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Diversification, Internationalization, and Performance: A Comparative Study of High- vs. Low-Diversified Japanese Manufacturing Industries

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Diversification, Internationalization, and Performance: A Comparative Study of High- vs. Low-Diversified Japanese Manufacturing Industries

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Abstract：
This study explores the impact of diversification and internationalization on firm performance in the Japanese manufacturing sector, emphasizing how these strategies function differently in industries with high versus low levels of diversification. Using a dataset of 2,675 firm-year observations from 2017 to 2023, the research assesses how firms leverage international expansion and diversification to enhance performance, particularly in response to external disruptions such as the COVID-19 pandemic. The findings highlight that internationalization plays a crucial role in improving firm performance, particularly in highly diversified industries, where firms benefit from global resource integration, expanded market access, and operational synergies. However, in these industries, excessive diversification negatively impacts performance due to managerial inefficiencies, resource misallocation, and coordination challenges, supporting the view that complexity can outweigh the advantages of business expansion.

In contrast, in less diversified industries, neither internationalization nor diversification shows a strong positive influence on firm performance. Firms operating in more specialized sectors often lack the necessary organizational structures and resource integration mechanisms to fully capitalize on these strategies. This suggests that the benefits of diversification and internationalization are contingent on firms' existing capabilities and strategic flexibility. The findings also demonstrate that the COVID-19 pandemic amplified the positive effects of internationalization for firms in highly diversified industries. As global supply chains faced disruptions, these firms effectively leveraged their international networks to maintain stability and mitigate risks. However, the pandemic had minimal impact on diversification outcomes, reinforcing the argument that diversification alone is not a sufficient mechanism for crisis resilience.

The study contributes to strategic management literature by underscoring the importance of industry context when formulating diversification and internationalization strategies. It suggests that firms in highly diversified industries should prioritize international expansion while carefully managing the risks of excessive diversification. For firms in low-diversification industries, the results indicate that simply pursuing diversification or internationalization without the necessary internal capabilities is unlikely to yield significant performance gains. These insights offer managerial guidance for firms navigating global disruptions, emphasizing the need to align strategic choices with industry conditions and organizational capacity. By focusing on structured internationalization and avoiding unnecessary complexity in diversification, firms can enhance their competitive advantage and long-term sustainability in an increasingly uncertain global market.

Key Words: Strategic resilience, Diversification, Internationalization, Japanese manufacturing, COVID-19 impact, Supply chain disruptions

1 Introduction

The resilience of manufacturing firms in the face of global disruptions has become a central focus of both academic research and managerial practice. In an era defined by rapid technological change, globalization, and unprecedented crises such as the COVID-19 pandemic, firms are under increasing pressure to develop strategies that ensure stability and growth. Two prominent strategies—diversification and internationalization—have emerged as critical tools for managing market volatility, enhancing competitiveness, and securing long-term performance. However, existing research offers limited insight into how industry-specific factors, particularly the level of diversification, influence the effectiveness of these strategies, especially during periods of crisis.

Diversification, broadly defined as a firm's expansion into multiple business segments, has long been debated in strategic management literature. Proponents argue that diversification enhances organizational resilience by spreading risk across different business lines, allowing firms to buffer against fluctuations in any single market (Rumelt, 1974; Teece, 1980). Critics, however, contend that diversification can lead to increased managerial complexity, resource misallocation, and operational inefficiencies, which can erode firm performance over time (Berger & Ofek, 1995; Hoskisson & Hitt, 1990). For Japanese manufacturing firms, diversification has often been pursued through horizontal and vertical integration, supported by long-standing Keiretsu networks and technological capabilities. Yet, the question of whether diversification serves as a strategic advantage or liability—especially during external shocks—remains unresolved.

In contrast, internationalization enables firms to diversify risk geographically while accessing external resources, markets, and technological innovations. From a theoretical perspective, internationalization is believed to enhance performance through economies of scale, market risk reduction, and the exploitation of global knowledge and financial assets (Rugman & Verbeke, 2001). Empirical evidence suggests that Japanese manufacturers, particularly in high-tech sectors, have effectively used international expansion to maintain competitive advantages (Delios & Beamish, 2001). However, the benefits of internationalization are not without challenges; firms must navigate institutional complexity, cultural differences, and geopolitical risks—factors that have been amplified by recent global disruptions.

Building on previous research (Mao & Park, 2025), which found divergent outcomes for Japanese manufacturing firms during the COVID-19 pandemic, this study aims to deepen the understanding of how diversification and internationalization strategies affect firm performance across different industry contexts. While internationalization was shown to enhance resilience during the crisis, diversification often amplified operational inefficiencies, particularly in highly complex organizational structures.

This research addresses two central questions:

RQ1: How do diversification and internationalization strategies influence firm performance across industries with different diversification levels?

RQ2: How does the effectiveness of these strategies vary across industry contexts under crisis conditions?

To answer these questions, we categorize Japanese manufacturing industries into high-diversification and low-diversification groups. Our findings reveal systematic differences in how firms benefit from—or are constrained by—strategic choices depending on their industry's diversification profile. These insights contribute to both theory and practice by demonstrating that industry context plays a pivotal role in shaping strategic outcomes. As firms continue to face increasing uncertainty in global markets, understanding the interaction between diversification, internationalization, and industry-specific factors becomes essential for building long-term resilience and sustaining competitive advantage.

2 Literature review

2.1 The Impact of Business Diversification on Firm Performance

Business diversification has long been a central theme in strategic management research, generating a spectrum of findings regarding its contribution, or detriment, to firm performance. From the perspective of the Resource-Based View (RBV), diversification can enhance performance if a firm successfully leverages its valuable and inimitable resources across multiple lines of business while managing the associated transaction costs effectively (Teece, 1980). By allocating shared capabilities, such as R&D or brand equity, to strategically related product segments, companies often realize economies of scope, provided they integrate these assets efficiently (Markides & Williamson, 1994). Zahavi and Lavie (2013) suggest that firms undergoing product-line expansion may initially face adaptation costs but ultimately experience performance gains, following a U-shaped trajectory due to economies of scope.

Insights from Transaction Cost Economics (TCE) indicate that diversification can reduce external transaction costs by internalizing multiple activities, mitigating opportunism and market inefficiencies (Williamson, 1975). However, this internalization also increases coordination costs, particularly if firms lack the necessary governance structures to manage complexity efficiently (Grant & Jammine, 1988). Some scholars argue that dynamic capabilities, including flexible governance mechanisms and resource reconfiguration, can help firms manage the additional burden of operating multiple business units (Døving & Gooderham, 2008). Still, diversification into areas unrelated to a firm's core competencies can increase inefficiencies, as top managers struggle to oversee and integrate distinct market environments, particularly in response to exogenous shocks (Li & Tallman, 2011).

Organizational Learning Theory suggests that diversification may accelerate knowledge exchange and innovation. By leveraging their core competencies in new domains, firms can expand their learning boundaries and foster cross-pollination of ideas, leading to competitive advantages (Prahalad & Hamel, 1994). Arend et al. (2014) highlight that these learning effects can bolster long-term market competitiveness, particularly when firms engage in a strategic balance of internal knowledge development and external alliances. However, Zahavi and Lavie (2013) caution that diversified structures can create negative transfer effects, where firms struggle to effectively apply knowledge across different business segments, especially when specialization requirements vary significantly.

On the positive side, scholars emphasize that diversification can (1) expand market reach, (2) spread operational risks across multiple product lines, and (3) achieve scale or scope economies. In more recent work, Sukanto and Nawir (2025) demonstrate that manufacturing firms with diversified operations reduce their dependence on single-product cycles, thereby stabilizing revenue. Wang et al. (2023) further identify that broader supplier networks can help cushion external shocks, such as those arising during the COVID-19 pandemic, indicating a protective effect of diversification when unexpected disruptions occur.

On the negative side, diversification may induce (1) management complexity, (2) heightened coordination costs, and (3) dilution of core competencies (Hill & Hoskisson, 1987). Jensen (1986) argues that firms with large free cash flows are prone to overinvestment, as managers have incentives to expand their firms beyond the optimal size, prioritizing growth to increase their power and control over resources, rather than maximizing shareholder value. Berger & Ofek (1995) provide empirical evidence that diversified firms suffer a 13-15% valuation discount, partly due to overinvestment in low-return projects and inefficient capital allocation. This challenge is also observed in some large conglomerates, where overexpansion without a clear strategic rationale leads to inefficiencies and declining performance.

In the Japanese manufacturing context, diversification outcomes hinge significantly on whether new segments align with existing competencies. Studies suggest that related diversification enables firms to redeploy resources over time, benefiting from inter-temporal economies of scope rather than just static synergies (Helfat & Eisenhardt, 2004). By contrast, Fukui and Ushijima (2007) report that while many Japanese manufacturers increased their diversification levels, those with low relatedness among business segments experienced declining profitability, reflecting resource misallocation and bureaucratic inefficiencies. Their findings further show that in the late 1990s, highly diversified firms actively restructured by divesting unrelated business units to restore performance levels.

In sum, prior literature indicates that business diversification can be a double-edged sword: while it potentially enhances performance through resource sharing, economies of scope, and risk mitigation, it may also undermine profitability if managerial complexity, coordination costs, or empire-building motives dominate. For

Japanese manufacturing firms in particular, success appears to rest on aligning diversification efforts with core competencies and robust management systems to handle the inherent complexity. This dynamic, where diversification strategies interface with firm-specific resources and industry factors, sets the stage for further empirical scrutiny, especially under evolving market conditions such as those from 2017 to 2023, including the disruptions caused by COVID-19.

