

STRATEGIC INNOVATION AND PERFORMANCE OUTCOMES: MODERATING IMPACT OF TRANSFORMATIONAL LEADERSHIP IN AN EMERGING MARKET

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ABSTRACT

The relationship between organisational innovation and firm performance was investigated in this study with transformational leadership as a moderator. Data were collected from 79 respondents across manufacturing firms listed on the main market of Bursa Malaysia using a stratified random sampling approach. Organisational innovation was conceptualised as a second-order construct comprising management, product and process innovation. Structural equation modelling was employed to test the proposed relationships. Results show that organisational innovation has a positive and significant effect on firm performance, whilst transformational leadership strengthens the relationship between organisational innovation and firm performance. These findings support the theoretical premise that firm-level capabilities and leadership behaviours jointly enhance firm performance. For firms seeking to enhance their competitive position, their innovation strategies must be supported by leadership styles that inspire, motivate and stimulate innovation. The empirical insights in this study are taken from an emerging market, making the results particularly relevant to policymakers and industry leaders in the Malaysian manufacturing sector.

Keywords: Organisational Innovation, Firm Performance, Transformational Leadership, Resource-Based View, Malaysian Manufacturing Sector.

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1. INTRODUCTION

In an era of rapid technological advancement and global competition, organisational innovation has emerged as a vital determinant of firm performance, particularly in the manufacturing sector. Innovation is no longer confined to product development but now encompasses managerial approaches, operational processes and organisational culture. These innovations are critical for organisations striving to improve their competitive advantage and sustain their long-term growth. As such, firm performance increasingly depends on firms' ability to embrace and integrate diverse innovation capabilities.

Malaysia's manufacturing sector is an essential pillar of its economy that faces the dual challenge of sustaining its growth whilst navigating a dynamic global landscape. Despite policy encouragement and technological advancements, the link between organisational innovation and firm performance remains underexplored within the local context. Many studies have examined innovation dimensions in isolation (e.g. product or process innovation) and their impact on performance yet failed to adopt a more holistic perspective that integrates multiple innovation types under the concept of organisational innovation (Liao et al., 2017). To address this gap, a multidimensional approach to organisational innovation is adopted in this study by incorporating management, product and process innovations as reflective components of a higher-order construct (Ali et al., 2016; Camisón & López, 2014).

Despite providing objective indicators of firm performance, financial ratios may not fully reflect the broader and more complex outcomes of organisational innovation (Ting et al., 2024), such as customer and employee satisfaction and responsiveness to market changes, which are not visible in financial statements. Therefore, perceived organisational performance, which is assessed from managerial perspectives, was employed in this study to evaluate both the financial and non-financial outcomes of organisational innovation. Integrating these managerial perspectives allows this study to capture the multi-faceted nature of firm performance, which aligns with the multi-dimensional construct of innovation under investigation. This approach also offers a comprehensive understanding of innovation effectiveness whilst maintaining alignment with the study's aim to examine how transformational leadership moderates the relationship between organisational innovation and firm performance.

Leadership plays a pivotal role in shaping the strategic direction and innovative behaviour of organisations. Transformational leadership, which emphasises inspiration, intellectual stimulation and individual consideration (Khan et al., 2022), has been widely recognised as a catalyst of change and innovation. Despite extensive research on the relationship between organisational innovation and firm performance, previous studies have mostly focused on a single dimension of innovation and neglected the combined effects of management innovation, product innovation and process innovation. Moreover, although transformational leadership has been examined broadly, previous studies (Chan et al., 2019; Zhu & Huang, 2023) have seldom investigated the role of transformational leadership in enhancing the effectiveness of the organisational innovation dimensions in driving both financial and non-financial performance, especially within manufacturing firms in emerging markets. These gaps are filled in this study to offer a comprehensive understanding of the relationship amongst organisational innovation, transformational leadership and firm performance.

This study offers several important contributions to the literature on organisational innovation and leadership. First, this study advances the conceptualisation of organisational innovation by integrating management, product and process innovations into a unified second-order construct. This approach addresses limitations in prior studies that have largely examined innovation types in isolation (Huynh et al., 2023; Ng et al., 2019) and responds to recent calls for multidimensional perspectives on innovation (Huynh et al., 2023; Ng et al., 2019). Second, this study extends the present theoretical understanding by examining transformational leadership as a moderating variable in the organisational innovation–firm performance relationship. Whilst leadership has been recognised as a key driver of organisational outcomes, its moderating influence on multiple innovation dimensions remains underexplored, particularly in emerging markets such as Malaysia where institutional constraints and market volatility shape innovation effectiveness (Hashim et al., 2019; Trinh et al., 2022). Positioning transformational leadership in this role reflects its potential in enhancing the impact of organisational innovation on firm performance (Lale & Arzu, 2009; Teece, 2014). Third, by integrating managerial perceptions with both financial and non-financial performance indicators, this study provides a more comprehensive and robust assessment of firm performance (Zhu et al., 2019). This dual assessment strengthens the empirical validity of the findings and aligns with contemporary performance measurement frameworks.

