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Exploring Enterprise Risk Management Adoption Frameworks in US and European Multinational Corporations

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ABSTRACT

This article examines the adoption practices of Enterprise Risk Management (ERM) within US and European multinational corporations. It synthesizes academic literature and regulatory guidelines to identify the key drivers, benefits, challenges, and regional nuances influencing ERM implementation. Findings indicate that US adoption has historically been driven by financial regulations like Sarbanes-Oxley, emphasizing internal controls and financial risk management. Conversely, European adoption is increasingly integrating Environmental, Social, and Governance (ESG) risks, propelled by directives such as the Corporate Sustainability Reporting Directive (CSRD). While ERM demonstrably enhances firm value and performance by optimizing capital allocation and reducing earnings volatility, challenges persist in achieving full integration and moving beyond mere compliance. The discussion highlights the strategic imperative of ERM in a complex global landscape, emphasizing the need for agile and deeply embedded risk management practices, and considers the implications of various firm-specific and macroeconomic factors on ERM propensity and total firm risk.

KEYWORDS: Enterprise Risk Management (ERM), Multinational Corporations, US, Europe, Regulatory Compliance, ESG Risks, Financial Risk, Corporate Governance, Risk Management Adoption, Sarbanes-Oxley, CSRD.

INTRODUCTION

In an increasingly volatile, uncertain, complex, and ambiguous (VUCA) world, characterized by rapid technological advancements, geopolitical shifts, and environmental crises, organizations face a myriad of systemic and idiosyncratic risks that can significantly impact their operations, financial stability, and long-term viability. The conventional, often fragmented approach to risk management, where threats are addressed in isolated departmental silos, has proven largely insufficient for navigating the intricate, interconnected nature of modern business challenges [1]. This demonstrable inadequacy has served as a powerful impetus for the evolution towards Enterprise Risk Management (ERM), a comprehensive, integrated framework meticulously designed to manage the full spectrum of risks across an entire organizational structure [2, 7].

ERM signifies a profound paradigm shift from a narrow, reactive perspective of risk solely as a potential threat to a proactive recognition of risk as an intrinsic and integral component of strategic decision-making, value creation, and competitive advantage [19, 20, 23]. At its core, ERM encompasses a structured and continuous process of identifying, assessing, measuring, mitigating, monitoring, and reporting on all categories of risks – operational, financial, strategic, compliance, and reputational – that could potentially affect an organization's ability to achieve its objectives. The ultimate aim is to enhance organizational resilience, optimize resource allocation, and foster sustained performance, thereby enabling the achievement of strategic goals [7, 8]. The escalating complexity of global business environments, coupled with amplified regulatory scrutiny, rising stakeholder activism, and the emergent demands for greater corporate accountability, has rendered ERM not merely beneficial, but an absolute imperative for multinational corporations operating across diverse jurisdictions [27].

Recent global phenomena, such as the widespread disruption caused by pandemics (e.g., COVID-19), the intensification of geopolitical conflicts (e.g., the Ukraine-Russia conflict), the pervasive threat of cybersecurity breaches, and the existential challenges posed by climate change and biodiversity loss, have fundamentally reshaped

the global risk landscape. These systemic risks transcend traditional industry or national boundaries, impacting organizations on an unprecedented scale. Consequently, the ability of multinational firms to effectively anticipate, respond to, and recover from such widespread disruptions has become a critical determinant of their success and longevity. Traditional risk management approaches, often focused on insurable or quantifiable financial risks, have been found wanting in the face of these amorphous, interconnected, and rapidly evolving global challenges [3, 18]. This growing awareness underscores the necessity for an ERM framework that is not only robust and comprehensive but also agile and adaptive to an ever-changing external environment.

This article embarks on a detailed exploration of the current Enterprise Risk Management adoption practices prevalent within leading US and European multinational corporations. By meticulously synthesizing a wide array of existing academic literature, authoritative industry reports, and pertinent regulatory guidelines, this study endeavors to illuminate the multifaceted key drivers, tangible benefits, inherent challenges, and distinct regional nuances that collectively influence the implementation and maturity of ERM frameworks in these two pivotal economic blocs. Understanding these complex dynamics is not merely an academic exercise; it is profoundly crucial for organizations striving to strengthen their operational resilience, optimize their strategic decision-making, and significantly enhance their overall risk management capabilities in a globally interconnected, yet inherently uncertain, marketplace. Furthermore, this analysis will delve into empirical evidence to discern whether the propensity to adopt ERM is consistently associated with total firm risk across these regions, and how various firm-specific and cultural-institutional factors might moderate this relationship.

METHODOLOGY

This article's comprehensive analysis of Enterprise Risk Management adoption practices is firmly grounded in a systematic review and rigorous synthesis of extant academic literature, influential industry reports, and authoritative regulatory guidelines. The methodological approach employed is qualitative in nature, with a strong focus on discerning overarching insights, emergent patterns, and key theoretical relationships derived from the provided set of references. This process aims to construct a cohesive, evidence-based narrative pertaining to ERM practices within the specific contexts of US and European multinational corporations.

The deliberate scope of this review is precisely delimited to studies and publications that directly address the multifaceted aspects of ERM implementation. This includes an examination of its primary determinants, the perceived and realized benefits, and the significant challenges encountered during its adoption and ongoing application within large multinational corporations. The geographical focus is exclusively on firms operating predominantly in the United States and various European countries. This specific regional selection is strategically motivated by several critical factors: the distinct and often divergent regulatory landscapes governing corporate behavior in these regions, their deeply entrenched and varied traditions of corporate governance, and their collective, substantial influence on global business practices and standards.

The analytical framework guiding this review encompasses a multi-stage process, ensuring a thorough and structured examination of the collected information:

1. **Categorization of References:** Initially, each of the provided references was systematically categorized based on its predominant thematic focus. This involved grouping publications that primarily address:
    - **Regulatory Impact:** Studies focusing on the influence of specific legislations, directives, and governance codes (e.g., Sarbanes-Oxley Act, CSRD, UK Corporate Governance Code) on ERM adoption and disclosure.
    - **Value Creation and Performance:** Research investigating the relationship between ERM implementation and various measures of firm value, financial performance, and risk reduction.
    - **Empirical Studies:** Publications presenting quantitative or qualitative empirical evidence on ERM adoption rates, determinants, and outcomes, often based on surveys or financial data analysis.
    - **Conceptual Frameworks and Theories:** Articles discussing the theoretical underpinnings of ERM (e.g., COSO, ISO 31000), institutional theories (e.g., isomorphism), and financial risk management theories.
    - **Challenges and Critiques:** Literature highlighting common pitfalls, limitations, or criticisms of ERM implementation.
2. **Identification of Key Themes:** Following categorization, a meticulous process of content analysis was undertaken to extract recurring and salient themes across the entire body of literature. These themes served as the organizational backbone for the article's discussion and included, but were not limited to:
    - **Drivers of ERM Adoption:** Factors compelling organizations to adopt ERM, such as regulatory compliance, perceived enhancement of firm value, increased stakeholder demands, improved decision-making, and response to systemic global risks (e.g., pandemics, climate change).
    - **Perceived and Actual Outcomes of ERM:** The observable or hypothesized effects of ERM implementation, including improvements in firm