2.2 The Impact of Internationalization on Firm Performance

Internationalization, often conceptualized as a firm's expansion across national borders, has been extensively examined for its impact on corporate performance. Drawing on eclectic paradigm (OLI) theory (Dunning, 1979), scholars argue that successful international expansion requires three main advantages: Ownership advantages (unique resources or capabilities), Location advantages (favorable country-specific factors), and Internalization advantages (the efficiency of controlling foreign activities in-house). When firms can capitalize on these factors, internationalization often leads to higher returns through larger market reach and resource optimization (Geringer et al., 1989).

Beyond the OLI framework, some studies adopt a U-shaped or inverted U-shaped perspective on the internationalization-performance relationship (Contractor et al., 2003). This view suggests that firms frequently incur high costs at the early stages of overseas expansion, due to cultural unfamiliarity, regulatory barriers, or "liability of foreignness" (Hymer, 1960), but see improved performance once they accumulate sufficient international experience. At the same time, over-internationalization can trigger diminishing returns and organizational complexity, causing performance to decline again (Li & Tallman, 2011). Empirical work supports this notion: Lu and Beamish (2001) found that Japanese SMEs face an initial disadvantage when venturing abroad but later benefit from foreign direct investment (FDI) strategies, while Fang et al. (2007) report a similar pattern where Japanese firms' subsidiaries initially underperform but eventually leverage cross-border knowledge flows to enhance overall profitability.

From a positive standpoint, internationalization allows firms to leverage economies of scale, expand global market reach, and access diverse knowledge pools (Vernon, 1966). By extending operations across multiple countries, multinational firms can distribute fixed costs across a broader revenue base, thereby reducing per-unit production costs (Geringer et al., 1989). Additionally, international expansion facilitates technology transfer and organizational learning, as firms acquire new production methods, management practices, and distribution strategies (Delios & Beamish, 2001). For example, Fang et al. (2007) demonstrate that Japanese manufacturers initially struggle with knowledge transfer in foreign subsidiaries, but over time, effective absorption enhances operational efficiency and profitability.

On the negative side, international expansion introduces cultural barriers, governance complexities, and foreign exchange risks. Cultural differences affect communication, staffing, and marketing, particularly when domestic managerial mindsets struggle to adapt to foreign environments (Nadkarni et al., 2011). Governance challenges arise as firms coordinate operations across diverse markets, leading to decision-making inefficiencies and suboptimal resource allocation (Li & Tallman, 2011). Additionally, external risks such as currency volatility and political instability can erode profit margins if multinational enterprises fail to hedge effectively (Shapiro, 1975). These difficulties are especially pronounced in highly globalized firms, highlighting a trade-off between the benefits of scale and the costs of complexity (Contractor et al., 2003).

Specific to Japanese manufacturers, internationalization often capitalizes on early-mover advantages in technology-intensive industries, leveraging home-country R&D strengths and established industrial clusters (Kogut & Chang, 1991). However, as geographic scope expands, managerial oversight becomes increasingly complex, particularly in global disruptions. For instance, the COVID-19 pandemic heightened coordination difficulties for multinational firms, complicating the management of overseas affiliates (Mishcheniuk, 2023). These challenges are particularly pronounced for smaller or highly leveraged Japanese firms, which face higher risks when entering distant markets but may improve performance over time with sustained FDI commitment (Lu & Beamish, 2004).

In short, the literature underscores an ambivalent effect of internationalization on firm performance: while it can deliver economies of scale, market diversification, and knowledge gains, it also exposes firms to cultural complexity, managerial burdens, and macroeconomic volatility. For Japanese manufacturing enterprises, a strategic alignment between internal capabilities, such as R&D and production expertise, and external host-country conditions appears crucial. The OLI paradigm combined with U-shaped insights into international expansion suggests that finding the “right level” of global engagement and organizational readiness is essential for sustaining performance.

2.3 COVID-19’s Impact on Diversification and Internationalization Strategies

The COVID-19 pandemic delivered simultaneous supply- and demand-side shocks, fundamentally reshaping manufacturing strategies worldwide (Pujawan & Bah, 2021). On the supply side, factory shutdowns, shipping delays, and inconsistent border policies caused widespread disruptions in global supply chains (Xu et al., 2020; Free & Hecimovic, 2020). On the demand side, sectoral shifts were observed, with industries such as travel and hospitality suffering steep declines, while essential goods, including food and medical supplies, remained in high demand (Bakar et al., 2021). Unlike earlier crises that focused primarily on financial or demand shocks, COVID-19 affected nearly every facet of production, logistics, and consumer behavior. These disruptions were

particularly acute for multinational firms managing extensive global operations, where international diversification introduced both resilience and risk in responding to volatility (Verbeke & Kano, 2016).

Research on diversification suggests that diverse revenue streams may mitigate risks, particularly during crises (Kuppuswamy & Villalonga, 2016). Firms employing supply chain diversification strategies managed to cushion financial shocks during COVID-19 by maintaining diversified suppliers, customers, and product lines (Wang et al., 2023). High-tech enterprises that sustained robust R&D and product portfolios were able to pivot resources to segments aligning with pandemic needs (Jin et al., 2021). Nonetheless, diversification introduces management complexity, particularly when different divisions require distinct operational responses (Jarratt, 1999). The effectiveness of diversification hinges on strategic coordination, as inefficient resource allocation may dilute its potential benefits (Jensen, 1986).

Meanwhile, Research on international diversification suggests that while global expansion can offer risk mitigation benefits, it also introduces vulnerabilities, particularly during crises (Mishcheniuk, 2023). The COVID-19 pandemic amplified these risks, with firms facing challenges in repatriating profits and re-routing supply flows due to export restrictions and lockdowns. Multinational firms with substantial liquidity and robust governance managed to weather the storm by shifting production among affiliates and leveraging local managerial expertise (Jiang et al., 2021). Early research suggests that certain Japanese manufacturers used their multi-product capabilities to redeploy personnel across divisions, reinforcing previous findings that resource-sharing can enhance resilience if supported by effective organizational structures (Ozturk & Erhan, 2025).

Taken together, studies indicate that diversification and internationalization played dual roles during the pandemic. While they sometimes served as strategic hedges against market-specific downturns, they also amplified coordination challenges in volatile global conditions (Kano et al., 2022). Firms that successfully leveraged their broad portfolios and geographic reach into adaptive responses, such as reallocating production capacity, securing alternative suppliers, or redeploying capital, demonstrated stronger resilience. Conversely, those lacking governance agility or excessively exposed to highly disrupted segments faced intensified operational difficulties.

The COVID-19 crisis did not radically alter global business strategies but instead underscored the importance of governance adaptability in managing multi-business and multinational operations during uncertainty.

2.4 Evolution of Strategic Adaptation in Japanese Manufacturing: 2017-2023

The Japanese manufacturing sector provides a distinctive context for examining diversification and internationalization strategies, particularly given its recent evolution and response to external challenges.

Empirical evidence from 2017-2023 reveals how the manufacturing sector adapted to external disruptions and industry-wide changes (Mao & Park, 2025).

The Japanese manufacturing sector has maintained relatively stable levels of diversification. Between 2017 and 2019, the sector's average diversification index increased from 0.838 to 0.848, reflecting a trend of business domain exploration during a period of relative economic stability. However, the COVID-19 pandemic marked a turning point, with the diversification index declining to 0.831 in 2021 and further to 0.830 in 2022. By 2023, the index showed a slight rebound to 0.833, potentially indicating signs of recovery in diversification efforts.

In terms of internationalization strategy, Japanese manufacturers have shown sustained commitment to global market expansion. An overall upward trend in the sector's Foreign Sales to Total Sales (FSTS) ratio rises from 48.08% in 2017 to 52.71% in 2022. However, 2023 saw a slight decline to 52.30%, potentially reflecting adjustments in overseas sales strategies.

Figure 1: Distribution of Japanese Manufacturing Industries by Strategic Orientation

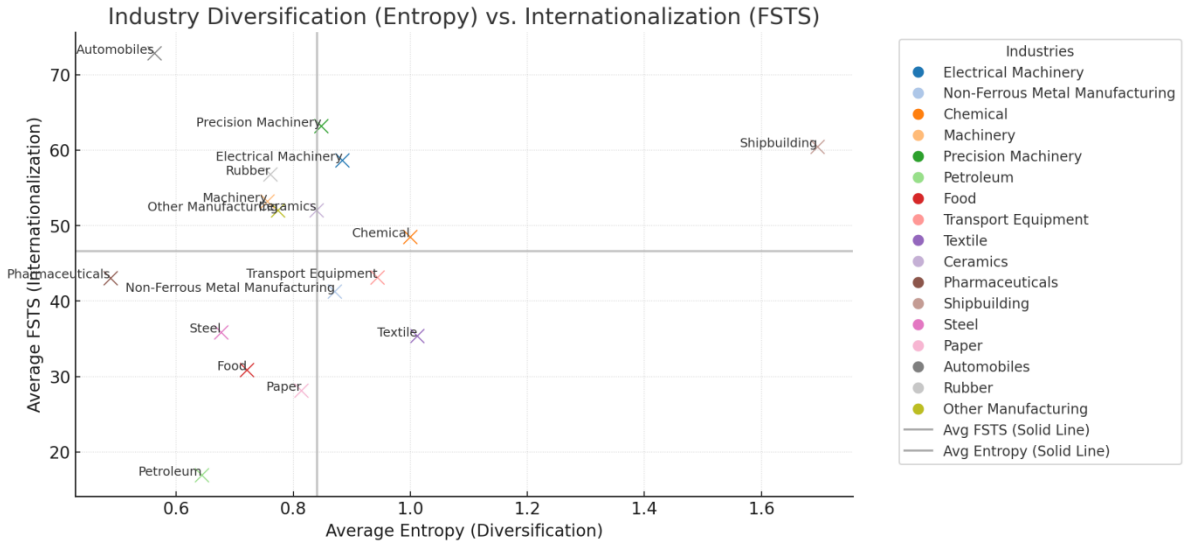

Figure 1 presents the distribution of Japanese manufacturing industries along the dimensions of diversification (Entropy Index) and internationalization (FSTS Ratio), revealing distinct strategic positions across sectors. The data shows significant strategic variations among industries, reflecting industry-specific competitive environments and capabilities. For instance, industries such as precision machinery, electrical equipment, and chemicals display higher levels of both diversification and internationalization. In contrast, industries such as food, petroleum, and paper products show relatively lower levels in both dimensions.