The rest of this paper is organised as follows. Section 2 reviews the literature and develops the hypotheses. Section 3 describes the data and methodology. Section 4 presents the findings, and Section 5 concludes the study with the limitations and directions for future research.

2. THEORETICAL DISCUSSION AND HYPOTHESES DEVELOPMENT

2.1. Theoretical Discussion

2.1.1 Resource-Based View Theory and Dynamic Capabilities Theory

Introduced by Barney (1991), resource-based view (RBV) suggests that firms may gain a lasting competitive edge by using valuable, rare, inimitable and well-organised resources plus capabilities. These resources include tangible assets, such as machinery and production facilities, as well as intangible assets, such as patents, technological knowhow and managerial expertise (Anand, 2002). Firms in the manufacturing industry must innovate and operate efficiently to survive, and RBV helps explain how these firms perform differently when deploying their planned assets. Manufacturing firms with specialised innovation resources and capabilities can respond more effectively to market shifts and digital disruptions due to their skilled employees, advanced technologies or proprietary processes (Galbreath, 2005). Meanwhile, dynamic capabilities theory (Teece, 2007; Teece, 2014) focuses on the capability of these firms to adjust and refresh their resource base in response to technological and market shifts. From a broader perspective, this theory underscores the importance of continuous adaptation in ensuring that firms remain competitive in the face of new opportunities, disruptions or environmental shifts.

In this regard, whilst RBV provides the foundation for understanding how existing resources contribute to firm performance, this view does not explain how firms sustain these advantages when facing rapid technological advances or market changes. To address this limitation, dynamic

capabilities theory complements RBV by explaining how firms integrate, reconfigure and renew their resource base to cope with dynamic environments (Teece, 2007). From this perspective, superior innovation outcomes are achieved not solely due to the ownership of valuable resources but also due to the firm's capability to adapt, transform and mobilise such resources effectively (Newbert, 2008; Teece, 2014). In other words, firms that treat innovation not merely as a resource but as an adaptive capability are better positioned to sustain their performance over time.

2.1.2 Transformational Leadership Theory

Introduced by Burns (1978) and expanded by Bass (1977), transformational leadership theory emphasises the roles of leaders in inspiring change, fostering innovation and motivating employees through four core dimensions, namely, idealised influence, inspirational motivation, intellectual stimulation and individualised consideration. This style of leadership is particularly effective in dynamic contexts where businesses are constantly changing and facing uncertainty (Aviolo & Bass, 2001). Transformational leadership theory is particularly critical to manufacturing firms that are switching to more innovative business models. Leaders in modern firms are required to guide their teams through digital disruptions, technological transitions and competitive challenges by promoting creative thinking, ethical leadership and employee empowerment (Husseini et al., 2021). Additionally, transformational leadership theory helps businesses develop innovative skills, enhance organisational commitment and align their people with their corporate goals, especially during times of structural upheaval. Therefore, this theory provides a solid theoretical framework for this study by demonstrating how visionary leadership may inspire organisational innovation and enhance the performance outcomes of large manufacturing firms (Zhao et al., 2023).

2.2. Hypotheses Development

2.2.1 Organisational Innovation and Firm Performance

Innovation nowadays has become indispensable in ensuring that firms, especially manufacturing ones, sustain their competitiveness and achieve long-term sustainability (Loong et al., 2019). Specifically, innovation enables these firms to effectively address shifting customer demands, satisfy evolving investor expectations and enhance both their financial and non-financial performance (Zakaria et al., 2016). Neely and Hill (1998) described innovation as occurring on a continuum from gradual to radical and demonstrated the various methods by which firms can innovate. Walker et al. (2015) and Loong et al. (2019) asserted that innovation is a leading catalyst of firm growth and a key component in enhancing firms' processes and products. Empirical research has also consistently demonstrated a positive relationship between organisational innovation and firm performance (Donbesuur et al., 2020; Radicic & Petković, 2023; Yunis et al., 2017; Zakaria et al., 2016). Specifically, innovation boosts a firm's ability to formulate competitive strategies and produce value-added results; this view agrees with RBV, which regards innovation as a distinctive, inimitable capability that fosters competitive advantage (Barney, 1991).

Damanpour (1991) and Camisón and López (2014) identified multiple dimensions of organisational innovation (i.e. management innovation, product innovation and process innovation), with each dimension contributing differently to firm performance. Mol and Birkinshaw (2006) and Volberda et al. (2013) argued that management innovation involves the adoption of new managerial practices, processes and structures. Other studies (Camisón & López,

2014; Ho, 2011) show that management innovation drives measurable gains in performance and utilise this type of innovation as a benchmark for measuring operational efficiency, employee morale or strategic clarity. However, some studies reveal that the benefits of management innovation are not always direct and may sometimes require supporting systems, such as performance management, to unlock its full potential (Walker et al., 2011).