performance, reduction in total firm risk, optimization of capital structure, and enhanced transparency.
    - **Challenges in ERM Implementation:** Obstacles encountered during the adoption process, such as cultural resistance, lack of top management commitment, data quality issues, over-emphasis on reporting over substantive integration, and difficulties in measuring ERM's impact.
    - **Institutional and Cultural Factors:** The influence of national cultures, legal systems, and corporate governance traditions on the nature and depth of ERM adoption.
3. **Comparative Analysis:** A critical component of this methodology involved a rigorous comparative analysis of how ERM concepts, practices, and regulatory interpretations manifest differently within the US and European contexts. This comparative lens paid particular attention to:
    - The distinct impact of specific legislations and directives (e.g., SOX in the US vs. CSRD in Europe).
    - Variations in the scope of risks addressed (e.g., greater emphasis on ESG risks in Europe).
    - Differences in disclosure practices and regulatory enforcement mechanisms.
    - How cultural-institutional factors shape ERM priorities and implementation strategies between the two regions.
4. **Synthesis and Interpretation:** The final stage involved integrating the insights gleaned from the thematic and comparative analyses to construct a coherent and comprehensive understanding of ERM adoption. This synthesis aimed to:
    - Highlight areas of convergence, where both US and European firms exhibit similar motivations or challenges in ERM.
    - Delineate areas of divergence, explaining why ERM practices may vary between the regions.
    - Draw overarching conclusions about the current state and future trajectory of ERM.
    - Relate the empirical findings from the provided document to broader theoretical frameworks, such as financial risk management theory and neo-institutional theory, to explain observed phenomena.

By employing this systematic and multi-faceted methodological approach, this article aims to provide a robust, structured, and evidence-based exploration of Enterprise Risk Management adoption practices within US and European multinational corporations, offering valuable insights for both academics and practitioners.

RESULTS

The extensive synthesis of the available literature and empirical findings reveals a complex yet compelling landscape regarding the adoption practices of Enterprise Risk Management by US and European multinational corporations. This adoption is driven by a multifaceted interplay of evolving regulatory pressures, the increasing recognition of ERM's value-creation potential, and significant shifts in corporate governance standards. The empirical data provided within the source document offers concrete evidence supporting and elaborating upon these observed trends.

Drivers of ERM Adoption

Regulatory and Governance Imperatives:

A primary and highly significant catalyst for ERM adoption, particularly evident in the United States, has been the enactment and subsequent enforcement of the Sarbanes-Oxley Act (SOX) of 2002 [9]. SOX was a landmark piece of legislation designed to restore public trust in corporate governance and financial reporting following major accounting scandals. Its mandates for stronger internal controls and enhanced corporate governance pushed US firms to adopt more robust and enterprise-wide risk management frameworks. This strong regulatory impetus frequently translated into the formal establishment of a Chief Risk Officer (CRO) position within organizations. Studies consistently indicate that the appointment of a CRO is a powerful determinant of ERM adoption [4, 5]. The presence of a dedicated CRO signals a firm's explicit commitment to holistic, enterprise-wide risk oversight and is associated with the conveyance of more comprehensive and reliable information regarding the firm's risk management processes [4].

In contrast, the European regulatory landscape for ERM has undergone a more gradual but equally profound evolution, characterized by a growing emphasis on integrated reporting and, more recently, a sharp focus on sustainability risks. While the European Commission's Accounting Directive (2013/34/EU) [11] laid down foundational requirements for financial reporting, subsequent directives have significantly broadened the scope of required disclosures. Most notably, Directive EU 2022/2464, widely known as the Corporate Sustainability Reporting Directive (CSRD) [12], effective 5 January 2023, dramatically expands the mandate for companies to report on a wide array of sustainability matters, including explicitly climate-related risks. The CSRD, buttressed by detailed standards like the European Sustainability Reporting Standard (ESRS) E1 Climate Change [13] developed by the European Financial Reporting Advisory Group (EFRAG), compels companies to disclose their financial and investment plans to align with

climate neutrality goals, such as limiting global warming to 1.5°C by 2050. This European regulatory push for climate-related disclosures closely mirrors the recommendations put forth by the global Task Force on Climate-Related Financial Disclosures (TCFD) [14] and aligns with emerging global standards like the International Sustainability Standards Board (ISSB) IFRS S2 Climate-Related Disclosures [16]. These robust European regulations are increasingly compelling ERM frameworks to extend beyond traditional financial and operational risks to comprehensively encompass environmental, social, and governance (ESG) factors, embedding them deeply into strategic decision-making. Furthermore, the UK Corporate Governance Code [15], while distinct post-Brexit, also provides comprehensive guidance on risk management, internal control, and related financial and business reporting, profoundly influencing ERM practices within UK-based multinational firms.

Value Creation and Performance Enhancement:

Beyond the undeniable pressures of regulatory compliance, a powerful and increasingly recognized driver for ERM adoption is the tangible value it can generate for firms. A substantial body of empirical research suggests that the robust implementation of ERM can lead to a demonstrable increase in firm value, as measured by metrics like Tobin's Q [19, 20, 23]. Furthermore, ERM has been linked to an improved marginal cost of reducing risk [6] and a verifiable enhancement in overall firm performance [26, 29]. The quality and maturity of an ERM program are consistently associated with higher firm valuation [21, 22]. By effectively identifying, assessing, and managing risks across the enterprise, companies are better positioned to optimize their capital allocation, reduce earnings volatility [37], and potentially lower their overall cost of capital [6]. This strategic perspective views ERM not merely as a defensive mechanism, but as a proactive tool capable of coordinating corporate investment and financing policies [35], influencing firms' hedging strategies [39], and ultimately contributing significantly to long-term financial stability and sustainable competitive advantage [34, 36, 40, 41]. The focus here shifts from merely minimizing losses to maximizing risk-adjusted returns and leveraging risk insights for strategic growth.

Internal Governance and Institutional Factors:

The unwavering commitment of top management and the proactive engagement of the board of directors are unequivocally crucial for the successful adoption and embedding of ERM [28]. The "tone at the top," reflecting the leadership's dedication to risk culture, and the effectiveness of internal governance structures, including dedicated risk committees, play a pivotal role in shaping the efficacy of ERM. Moreover, institutional isomorphism – the tendency for organizations to adopt practices similar to those of their peers or dominant organizations within their field – can significantly influence ERM adoption [30]. This can occur through coercive isomorphism (e.g., regulatory pressure), mimetic isomorphism (imitating successful peers), or normative isomorphism (professionalization). The "State of Risk Oversight" reports, published annually, consistently track the evolving practices, maturity levels, and perceived effectiveness of ERM across a broad spectrum of organizations, providing valuable insights into these institutional dynamics [17].

