MAPPING GLOBAL RISKS FOR THE NEXT FIVE YEARS (2026–2030): AN INTEGRATED VUCA–PESTEL FRAMEWORK FOR CROSS-INDUSTRY STRATEGIC RESILIENCE

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Abstract

Global economic and organizational environments are increasingly shaped by heightened uncertainty arising from overlapping crises, rapid technological change, geopolitical fragmentation, and intensifying climate impacts. While prior studies have examined specific risks or sectoral contexts, comprehensive cross-industry risk mapping with a medium-term horizon remains limited. This study aims to identify and interpret dominant global risks for the period 2026–2030 using an integrated VUCA–PESTEL framework. The study adopts a conceptual–analytical research design, employing expert-informed risk synthesis based on authoritative global reports and selected academic literature. The analysis follows three stages: thematic risk identification, risk clustering, and multidimensional mapping, in which VUCA is treated as the operating environment and PESTEL as macro-environmental risk domains.The analysis identifies ten dominant global risk clusters with systemic and cross-industry implications, including climate-related systemic risk, food insecurity, geopolitical fragmentation, economic slowdown, technological disruption, cybersecurity vulnerability, erosion of public trust, regulatory acceleration, supply chain and energy insecurity, and reputational risk. The findings indicate that contemporary risks are increasingly interconnected and non-linear, challenging traditional silo-based risk management approaches. This study extends existing approaches by integrating VUCA and PESTEL into a unified framework for medium-term global risk mapping, supporting anticipatory risk governance and organizational resilience across industries.

Keywords: *Global Risk; VUCA - PESTEL; Risk Governance; Strategic Foresight; Organizational Resilience*

1. INTRODUCTION

The global operating environment is entering a period of intensified uncertainty characterized by overlapping economic, geopolitical, technological, and environmental disruptions. Unlike previous cycles of volatility that were largely sectoral or regional, contemporary risks increasingly manifest as **systemic phenomena**, affecting multiple industries and jurisdictions simultaneously. This shift has challenged the adequacy of conventional risk management approaches that rely on historical trends and linear forecasting.

Recent global assessments consistently indicate that the world economy is facing heightened vulnerability in the medium term. The **World Economic Forum** in its *Global Risks Report*

2024 and *2025* emphasizes that global risks rarely occur in isolation; instead, they interact through complex networks that generate cascading and compounding impacts across economic, social, technological, and geopolitical systems. Similarly, the **International**

Monetary Fund in the *World Economic Outlook 2024* and *2025* highlights persistent downside risks to global growth arising from elevated debt levels, geopolitical fragmentation, and climate-related shocks.

From a structural perspective, the **Food and Agriculture Organization** reports in *The State of Food Security and Nutrition in the World (SOFI) 2023–2024* that food insecurity remains widespread, exacerbated by climate variability, conflict, and economic slowdown. At the same time, the **Intergovernmental Panel on Climate Change** in its *Sixth Assessment Report (AR6) Synthesis Report, 2023* concludes with high confidence that climate-related risks have already intensified and will increasingly affect economic stability, social resilience, and institutional capacity.

These converging findings suggest that organizations across industries are no longer exposed to isolated risks but operate within a **VUCA environment**—characterized by volatility, uncertainty, complexity, and ambiguity—where multiple risk dimensions materialize concurrently. While the **PESTEL framework** has long been employed to analyze macro- environmental conditions, its traditional application often assumes relatively stable and separable external factors. Such assumptions are increasingly misaligned with current global realities.

Despite the growing literature on global risk and uncertainty, three important gaps remain. First, many studies focus on **single-risk categories or specific sectors**, limiting cross-industry applicability. Second, existing research tends to emphasize either short-term shocks or long- term scenarios, leaving the **medium-term horizon (approximately five years)** underexplored. Third, there is limited conceptual work that explicitly integrates the dynamic characteristics of VUCA into established environmental analysis frameworks such as PESTEL.