Technological innovation, which encompasses both product and process innovation, plays a critical role in enhancing the performance of firms that operate in dynamic and competitive environments. Product innovation refers to the development of new or significantly improved goods or services, which enable firms to differentiate themselves in saturated markets and efficiently meet evolving customer needs (Agustia et al., 2022; Tajeddini, 2016).

Process innovation involves the implementation of new or significantly improved production or delivery methods (Ali et al., 2016). This type of innovation is often associated with efficiency gains, cost reductions and enhanced internal capabilities, which strengthen a firm's operational performance (Ali et al., 2016; Sa'di et al., 2017). Empirical findings suggest that whilst the individual impact of product or process innovation on performance may vary depending on the context, their combined implementation often yields superior outcomes (Chen et al., 2020; Rousseau et al., 2016). For instance, Sa'di et al. (2017) found that process innovation has a statistically significant positive effect on the operational performance of Jordanian manufacturing firms, but product innovation alone does not produce such a notable impact. Similarly, Ali et al. (2016) reported that product innovation has limited significance, yet process innovation exhibits a more substantial direct effect on firm performance. These findings suggest that process innovation may serve as a foundational capability that enhances a firm's capacity to absorb and implement product innovation effectively. Therefore, by integrating RBV and dynamic capabilities theory, this study posits that higher levels of organisational innovation lead to a superior firm performance: *H₁: Organisational innovation has a positive influence on firm performance.*

2.2.2 Transformational Leadership as a Moderator

Transformational leadership is widely regarded as one of the most effective leadership styles in enhancing firm performance across diverse organisational contexts (Foss & Lindenberg, 2013; Judge & Piccolo, 2004; Mu et al., 2018). Previous studies agree that transformational leadership enables leaders to align their internal capabilities with their firms' strategic need for change and adaptability (Adner & Helfat, 2003). Bass and Avolio (1995) and Judge and Piccolo (2004) divided transformational leadership into four key components, namely, inspirational motivation, idealised influence, intellectual stimulation and individualised consideration. In an innovation-driven era, leaders who exhibit these traits often foster creativity, openness to change and employee empowerment, all of which are crucial in an innovation-driven environment (Mu et al., 2018). Therefore, leaders should have a deep understanding of these four components and demonstrate these qualities in their firms (Iranmanesh et al., 2021).

Inspirational motivation requires a persuasive vision of the future. Leaders' behaviour, particularly idealised influence and intellectual stimulation can enhance innovation capability by making a firm more distinctive and difficult to imitate (Barney, 1991; Mu et al., 2018). Through idealised influence, a leader models exemplary behaviour and articulates clear values, which foster employee

commitment and trust and eventually facilitate the implementation of innovative practices (Afshari, 2022). Intellectual stimulation encourages employees to challenge assumptions (Khan et al., 2022), explore alternative solutions (Thuan, 2020) and integrate process and product innovations effectively (Sandvik et al., 2018), which would strengthen their firms' long-term competitive advantage (Husseini et al., 2021; Teng & Hassan, 2015). Individualised consideration highlights the importance of attending to the needs of followers (Khan et al., 2022), demonstrating empathy and expressing appreciation and support for their ideas and perspectives (Chan et al., 2019).

Beyond its direct effect, transformational leadership may also function as a moderator that strengthens the relationship between organisational innovation and firm performance. Husseini et al. (2021) argued that transformational leaders not only motivate but also act as mentors, role models and change agents (Chan et al., 2019; Iranmanesh et al., 2021; Mu et al., 2018). These leaders cultivate innovation by articulating a compelling vision, providing intellectual stimulation and modelling innovative behaviour (Husseini et al., 2021; Teng & Hassan, 2015). According to Khan et al. (2020), transformational leaders play a critical role in coaching and training employees to explore new approaches to innovation, especially in process improvement.

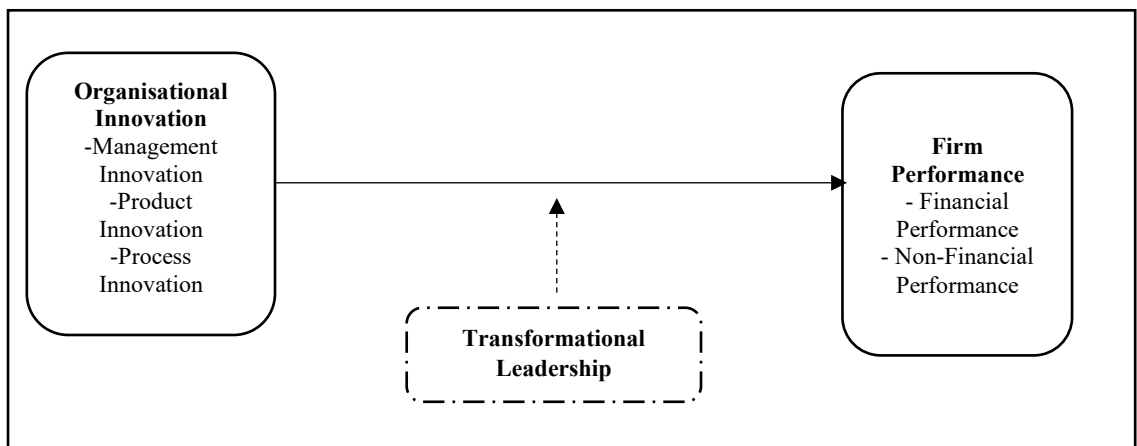
In sum, the success of organisational innovation in enhancing firm performance largely depends on contextual factors such as leadership (Khan et al., 2020). Transformational leadership, with its emphasis on vision, intellectual stimulation and individualised support, may strengthen the link between organisational innovation and firm performance by fostering a culture of trust, readiness for change and strategic alignment (Zhu & Huang, 2023). This moderating role is supported by RBV theory, which views leadership as a critical intangible resource that enables firms to leverage innovation for performance gains. The following hypotheses are then proposed:

H₂: Transformational leadership has a positive influence on firm performance.

H₃: Transformational leadership positively moderates the relationship between organisational innovation and firm performance.

The hypothesised relationships are illustrated in Figure 1.

Figure 1: Research framework



3.1. Data Collection

A total of 250 publicly listed firms on the main market of Bursa Malaysia were invited to complete a cross-sectional survey. Data were collected using a structured questionnaire targeting managerial personnel working in listed manufacturing firms for more than five years. Stratified random sampling was employed to ensure that the sample adequately represented key groups within the population. Managerial-level employees, specifically top- (i.e. CEOs, directors, senior executives, chairpersons and senior management) and middle-level managers (i.e. general managers and department heads) were selected to answer the questionnaire given that they are suitably positioned to provide reliable information for the study (Zikmund et al., 2013).

Data were collected from September 2024 to January 2025. The 250 eligible firms were initially contacted by phone to identify the appropriate respondents (typically department managers). Once identified, survey invitations were sent by email along with a cover letter that assured the respondents of the confidential and voluntary nature of their participation. Follow-up emails were sent two weeks after the initial contact with a final reminder issued two weeks later. However, only 10 firms responded to these emails, and the researchers made additional phone calls to encourage participation amongst the non-respondents and maximise the response rate. Most of the questionnaires were completed via phone interviews (lasting for approximately 10 minutes), whilst the other responses were submitted through Google Forms. Previous studies have mentioned that large firms tend to be more cautious in disclosing internal information due to reputational risk, corporate governance restrictions and legal compliance matters (Asiasi et al., 2021), thereby resulting in typically low response rates in organisational level research (Baruch & Holtom, 2008). These challenges are especially evident in emerging market contexts where firms observe caution and limit their research engagement (Chong et al., 2024). A 31.6% response rate (n = 79) was ultimately achieved, which is comparable to the response rates reported in other studies targeting top managers around Asia. The respondents had been working in their positions for an average of 10 years. The participating firms were categorised under several sub-sectors as shown in Table 1.

Table 1: Percentage of responses for each sub-sector

Category	Information	Frequency	Percentage (%)
Sub- Sector	Agricultural Products	4	5.1
	Auto Parts	3	3.5
	Automotive	3	3.8
	Building Materials	5	6.3
	Chemicals	3	3.8
	Consumer Goods	2	2.5
	Diversified Industry	2	2.5
	Food and Beverages	13	16.5
	Health Care Equipment	2	2.5
	Household Goods	2	2.5
	Industrial Engineering	1	1.3
	Industrial Material Components and Equipment	3	3.8
	Industrial Services	1	1.3
	Metals	7	8.9
	Packaging Materials	6	7.6

	Personal Goods	6	7.6
	Pharmaceuticals	1	1.3
	Products and Services	2	2.5
	Semiconductors	7	8.9
	Wood and Wood Products	5	6.3
	Others	1	1.3
	Total	79	100.0

3.2 *Non-Response Bias*

To assess the presence of non-response bias, the early and late respondents were compared based on their demographic characteristics and key variables. The rationale is that late respondents are often considered proxies for non-respondents (Armstrong & Overton, 1977). Results from independent sample t-tests revealed no significant differences between these two groups, indicating that non-response bias is unlikely to pose a significant concern in this study. The demographic data (e.g. firm size, ownership structure and respondent position) of these two groups and the known characteristics of the sampling frame also showed consistency, thus further confirming the absence of non-response bias.

3.3 *Common Method Bias*

Procedural and statistical remedies were applied to mitigate the potential common method bias (CMB). Procedurally, the questionnaire was designed using proximal separation, where the items for each construct were grouped into sections A to E following the recommendations of Podsakoff et al. (2012). This approach aims to reduce the respondents' tendency to provide consistent or socially desirable answers. Statistically, the full collinearity test designed by Kock and Lynn (2012) was applied, where variance inflation factors (VIFs) were used to detect potential CMB. All latent variables (i.e. organisational innovation, transformational leadership and firm performance) were tested, and their VIF values ranged from 1.751 to 2.595, falling below the threshold of 3.3 (Kock, 2015). These results suggest that CMB is unlikely to pose a significant concern in this study. Although different Likert scales were used for the constructs (5-point scales for organisational and firm performance and 7-point scales for transformational leadership), procedural remedies such as item grouping and statistical tests (full collinearity VIF) were applied to minimise the potential for CMB (Merkle, 2025). These measures ensure that the variations in scale format do not materially affect the respondents' answers or the reliability of the constructs (Awang et al., 2016).