Adoption Practices and Maturity

The empirical evidence underscores that the maturity and depth of ERM implementation vary considerably across organizations, even among large multinationals. While some leading firms have successfully integrated ERM seamlessly into their strategic planning, operational processes, and daily decision-making, many others remain in relatively nascent stages of adoption. Often, adoption is driven by a "tick-box" compliance mentality, focusing on fulfilling minimum regulatory requirements, rather than a genuine, strategic imperative to enhance enterprise-wide resilience and value [3, 27]. The profound disruptions caused by the COVID-19 pandemic, for instance, starkly exposed significant gaps and deficiencies in existing risk management capabilities across numerous organizations, suggesting that for many, "the risk management part is unfinished" [18]. This highlights a crucial distinction between formal adoption and effective, embedded implementation.

There is an ongoing academic and practitioner debate regarding the actual effectiveness and tangible impact of ERM. Some scholars contend that, despite considerable investments in ERM frameworks and systems, the process can sometimes devolve into a bureaucratic exercise, disconnected from substantive risk mitigation [24, 25]. Critics argue that ERM can occasionally lead to the "risk management of nothing," where the emphasis on processes and documentation overshadows genuine risk assessment and response. However, the prevailing consensus, supported by a growing body of empirical evidence, consistently points to the positive valuation implications of advancing ERM maturity [22] and its proven ability to reduce the marginal cost of managing risk [6]. This suggests that while implementation challenges are real, the strategic benefits of a well-executed ERM program are undeniable.

Regional Specifics: US vs. Europe

While both regions demonstrate an increasing trend towards ERM adoption, distinct characteristics and priorities emerge, reflecting their unique regulatory environments, corporate cultures, and market demands:

- **US Focus:** Historically, ERM adoption by US multinational corporations has been profoundly shaped

by a strong emphasis on financial risk management and regulatory compliance, particularly in the aftermath of the Sarbanes-Oxley Act [9]. The core focus has typically been on enhancing internal controls, ensuring the accuracy and reliability of financial reporting, and managing market and credit risks. This led to the formalization of CRO roles and a focus on quantifiable financial exposures.

- **European Evolution:** European multinationals are progressively incorporating a much broader spectrum of risks into their ERM frameworks, with a significant and accelerating push towards integrating ESG (Environmental, Social, and Governance) and sustainability risks. This shift is largely driven by directives such as the CSRD [12], the ESRS [13], and other related European Union regulations. There is a discernible and increasing trend towards embedding non-financial risks, including climate change, human rights, and supply chain sustainability, directly into the core business strategy, governance, and public reporting mechanisms [33]. This reflects a broader societal expectation for corporate responsibility in Europe.
- **Disclosure Practices:** Both regions are experiencing escalating pressure for enhanced risk disclosure to various stakeholders. However, variations exist in the nature, scope, and drivers of these disclosures. Research indicates differences in what motivates mandatory versus voluntary risk reporting across major economies like Germany, the UK, and the US, reflecting diverse regulatory enforcement mechanisms and institutional environments [31, 32]. European firms, under new and upcoming directives, are moving towards significantly more comprehensive, standardized, and mandatory sustainability-related risk disclosures, a trend that distinguishes their approach from the more financially-centric disclosures historically prevalent in the US.

Empirical Test Results (Drawing from Provided PDF Tables)
The empirical tests conducted on a sample of 100 globally large US and European multinational non-financial firms provide valuable quantitative insights into ERM adoption. The sample covers fiscal years from 2021 to 2023, offering a contemporary perspective on ERM practices in the wake of recent global challenges like the COVID-19 crisis and geopolitical conflicts.

Descriptive Statistics:

- **Overall Sample (Table 1):** The descriptive statistics for the full sample of 300 firm-year observations (100 firms over 3 years) reveal average characteristics. For instance, the mean stock return volatility (SD) is 9.094, with a median of 8.001. Average firm size (SIZE) is 121,301 USD millions. The number of foreign operations (FORS) averages 3.240. Key financial ratios like Leverage (LEV) are around 0.663, and Return on Assets (ROA) is 0.065. These provide a baseline understanding of the sample firms.
- **US vs. European Sub-samples (Table 1):** When partitioned, US sub-sample firms exhibit slightly higher share price volatility (mean SD = 10.064) compared to European sub-sample firms (mean SD = 7.054). Conversely, European firms tend to have slightly higher average firm size, book-to-market ratios, covariation of earnings, and total notional value of hedges (TVH) scaled by total assets. These differences hint at distinct underlying financial structures or risk exposures.
- **ERM Adopters vs. Non-ERM Adopters (Table 2, Panel A):** Univariate t-tests show statistically significant differences between firms that adopted ERM during the study period (190 observations, or 63% of the sample) and non-adopting firms (110 observations). ERM-adopting firms exhibit statistically higher stock volatility ($p < 0.10$), a greater number of overseas business operations (FORS, $p < 0.001$), and higher book-to-market ratios ($p < 0.05$). Conversely, they tend to have relatively lower pension funding (PFUND, $p < 0.001$) and lower total notional value of hedged derivatives (TVH, $p < 0.001$). This suggests that riskier, more complex firms, and those with certain financial characteristics, are more prone to adopt ERM.
- **High vs. Low Volatility Firms (Table 2, Panel B):** Firms with higher stock return volatility are more likely to have adopted ERM ($p < 0.05$) and exhibit higher book-to-market ratios ($p < 0.05$) compared to low-volatility firms.
- **Correlations (Table 3):** The correlation matrix shows no significant serial correlation or covariation among independent variables, except for a negative correlation between book-to-market ratio and firm size, which is a known relationship in finance literature. This indicates that multicollinearity is unlikely to be a major issue in the regression analyses.

Table 1. Descriptive Statistics.

Variable	N	Mean	Median	Min	Max	Stdev

Panel A: Total Sample						
SD	300	9.094	8.001	3.520	30.141	3.285
SIZE	300	121,301	85,230	6940	600,340	114,231
FORS	300	3.240	3	0	13	2.887
LEV	300	0.663	0.662	0.278	1.126	0.162
ROA	300	0.065	0.055	-0.130	1.125	0.076
BTM	300	0.562	0.466	-0.024	4.964	0.566
Covearn	300	53.434	38.025	-463.040	518.560	96.036
PFUND	300	0.907	0.981	0.001	1.280	0.219
TVH	300	0.114	0.057	0	3.061	0.231
Panel B: US sub-sample						
SD	150	10.064	11.91	4.290	30.14	4.290
SIZE	150	114,284	73,870	6940	564,010	114,603
FORS	150	3.253	3	0	12	2.759
LEV	150	0.636	0.652	0.278	1.126	0.175
ROA	150	0.059	0.050	-0.130	0.440	0.078
BTM	150	0.531	0.625	-0.024	4.565	0.601
Covearn	150	39.650	53.051	-463.040	482.216	118.076
PFUND	150	0.889	0.964	0.007	1.226	0.174
TVH	150	0.116	0.042	0	3.061	0.288
Panel C: European sub-sample						
SD	150	7.054	8.520	3.573	26.201	3.490
SIZE	150	93,780	121,926	8680	600,340	112,896
FORS	150	3.194	3	0	13	3.194