To address these gaps, this study aims to **conceptually map the dominant global risks for the period 2026–2030** using an integrated **VUCA–PESTEL framework**. By synthesizing insights from authoritative global reports and relevant academic literature, this research seeks to identify key risk clusters with cross-industry relevance.

The novelty of this study lies in three aspects. First, it proposes a unified conceptual integration of VUCA and PESTEL, treating uncertainty not merely as context but as an operating condition shaping all macro-environmental dimensions. Second, it offers a medium-term, cross-industry global risk map that bridges the gap between short-term operational risk assessments and long-term scenario planning. Third, it reframes traditional risk management toward **risk governance**, emphasizing anticipatory, systemic, and resilience-oriented decision-making.

Research Gap

Although prior studies and practitioner-oriented analyses have employed **VUCA** as a lens to describe turbulent environments (Bennett & Lemoine, 2014) and **PESTEL** as a tool for macro- environmental scanning in strategic management (Johnson, Scholes, & Whittington, 2017; Yüksel, 2012), existing applications largely remain **parallel, descriptive, or sector-specific**. Several studies apply PESTEL analysis within VUCA contexts to examine organizational challenges or project-level risks (Popova et al., 2018; Oehmen et al., 2020), while others invoke VUCA primarily as a contextual backdrop for leadership and strategy discussions rather than as an analytical construct.

Moreover, much of the existing literature focuses either on **short-term operational disruptions** or **long-term scenario planning** (World Economic Forum, 2024; 2025), leaving the **medium-term horizon (approximately five years)** relatively underexplored, particularly in a **cross-industry global risk context**. Consequently, there remains a gap in the literature for a **unified conceptual framework** that systematically integrates VUCA dynamics with PESTEL dimensions to support **medium-term, cross-industry global risk mapping and anticipatory risk governance**.

Literature Review and Conceptual Framework
Global Risk and Systemic Uncertainty

The notion of global risk has evolved significantly in recent decades. Global risks are increasingly understood as events or conditions with the potential to cause widespread negative impacts across countries, industries, and societal systems within a relatively short time horizon. According to the **World Economic Forum** (*Global Risks Report 2024; 2025*), the defining characteristic of contemporary global risk is not only its scale but also its **interconnectedness**, whereby the occurrence of one risk amplifies others through complex feedback loops.

Complementing this perspective, the **Organisation for Economic Co-operation and Development** in its *Global Outlook on Financing for Sustainable Development 2021* and subsequent policy outlooks emphasizes that uncertainty increasingly stems from structural transformations such as digitalization, climate transition, demographic shifts, and geopolitical realignments rather than isolated exogenous shocks. These transformations contribute to persistent uncertainty and reduce the predictive power of traditional forecasting models.

From a scientific standpoint, the **Intergovernmental Panel on Climate Change** (*AR6 Synthesis Report, 2023*) demonstrates that climate-related risks now operate as systemic stressors, simultaneously affecting economic performance, social stability, and regulatory responses. Together, these perspectives reinforce the view that global risks must be analyzed as **systemic and multidimensional phenomena**, rather than as discrete or independent threats.

VUCA as a Strategic Context for Risk Analysis

The concept of **VUCA—Volatility, Uncertainty, Complexity, and Ambiguity**—has become a central lens for understanding contemporary strategic environments. Originally introduced in military and strategic studies, VUCA has been widely adopted in management research to describe conditions in which change is rapid, outcomes are unpredictable, causal relationships are intertwined, and information is often incomplete or contradictory.

Bennett and Lemoine (2014) argue that VUCA fundamentally alters managerial decision- making by rendering traditional planning and control mechanisms insufficient. In such contexts, risks are not merely more frequent but qualitatively different: they are harder to anticipate, more interconnected, and more likely to propagate across organizational and sectoral boundaries.