3.4 *Variables Measurement*

Dependent Variable: Firm Performance. Firm performance was conceptualised in this study as a second-order reflective construct that comprises financial and non-financial dimensions (Ng et al., 2020; Huynh et al., 2023). The respondents were asked to evaluate their firms' performance over the past three years using financial and non-financial indicators. For financial performance, Ng et al. (2019) used five items, namely, assessing profitability, sales growth, return on investment, cash flow and market share, to reflect an organisation's capacity to generate economic returns and sustain financial health. For non-financial performance, Huynh et al. (2023) used six items, namely, employee satisfaction, customer satisfaction, market share, new product launch, new market development and new technology development, to reflect organisational innovation output,

stakeholder satisfaction and strategic positioning. This approach is grounded in empirical and conceptual studies that recommend a holistic evaluation of firms' performance, particularly in terms of innovation and operations in uncertain environments (Sethibe, 2018). Combining both perspectives ensures that the results capture both the tangible economic returns and intangible innovation-driven outcomes of the sampled organisations, thus offering a comprehensive understanding of how innovation affects firm performance under the moderation of transformational leadership.

Although archival financial ratios, such as return on investment, profitability and sales growth, are available for publicly listed firms, the perceived financial performance reported by managers were captured in this study instead because these managers offer the most authoritative views on the effectiveness of their firms' innovation practices, strategic decisions and operational outcomes over the past three years. The use of Likert-scale evaluations allowed the integration of financial and non-financial performance outcomes into a comprehensive performance assessment.

A 5-point Likert-scale (1 = strongly disagree, 5 = strongly agree) was used to measure the financial and non-financial performance of the sample firms following prior studies (Huyhn et al., 2023; Ng et al., 2019). This scale was specifically selected to allow for a sufficient variation in the responses and for the convenience of the respondents (Preston & Colman, 2000).

Independent Variable: Organisational Innovation. Following Liao et al. (2017), organisational innovation was conceptualised in this study as a second-order reflective construct. The adopted measure comprised 7, 6 and 5 items that capture how firms implement innovation across their internal structures, product development and process improvement, respectively. Specifically, the management innovation items reflect changes in organisational structure, leadership and administrative systems, the product innovation items reflect the firm's capacity for market-oriented product development and the process innovation items represent improvements in the firms' production efficiency and adaptability. These items altogether provide a comprehensive assessment of innovation practices within the firm. Each item was rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), whilst an additional global item was rated on a 7-point scale to capture overall innovation intensity.

Moderating Variable: Transformational Leadership. The multifactor leadership questionnaire (Bass & Avolio, 1995) was adopted in this study to measure transformational leadership. A total of 16 items were used to measured transformational leadership, with each item rated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). This scale has been widely validated in leadership studies (Bass & Avolio, 1995) as appropriate for assessing the moderating effect of transformational leadership on the relationship between organisational innovation and firm performance.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

A total of 79 responses from the recruited manufacturing firms were analysed. The respondents held managerial positions across various functional departments, and the majority of the participating firms were spread across diverse sub-sectors as shown in Table 2. Firms from the food and beverages sub-sector accounted for the majority of the sample (16.5%), followed by firms from the metals and semiconductors sub-sectors (8.9%). Locally owned organisations accounted for the majority in terms of ownership structure (81%), and 79.8% of the participating firms had been in operation for over 30 years. In terms of size and financial capacity, 45.9% of the participating firms had 1,001 to 5,000 employees, whilst 92.4% of these firms reported annual sales exceeding RM50 million. In sum, the sample largely comprised well-established, large-scale firms. Consistent with the role-based criteria proposed by Birasnav (2013) and Van der Merwe et al. (2014), only those respondents from the top and middle management levels were invited to answer the survey questionnaire given their relevant insights into their firms' activities and operations and their years of experience in their current roles (minimum of one to three years).