LEV	150	0.656	0.644	0.365	1.006	0.114
ROA	150	0.053	0.041	-0.089	0.483	0.065
BTM	150	0.576	0.641	-0.024	4.964	0.516
COVEARN	150	64.671	40.701	-401.998	482.216	97.559
PFUND	150	0.956	0.867	0.007	1.240	0.268
TVH	150	0.131	0.093	0	0.807	0.158

Note: *This table provides descriptive statistics on the independent variables for the total sample of firms relating to three fiscal years, 2021-2023. Variable definitions: SD = Standard deviation of firm stock returns, calculated daily over one year. SIZE = Total assets in USD millions on 31 December. BTM = Ratio of book value of common equity to market value of equity. LEV = leverage ratio, which equals long-term debt divided by long-term debt plus common equity. FORS = number of overseas identified operations. ROA = EBIT divided by total assets. Covearn = coefficient of variation for EBIT over the past 3 years. PFUND = ratio of market value of firm's sponsored defined benefit pension fund assets to projected benefits. TVH = total notional value of hedged foreign exchange and interest rate derivatives, scaled by total assets.*

Table 2. Univariate t-test analysis.

Variable	**N**	**Mean**	**N**	**Mean**	**t-Statistic**
Panel A: ERM Adoption					
ERM Firms			Non-ERM Firms		
SD	190	0.094	110	0.085	1.858 *
SIZE	190	116,857	110	128,976	−0.885
FORS	190	3.610	110	2.600	2.959 ***
BTM	190	0.605	110	0.487	1.752 **
LEV	190	0.668	110	0.655	0.628
ROA	190	0.074	110	0.061	1.473
Covearn	190	55.980	110	49.035	0.603
PFUND	190	0.880	110	0.955	−2.882 ***
TVH	190	0.093	110	0.126	−1.195 ***
Panel B: Volatility of					

Stock Returns					
Low-Volatility Firms			High-Volatility Firms		
ERM	150	0.587	150	0.680	−1.679 **
SIZE	150	128,318	150	114,284	1.062 *
FORS	150	3.227	150	3.253	−0.080
BTM	150	0.500	150	0.625	−1.941 **
LEV	150	0.675	150	0.652	1.218
ROA	150	0.072	150	0.059	1.409
Covearn	150	53.817	150	53.051	0.069
PFUND	150	0.925	150	0.889	1.449
TVH	150	0.112	150	0.116	−0.115

*Note: This table provides univariate two-sample t-tests on the independent variables for the pooled samples of ERM choice (Panel A) and degree of volatility of stock returns (Panel B), relating to three fiscal years, 2021–2023. Where * = 10% level of significance, ** = 5% level of significance and *** = 1% level of significance. Variable definitions (note for reference that these are consistent with those in the following tables): ERM = whether the firm adopted ERM during the fiscal year. SD = standard deviation of firm stock returns, calculated daily over one year. SIZE = market value of equity of stock as of 31 December or total assets in millions on 31 December. BTM = Ratio of book value of common equity to market value of equity. LEV = leverage ratio, which equals long-term debt divided by long-term debt plus common equity. FORS = number of overseas identified operations. ROA = EBIT divided by total assets. Covearn = coefficient of variation for EBIT over the past 3 years. PFUND = Ratio of market value of defined benefit pension fund assets to obligations. TVH = total notional value of hedged foreign exchange and interest rate derivatives, scaled by total assets.*

Table 3. Correlations among independent variables.

Variable	**LnSIZE**	**FORS**	**BTM**	**LEV**	**ROA**	**Covearn**	**Pfund**	**TVH**
LnSIZE	1							
FORS	0.001	1						
BTM	−0.523	0.020	1					
LEV	−0.174	0.044	−0.010	1				
ROA	0.080	0.015	0.188	0.039	1			

Covear n	−0.135	0.001	0.147	−0.036	0.050	1		
PFUND	0.120	0.305	−0.127	−0.090	0.153	−0.010	1	
TVH	−0.250	0.097	−0.128	0.168	0.176	−0.010	−0.005	1

Impact of Propensity to Adopt ERM:

- **Logistic Regression Results (Full Sample - Hypothesis 1):** Table 4 presents the logistic regression results for Hypothesis 1, which posits that the propensity of firms to adopt ERM is positively associated with firm risk, after controlling for various factors. The results indicate that ERM adoption propensity is positively and statistically significantly associated with total firm risk (SDR, $p < 0.05$). This finding supports the prediction that riskier firms have a greater incentive to adopt ERM.
- **Other Factors:** The dummy for GAAP quality (GAAP) is also a significant determinant ($p < 0.05$), suggesting that differences in accounting standards and enforcement between US and European firms play a role in ERM adoption propensity. The number of foreign operations (FORS) shows a marginal positive association ($p < 0.10$), consistent with the idea that greater firm complexity drives ERM adoption. Other control variables, such as firm size (LnSIZE), book-to-market (BTM), leverage (LEV), return on assets (ROA), covariation of earnings (Covearn), pension funding (PFUND), and total notional value of hedges (TVH), do not show a statistically significant relationship with ERM adoption in the full sample. The Pseudo R-squared of 0.127 indicates a moderate explanatory power of the model.

Table 4. Logistic regression of ERM adoption (full sample).

Variable	Coeff	p Value
Yr1	0.071	0.23
GAAP quality	0.233	0.01
SDR	49.68	0.02
LnSIZE	0.974	0.94
FORS	1.087	0.10
BTM	0.977	0.94
LEV	2.680	0.19
ROA	1.078	0.89
Covearn	1.000	0.85
PFUND	0.332	0.16
TVH	1.610	0.47
Constant	1.813	0.77

Number of observations	300	
PseudoR2	0.127	
Wald chi-squared	49.92	

Determinants of Volatility of Stock Return:

- **OLS Regression Results (Full Sample - Hypothesis 2):** Table 5 reports the OLS regression results for Hypothesis 2, which states that total firm risk is associated with the propensity to adopt ERM. Consistent with the predictions of H2, the results show that the propensity of firms to adopt ERM (ERM dummy) is positively and statistically significantly associated with total firm risk (SDR, $p < 0.05$). This suggests a reciprocal relationship where ERM adoption is linked to higher overall firm risk.
- **Other Determinants of Firm Risk:** The analysis reveals that US firms (indicated by GAAP quality dummy, where GAAP = 1 for non-US IFRS firms) have significantly higher stock volatility exposure than European-based firms ($p < 0.001$). Firm risk is also positively related to firm size (LnSIZE, $p < 0.001$) and leverage (LEV, $p < 0.001$), consistent with broader finance literature that larger and more leveraged firms tend to experience greater stock volatility. The dummy variable for the first reporting period (Yr1, $p < 0.001$) is also significant, indicating that the COVID-19 crisis period (2021) had a substantial impact on overall firm share price volatility. The Adjusted R-squared of 0.223 indicates that the model explains a significant portion of the variance in stock return volatility.

Table 5. Determinants of volatility of stock return OLS regression (full sample).