However, despite its conceptual relevance, VUCA is often applied descriptively rather than analytically. Many studies invoke VUCA to characterize environmental turbulence without clearly integrating it into structured tools for systematic risk assessment. This limitation reduces its operational value for cross-industry risk mapping and strategic foresight.

The PESTEL Framework and Its Analytical Limitations

The **PESTEL framework**—Political, Economic, Social, Technological, Environmental, and Legal—has long served as a foundational tool for macro-environmental analysis in strategic management. It offers a structured approach to identifying external factors that influence organizational performance and long-term sustainability.

Nevertheless, traditional applications of PESTEL often assume relatively stable relationships among its dimensions. In practice, contemporary environments exhibit rapid policy shifts, technological acceleration, social polarization, and climate-induced disruptions that unfold within compressed timeframes. Under such conditions, analyzing PESTEL dimensions independently risks oversimplifying the nature of external threats and underestimating their interactive effects.

As a result, PESTEL applied without an explicit uncertainty lens may function as a static checklist rather than a dynamic analytical framework capable of capturing evolving global risk landscapes.

Integrating VUCA and PESTEL: A Conceptual Synthesis

This study proposes that the analytical value of PESTEL can be significantly enhanced by embedding it within a VUCA perspective. Rather than treating VUCA and PESTEL as separate constructs, this research conceptualizes **VUCA as the operating mode through which PESTEL dimensions materialize**.

Under this integrated view:

- Political, economic, social, technological, environmental, and legal factors are shaped by volatility, uncertainty, complexity, and ambiguity.
- Risks emerging in one PESTEL dimension are likely to propagate rapidly across others.
- Medium-term horizons, such as a five-year period, become analytically meaningful for identifying persistent risk clusters rather than isolated events.

The integration of VUCA and PESTEL thus enables a multidimensional and dynamic interpretation of global risks, aligning environmental analysis with contemporary uncertainty conditions.

Several academic studies and practitioner writings have discussed the use of **PESTEL analysis in VUCA environments** or applied both lenses within specific organizational and sectoral contexts, such as maritime business resilience and project management under uncertainty (Popova et al., 2018; Oehmen et al., 2020). These contributions provide valuable descriptive insights but are typically **tool-parallel**, where VUCA and PESTEL are employed side by side, or **context-bounded**, focusing on particular industries or cases.

This study extends prior work by **conceptually integrating VUCA and PESTEL into a unified analytical framework**, in which **VUCA is explicitly positioned as the operating environment** shaping how macro-environmental risks emerge, interact, and escalate across PESTEL dimensions. Furthermore, unlike existing studies that emphasize either short-term disruptions or long-term foresight, this research applies the integrated framework to **medium- term (2026–2030) cross-industry global risk mapping**, with an explicit orientation toward **risk governance and organizational resilience** (Kaplan & Mikes, 2012; World Economic Forum, 2024).