These strategic variations highlight an important issue: firms' choices in diversification and internationalization strategies may be profoundly influenced by industry characteristics. These differences not

only reflect the structural features of various industries but also suggest that different sectors may require differentiated strategic approaches. The implications of this industry-level heterogeneity for strategic effectiveness will be examined in detail in subsequent methodological and analytical sections.

3 Methodology

3.1 Sample and Data Sources

Our sample encompasses all manufacturing firms listed on the Tokyo Stock Exchange Prime Market from 2017 to 2023, resulting in 2,675 firm-year observations after excluding cases with missing financial data. We obtained financial and operational information from the Nikkei NEEDS Financial Database. The manufacturing sector is particularly suited for this study, given its relatively standardized reporting practices and its significant role in Japan's international trade.

3.2 Variables and Measurement

Dependent Variable

Return on Assets (ROA): Calculated as net income over total assets, reflecting profitability and operational efficiency.

Independent Variables

Diversification (ENTROPY):

$$\text{ENTROPY} = \sum_{i=1}^{N} P_i \ln\left(\frac{1}{P_i}\right), \quad \text{where } P_i = \frac{\text{Revenue of Segment } i}{\text{Total Firm Revenue}}$$

N represents the number of business segments, and P_i is the revenue share of segment i.

This entropy-based index accounts for both the number and relative importance of business segments, providing a comprehensive measure of diversification by incorporating revenue distribution across segments. A higher entropy value indicates a more diversified firm, whereas a lower value suggests higher concentration in fewer business areas.

Internationalization (FSTS):

$$\text{FSTS} = \frac{\text{Foreign Sales}}{\text{Total Sales}}$$

The Foreign Sales to Total Sales (FSTS) ratio measures the extent to which a firm depends on international markets for revenue generation. A higher FSTS value indicates greater reliance on foreign markets, reflecting a

firm's degree of internationalization. Conversely, a lower FSTS suggests a stronger focus on the domestic market. This metric is widely used to assess a firm's global market engagement and strategic orientation in international business.

Moderating Variable

COVID-19 Dummy (COVID_DUMMY): A binary variable set to 1 for 2020-2023 and 0 for 2017-2019, allowing us to assess how the pandemic influenced firm performance.

Control Variables

To minimize omitted variable bias, we include:

Firm Age (AGE): Years since establishment, capturing the effect of experience and legacy structures.

Firm Size (LOG_REVENUE): The logarithm of total revenue, representing firm scale. Logarithmic transformation is applied to reduce heteroscedasticity and the influence of extreme values.

Equity Growth Rate (EQUITY GROWTH): Percentage change in equity, reflecting firm expansion and financial stability.

Leverage (DEBT_RATIO): Ratio of total liabilities to total assets, indicating financial risk.

3.3 Sample Classification

To investigate the potentially heterogeneous effects of diversification and internationalization strategies, we employed a classification approach based on the sample mean of diversification (ENTROPY) across the manufacturing sector. Industries with an average diversification level above this threshold are classified as highly diversified, while those below the threshold are considered low-diversification industries.

Our analysis revealed two distinct groups within the manufacturing sector. The high diversification group, comprising 1,528 firm-year observations, consists of seven industries that exhibit above-average diversification levels. These industries include the chemical sector, precision machinery manufacturers, textile companies, transport equipment producers, shipbuilding enterprises, electrical machinery manufacturers, and non-ferrous metal manufacturing firms. These industries typically feature more complex product portfolios and diverse market applications, reflecting their higher diversification levels.

Conversely, the low diversification group encompasses 1,147 firm-year observations from ten industries characterized by below-average diversification levels. This group includes other manufacturing, rubber products, pharmaceuticals, machinery, petroleum, ceramics, paper products, automobiles, steel, and food industries. These sectors generally maintain more focused business models, often concentrating on specific product categories or market segments.

3.4 Model Specification and Estimation Method

To examine the effects of internationalization and diversification on firm performance, we employ a panel regression model with industry fixed effects to control for unobserved heterogeneity. Given the nature of our dataset, we estimate models using heteroskedasticity-robust standard errors to address potential variance inconsistencies across firms. Our estimation strategy is divided into four stages, progressively incorporating interaction effects to test the moderating role of the COVID-19 pandemic.

The first stage assesses the direct impact of internationalization (FSTS) and diversification (ENTROPY) on firm performance, measured by return on assets (ROA). The model specification is as follows:

$$ROA_{i,t} = \beta_0 + \beta_1 FSTS_{i,t} + \beta_2 ENTROPY_{i,t} + \beta_3 AGE_{i,t} + \beta_4 \text{LOG\_REVENUE}_{i,t} + \beta_5 EQUITYGROWTH_{i,t} + \beta_6 DEBT\_RATIO_{i,t} + \gamma_{\text{industry}} + \epsilon_{i,t}$$

Where:

γ_{industry} denotes industry fixed effects, which account for sectoral heterogeneity.

$\epsilon_{i,t}$ is the error term.

This model is estimated using the areg command in Stata, which absorbs industry fixed effects.

To evaluate whether the pandemic influenced the impact of internationalization and diversification, we introduce an interaction with the COVID-19 dummy variable:

$$ROA_{i,t} = \beta_0 + \beta_1 FSTS_{i,t} + \beta_2 ENTROPY_{i,t} + \beta_3 COVID\_DUMMY_t + \beta_4 (FSTS_{i,t} \times COVID\_DUMMY_t) + \beta_5 (ENTROPY_{i,t} \times COVID\_DUMMY_t) + \beta_6 AGE_{i,t} + \beta_7 \text{LOG\_REVENUE}_{i,t} + \beta_8 EQUITYGROWTH_{i,t} + \beta_9 DEBT\_RATIO_{i,t} + \gamma_{\text{industry}} + \epsilon_{i,t}$$

where $COVID\_DUMMY_t$ is set to 1 for 2020-2023 and 0 for 2017-2019, capturing potential shifts in strategic effectiveness during the pandemic.

While this study does not explicitly address potential endogeneity concerns using instrumental variable techniques or dynamic panel models, several factors mitigate the potential bias. First, the inclusion of industry fixed effects helps control for unobserved industry-level heterogeneity. Second, our panel dataset spans multiple years (2017-2023), reducing the risk of omitted variable bias arising from short-term fluctuations. Nevertheless, we acknowledge that unobserved firm-specific characteristics may influence both diversification or internationalization decisions and firm performance. Future research could further address these concerns by employing instrumental variable approaches or Generalized Method of Moments (GMM) estimation to provide additional robustness.

4 Hypotheses

4.1 The Effect of Internationalization on Firm Performance

The effectiveness of internationalization strategies varies significantly across industries with different levels of diversification. While internationalization generally enables firms to access diverse markets and resources, its performance implications depend critically on the industry context in which firms operate. Drawing on the resource-based view (Barney, 1991) and organizational learning theory, we argue that firms' ability to benefit from international expansion is fundamentally shaped by their industry's diversification level, which influences their organizational capabilities and resource integration mechanisms.

In highly diversified industries, internationalization serves as a strategic mechanism for integrating globally distributed complementary resources. The Resource-Based View (RBV) suggests that firms with extensive diversification can leverage their unique capabilities to integrate and exploit complementary resources across international markets, thereby enhancing firm performance (Teece, 1980; Markides & Williamson, 1994). These firms have developed organizational routines and management systems that enable them to effectively coordinate dispersed technological capabilities, market knowledge, and operational expertise.

Doukas and Lang (2003) suggest that foreign investments increasing industrial diversification can harm a firm's subsequent performance. However, the combination of unrelated lines of business with the core operations of multi-segment firms appears to have less harmful effects on performance compared to similar investments by single-segment firms. The less dramatic negative effects of industrial and international diversification on the performance of multi-segment firms reveal the power of industrial and international diversity of these organizations to handle the risks of new business.

Through international expansion, diversified firms can achieve synergistic benefits by combining their domestic capabilities with foreign resources, thereby improving operational efficiency and market competitiveness (Kogut & Chang, 1991; Geringer et al., 1989). For instance, technological knowledge acquired in advanced economies can be integrated with manufacturing capabilities in emerging markets, while diverse market insights can inform product development and innovation strategies. Empirical evidence supports this perspective. Lu and Beamish (2001) found that diversified firms engaging in international expansion experienced a U-shaped relationship with performance, where firms initially faced adaptation challenges but eventually benefited from effective resource integration. Similarly, Fang et al. (2007) documented how Japanese manufacturers leveraged their global networks to enhance competitiveness by accessing diverse technological and market resources.