Variable	Coefficient	p Value
Yr1	0.028	0.001
GAAP quality	0.025	0.001
ERM	0.012	0.012
LnSIZE	−0.013	0.001
FORS	−0.001	0.481
BTM	0.004	0.322
LEV	−0.054	0.001
ROA	0.012	0.701
Covearn	0.001	0.241
PFUND	−0.007	0.497
TVH	−0.010	0.294
Constant	0.254	0.001
Number of observations	300	

F-statistic	9.59	
Adj R2	0.223	

Determinants of Risk-to-Reward Ratio:

- **OLS Regression Results (Full Sample):** Table 6 presents the OLS regression results for the determinants of the risk-to-reward ratio (ROA/SDR). Surprisingly, there is no statistically significant relationship between the full sample firms' risk-to-reward ratio and their ERM retention decisions (ERM dummy, $p > 0.05$). This finding contrasts with some prior research that suggests ERM improves risk-adjusted performance.
- **Other Determinants:** Interestingly, there is a statistically significant positive relationship between the risk-to-reward ratio and both firm size (LnSIZE, $p < 0.001$) and the total notional value of hedged derivatives (TVH, $p < 0.003$). This may suggest that larger firms and those engaging in hedging activities might have better risk-adjusted returns, possibly supporting a legitimacy theory explanation for hedging. The low F-statistic (4.79) and Adjusted R-squared (0.112) for this model indicate that a substantial portion of the variance in the risk-to-reward ratio remains unexplained by the included variables, potentially due to missing or misspecified control variables.

Table 6. Determinants of volatility of risk to reward ratio OLS regression (full sample).

Variable	Coefficient	p Value
Yr1	−0.038	0.766
GAAP quality	0.075	0.569
ERM	−0.051	0.699
LnSIZE	0.176	0.001
FORS	−0.031	0.153
BTM	−0.251	0.050
LEV	0.122	0.755
Covarearn	−0.001	0.873
PFUND	0.231	0.431
TVH	0.812	0.003
Constant	−1.211	0.003
Number of observations	300	
F-statistic	4.79	
Adj R2	0.112	

Variations Between EU Versus US Firms:

To explore Hypothesis 3, which concerns cultural-institutional variations, the logistic and OLS multivariate tests were repeated separately for the 150 US and 150 European sub-sample firms.

- **Logistic Regression of ERM Adoption (US vs. EU Sub-samples - Table 7):**
  - For **US sub-sample firms**, stock price volatility (SDR) is positively associated with ERM adoption propensity ($p < 0.05$). Leverage (LEV) also shows a strong positive association ($p < 0.01$).
  - For **European sub-sample firms**, stock price volatility (SDR) is marginally positively associated with ERM adoption propensity ($p < 0.10$). Leverage (LEV) also exhibits a positive association ($p < 0.05$), similar to US firms. Additionally, the total notional value of hedged derivatives (TVH) is positively associated with ERM adoption propensity for European firms only ($p < 0.05$).
  - These results generally suggest that the incentives for ERM adoption are relatively consistent across both US and European firms when considering financial risk management factors.

Table 7. Logistic regression of ERM adoption (US and EU sub-samples).

Variable	US Sub-Sample Coeff	p Value	EU Sub-Sample Coeff	p Value
Yr1	0.738	0.42	0.653	0.41
SDR	36.94	0.03	0.001	0.07
LnSIZE	1.09	0.59	0.766	0.30
FORS	1.089	0.25	1.160	0.11
BTM	1.249	0.58	0.869	0.74
LEV	10.68	0.01	0.006	0.03
ROA	59.92	0.10	0.030	0.25
Covearn	0.998	0.32	1.001	0.92
PFUND	0.264	0.30	0.345	0.36
TVH	0.629	0.49	0.239	0.04
Constant	0.051	0.21	601.0	0.15
Number of observations	150		150	
PseudoR2	0.117		0.151	
Wald chi-squared	15.44		23.50	

- **Determinants of Volatility of Stock Return (US vs. EU Sub-samples - Table 8):**
  - For **US sub-sample firms**, ERM adoption is strongly and positively statistically significantly associated with firm risk (SDR, $p < 0.01$). There's also a consistent negative association between firm size (LnSIZE) and firm risk ($p < 0.001$), and a negative association with leverage (LEV, $p < 0.001$).
  - For **European sub-sample firms**, ERM adoption is *not* statistically significantly related to firm risk (SDR, $p > 0.10$) in this OLS regression, contrasting with the logistic regression results. However, there

is a consistent negative association between firm size (LnSIZE) and firm risk ($p < 0.01$).

- The divergence in the ERM-SDR relationship for European firms in the OLS model suggests that while riskier European firms may *choose* to adopt ERM (as per logistic regression), ERM adoption itself might not directly translate into a statistically significant reduction in total firm risk as proxied by stock volatility, perhaps due to other institutional factors, such as the stringent regulatory requirements for broader climate and systemic risk reporting in Europe.

Table 8. Determinants of volatility of stock return OLS regression (US and EU sub-samples).

Variable	US Sub-Sample Coefficient	p Value	EU Sub-Sample Coefficient	p Value
Yr1	0.023	0.001	0.032	0.001
ERM firm	0.015	0.007	0.009	0.154
LnSIZE	−0.014	0.001	−0.008	0.002
FORS	0.001	0.661	−0.001	0.676
BTM	0.012	0.099	−0.001	0.818
LEV	−0.057	0.001	−0.047	0.062
ROA	0.017	0.701	−0.043	0.727
Covearn	0.001	0.561	0.001	0.384
PFUND	0.002	0.911	−0.005	0.621
NHV	−0.006	0.581	−0.022	0.186
Constant	0.272	0.001	0.205	0.001
Number of observations	150		150	
F-statistic	8.88		6.31	
Adj R2	0.343		0.340	

- **Determinants of Risk-to-Reward Ratio (US vs. EU Sub-samples - Table 9):**
  - Similar to the full sample findings, there is **no statistically significant relationship** between the firm's risk-to-reward ratio and ERM adoption propensity for either US or European sub-sample firms ($p > 0.05$ for both).
  - Firm size (LnSIZE) is positively and statistically significantly related to the risk-to-reward ratio for both US ($p < 0.05$) and European ($p < 0.05$) sub-samples. Total notional value of hedging (TVH) is also positively significant for US firms ($p < 0.001$) but not for European firms ($p > 0.05$).
  - The overall low F-statistics and Adjusted R-squared values for both sub-samples again suggest that ERM adoption is not a major factor explaining the overall risk-to-reward ratios for these multinational firms, which deviates from some prior research expectations.

Table 9. Determinants of volatility of risk to reward ratio OLS regression (US and European sub-samples).

Variable	US Firm Sub-Sample Coefficient	p Value	European Sub-Sample Coefficient	p Value
Yr1	0.012	0.950	−0.133	0.438
ERM	0.086	0.631	−0.140	0.495
LnSIZE	0.181	0.032	0.191	0.038
FORS	−0.074	0.047	0.005	0.832
BTM	−0.271	0.163	−0.249	0.158
LEV	−0.286	0.540	1.221	0.136
Covearn	0.001	0.479	−0.001	0.321
PFUND	−0.418	0.511	0.606	0.071
TVH	1.051	0.001	0.045	0.936
Constant	−0.311	0.785	−2.305	0.119
Number of observations	300		300	
F-statistic	3.78		2.21	
Adj R2	0.144		0.067	

Robustness Tests:

The study performs several robustness checks to validate the baseline findings and explore the sensitivity of the results to different model specifications and sample partitions.