Table 2: Demographic profile of the participating firms

Category	Information	Frequency	Percentage (%)
Sub-Sector	Agricultural Products	4	5.1
	Auto Parts	3	3.5
	Automotive	3	3.8
	Building Materials	5	6.3
	Chemicals	3	3.8
	Consumer Goods	2	2.5
	Diversified Industry	2	2.5
	Food and Beverages	13	16.5
	Health Care Equipment	2	2.5
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	Industrial Services	1	1.3
	Metals	7	8.9
	Packaging Materials	6	7.6
	Personal Goods	6	7.6
	Pharmaceuticals	1	1.3
	Products and Services	2	2.5
	Semiconductors	7	8.9
	Wood and Wood Products	5	6.3
Others	1	1.3	
Total	79	100.0	
Ownership Structure	Local	64	81.0
	Joint Venture	9	11.4
	Foreign/Multinational	6	7.6
	Total	79	100.0
	Below 10 years	0	0.0

Years in Operation	10–20 years	5	6.3
	21–30 years	11	13.9
	31–40 years	28	35.4
	41–50 years	18	22.8
	Over 50 years	17	21.6
	Total	79	100.0
Number of Employees	Less than 75	1	1.3
	75–100	3	3.8
	101–500	9	11.4
	501–1,000	18	22.8
	1,001–5,000	36	45.6
	5,001–10,000	7	8.9
	More than 10,000	5	6.3
	Total	79	100.0
Annual Sales	Less than 15 million	2	5.1
	15–50 million	4	5.1
	More than 50 million	73	92.4
	Total	79	100.0

The latent construct scores were divided into three equal categories (low, middle and high) based on cumulative percentages of 33% and 67% to avoid arbitrary classifications and to ensure a balanced categorisation across samples. The scores of the latent variables are shown in Table 3.

Table 3: Range of cutoff points and level of categories

Latent Variables	Range	Level
OI	4.00–4.13	Low
	4.14–4.26	Medium
	4.27–4.39	High
TL	4.06–5.72	Low
	5.72–6.16	Medium
	6.17–7.00	High
OP	3.74–3.95	Low
	3.96–4.17	Medium
	4.18–4.40	High

Note: OI = Organisational innovation; TL = Transformational leadership; OP = Firm performance. The range was calculated using the formula of De Vaus et al. (2014).

As shown in Table 4, organisational innovation was moderately practiced across the sample firms (Mean = 4.19, SD = 0.39). Meanwhile, transformational leadership was reported at a moderate level (Mean= 5.94, SD = 0.50), with intellectual stimulation receiving the highest rating (Mean = 5.98) followed closely by the other dimensions. The overall mean of firm performance was 4.07 (SD = 0.58), with non-financial performance (Mean = 4.27) being rated higher than financial performance (Mean = 3.77), thereby suggesting a stronger emphasis on strategic and operational outcomes.

Table 4: Descriptive analysis

Latent Variables	Mean	Standard Deviation
OI	4.1878	0.3923
Management innovation (OMI)	4.0579	0.4639
Product innovation (OPI)	3.9873	0.5282
Process innovation (OPR)	4.6101	0.4307
TL	5.9359	0.5015
Idealised influences (TLI)	5.8924	0.5470
Inspirational motivation (TLM)	5.9146	0.5574
Intellectual stimulation (TLS)	5.9842	0.5737
Individualised consideration (TLC)	5.9525	0.6125
OP	4.0696	0.5765
Financial performance (FFP)	3.7690	0.8732
Non-financial performance (NFP)	4.2700	0.4739

Note: OI = Organisational innovation; TL = Transformational leadership; OP = Firm performance.

4.2 Measurement Model Assessment

The reliability and validity of the constructs were assessed using composite reliability (CR) coefficients, average variance extracted (AVE) and factor loadings. The internal consistency reliability and convergent validity for all related constructs are presented in Table 5 along with the indicator loadings, CR and AVE. These metrics ensure that all related items adequately measure their respective constructs. According to Hair et al. (2014), indicator loadings and CR values exceeding 0.70 are generally considered acceptable, whilst an AVE of more than 50% indicates an adequate convergent validity. All respective constructs had indicator loadings exceeding the threshold of 0.70 (ranging from 0.760 to 0.97), thereby indicating satisfactory adequacy, whilst their CR values ranged from 0.868 to 0.903, which indicates satisfactory internal consistency. Their AVE values also exceeded the minimum criterion of 50% (ranging from 0.688 to 0.797), which suggests that more than 50% of the variance in the indicators is explained by these constructs.

Table 5: Internal consistency and convergent results

Constructs	Items	Loading	CR	AVE
OI	MI	0.856	0.868	0.688
	PI	0.852		
	PR	0.777		
TL	TLI	0.760	0.903	0.701
	TLM	0.838		
	TLS	0.883		
	TLC	0.864		
OP	FFP	0.867	0.887	0.797
	NFP	0.917		

Note: OI = Organisational innovation; TL = Transformational leadership; OP = Firm performance; OMI = Management innovation; OPI = Product innovation; OPI = Product innovation; OPR = Process innovation; TLI = Idealised influences; TLM = Inspirational motivation; TLS = Intellectual stimulation; TLC = Individualised consideration; FFP = Financial performance; NFP = Non-financial performance.