Figure 1. Integrated VUCA–PESTEL Conceptual Framework
Global Risk Analysis Model: Positioning VUCA as the Operating Environment for PESTEL Domains
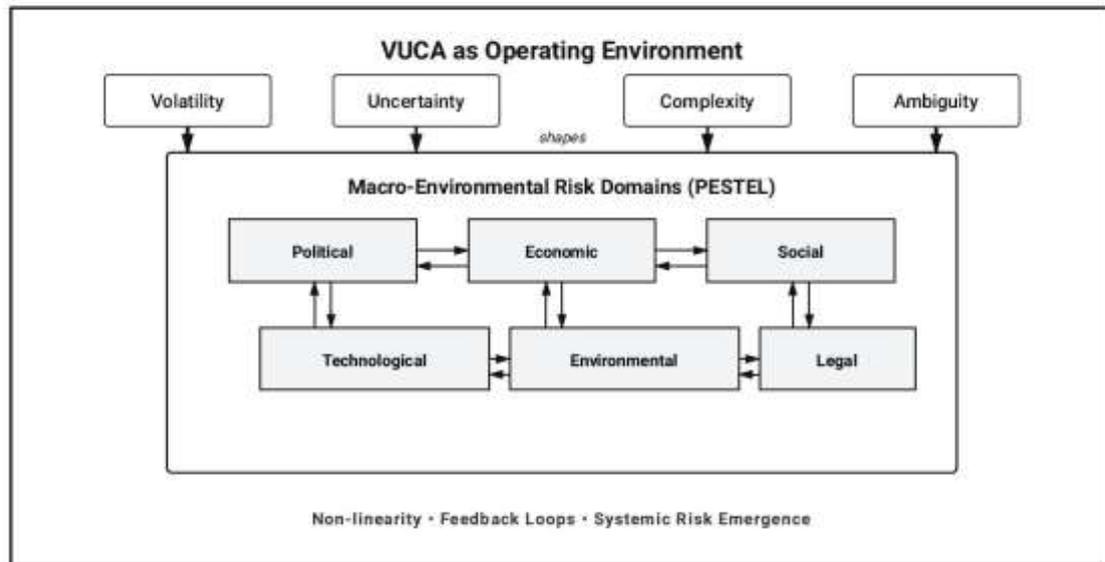

Figure 1. Integrated VUCA–PESTEL conceptual framework for global risk analysis. This figure presents the original conceptual framework proposed in this study, positioning VUCA (Volatility, Uncertainty, Complexity, Ambiguity) as the operating environment that shapes the emergence, interaction, and escalation of macro-environmental risks across PESTEL dimensions.

Source: Original Framework

Figure 1 presents the original conceptual framework proposed in this study, positioning VUCA as the operating environment that shapes the emergence and interaction of macro-environmental risks across PESTEL dimensions.

Conceptual Framework and Research Positioning

Building on this synthesis, the present study positions global risk mapping as a **conceptual– analytical exercise** aimed at identifying dominant risk clusters rather than predicting precise outcomes. The integrated VUCA–PESTEL framework provides the conceptual foundation for clustering and interpreting global risks expected to shape the period 2026–2030.

Unlike empirical studies relying on primary data or statistical modeling, this research emphasizes **evidence-based synthesis** derived from authoritative global reports and established academic insights. This approach is particularly appropriate for examining complex, cross-industry risk landscapes where quantitative precision is limited but strategic understanding is essential.

By doing so, this study contributes to the literature by:
(1) advancing the conceptual integration of VUCA and PESTEL in global risk analysis; (2) offering a structured framework for medium-term, cross-industry risk mapping; and (3) supporting a shift from traditional risk management toward **risk governance and organizational resilience**.

2. RESEARCH METHODOLOGY
Research Design and Approach

This study adopts a **conceptual–analytical research design** aimed at mapping dominant global risks over a medium-term horizon (2026–2030). Rather than testing

hypotheses through primary data collection, the research focuses on **theoretical integration and evidence-based synthesis** to address the complexity and systemic nature of contemporary global risks.

The chosen approach is appropriate for three reasons. First, global risks are inherently multidimensional and interdependent, limiting the applicability of single-variable or sector-specific empirical models. Second, authoritative global institutions regularly publish high-quality risk assessments that provide a robust empirical foundation for conceptual analysis. Third, the objective of this study is not prediction accuracy, but **strategic interpretation and risk governance insight** applicable across industries.

Accordingly, this research employs an **expert-informed risk synthesis** approach, which is widely used in policy-oriented and strategic foresight studies to analyze complex risk landscapes where quantitative precision is constrained.