In contrast to highly diversified firms, those with lower diversification levels face significant constraints in leveraging international expansion for performance enhancement. The findings of Doukas and Lang (2003) indicate that single-segment firms often suffer substantially greater losses from industrial diversification compared to multi-segment firms across countries. This suggests that single-segment firms might be on a survival

path, potentially because they have exhausted their domestic core-business competencies and seek growth outside their home markets, often in industries where they lack the necessary management skills to succeed.

The Resource-Based View (RBV) suggests that firms with a narrow resource base may struggle to achieve synergistic benefits from international expansion due to a lack of complementary assets necessary for cross-border knowledge transfer and operational adaptation (Barney, 1991; Prahalad & Hamel, 1990). Unlike highly diversified firms that exploit economies of scope by integrating international resources across multiple business units, less diversified firms tend to rely on a smaller set of specialized capabilities, limiting their ability to capture foreign market synergies (Hitt et al., 1997). For instance, firms operating within a single product category or a narrow technology focus may find it difficult to translate domestic expertise into international success due to institutional differences and market-specific challenges (Geringer et al., 1989).

Empirical studies confirm these constraints. Fang et al. (2007) found that Japanese firms with narrow product portfolios faced greater challenges in adapting to foreign markets, limiting their ability to integrate international resources effectively. Similarly, Fukui & Ushijima (2007) observed that specialized manufacturers expanding internationally often struggled with the complexity of managing global operations, resulting in limited performance improvements. Furthermore, Contractor et al. (2003) proposed that firms with lower diversification levels may experience an inverted-U relationship between internationalization and performance, where excessive global expansion results in diminishing returns due to coordination inefficiencies.

Based on these arguments, we hypothesize:

Hypothesis 1: In highly diversified industries, internationalization has a positive effect on firm performance.

Hypothesis 2: In less diversified industries, internationalization also has a positive but weaker effect on firm performance.

4.2 The Effect of Diversification on Firm Performance

The relationship between diversification and firm performance represents a fundamental paradox in strategic management: while diversification can provide risk mitigation benefits and resource synergies, it also introduces significant organizational complexity and coordination challenges. We argue that this relationship is particularly sensitive to industry context, as firms' existing diversification levels shape both their capabilities to manage additional complexity and their potential to realize synergistic benefits.

For firms operating in highly diversified industries, diversification is expected to contribute positively to firm performance through established dynamic capabilities and organizational routines. The Dynamic Capabilities

Perspective (Teece et al., 1997) suggests that firms with extensive diversification develop sophisticated abilities to sense and seize market opportunities while continuously reconfiguring their resource base. By managing multiple business domains over time, these firms cultivate the organizational capacity to effectively integrate knowledge assets and redeploy resources across business units, minimizing coordination costs while maximizing synergistic benefits (Helfat & Eisenhardt, 2004).

These capabilities, developed through sustained engagement with diverse business operations, enable firms to leverage resource synergies while maintaining operational efficiency. The Resource Synergy Perspective further suggests that highly diversified firms can effectively utilize shared capabilities, such as R&D, marketing channels, and supply chain networks, across different business domains, leading to enhanced performance (Hitt et al., 1997; Markides & Williamson, 1994). In the Japanese context, firms historically leveraged Keiretsu ties to facilitate inter-firm knowledge transfer and cross-unit coordination (Aoki & Lennerfors, 2013). While this primarily applies to inter-organizational relationships, similar coordination advantages may exist within highly diversified firms that successfully integrate their internal business units. Beyond inter-firm networks such as Keiretsu, Japanese firms have also developed internal mechanisms to facilitate knowledge transfer and mitigate the administrative complexities of managing diversified operations (Fukui & Ushijima, 2007). Furthermore, studies indicate that related diversification in Japanese manufacturing enhances performance by allowing firms to reallocate resources dynamically and exploit inter-temporal economies of scope (Helfat & Eisenhardt, 2004).

Hitt et al. (1997) analyzed 295 large manufacturing firms and found that international diversification initially improves performance, but excessive diversification can lead to diminishing returns. They also found that product diversification moderates this relationship, with highly diversified firms benefiting more from international expansion through economies of scope and knowledge transfer across business units.

In contrast, firms in industries with low baseline diversification levels often achieve competitive advantage through focus and specialization rather than expansion into multiple business domains. The Core Competency Theory (Prahalad & Hamel, 1990) posits that these firms derive their competitive advantage from developing concentrated expertise within specific domains. This specialized knowledge, coupled with focused R&D investments and refined operational capabilities, forms the foundation of their market competitiveness. By maintaining a well-defined strategic focus, these firms can efficiently allocate resources, optimize operational efficiency, and sustain high performance in their niche markets (Helfat & Eisenhardt, 2004).

However, when firms in these industries attempt to diversify, they face significant challenges in maintaining their strategic focus while managing expanded operations. The dispersion of managerial attention and resources across multiple business domains can dilute their specialized capabilities, eroding their core competitive advantages (Fukui & Ushijima, 2007). Furthermore, these firms typically lack the established mechanisms for

cross-unit coordination and resource sharing, which are essential for effective diversification (Grant & Jammine, 1988).

This aligns with the Transaction Cost Economics (TCE) perspective (Williamson, 1975), which suggests that firms face increasing coordination costs when expanding beyond their core competencies. Without robust institutional structures and organizational routines for managing diverse business portfolios, the administrative burden and resource misallocation associated with diversification often outweigh its potential benefits (Jensen, 1986; Berger & Ofek, 1995).

Empirical findings confirm this argument. Berger & Ofek (1995) found that firms pursuing unrelated diversification experienced a valuation discount due to inefficiencies in capital allocation and increased management complexity. In the Japanese manufacturing context, Fukui & Ushijima (2007) demonstrated that firms venturing into unrelated diversification struggled with declining profitability due to misaligned capabilities and inadequate management systems. Additionally, Hill & Hoskisson (1987) highlight that firms with limited diversification capabilities often experience diseconomies of scale, leading to inefficiencies in resource deployment and strategic misalignment.

Based on these arguments, we hypothesize:

Hypothesis 3: In highly diversified industries, diversification has a positive effect on firm performance.

Hypothesis 4: In less diversified industries, diversification has a negative effect on firm performance.

4.3 The Moderating Effect of COVID-19

The COVID-19 pandemic represents an unprecedented external shock that fundamentally disrupted firms' strategic operations. Beyond its immediate impact on global supply chains and market demand, we argue that the pandemic's effect on firm performance was systematically influenced by industry characteristics, particularly how firms in different diversification contexts could leverage or were constrained by their strategic choices during this period of extreme uncertainty.

4.3.1 COVID-19 and Internationalization

The COVID-19 pandemic fundamentally disrupted the institutional environment of international business operations, creating unprecedented challenges in cross-border coordination and resource allocation. The magnitude and impact of these challenges varied across different organizational contexts, particularly in firms with varying levels of business diversification.

For highly diversified firms, the pandemic amplified the institutional complexity inherent in managing international operations. The Institutional Complexity Framework (Verbeke & Kano, 2016) suggests that multinational enterprises (MNEs) face heightened challenges when institutional environments experience dramatic shifts. During COVID-19, these firms encountered multiple, often conflicting institutional pressures across their international networks, including divergent pandemic regulations, market-specific restrictions, and disrupted global supply chains (Mishcheniuk, 2023; Wang et al., 2023).

This institutional complexity was particularly pronounced for highly diversified firms due to their extensive international networks and complex organizational structures. As national governments implemented varying policy responses, firms with multi-market operations faced increased difficulties in coordinating their global activities (Kano et al., 2022). The multiplication of institutional pressures across diverse business units and geographic locations created what Verbeke & Kano (2016) term "compound institutional complexity," where firms must simultaneously manage multiple layers of institutional changes while maintaining operational coherence.

Empirical evidence supports this perspective. Kano et al. (2022) found that multinational firms with complex international structures faced higher operational inefficiencies during COVID-19.

Conversely, firms in less diversified industries demonstrated distinct adaptive capabilities during the COVID-19 pandemic. Drawing on the discussion of adaptive strategies and dynamic capabilities in Hitt et al. (2020), firms with simpler structures and more focused operations may be better positioned to respond rapidly to environmental changes. These firms, characterized by shorter decision-making chains and concentrated resource deployment, possessed inherent advantages in adapting their international strategies during the crisis (Delios & Beamish, 2001; Lu & Beamish, 2001).

Their focused organizational structure enhanced their ability to rapidly reconfigure operations and reallocate resources, aligning with the notion of adaptive efficiency discussed in Hitt et al. (2020). With fewer organizational layers and more streamlined decision-making processes, these firms demonstrated enhanced capability in interpreting and responding to local market conditions (Fang et al., 2007). Their concentrated organizational structure facilitated rapid implementation of adaptive measures while maintaining operational flexibility across international operations (Geringer et al., 1989).

This strategic agility became particularly valuable during COVID-19, where rapid response to changing circumstances often determined firm survival and success. Less diversified firms exhibited greater adaptability in adjusting their international operations to accommodate evolving health protocols and policy changes (Mishcheniuk, 2023). Their streamlined organizational structure enabled swift adaptation to supply chain disruptions and dynamic market demands, allowing them to maintain operational continuity while responding to emerging challenges (Wang et al., 2023).