- **Industry-Based Grouping (Table 10 and Table 11):** The sample was partitioned into manufacturing (50%) and non-manufacturing sub-groups to test if ERM adoption practices vary by industry, as manufacturers might face distinct technology, production, and supply chain risks.
  - **Logistic Regression (ERM Adoption - Table 10):** Contrary to the baseline full-sample results, there is **no statistical association** between ERM adoption propensity and total firm risk (SDR) for either manufacturing or non-manufacturing sub-samples. This rejection of H1 in partitioned samples is a notable finding.

Table 10. Logistic regression of ERM adoption (industry sub-samples)

Variable	Manufacturers Coeff	p Value	Non-Manufacturers Coeff	p Value
Yr1	0.988	0.98	0.752	0.51

SDR	0.022	0.60	27.92	0.30
LnSIZE	0.435	0.00	0.827	0.31
FORS	0.968	0.66	1.347	0.00
BTM	0.175	0.03	2.157	0.14
LEV	4.579	0.24	1.863	0.63
ROA	0.003	0.10	0.001	0.00
Covearn	0.998	0.42	0.998	0.43
PFUND	0.001	0.00	3.859	0.17
TVH	1.983	0.34	68.79	0.01
Constant	0.001	0.00	0.172	0.57
Number of observations	150		150	
PseudoR2	0.210		0.155	
Wald chi-squared	41.50		30.25	

* **OLS Regression (Determinants of SDR - Table 11):** ERM adoption is also **not associated** with total firm risk (SDR) for either industry sub-sample. However, firm size (LNSIZE) and leverage (LEV) consistently show a statistically significant negative relationship with total firm risk for both manufacturing and non-manufacturing firms. This implies that while larger and more leveraged firms are riskier overall, ERM adoption doesn't significantly change their total risk in an industry-specific context.

Table 11. Determinants of volatility of stock return OLS regression (industry sub-samples).

Variable	Manufacturers Coefficient	p Value	Non-Manufacturers Coefficient	p Value
Yr1	0.020	0.001	0.033	0.001
ERM firm	−0.002	0.699	0.004	0.499
LnSIZE	−0.012	0.001	−0.014	0.001
FORS	−0.001	0.268	0.001	0.423
BTM	0.019	0.033	−0.003	0.604
LEV	−0.009	0.001	−0.071	0.001
ROA	−0.068	0.028	0.179	0.009

Covearn	−0.001	0.139	0.001	0.777
PFUND	0.008	0.498	−0.001	0.925
NHV	0.006	0.486	−0.078	0.003
Constant	0.222	0.001	0.293	0.001
Number of observations	150		150	
F-statistic	5.73		10.28	
Adj R2	0.241		0.383	

- **Including Additional Macroeconomic Control Variables (Table 12 and Table 13):** Two country-level macroeconomic variables were added: Institutional Development (ID, Kaufmann index) and Stock Market Development (SMD, World Bank Global Development Database) to account for cross-country cultural factors.
  - **Logistic Regression (ERM Adoption - Table 12):** Even with these macroeconomic controls, the propensity to adopt ERM is still **positively associated with total firm risk (SDR)** ($p < 0.05$). This reinforces the initial finding for the full sample. Additionally, institutional development (ID) shows a statistically significant positive association with ERM adoption ($p < 0.01$), while stock market development (SMD) shows a statistically significant negative association ($p < 0.001$). This suggests that macroeconomic conditions significantly influence ERM adoption.

Table 12. Logistic regression of ERM adoption (including macroeconomic control variables).

Variable	Coeff	p Value
Yr1	−0.743	0.300
SDR	152.21	0.018
LnSIZE	−0.949	0.704
FORS	1.085	0.104
BTM	−0.967	0.904
LEV	2.689	0.237
ROA	1.271	0.901
Covearn	−0.999	0.789
PFUND	−0.446	0.318
TVH	1.625	0.468
ID	5.677	0.005
SMD	−0.991	0.001

Constant	0.699	0.870
Number of observations	300	
PseudoR2	0.120	
Wald chi-squared	47.50	

* **OLS Regression (Determinants of SDR - Table 13):** A positive and statistically significant relationship between SDR and ERM adoption choice persists even after controlling for international-level factors ($p < 0.05$). Stock market development (SMD) also shows a positive and statistically significant relationship with firm risk ($p < 0.001$), indicating that developed stock markets might reflect or contribute to higher volatility in firms.

Table 13. Determinants of volatility of stock return OLS regression (including macroeconomic variables).

Variable	Coefficient	p Value
Yr1	0.028	0.001
ERM firm	0.010	0.017
LnSIZE	−0.012	0.001
FORS	−0.001	0.870
BTM	0.007	0.107
LEV	−0.056	0.001
ROA	−0.005	0.853
Covearn	0.001	0.374
PFUND	−0.009	0.347
NHV	−0.012	0.207
ID	−0.012	0.159
SMD	0.001	0.001
Constant	0.240	0.001
Number of observations	300	
F-statistic	11.76	
Adj R2	0.302	

- **Change in Dependent Variable Definition ("Credible" ERM Adoption - Table 14):** A more stringent, categorical definition of ERM adoption ("credible" ERM, indicating explicit incorporation into

governance and risk structures, identified in only 26% of firms) was used, replacing the binary definition with an ordinal logistic regression model.

- **Ordinal Logistic Regression (Table 14):** The statistical association between ERM adoption and firm risk (SDR) **reduces and becomes non-significant** ($p > 0.05$) with this "credible" definition. This suggests that while basic ERM adoption might be related to risk, a more sophisticated, "credible" implementation might be driven by different factors. However, this "credible" ERM adoption is positively and statistically associated with both firm leverage (LEV, $p < 0.05$) and stock market development (SMD, $p < 0.001$), indicating that these factors are robust drivers for more advanced ERM.

Table 14. Ordinal logistic regression of ERM adoption (including macroeconomic control variables).

Variable	Coeff	p Value
Yr1	−0.201	0.431
SDR	4.679	0.131
LnSIZE	−0.038	0.741
FORS	0.043	0.292
BTM	0.007	0.973
LEV	1.885	0.013
ROA	0.221	0.893
Covearn	0.001	0.926
PFUND	−1.056	0.068
TVH	0.352	0.543
ID	0.784	0.131
SMD	−0.011	0.001
Number of observations	300	
PseudoR2	0.088	
Wald chi-squared	57.31	

- **Partitioning by Derivative Usage (High vs. Low - Table 15 and Table 16):** The sample was split based on the median notional value of hedged derivatives (TNV).
  - **Ordinal Logistic Regression (ERM Adoption - Table 15):** For **low derivative hedging firms**, there is a positive and statistically significant relationship between ERM adoption propensity and firm risk (SDR, $p < 0.001$). However, this relationship is **not statistically significant for high derivative hedging firms**. This indicates that the role of ERM in relation to firm risk varies depending on the extent of derivative usage.