Data Sources

The analysis draws on **secondary data** obtained from globally recognized institutions and peer-reviewed academic literature. The primary sources include:

- Global risk assessments published by the **World Economic Forum**, particularly the *Global Risks Report* (2024 and 2025 editions);
- Macroeconomic outlooks and risk analyses from the **International Monetary Fund**, notably the *World Economic Outlook* (2024 and 2025);
- Food security and agricultural risk assessments from the **Food and Agriculture Organization**, especially *The State of Food Security and Nutrition in the World* (2023–2024);
- Climate risk syntheses from the **Intergovernmental Panel on Climate Change**, with emphasis on the *Sixth Assessment Report (AR6) Synthesis Report* (2023);
- Supporting academic literature from peer-reviewed journals (Scopus-indexed and nationally accredited journals) addressing systemic risk, uncertainty, VUCA environments, PESTEL analysis, and organizational resilience.

These sources were selected based on their methodological rigor, global coverage, and relevance to cross-industry risk analysis.

Analytical Procedures

The analysis was conducted through a three-stage process.

Stage 1: Thematic Risk Identification

Key risk themes were identified through close reading and comparison of the selected global reports. Recurrent risks appearing across multiple sources were prioritized to reduce institutional or sectoral bias.

Stage 2: Risk Clustering and Synthesis

Identified risks were grouped into broader **risk clusters** based on conceptual similarity and systemic interaction. This process emphasized interdependencies rather than isolated risk events, allowing the identification of dominant global risk patterns relevant to multiple industries.

Stage 3: VUCA–PESTEL Mapping

Each risk cluster was then mapped onto the integrated **VUCA–PESTEL framework** proposed in this study (see Figure 1). VUCA was treated as the operating environment shaping the manifestation of risks, while PESTEL dimensions served as structured macro-

environmental domains for interpretation. This step enabled a multidimensional analysis of how risks emerge, interact, and escalate across domains.

Validity and Analytical Rigor

To enhance analytical rigor, this study employed **source triangulation** by comparing findings across multiple authoritative reports and academic sources. Risks that appeared consistently across different institutions and analytical frameworks were considered more robust.

In addition, conceptual coherence was ensured by grounding the analysis in established theoretical constructs, including systemic risk theory, VUCA-based strategic analysis, and macro-environmental assessment via PESTEL. This combination strengthens the internal validity of the proposed framework while maintaining flexibility for cross-industry application.

Limitations of the Study

Several limitations should be acknowledged. First, the study does not utilize primary empirical data or statistical testing, which limits the ability to quantify risk probabilities or impacts. Second, the conceptual nature of the framework means that interpretations may vary depending on industry context and organizational characteristics. Third, while the analysis draws on globally recognized sources, regional or sector-specific nuances may not be fully captured.

Nevertheless, these limitations are consistent with the exploratory and integrative objectives of the study. The framework is intended to provide **strategic orientation and analytical structure**, rather than precise risk forecasts.

Ethical Considerations

All data used in this study were obtained from publicly available sources. Proper attribution is provided for all referenced reports and academic works. The conceptual framework and analytical interpretations presented in this paper are **original contributions of the authors**, developed through synthesis and critical analysis of existing knowledge.

3. RESULT AND DISCUSSION

3.1 Overview of Global Risk Landscape (2026–2030)

Based on the conceptual–analytical synthesis of authoritative global reports and academic literature, this study identifies **ten dominant global risk clusters** expected to shape cross- industry environments over the period **2026–2030**. These risks are not presented as isolated threats, but as **interconnected and systemic phenomena** that manifest across multiple PESTEL dimensions under conditions of heightened VUCA.

Consistent with recent assessments by the **World Economic Forum** (Global Risks Report 2024; 2025), the findings indicate that contemporary risks increasingly reinforce one another, producing cascading effects that challenge traditional, silo-based risk management approaches. The results further suggest that medium-term risk dynamics are driven less by singular shock events and more by **structural vulnerabilities and interaction effects**.

3.2 Dominant Global Risk Clusters

1. Climate-Related Systemic Risk

Climate-related risks emerge as a foundational risk cluster influencing economic stability, social resilience, and regulatory frameworks. According to the **Intergovernmental Panel on Climate Change** (*AR6 Synthesis Report, 2023*), climate impacts have already intensified and are projected to increase further within the next decade.