Empirical studies support this view. Research on organizational responses to COVID-19 suggests that firms with simpler organizational structures demonstrated greater resilience in managing international operations during the crisis (Mishcheniuk, 2023; Kano et al., 2022). However, the extent to which less diversified firms benefited from strategic agility likely varied by industry and market conditions. Their focused operational approach enhanced their ability to leverage international presence while maintaining operational stability, ultimately contributing to superior performance outcomes during the pandemic period (Lu & Beamish, 2001; Fang et al., 2007).

Based on these arguments, we hypothesize:

Hypothesis 5: In highly diversified industries, COVID-19 weakens the positive relationship between internationalization and firm performance.

Hypothesis 6: In less diversified industries, COVID-19 strengthens the positive relationship between internationalization and firm performance.

4.3.2 COVID-19 and Diversification

For highly diversified firms, the pandemic intensified internal resource competition, leading to heightened strategic complexity and operational inefficiencies. The Resource Orchestration Theory (Sirmon et al., 2011) suggests that firms facing external shocks must reconfigure and redeploy resources efficiently, yet highly diversified firms often struggle with simultaneous demands across multiple business units. Recent studies on COVID-19's corporate impact confirm that firms with broader business portfolios faced greater resource allocation tensions, as different units competed for capital, managerial attention, and operational support (Wang et al., 2023).

The Resource Orchestration Perspective suggests that during periods of environmental turbulence, the challenge of optimal resource allocation becomes particularly acute. As COVID-19 disrupted normal business operations, different business units within diversified firms simultaneously demanded additional resources to address emerging challenges (Jensen, 1986; Berger & Ofek, 1995). This concurrent demand for scarce organizational resources created what Sirmon et al. (2011) term "resource allocation tension," where the benefits of having multiple business units are outweighed by the costs of internal resource competition.

Empirical evidence supports this perspective. Jensen (1986) and Berger & Ofek (1995) provide evidence that firms with excessive diversification often experience inefficiencies due to suboptimal capital allocation and bureaucratic complexity.

The COVID-19 pandemic presented significant challenges for firms across various industries, with less diversified firms particularly constrained in their ability to support diversification initiatives. Penrose's (1959)

Theory of Firm Growth posits that a firm's expansion is fundamentally limited by its managerial resources and organizational capabilities. These constraints became particularly acute during the pandemic, as firms with narrow business scopes struggled to mobilize the necessary financial and managerial resources to sustain or expand their diversification efforts.

From the perspective of Resource Constraint Theory, firms face significant obstacles when attempting to expand beyond their existing resource base during periods of environmental uncertainty (Teece, 1980; Helfat & Eisenhardt, 2004). For less diversified firms, the pandemic introduced what Penrose (1959) describes as a "managerial limit", a structural barrier to effective diversification. This limitation manifested through multiple channels. First, financial constraints became more pronounced, as declining revenues and heightened uncertainty restricted access to external financing, though some firms managed to partially mitigate these constraints through financial technology (Ling et al., 2021). Second, heightened uncertainty in market conditions increased the risk premium on diversification strategies, further disincentivizing firms from expanding their business portfolios (Mishcheniuk, 2023). Finally, managerial attention became increasingly absorbed by crisis management efforts, with firms experiencing higher levels of disruption forced to focus on immediate operational challenges rather than strategic expansion (Kushermanto et al., 2023).

During the COVID-19 crisis, firms attempting to expand their operations faced increased challenges in resource allocation and coordination, suggesting that maintaining focus on core operations might have been a more prudent strategy for less diversified firms.

Based on these arguments, we hypothesize:

Hypothesis 7: In highly diversified industries, COVID-19 weakens the positive relationship between diversification and firm performance.

Hypothesis 8: In less diversified industries, COVID-19 strengthens the negative relationship between diversification and firm performance.

5 Results

5.1 Statistical Overview of Manufacturing Industries

To analyse the effects of diversification and internationalization on firm performance, we classify industries into highly diversified (e.g., Chemical, Transport Equipment, Electrical Machinery) and less diversified (e.g., Pharmaceuticals, Food, Steel) groups based on an entropy-based index. The former engages in multi-segment business activities, while the latter remains specialized in core segments.

5.1.1 Descriptive Statistics

Table 1: Descriptive Statistics and Correlation Analysis for Above-Average Diversification Industries

	Variables	Mean	SD	1	2	3	4	5	6	7	8
1	ROA (Return on Assets)	6.545	4.785	1							
2	Internationalization (FSTS)	49.321	21.739	0.216*	1						
3	Diversification	0.945	0.416	-0.145*	-0.072*	1					
4	Equity Growth Rate	78.397	24.045	0.387*	0.132*	-0.024	1				
5	Leverage (Debt Ratio)	2.107	0.975	-0.322*	-0.027	0.194*	0.021	1			
6	Firm Age	7.112	12.975	-0.125*	-0.174*	0.242*	-0.090*	-0.039	1		
7	Firm Size (log of revenue)	12.225	1.401	0.009	0.277*	0.392*	0.039	0.266*	0.142*	1	
8	COVID (Dummy Variable)	0.584	0.493	-0.053*	0.084*	-0.031	0.177*	-0.023	0.056*	0.016	1

* $p < 0.05$

Table 2: Descriptive Statistics and Correlation Analysis for Below-Average Diversification Industries

	Variables	Mean	SD	1	2	3	4	5	6	7	8
1	ROA (Return on Assets)	6.198	4.337	1							
2	Internationalization (FSTS)	45.862	23.354	0.034	1						
3	Diversification	0.778	0.403	-0.053	-0.212*	1					
4	Equity Growth Rate	77.095	25.488	0.399*	0.048	-0.022	1				
5	Leverage (Debt Ratio)	2.053	1.07	-0.262*	0.017	0.096*	0.081*	1			
6	Firm Age	7.288	11.919	-0.075*	-0.054	0.145*	-0.015	0.056	1		
7	Firm Size (log of revenue)	12.473	1.522	-0.04	0.201*	0.061*	0.077*	0.345*	0.052	1	
8	COVID (Dummy Variable)	0.586	0.493	-0.057	0.068*	-0.006	0.224*	-0.007	0.056	0.017	1

* $p < 0.05$

Table 1 and Table 2 present the descriptive statistics and correlation matrices for firms operating in industries with above- and below-average diversification, respectively.

Firms in highly diversified industries exhibit slightly higher ROA (6.55%) and internationalization (FSTS = 49.32%) than less diversified firms (ROA = 6.20%, FSTS = 45.86%), though the differences are modest. The diversification index also reflects this pattern (0.945 vs. 0.778). These descriptive patterns suggest that firms in industries with broader diversification scopes may achieve higher profitability, yet their operational complexity and managerial coordination challenges may also offset potential benefits. However, these differences necessitate further hypothesis testing through regression analysis.

5.1.2 Correlation Analysis

Diversification-Performance Relationship

For industries with above-average diversification, diversification is negatively correlated with ROA ($r = -0.145$, $p < 0.05$). This suggests that even in industries characterized by higher diversification levels, increasing diversification may impose managerial inefficiencies that outweigh potential risk mitigation benefits.

Conversely, in industries with below-average diversification, diversification also exhibits a negative, albeit weaker, correlation with ROA ($r = -0.053$, not significant). This indicates that firms in less diversified industries may lack the requisite managerial capabilities to efficiently oversee multiple business lines. However, the small effect size and lack of statistical significance suggest that further analysis is needed to confirm this relationship.

Internationalization-Performance Relationship

In industries with above-average diversification, internationalization is positively correlated with ROA ($r = 0.216$, $p < 0.05$), suggesting that firms with broader diversification structures may leverage international expansion to optimize resource allocation and market opportunities.

In contrast, for industries with below-average diversification, internationalization exhibits a statistically insignificant correlation with ROA ($r = 0.034$, $p > 0.05$), indicating that firms with specialized business models may face challenges in capitalizing on international expansion due to limited organizational flexibility.

Control Variables and Additional Insights

Firm-specific characteristics play a crucial role in shaping both strategic choices (diversification and internationalization) and firm performance (ROA). This section examines how firm size, firm age, financial leverage, and equity growth influence these two dimensions.

Control Variables and Strategic Choices

Firm size and age play a crucial role in shaping diversification and internationalization strategies. Larger firms tend to diversify more ($r = 0.392$) and expand internationally ($r = 0.277$) in highly diversified industries, reflecting their superior financial and managerial resources. This pattern aligns with the resource-based view (RBV), which posits that well-resourced firms can better exploit economies of scope and scale. Although the relationship remains significant in less diversified industries, its impact is weaker ($r = 0.061$ for diversification, $r = 0.201$ for internationalization), suggesting that firm size is less critical for expansion in these contexts.

Similarly, older firms exhibit broader diversification ($r = 0.242$ in highly diversified industries; $r = 0.145$ in less diversified industries), likely due to accumulated market experience and resource advantages. However, firm age is negatively correlated with internationalization ($r = -0.174$), indicating that younger firms are more inclined toward global expansion, possibly due to greater adaptability and risk-taking tendencies.

Financial leverage negatively affects both diversification ($r = -0.194$) and internationalization ($r = -0.027$, n.s.) in highly diversified industries, implying that firms with high debt burdens face constraints in expanding their business scope. This effect is weaker in less diversified industries ($r = -0.096$ for diversification; $r = 0.017$, n.s. for internationalization), suggesting that financial constraints impact firms differently depending on their strategic focus.