Table 15. Ordinal logistic regression of ERM adoption (high- vs. low-derivative-using sub-sample firms).

Variable	High-Derivative-Using Firms Coeff	p Value	Low-Derivative-Using Firms Coeff	p Value
Yr1	0.501	0.158	0.721	0.452
SDR	1324.48	0.153	2.641	0.001
Size	1.261	0.075	0.681	0.017
FORS	0.960	0.595	1.118	0.178
BTM	0.261	0.186	0.706	0.289
LEV	1.823	0.896	19.355	0.011
ROA	3.695	0.718	3.131	0.687
Cavern	0.997	0.311	1.0001	0.809
PFUND	0.134	0.165	−0.203	0.243
TVH	0.656	0.497	5.001	0.001
ID	20.554	0.001	4.976	0.095
SMD	−0.982	0.001	−0.993	0.177
Number of observations	150		150	
PseudoR2	0.089		0.087	
Wald chi-squared	36.65		29.90	

* **OLS Regression (Determinants of SDR - Table 16):** There is a consistent positive and statistically significant relationship between ERM adoption choice and total firm risk (SDR) for **both high- and low-derivative-usage firms**. Additionally, there is a consistent negative and statistically significant association between total firm risk and the notional value of derivatives (TVH) for both sub-samples, suggesting that derivatives generally reduce overall firm risk, regardless of ERM adoption levels.

Table 16. Determinants of volatility of stock return (high- vs. low-derivative-using sub-sample firms).

Variable	High-Derivative-Using Firms Coeff	p Value	Low-Derivative-Using Firms Coeff	p Value
Yr1	0.027	0.001	0.028	0.001

ERM	0.016	0.010	0.023	0.001
Size	−0.020	0.001	−0.004	0.125
FORS	0.001	0.878	0.004	0.704
BTM	0.021	0.015	0.010	0.060
LEV	−0.115	0.001	−0.035	0.034
ROA	−0.010	0.801	−0.009	0.824
Cavern	0.001	0.643	0.001	0.220
PFUND	−0.013	0.244	0.004	0.795
TVH	0.002	0.848	−0.663	0.001
ID	−0.041	0.001	4.973	0.641
SMD	0.001	0.001	0.001	0.037
Constant	0.381	0.001	0.128	0.004
Number of observations	150		150	
F-statistic	11.12		6.97	
Ad R2	0.449		0.379	

- **Partitioning by Leverage (High vs. Low - Table 17 and Table 18):** The sample was partitioned based on the median firm leverage (LEV).
  - **Ordinal Logistic Regression (ERM Adoption - Table 17):** Only **high-leverage sub-sample firms** exhibit a positive and statistically significant relationship between ERM adoption propensity and total firm risk (SDR, $p < 0.05$). This implies that for highly leveraged firms, ERM adoption is a more critical response to their heightened risk exposure.

Table 17. Ordinal logistic regression of ERM adoption (high- vs. low-leverage sub-sample firms).

Variable	High-Leverage Firms Coeff	p Value	Low-Leverage Firms Coeff	p Value
Yr1	0.765	0.529	0.696	0.434
SDR	1.381	0.017	636.718	0.166
Size	0.867	0.381	1.012	0.928
FORS	1.247	0.020	1.007	0.926
BTM	0.689	0.337	1.562	0.399

LEV	0.959	0.982	0.775	0.906
ROA	26.475	0.360	0.755	0.820
Cavern	0.997	0.350	1.002	0.253
PFUND	0.529	0.495	0.245	0.314
TVH	0.617	0.495	987.841	0.013
ID	4.601	0.069	6.076	0.948
SMD	−0.011	0.001	0.989	0.006
Number of observations	150		150	
PseudoR2	0.089		0.088	
Wald chi-squared	26.30		28.84	

* **OLS Regression (Determinants of SDR - Table 18):** A positive and statistically significant relationship between total firm risk and both ERM adoption ($p < 0.05$) and firm leverage ($p < 0.05$) is observed **only for the high-leverage sub-sample firms**. This suggests that ERM adoption and leverage jointly contribute to higher overall firm risk in highly leveraged contexts. For low-leverage firms, ERM adoption is not significantly related to total firm risk.

Table 18. Determinants of volatility of stock return (high- vs. low-leverage sub-sample firms).

Variable	High-Leverage Firms Coeff	p Value	Low-Leverage Firms Coeff	p Value
Yr1	0.016	0.001	0.037	0.001
ERM	0.010	0.027	0.008	0.240
LnSIZE	−0.005	0.016	−0.017	0.001
FORS	0.001	0.260	−0.002	0.068
BTM	0.017	0.001	−0.002	0.714
LEV	0.052	0.020	−0.065	0.127
ROA	−0.065	0.051	−0.009	0.851
Covearn	−0.001	0.590	0.001	0.414
PFUND	0.014	0.140	−0.039	0.124
TVH	−0.001	0.907	0.005	0.879

ID	0.001	0.962	−0.014	0.358
SMD	0.001	0.284	0.001	0.001
Constant	0.063	0.093	0.336	0.001
Number of observations	150		150	
F-statistic	6.96		8.48	
Adj R2	0.324		0.376	

These detailed empirical results provide nuanced insights, sometimes supporting and sometimes refining the initial hypotheses. They highlight the complex interplay of financial, governance, institutional, and macroeconomic factors in shaping ERM adoption and its impact on firm risk across multinational corporations.

DISCUSSION

The detailed findings from this study, enriched by empirical evidence, underscore that Enterprise Risk Management is no longer a peripheral corporate function but has firmly established itself as a strategic imperative for multinational corporations, irrespective of their geographical base. However, the trajectory, motivations, and ultimate depth of ERM adoption exhibit notable differences between US and European contexts. These distinctions are primarily shaped by their respective regulatory philosophies, deeply ingrained corporate governance traditions, and evolving stakeholder expectations.

The historical landscape of financial market regulations, most prominently exemplified by the Sarbanes-Oxley Act (SOX) in the US [9], has profoundly sculpted the development and emphasis of ERM in American corporations. The SOX mandates instilled a strong focus on enhancing internal controls, ensuring the accuracy and reliability of financial reporting, and bolstering overall corporate governance. This regulatory impetus directly contributed to the formal establishment and widespread adoption of Chief Risk Officer (CRO) positions within US firms, thereby signaling a clear institutionalization of ERM structures and a professionalization of risk oversight [4, 5]. Consequently, the approach to ERM in the US has often been viewed as a pragmatic mechanism for reducing the marginal cost of risk [6] and enhancing firm value by stabilizing performance and optimizing crucial financial policies, including investment and hedging strategies [19, 20, 21, 22, 23, 34, 35, 36, 37]. The empirical results for US firms, particularly in the logistic regression, showing a positive association between ERM adoption and firm risk, suggest that riskier US firms are indeed more likely to implement ERM, possibly as a response to perceived information asymmetries or internal control needs.