The Heterotrait–Monotrait (HTMT) ratio is a critical measure of discriminant validity (Henseler et al., 2015), with HTMT ratios below 0.85 (strict) and 0.90 (liberal) indicating satisfactory discriminant validity. Given that higher-order (HOC) or second-order constructs were adopted in this study, the HTMT ratios should be interpreted following the guidelines issued by Sarstedt et al. (2019), which used two main conditions when dealing with HOC. First, the lower-order constructs (LOCs) must show discriminant validity with one another and with all other constructs in the respective model except for their respective HOCs. Second, the HOCs must exhibit discriminant validity with all other constructs in the respective model. In Table 6, a dash (-) was used to indicate those pairs where the LOCs are compared with their respective HOCs because such comparisons cannot be used to indicate discriminant validity. The HTMT ratios of the LOCs fell below the threshold of 0.90, thus indicating that the measurement model has acceptable discriminant validity (Cheung et al., 2024).

Table 6: Heterotrait–monotrait ratio correlations matrix

	OI	OIM	OIP	OIR	OP	FPP	NFP	TL	TLC	TLI	TLM	TLS
OI												
OIM	-											
OIP	-	0.802										
OIR	-	0.522	0.631									
OP	0.548	0.486	0.456	0.472								
FPP	0.804	0.780	0.691	0.602	-							
NFP	0.718	0.669	0.608	0.575	-	-						
TL	0.696	0.764	0.597	0.425	0.544	0.630	0.632					
TLC	0.634	0.732	0.549	0.343	0.480	0.573	0.565	-				
TLI	0.662	0.663	0.548	0.487	0.392	0.468	0.462	-	0.807			
TLM	0.577	0.665	0.510	0.305	0.498	0.583	0.581	-	0.760	0.771		
TLS	0.714	0.766	0.613	0.455	0.567	0.674	0.667	-	0.891	0.839	0.854	

Note: OI = Organisational innovation; TL = Transformational leadership; OP = Firm performance; OMI = Management innovation; OPI = Product innovation; OPR = Process innovation; TLI = Idealised influences; TLM = Inspirational motivation; TLS = Intellectual stimulation; TLC = Individualised consideration; FPP = Financial performance; NFP = Non-financial performance.

4.3 Structural Model Assessment

The structural model was evaluated using effect size (f^2) and coefficient of determination (R^2) for the dependent variable to assess the explanatory power and significance of the relationship amongst the related constructs. The R^2 and f^2 values are shown in Table 7. According to Cohen (1988) and Hair et al. (2021), the threshold for f^2 can be set at 0.02 (small effect), 0.15 (medium effect) and 0.35 (large effect). According to this benchmark, organisational innovation had a large effect on firm performance ($f^2 = 0.355$) (Table 7), whilst transformational leadership only exerted a small effect ($f^2 = 0.145$). Similarly, transformational leadership only had a small interaction effect on the relationship between organisational innovation and firm performance ($f^2 = 0.129$) per Cohen (1988)'s guidelines. This result suggests that although transformational leadership adds incremental explanatory power, its unique contribution to firm performance beyond its main effects

is limited. Given the multifaceted nature of firm performance and the strong direct influence of organisational innovation, a modest moderating effect is expected.

Table 7: Explanatory power (R^2) and effect size (f^2)

Relationship	Effect Size (f^2)		Explanatory Power (R^2)	Meaning
	f^2	Magnitude		
OI → OP	0.355	Medium	0.499 (Substantial)	OI significantly improves OP
TL → OP	0.145	Small		
TL*OI → OP	0.129			TL moderates the effect on OP

Note: OI = Organisational innovation; TL = Transformational leadership; OP = Firm performance.

4.4 Significance of Path Relationship

Following the recommendation of Hair et al. (2021), PLS-SEM and a bootstrapping procedure with 5,000 resamples were applied to evaluate the hypothesised relationships. The theoretical relationships amongst the constructs were used as basis for the structural model (Figure 2). The results of the proposed structural equation model in Table 8 offer strong empirical support to the hypothesised relationships. Organisational innovation and firm performance (H1) showed a positive correlation, whilst their path coefficient indicated statistical significance ($\beta = 0.653$, $t = 7.210$, $p < 0.001$) with a 95% bias-corrected confidence interval that excluded zero, thereby indicating a robust and significant effect. In sum, firms with innovation capabilities tend to achieve a higher performance, thus supporting H1.

Transformational leadership was included in the model to assess its independent influence on firm performance. The result was statistically significant ($\beta = 0.205$, $t = 2.441$, $p < 0.05$), which indicates that transformational leadership directly contributes to firm performance, thereby supporting H2. However, the main focus of the study lies primarily on the main effects of organisational innovation. The moderating results support H3 due to the significant positive interaction effect ($\beta = 0.184$, $t = 2.213$, $p < 0.05$), indicating that transformational leadership strengthens the impact of organisational innovation on firm performance.