Finally, equity growth positively correlates with both diversification (r = 0.132) and internationalization (r = 0.048) across all industries. Firms with stronger equity growth likely possess greater financial flexibility, enabling them to pursue new business opportunities and expand into global markets.

Control Variables and Firm Performance

Financial leverage consistently exhibits a negative relationship with ROA across both industry groups (r = -0.322 for highly diversified; r = -0.262 for less diversified), supporting capital structure theory. High debt levels restrict financial flexibility, limiting strategic investments and increasing financial risk, which ultimately constrains profitability.

Conversely, equity growth rate is positively associated with ROA (r = 0.387 and r = 0.399), underscoring the importance of financial growth in sustaining competitive advantages and navigating market uncertainties. Firms with strong equity growth have greater internal capital access, reinforcing financial flexibility as a key enabler of strategic resilience.

Firm size and firm age, however, do not show strong direct effects on ROA. While large firms benefit from economies of scale, their size alone does not necessarily translate into higher profitability (r = 0.009, n.s. in highly diversified industries; r = -0.040, n.s. in less diversified industries), indicating that other firm-specific and market-driven factors mediate the size-performance relationship. Similarly, older firms may leverage accumulated knowledge and stable market positions, but organizational inertia and inefficiencies could offset these advantages, as indicated by their weak negative correlation with ROA (r = -0.125 and r = -0.075).

5.2. Main Effects Analysis

Table 2 presents the regression results for both above-average and below-average diversified industries. The models demonstrate good overall fit, with R^2 values of 0.3147 and 0.32 respectively, allowing us to test our hypotheses about the differential effects of strategic choices across these industry contexts.

5.2.1 The Effect of Internationalization on Firm Performance (H1 & H2)

The analysis reveals contrasting effects of internationalization across industry contexts. In highly diversified industries, supporting Hypothesis 1, internationalization exhibits a significant positive effect on ROA ($\beta = 0.0249$, $t = 4.61$, $p < 0.01$). This beneficial impact can be attributed to several factors. Expanding into international markets allows these firms to access new customer bases, benefit from economies of scale, and leverage competitive advantages across different regions. Moreover, internationalization provides an additional layer of revenue diversification, reducing firms' exposure to domestic market fluctuations and economic downturns.

In contrast, for less diversified industries, internationalization shows no significant impact on performance ($\beta = 0.0004$, $t = 0.07$, n.s.), failing to support Hypothesis 2. The non-significant relationship suggests that internationalization does not contribute meaningfully to firm performance in these industries. This may be due to several factors: firms in sectors such as pharmaceuticals, rubber, and petroleum often prioritize specialization in their core markets rather than aggressive international expansion. These industries face substantial barriers to international entry, including regulatory constraints, high capital intensity requirements, and significant operational costs. Furthermore, their competitive advantage may derive more from domestic market stability, technological specialization, and regional supply chain integration, making international expansion less crucial for performance enhancement.

The stark contrast in internationalization effects between the two groups (0.0249 vs 0.0004) suggests that the value of international expansion is deeply contingent on industry context. While firms in highly diversified industries can effectively leverage international opportunities for performance improvement, those in less diversified industries may lack the necessary capabilities or strategic incentives to benefit from internationalization. These findings highlight how industry characteristics and operational focus fundamentally shape the relationship between internationalization and firm performance.

Table 2: Main Effects of Strategic Choices on Firm Performance

Variables	Above-Average Diversification Industries	Below-Average Diversification Industries
Internationalization (FSTS)	0.0249***	0.0004
	(4.61)	(0.07)
Diversification	-1.1762***	-0.3921
	(-3.89)	(-1.31)
Firm Age	-0.0198***	-0.0147***
	(-4.28)	(-3.54)
Firm Size (log of revenue)	0.38999***	0.2309**
	(3.81)	(2.10)
Equity Growth Rate	0.1357***	0.1469***
	(7.93)	(6.39)
Leverage (Debt Ratio)	-1.6025***	-1.1552***
	(-10.78)	(-4.61)
Constant	5.6194***	6.0426***
	(5.60)	(4.78)
R^2	0.3147	0.32
F-statistic	32.75	18.03
Observations	1,528	1,147

Significance Levels * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The values in parentheses represent the t-statistics.

5.2.2 The Effect of Diversification on Firm Performance (H3 & H4)

Our analysis reveals contrasting effects of diversification across the two industry groups. In highly diversified industries, contrary to Hypothesis 3, we find a significant negative relationship between diversification and ROA ($\beta = -1.1762$, $t = -3.89$, $p < 0.01$). This unexpected finding challenges our theoretical prediction that firms in highly diversified industries would benefit from their established capabilities in managing diverse business portfolios. The result aligns more with transaction cost theory (Williamson, 1975), suggesting that managing unrelated business units increases coordination costs and resource misallocation.

Beyond transaction cost concerns, another key factor shaping this negative effect in Japan's highly diversified industries is the Keiretsu system. Yafeh (2003) highlights that Keiretsu-affiliated firms often exhibit lower profitability due to rigid intra-group financial relationships and cross-subsidization among member firms. While Keiretsu networks historically provided stability and facilitated resource sharing (Lincoln & Gerlach, 2004), they may also lead to inefficient capital allocation, particularly in highly diversified firms. Instead of optimizing investments based on market efficiency, Keiretsu firms may prioritize intra-group relationships, sustaining weaker business units even when external market conditions demand resource reallocation. This structural rigidity can exacerbate the negative effects of diversification, as firms are less able to divest underperforming segments or pivot their strategies during crises such as the COVID-19 pandemic. As a result, the benefits of scope economies in highly diversified industries may be outweighed by the inefficiencies inherent in Japan's corporate governance structures.

In less diversified industries, contrary to Hypothesis 4, we find that the relationship between diversification and performance is negative but not statistically significant ($\beta = -0.3921$, $t = -1.31$, n.s.). This lack of significance suggests that diversification does not have a definitive negative impact on firm performance in these industries. While diversification might introduce managerial and operational challenges, the non-significant result implies that firms in less diversified industries may neither suffer nor significantly benefit from expanding into multiple business lines. The results suggest that these firms may be more adaptable in managing diversification, or that other industry-specific factors moderate the impact of diversification on performance.

The comparison between these two groups provides interesting insights. The stronger negative effect in highly diversified industries (-1.1762 vs -0.3921) suggests that the costs of additional diversification may be particularly pronounced when firms already operate in complex, multi-business environments. This could indicate the existence of an optimal diversification threshold, beyond which the coordination costs and resource misallocation challenges outweigh potential benefits from scope economies. However, in less diversified industries, the absence of statistical significance suggests that the negative effects of diversification may not be

as strong or consistent, highlighting the need for further investigation into industry-specific conditions that shape the diversification-performance relationship.

5.2.3 Effects of Control Variables

The analysis of control variables reveals both consistent patterns and interesting variations across industry contexts. Our findings highlight how the influence of firm characteristics on performance varies with industry diversification levels.

Firm age demonstrates a consistently negative relationship with ROA across both groups, though with varying magnitudes ($\beta = -0.0198$, $t = -4.28$, $p < 0.01$ in highly diversified industries; $\beta = -0.0147$, $t = -3.54$, $p < 0.01$ in less diversified industries). In both contexts, older firms face challenges such as bureaucratic inefficiencies and declining innovation capacity. However, the stronger negative effect in highly diversified industries suggests that organizational aging may pose greater challenges when managing complex, multi-business operations.

The effect of firm size on performance shows notable variation between groups. While positive in both cases, the effect is substantially stronger in highly diversified industries ($\beta = 0.38999$, $t = 3.81$, $p < 0.01$) compared to less diversified industries ($\beta = 0.2309$, $t = 2.10$, $p < 0.05$). This difference suggests that economies of scale and resource advantages associated with firm size may be particularly valuable in managing diverse business portfolios, where larger firms can better leverage their resources across multiple operations.

Equity growth rate maintains a relatively consistent positive influence across both groups ($\beta = 0.1357$, $t = 7.93$, $p < 0.01$ in highly diversified industries; $\beta = 0.1469$, $t = 6.39$, $p < 0.01$ in less diversified industries). This suggests that regardless of industry context, firms benefit from expanding their equity base, which enables greater investment capacity and financial flexibility.

Leverage shows a strong negative effect in highly diversified industries ($\beta = -1.6025$, $t = -10.78$, $p < 0.01$), with a relatively weaker but still significant negative impact in less diversified industries ($\beta = -1.1552$, $t = -4.61$, $p < 0.01$). This difference in magnitude suggests that debt burden may pose greater challenges in complex organizational settings, where financial flexibility is particularly crucial for managing diverse operations.

5.3. The Moderating Effects of COVID-19

To test hypotheses H5-H8 regarding how COVID-19 moderates the relationships between strategic choices and firm performance, we examined the interaction effects between COVID-19 and strategic variables (internationalization and diversification) across both industry groups. The analysis focuses on how the pandemic

period affected the effectiveness of firms' internationalization and diversification strategies in different industry contexts.