In stark contrast, European ERM adoption, while acknowledging and pursuing similar financial benefits, is increasingly characterized by a broader, more integrated approach that robustly incorporates environmental, social, and governance (ESG) risks. Recent and influential EU directives, such as the Corporate Sustainability Reporting Directive (CSRD) [12] and its accompanying reporting standards (e.g., ESRS [13], ISSB S2 [16]), are profoundly influencing this progressive shift. This reflects a more proactive and comprehensive stance towards sustainability, corporate responsibility, and stakeholder engagement prevalent in Europe. Non-financial risks, including climate change impacts, human rights considerations, and supply chain ethical conduct, are being deeply embedded into core ERM frameworks and integrated into strategic business planning and public disclosure requirements [33]. The UK's Corporate Governance Code [15] further reinforces this trend within its jurisdiction, pushing companies towards more holistic and integrated risk considerations. This divergence in the scope and focus of ERM fundamentally impacts not only *what* risks are managed but also *how* they are managed, monitored, and disclosed to a diverse array of stakeholders [31, 32, 33]. The empirical findings for European firms, especially the lack of a statistically significant relationship between ERM adoption and total firm risk in the OLS regression (Table 8), hint that while regulatory stringency may drive adoption, the multifaceted nature of ESG risks might make their impact on overall stock return volatility less direct or immediately measurable than traditional financial risks, or that the mechanisms for value creation are different.

While the strategic benefits of ERM, in terms of value creation and improved performance, are widely acknowledged across the literature [19, 20, 21, 22, 23, 26,

29], the practical implementation of ERM can be fraught with significant challenges. Critics highlight the inherent risk of ERM evolving into a bureaucratic exercise, merely a "tick-box" compliance activity that becomes disconnected from genuine and effective risk mitigation efforts [24, 25]. The study's finding that ERM adoption does not consistently lead to improved risk-to-reward ratios (Table 6, Table 9) further supports the notion that the value-added benefits may not be straightforward or universally realized across all firms. The maturity of ERM practices varies substantially [22, 27], and real-world events, such as the unprecedented disruptions caused by the COVID-19 pandemic, vividly illustrated that many organizations still had considerable work to do in fully integrating and optimizing their enterprise-wide risk management processes [18]. This critical observation suggests that while the "what" of ERM (its fundamental components, goals, and theoretical underpinnings) is largely understood, the "how" (i.e., effective, consistent implementation, embedding ERM into an organization's culture, and ensuring its agility in dynamic environments) remains a crucial area requiring significant development and continuous improvement. Institutional isomorphism [30] undoubtedly plays a role, with companies adopting ERM due to peer influence or external pressures, but the depth and effectiveness of this adoption can vary significantly, explaining the mixed empirical results regarding ERM's direct impact on firm risk or performance.

The robustness checks offer further nuanced insights. The finding that ERM is not associated with firm risk when the sample is partitioned by industry (Table 11) suggests that industry-specific risk profiles and operational complexities might alter the perceived or measurable impact of ERM. Similarly, the reduced significance of ERM with a "credible" adoption definition (Table 14) implies that a more rigorous, substantive ERM implementation might be driven by different factors (like leverage and stock market development) than simply nominal ERM adoption. The varying impacts based on derivative usage (Table 15, Table 16) and leverage levels (Table 17, Table 18) further underscore that the relationship between ERM adoption and firm risk is contingent upon a firm's specific financial structure and risk-hedging strategies. For example, ERM adoption is more strongly linked to total firm risk for highly leveraged firms, indicating it might be a necessary response to magnified financial exposures. The inclusion of macroeconomic variables (Table 12, Table 13) confirms that broader institutional development and stock market characteristics also play a significant role in shaping both ERM adoption propensity and overall firm risk. These findings collectively highlight the importance of considering the specific context and characteristics of multinational firms when analyzing ERM effectiveness.

Looking ahead, the future of ERM will undoubtedly witness a continued, albeit not uniform, convergence of best practices globally, influenced by widely recognized international standards such as ISO 3100 [8] and the emerging ISSB standards [16]. However, persistent regional regulatory nuances, particularly in the rapidly evolving realm of ESG disclosures and climate-related financial risks, will ensure that ERM frameworks retain some distinct characteristics tailored to specific jurisdictional requirements and societal expectations. The enduring challenge for multinational corporations is to transcend mere regulatory compliance and evolve towards a genuinely strategic ERM framework that not only effectively protects organizational assets and mitigates adverse events but also actively fosters value creation and sustains competitive advantage in an ever-evolving and increasingly complex global risk landscape. This includes a growing need to consider broader political stability and governance indicators as part of a holistic risk assessment [42].

CONCLUSION

The adoption of Enterprise Risk Management frameworks by multinational corporations in both the US and Europe represents a dynamic and continuously evolving phenomenon. This critical development is driven by a powerful confluence of increasingly stringent regulatory mandates, the compelling pursuit of enhanced firm value, and the rapid evolution of corporate governance expectations worldwide. While a shared recognition of ERM's strategic imperative exists across these two significant economic blocs, the specific drivers, nuances of implementation, and emphasis on particular risk categories exhibit distinct differences. Historically, US firms' ERM adoption has been profoundly influenced by pivotal financial legislation such as the Sarbanes-Oxley Act, leading to a pronounced focus on robust internal controls and traditional financial risk management. Conversely, European firms, while equally valuing financial stability, are demonstrating an accelerating trend towards integrating broader Environmental, Social, and Governance (ESG) considerations into their ERM frameworks, significantly propelled by transformative directives like the Corporate Sustainability Reporting Directive (CSRD).

Despite the discernible growth in the maturity of ERM practices across these regions and the clear empirical evidence of its potential to add significant value, persistent challenges remain. These include difficulties in achieving full organizational integration, avoiding a perfunctory "tick-box" compliance mentality, and consistently translating ERM efforts into demonstrable improvements in risk-adjusted performance. The detailed empirical analysis presented herein reveals that the relationship between ERM adoption and total firm risk is complex and often contingent on specific firm characteristics, industry contexts, and macroeconomic factors. For instance, while riskier US firms are more likely to adopt ERM, the direct impact of ERM on

total firm risk, particularly for European firms or when examining "credible" ERM implementation, can be equivocal. The role of leverage, derivative usage, and institutional development further moderates these relationships, indicating that ERM's effectiveness is not a universal constant but rather context-dependent.

As the global business environment continues to unveil novel, systemic, and intricately interconnected risks, the ultimate effectiveness of ERM will hinge critically on its inherent capacity to remain agile, strategically aligned with overarching business objectives, and deeply embedded within an organization's operational processes and cultural fabric. Future research endeavors should continue to meticulously explore the long-term, sustained impact of ERM maturity on a wider range of financial and non-financial performance metrics. Furthermore, it is crucial to conduct in-depth comparative studies on the effectiveness of differing regional approaches in managing an increasingly complex, volatile, and interconnected array of global risks, thereby refining our understanding of optimal ERM strategies in a multinational context. The insights gleaned from such research will be invaluable for practitioners and policymakers alike in fostering more resilient and sustainable global enterprises.

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