mix right, as the data suggests, stand to gain significantly in terms of profitability and market esteem. Those that neglect one or more of these aspects may fall behind their peers.

Recommendations

1. Holistic Board Reform: Companies (especially those with dominant shareholders) should undertake holistic board reforms – simultaneously increasing independent director representation and improving diversity. For example, when seeking new directors, prioritize candidates who add to diversity (gender or otherwise) and meet independence criteria. Aim for at least one-third women and a majority of independents on the board as near-term goals, on the way to possibly equal gender balance and a supermajority independent board in the longer term.
2. Strengthen Nomination Processes: The board Nomination Committee should have a formal, transparent process to identify board candidates from outside traditional networks. Use external search firms or director registries to find talent that diversifies the board's composition. Incorporate diversity and independence as explicit factors in board skill matrix evaluations. This can help overcome unconscious biases and ensure a wide net is cast for new directors.

3. Empower Independent Directors: It's not enough to appoint independent and diverse directors; they must be empowered. Ensure independents hold key positions (e.g., board Chair or Lead Independent Director, chairs of Audit and Nomination Committees). Provide orientation and education so all board members fully understand their role and have equal access to information. Encourage a board culture where questioning and constructive dissent are welcomed. Regular board evaluations (possibly by external parties) can help identify if any voices are being unheard and recommend improvements.
4. Leverage Institutional Influence: Institutional investors with significant stakes in companies should use their influence responsibly to advocate governance enhancements. This could include behind-the-scenes engagement with management and boards, as well as exercising voting rights in support of shareholder resolutions on diversity or governance. For instance, an institutional investor coalition could agree to collectively vote against re-election of directors in firms that consistently fail to appoint any women. By presenting a united front, they can press for changes that a single investor alone might not achieve.
5. Continuous Monitoring and Disclosure: Companies should disclose their board composition and ownership structure transparently in annual reports, along with policies on diversity. Regulators might require disclosure of not just current board diversity but board diversity policies and targets (the MCCG already encourages this). Firms should also disclose the mix of ownership (perhaps the top shareholders and their categories) so stakeholders can assess potential governance risks. Such transparency can itself incentivize firms to improve, as they know they are being watched by analysts and investors who care about governance.
6. Minority Shareholder Empowerment: Mechanisms to empower minority shareholders in governance can also be beneficial. For example, cumulative voting or proportional board representation could allow minority shareholders (often institutions or funds) to elect a director of their choice to the board, which could increase board independence and diversity. Regulators could promote the use of such mechanisms in companies with a high concentration of family ownership to ensure some independent representation of minority interests.
7. Capacity Development: Support the development of more women and independent professionals ready to take on director roles. Universities, professional institutes, and director training programs should incorporate governance best practices and leadership training focusing on women in business. Seasoned directors (male and female) can mentor rising female executives on how to navigate to board positions. Expanding the pool of capable candidates will make it easier for companies to meet diversity and independence goals without compromising on quality.

By implementing these recommendations, firms can move toward a virtuous cycle of governance: strong oversight attracts quality investors, which in turn pushes further governance improvements, leading to sustained high performance. The research provides empirical affirmation that such efforts are not just good governance but good business. As the corporate world continues to evolve, those companies that embrace inclusive and independent governance will be better poised to adapt, innovate, and thrive – delivering value not only to shareholders but to all stakeholders in the long run.

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