Table 4: Moderating Effects of COVID-19 on Strategic Choices

Variables	Above-Average Diversification Industries		Below-Average Diversification Industries	
Internationalization (FSTS)	0.0276***	0.0177***	0.0034	0.0042
	(5.19)	(2.94)	(0.59)	(0.64)
Diversification	-1.2342***	-1.0252***	-0.4013	-0.3043
	(-4.10)	(-3.15)	(-1.38)	(-0.82)
COVID (Dummy Variable)	-1.3542***	-1.8623***	-1.4155***	-1.2158***
	(-6.23)	(-6.32)	(-5.94)	(-3.49)
COVID × Internationalization		0.0230**		-0.0020
		(2.40)		(-0.28)
COVID × Diversification		-0.4455		-0.2226
		(-1.07)		(-0.48)
Firm Age	-0.0170***	-0.0165***	-0.0124***	-0.0125***
	(-3.71)	(-3.61)	(-3.01)	(-3.02)
Firm Size (log of revenue)	0.3849***	0.3864***	0.2205**	0.2176**
	(3.79)	(3.84)	(2.03)	(2.00)
Equity Growth Rate	0.1446***	0.1428***	0.1599***	0.1593***
	(7.39)	(7.39)	(6.45)	(6.43)
Leverage (Debt Ratio)	-1.6095***	-1.6214***	-1.1775***	-1.1716***
	(-10.67)	(-10.54)	(-4.52)	(-4.51)
Constant	6.1309***	6.3748***	6.6461***	6.5686***
	(6.13)	(6.43)	(5.44)	(5.40)
R^2	0.3333	0.3392	0.344	0.345
F-statistic	30.06	23.77	17.13	13.97
Observations	1,528	1,528	1,147	1,147

Significance Levels * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The values in parentheses represent the t-statistics.

5.3.1 COVID-19's Moderation of Internationalization Effects (H5 & H6)

The analysis reveals contrasting patterns in how COVID-19 moderated the internationalization-performance relationship across industry groups. In highly diversified industries, contrary to Hypothesis 5, we find a significant positive interaction effect ($\beta = 0.0230$, $t = 2.40$, $p < 0.05$), indicating that internationalization became even more beneficial for firm performance during the pandemic period, rather than weakening as hypothesized. This finding suggests that internationally diversified firms in these industries were better positioned to navigate the economic challenges posed by COVID-19. Firms operating in multiple countries could mitigate losses in severely impacted regions by maintaining operations in less affected markets, while their established international

supply chains and diversified customer bases provided greater resilience in managing logistical disruptions and adapting to shifting demand patterns. Thus, our results do not support Hypothesis 5, but rather indicate that internationalization served as a strategic advantage for firms in highly diversified industries during the pandemic.

In contrast, for less diversified industries, we find no significant moderation effect (β = -0.0020, t = -0.28, n.s.), failing to support Hypothesis 6's prediction that COVID-19 would strengthen the internationalization-performance relationship. This absence of moderation suggests that the pandemic's impact on international operations was more challenging for firms in these industries. The highly uncertain global business environment, characterized by travel restrictions, border closures, and fluctuating regulations, may have limited the benefits typically associated with international diversification. Additionally, these firms may have faced heightened supply chain risks and operational inefficiencies that offset potential gains from market diversification.

The contrast between these findings highlights how industry context shaped firms' ability to leverage international operations during the crisis. Firms in highly diversified industries, with their established capabilities in managing complex operations, could better utilize their international presence as a risk mitigation mechanism. However, firms in less diversified industries, despite their potentially strong specialized capabilities, found that the advantages of international market expansion were largely neutralized by the pandemic's widespread disruptions. These results suggest that the effectiveness of internationalization as a strategic response to crisis conditions depends significantly on firms' existing organizational capabilities and industry characteristics.

5.3.2 COVID-19's Moderation of Diversification Effects (H7 & H8)

Our analysis reveals that COVID-19's moderating effect on the diversification-performance relationship was not statistically significant in either industry group. In highly diversified industries, the interaction term is negative (β = -0.4455, t = -1.07, n.s.), failing to support Hypothesis 7, which predicted that COVID-19 would weaken diversification's positive effect on performance. Similarly, in less diversified industries, the interaction term (β = -0.2226, t = -0.48, n.s.) is also not significant, contradicting Hypothesis 8's prediction that COVID-19 would strengthen diversification's negative effect.

The lack of significant moderation effects in highly diversified industries suggests that diversification strategies yielded mixed outcomes during the pandemic. While some diversified firms may have leveraged their multiple business lines to mitigate risks, others faced heightened coordination challenges and inefficiencies. The effectiveness of diversification likely varied across sectors, firms in technology and healthcare may have capitalized on new opportunities, whereas those in tourism and retail faced severe operational constraints. Moreover, unrelated diversification, particularly into unfamiliar industries, may have been riskier during COVID-19 due to firms' limited expertise and difficulties in resource allocation.

In less diversified industries, the absence of a significant moderation effect may be due to firms' inherently low exposure to multiple business lines. Unlike their highly diversified counterparts, these firms may not have had sufficient diversification to realize any potential stabilizing benefits. Additionally, the pandemic's industry-specific effects may have played a dominant role, overshadowing diversification's potential impact. For example, firms in pharmaceuticals or food manufacturing may have maintained stable performance irrespective of their diversification strategies, while those in sectors such as petroleum or steel experienced demand shocks that diversification alone could not mitigate.

These findings indicate that the fundamental relationship between diversification and performance remained largely unchanged during the pandemic, regardless of industry context. The absence of significant moderation effects implies that the underlying mechanisms, whether increased coordination costs in highly diversified industries or specialization benefits in less diversified industries, persisted despite the economic turmoil caused by COVID-19.

6 DISCUSSION AND IMPLICATIONS

This study examines how industry context shapes the effectiveness of internationalization and diversification strategies, and how these relationships evolved during the COVID-19 pandemic. Our findings extend existing theory in several important ways.

6.1 Theoretical Implications

Internationalization as a Strategic Asset in Complex Industries

Traditional international business theories, such as the eclectic (OLI) paradigm (Dunning, 1979), posit that firms with strong ownership advantages can leverage internationalization to achieve superior performance. However, our findings challenge the assumption that OLI advantages are universally applicable by showing that industry diversification levels serve as a crucial condition that determines the effectiveness of internationalization.

Specifically, in highly diversified industries, internationalization has a significant positive effect on firm performance ($\beta = 0.0249$, $p < 0.01$), suggesting that firms operating in complex environments possess the requisite capabilities to coordinate international expansion effectively. These firms leverage pre-existing management routines and cross-unit integration mechanisms to mitigate risks and optimize global resource allocation. Conversely, in less diversified industries, internationalization does not exhibit a significant effect on

performance (β = 0.0004, n.s.), indicating that even strong ownership advantages may be insufficient to generate performance gains without the necessary internal organizational mechanisms.

This finding extends RBV and dynamic capabilities theory (Barney, 1991; Teece et al., 1997) by demonstrating that internationalization effectiveness is contingent not only on firm-specific advantages but also on firms' broader strategic context. It further suggests that internationalization is most effective when firms have pre-established capabilities in managing operational complexity, reinforcing the view that dynamic capabilities are essential for translating international expansion into competitive advantage (Teece, 2007).

Limits of Diversification

The relationship between diversification and firm performance has been widely debated in strategic management research. While early studies suggested that diversification enhances performance through resource sharing and economies of scope (Rumelt, 1974; Teece, 1980), our results paint a more nuanced and paradoxical picture.

In highly diversified industries, diversification exhibits a significant negative effect on firm performance (β = -1.1762, $p < 0.01$), despite firms' accumulated experience in managing multi-business operations. This finding challenges the notion that experience alone mitigates the downsides of diversification and suggests that cognitive and coordination burdens become more severe as firms increase their business complexity. Even firms with extensive diversification histories struggle to maintain efficiency due to rising managerial costs, increased decision-making bottlenecks, and resource allocation inefficiencies. This aligns with transaction cost theory (Williamson, 1975), which posits that the costs of managing complex structures may outweigh the benefits of diversification beyond a certain threshold.

Additionally, our findings complement organizational learning theory (Hamel & Prahalad, 1994) by highlighting that diversification-induced complexity does not always translate into learning benefits. Instead, diversification can overwhelm managerial attention and dilute core competencies, leading to diminishing returns. Our results further extend the Japanese empirical literature (Fukui & Ushijima, 2007) by demonstrating that even in industries where firms have historically developed strong cross-unit coordination mechanisms, excessive diversification still leads to performance deterioration.

Conversely, in less diversified industries, diversification exhibits no significant effect on performance (β = -0.3921, n.s.), suggesting that the resource-sharing benefits of diversification may be insufficient to overcome the added complexity for firms lacking a multi-business management foundation. This finding aligns with Penrose's (1959) growth theory, which argues that firms face managerial limits to expansion, particularly in environments where they lack prior diversification experience.

COVID-19's Nuanced Impact

The COVID-19 pandemic provided a natural experiment to examine how firms' structural complexity affects their crisis response. Conventional perspectives suggest that organizational complexity increases vulnerability during crises due to heightened coordination challenges. However, our findings reveal a more dynamic and counterintuitive relationship:

In highly diversified industries, the positive effect of internationalization on performance strengthened during the crisis ($\beta = 0.0230$, $p < 0.05$). This suggests that firms accustomed to managing operational complexity in normal conditions were better equipped to navigate uncertainty, reallocate resources, and adjust global supply chains during the pandemic. These firms' pre-existing capabilities in multi-market coordination and risk management allowed them to transform organizational complexity from a potential liability into an adaptive capability. This supports recent arguments in the strategic resilience literature (Pujawan & Bah, 2021; Kano et al., 2022) that firms with robust resource orchestration capabilities (Sirmon et al., 2011) can leverage complexity as a source of agility during external shocks.