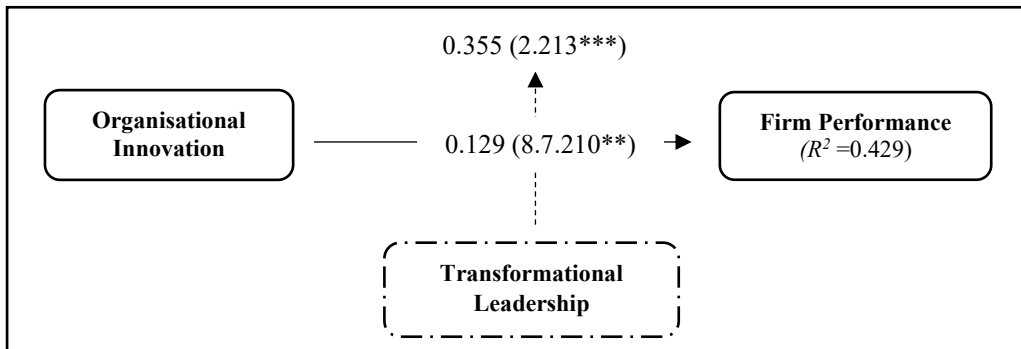
Table 8: Structural equation results (direct and indirect effects)

Relationship	VIF	β	Std.Dev	t -value	p -value	CI (BC)		Decision
	OP					LL	UL	
H ₁ : OI → OP	1.656	.653	0.094	7.210	<0.001	0.376	0.678	H ₁ Accepted
H ₂ : TL → OP	1.701	.205	0.124	2.441	0.003	0.152	0.562	H ₂ Accepted
H ₃ : OI *TL → OP	-	.184	0.086	2.213	0.008	0.056	0.334	H ₃ Accepted

Note: One-tailed test, OI - organisational innovation; TL – transformational leadership; OP- firm performance n.s., indirect effect, CI= confidence interval, BC= bias corrected, LL = lower limit, UL = upper limit.

The structural model is shown in Figure 2.

Figure 2: Structural Model



5. CONCLUSION

5.1 Conclusion

This study examined the relationship between organisational innovation and firm performance in Malaysia's manufacturing sector, with transformational leadership as a moderating variable. The findings confirm that organisational innovation positively influences firm performance, highlighting the strategic importance of innovation in enhancing competitiveness and long-term firm viability. Furthermore, transformational leadership strengthens this relationship, indicating that effective leadership plays a critical role in translating innovative capabilities into improved performance outcomes. From a sustainable development perspective, these findings suggest that innovation-led strategies, supported by strong leadership, contribute to more resilient organisations, productivity enhancement, and sustainable industrial growth. Overall, the study demonstrates how internal capabilities and leadership dynamics can support firm-level success while contributing to broader economic sustainability objectives.

5.2 Research Implications

From a theoretical perspective, this study extends RBV by demonstrating that organisational innovation alone cannot sufficiently generate stronger performance outcomes unless supported by leadership capabilities. By modelling organisational innovation as a multi-dimensional, second-order construct, this study provides evidence that management, product and process innovation collectively function as a strategic resource bundle rather than as isolated capabilities. Moreover, as indicated by its moderating effect, transformational leadership helps firms translate their innovation efforts into improved outcomes. This result strengthens the RBV perspective by showing that transformational leadership acts as a complementary capability that empowers the value and impact of innovation resources. These findings also align with dynamic capabilities theory, which suggests that firms with strong innovation capabilities supported by transformational leadership can better sense, seize and reconfigure their resources in response to changing environments, thereby sustaining their performance advantages.

For practitioners, the findings statistically suggest that organisational innovation is essential to achieve firm performance. These results highlight the need to integrate innovation practices into daily operational routines rather than treating them as standalone projects. These routines include formalising cross-functional innovation teams, allocating dedicated employees to experiment with new ideas and integrating innovation into performance evaluations.

In addition, although a small magnitude occurs in the moderating effect, it is important to firms to emphasize at the leadership level, firms may benefit from targeted programmes that are designed to cultivate transformational behaviours, such as communicating vision, encouraging intellectual stimulation and recognising individual contributions, all of which can greatly boost the efficiency of innovation-driven techniques. These programmes are especially important for industrial firms that are dealing with rapid shifts in technical environments and changing consumer expectations.

5.3 Limitations and Directions for Future Research

Despite its contributions, this study is subject to several limitations. First, the use of self-reported survey data introduces the risk of CMB even though procedural remedies (e.g. anonymity and separating the measurement of predictor and criterion variables) were applied. Future studies could incorporate multi-source data (e.g. objective financial metrics, employee-level data or customer satisfaction indices) to triangulate the findings and enhance data validity.

Second, the sample was restricted to publicly listed manufacturing firms in Malaysia, which may not fully capture the diversity of organisational structures, innovation capabilities and leadership styles in other sectors or amongst small and medium-sized enterprises (SMEs). The findings should thus be interpreted with caution when generalising to other industry contexts or less formalised organisational settings. Expanding the sample to include SMEs, family businesses or service-based organisations could offer a broader perspective.

Finally, although a higher-order model of innovation was adopted in this study, each innovation dimension was given the same weight throughout the investigation. Future research may investigate whether different types of innovation exert different effects on performance depending on certain factors, such as firm age, market conditions or level of technological intensity.

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