By contrast, the performance effects of diversification did not significantly change during COVID-19, suggesting that diversification did not provide the expected risk-buffering benefits. This challenges traditional views that diversified firms are more resilient to shocks (Kuppuswamy & Villalonga, 2016) and suggests that organizational resilience is more dependent on firms' ability to dynamically allocate resources rather than simply possessing a diversified portfolio. The inability of diversified firms to leverage their breadth of operations effectively during COVID-19 further underscores the limitations of diversification as a standalone resilience strategy.

Taken together, these findings expand the strategic resilience framework by demonstrating that firms with complex international structures can transform environmental turbulence into strategic advantage, provided they possess the necessary coordination and reallocation mechanisms. This insight also refines Verbeke and Kano's (2016) framework on "compound institutional complexity" by illustrating how multinational firms differentially navigate overlapping institutional pressures under crisis conditions.

6.2 Managerial Implications

Tailor Strategies to Industry Diversification Baselines

Managers should recognize that industry conditions fundamentally shape the effectiveness of internationalization and diversification strategies. A firm's diversification level determines whether international expansion can enhance performance or introduce additional complexity.

For firms in highly diversified industries, internationalization is a key strategic priority. These firms can leverage their existing cross-border coordination capabilities, supply chain flexibility, and risk diversification strategies to optimize performance. Expanding into international markets allows them to mitigate domestic market saturation and capitalize on global synergies. To fully harness these benefits, managers should invest in digital coordination tools, strengthen global supply networks, and enhance cross-market knowledge sharing.

Conversely, for firms in less diversified industries, neither internationalization nor diversification provides automatic performance gains. Entering foreign markets without strong internal integration mechanisms can lead to inefficiencies and managerial overload. These firms should prioritize strengthening core competencies, deepening technological expertise, and improving value-chain integration before expanding internationally. A gradual, capability-driven internationalization approach will be more sustainable than rapid expansion.

At the same time, managers should rethink diversification strategies. The findings indicate that diversification beyond a certain threshold does not necessarily yield performance benefits, even in firms with extensive multi-business experience. Instead of viewing diversification as a default growth strategy, managers should focus on targeted diversification that aligns with existing resource strengths and operational synergies.

Manage Over-Diversification Risks

As firms expand into multiple markets and business segments, they must navigate the delicate balance between reaping the benefits of diversification and managing its inherent complexities. While diversification can generate operational synergies and enhance market reach, our findings indicate that beyond a certain threshold, the increasing coordination costs and managerial inefficiencies can outweigh its advantages, leading to declining performance. This paradox underscores the need for firms to adopt a strategic approach to complexity management, ensuring that expansion does not come at the cost of organizational inefficiency.

One key challenge for highly diversified firms is the fragmentation of decision-making processes, which can slow down strategic execution and reduce overall efficiency. To mitigate these risks, firms should consider leveraging advanced coordination mechanisms, such as AI-driven business analytics and digital collaboration tools, to facilitate information flow and enhance decision-making across business units. At the same time, a decentralized management structure can empower local subsidiaries or divisions with greater autonomy, allowing them to respond more effectively to market dynamics while reducing bottlenecks in corporate resource allocation.

Another critical issue is the suboptimal utilization of shared resources. In many diversified firms, different business segments operate in silos, failing to exploit potential synergies. Establishing cross-functional integration mechanisms, such as joint innovation initiatives, shared service platforms, and inter-unit knowledge transfer systems, can help firms extract greater value from their diversified operations and improve overall efficiency.

For Japanese firms embedded in Keiretsu networks, these challenges are particularly pronounced. While Keiretsu affiliations have historically provided stability and long-term investment horizons, they can also restrict firms' ability to reallocate resources dynamically, reinforcing inefficiencies in highly diversified firms. Managers must critically assess whether intra-group capital allocation is genuinely contributing to strategic growth or merely sustaining underperforming units. Greater flexibility in investment decisions, moving beyond legacy intra-group obligations and adopting a more performance-driven resource allocation model, will be essential for long-term competitiveness.

By implementing these strategies, firms can better manage the complexity associated with diversification, ensuring that expansion remains a source of strategic advantage rather than an operational burden.

Build Dynamic Capabilities Before Expanding Globally

While international expansion offers firms opportunities to diversify revenue streams, optimize resource allocation, and enhance market competitiveness, it also introduces new layers of organizational and operational complexity. Unlike domestic expansion, where firms operate within a relatively unified regulatory and cultural framework, internationalization requires them to navigate institutional heterogeneity, fragmented supply chains, and market-specific risks. The challenge is particularly pronounced for firms in highly diversified industries, as they must simultaneously manage cross-border operations and the complexities of multi-business coordination.

Effectively managing internationalization complexity is not just about scaling operations across multiple regions, it requires firms to develop robust coordination mechanisms, empower regional decision-making, and build adaptive capabilities to respond to global uncertainties. One crucial aspect of success is enhancing global coordination capabilities. Firms should integrate data-driven decision-making, centralized knowledge management systems, and AI-powered supply chain analytics to improve visibility and responsiveness across international operations. By adopting real-time monitoring tools and predictive analytics, firms can optimize logistics, reduce operational inefficiencies, and ensure that strategic decisions are based on accurate, up-to-date market insights.

At the same time, firms must strike a balance between centralized control and regional autonomy. While a strong headquarters presence can provide strategic direction and resource alignment, excessive centralization may lead to bureaucratic bottlenecks and slower responses to local market dynamics. To mitigate this, firms should empower regional subsidiaries with greater decision-making authority, allowing them to adapt strategies based on local consumer preferences, regulatory requirements, and competitive landscapes, while still maintaining overall alignment with corporate objectives.

Furthermore, internationalization success is not just about expanding geographically but about developing the agility to navigate volatile global environments. As firms operate across multiple jurisdictions, they must

continuously refine their internationalization strategies in response to shifting regulatory frameworks, currency fluctuations, and geopolitical risks. Firms that invest in dynamic capability-building, such as flexible resource reallocation mechanisms, scenario-based risk assessment models, and cross-border talent development programs, will be better positioned to turn international complexity into a strategic advantage.

For Japanese firms embedded in Keiretsu structures, international expansion presents additional governance challenges. Unlike Western multinationals that typically operate with decentralized, performance-driven investment models, Keiretsu-affiliated firms often prioritize intra-group transactions and long-term relational commitments. While these structures provide stability and shared resources, they can also limit firms' ability to reallocate capital efficiently in response to global market shifts. To remain competitive, Keiretsu firms should consider modernizing their global governance frameworks, reducing over-reliance on traditional group-based financial structures, and adopting a more performance-oriented approach to international resource allocation.

6.3 Limitations and Future Research

While our study provides important insights, several limitations suggest promising directions for future research. First, our analysis focuses on Japanese publicly listed manufacturing firms from 2017 to 2023, which may limit the generalizability of our findings to other institutional and industrial contexts. While Japan presents a unique setting to examine strategic decision-making within highly structured corporate networks (e.g., Keiretsu), future research could explore whether similar patterns hold in markets with different corporate governance structures, such as emerging economies where firms operate under weaker institutional support and higher environmental uncertainty. Expanding the scope beyond manufacturing to industries with different strategic imperatives, such as technology or energy, may also offer further insights into how firms manage complexity in international expansion.

Second, while our study identifies broad patterns in how diversification and internationalization affect firm performance, it does not directly examine the mechanisms through which these strategies create value or impose costs. For example, does internationalization enhance performance primarily through knowledge transfer, supply chain flexibility, or financial risk diversification? Similarly, do the negative effects of excessive diversification stem from managerial overload, misaligned incentive structures, or coordination failures? Future research could explore these questions using mediation or moderation models, qualitative case studies, or firm-level operational data.

Finally, our study uses the entropy index to measure diversification, which effectively captures the breadth of business expansion but does not distinguish between related and unrelated diversification. Given that related diversification may foster synergies and resource-sharing, while unrelated diversification may introduce greater

managerial complexity, future studies could refine this measure by incorporating technological proximity indicators.

7 Conclusion

This study examines how industry characteristics shape the effectiveness of internationalization and diversification strategies, providing new insights into their performance implications for firms. Our findings reveal that the impact of these strategies varies significantly depending on firms' diversification levels. In highly diversified industries, internationalization enhances firm performance, as these firms possess the necessary capabilities to manage complexity and leverage cross-border synergies. Conversely, in less diversified industries, internationalization does not yield significant performance benefits, suggesting that firms without strong internal coordination mechanisms may struggle to capitalize on global expansion.

Similarly, the effects of diversification are highly context-dependent. While diversification is often seen as a strategy for enhancing operational resilience, our results indicate that in highly diversified industries, further expansion leads to diminishing returns due to rising coordination costs and organizational inefficiencies. However, in less diversified industries, diversification does not necessarily harm performance, implying that firms may still have room to expand before reaching the threshold where complexity outweighs benefits.

These findings contribute to strategic management theory by emphasizing the importance of industry context in shaping the value of internationalization and diversification strategies. They also offer practical insights for corporate decision-makers, suggesting that firms should carefully assess their existing capabilities and industry environment before pursuing expansion strategies.

While this study advances understanding of these strategic relationships, it also highlights the need for future research to further explore causal mechanisms, long-term adaptation strategies, and the role of firm-specific capabilities in managing complexity. As global markets continue to evolve, firms must remain adaptable, ensuring that their strategic choices align with both current industry conditions and future uncertainties.

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