Within the VUCA–PESTEL framework, climate risk primarily manifests across the **Environmental** dimension but rapidly propagates to **Economic**, **Social**, and **Legal** domains through physical damage, regulatory responses, and social disruption. This finding reinforces the interpretation of climate change as a **systemic financial and organizational risk**, rather than a purely environmental concern.

2. Food Security and Agricultural Vulnerability

Food security represents a critical global risk cluster, particularly in regions exposed to climate variability, conflict, and economic instability. The **Food and Agriculture Organization** reports in *SOFI 2023–2024* that hundreds of millions of people continue to face food insecurity, with medium-term risks amplified by climate stress and geopolitical disruption.

This risk cluster spans **Economic**, **Social**, and **Political** PESTEL dimensions, reflecting its potential to trigger inflationary pressures, social unrest, and policy intervention. Under VUCA conditions, food-related risks tend to escalate rapidly due to uncertainty in supply chains and ambiguity in policy responses.

3. Geopolitical Fragmentation and Conflict

Geopolitical fragmentation, including regional conflicts and strategic rivalry, constitutes a major risk cluster with far-reaching implications. The **World Economic Forum** consistently highlights geopolitical tensions as a high-impact risk affecting trade, investment flows, and institutional cooperation.

Within the VUCA–PESTEL framework, geopolitical risk primarily affects the **Political** and **Economic** domains, but also influences **Technological** and **Legal** dimensions through sanctions, export controls, and regulatory divergence. The non-linear interaction between geopolitical shocks and economic vulnerabilities increases systemic uncertainty across industries.

4. Global Economic Slowdown and Debt Vulnerability

Macroeconomic risk remains a dominant concern for the 2026–2030 period. The **International Monetary Fund** (*World Economic Outlook 2024; 2025*) emphasizes persistent downside risks stemming from elevated debt levels, tightening financial conditions, and uneven recovery across regions.

This risk cluster primarily manifests within the **Economic** domain but interacts strongly with **Political** and **Social** dimensions as fiscal constraints limit policy space and heighten distributional tensions. Under VUCA conditions, economic risks are characterized by ambiguity in policy effectiveness and uncertainty in growth trajectories.

5. Technological Disruption and Artificial Intelligence Risk

Rapid technological advancement, particularly in artificial intelligence and digital platforms, represents a dual-edged risk cluster. While offering productivity gains, technological disruption also introduces operational, ethical, and governance challenges.

This risk spans **Technological**, **Social**, and **Legal** PESTEL dimensions, as organizations face uncertainty regarding workforce adaptation, data governance, and regulatory alignment. The complexity of AI-driven systems amplifies ambiguity and limits the predictability of outcomes, consistent with a VUCA environment.

6. Cybersecurity and Digital Infrastructure Vulnerability

Cybersecurity risk emerges as a critical operational and systemic threat. Increasing digital interdependence exposes organizations to cascading failures triggered by cyber incidents.

Within the framework, cyber risk predominantly affects the **Technological** domain but rapidly propagates to **Economic**, **Legal**, and **Social** dimensions through service disruption, financial loss, regulatory penalties, and erosion of trust. The volatility and opacity of cyber threats underscore the inadequacy of reactive security approaches.

7. Erosion of Public Trust and Institutional Legitimacy

Erosion of trust in public and private institutions constitutes a cross-cutting risk cluster. Declining trust amplifies the impact of other risks by undermining compliance, cooperation, and social cohesion.

This risk cluster primarily affects **Social** and **Political** domains but interacts with **Legal** and **Economic** dimensions through governance challenges and reputational consequences. In a VUCA context, trust deficits accelerate crisis escalation and complicate recovery efforts.

8. Regulatory Acceleration and Compliance Complexity

Regulatory environments are becoming more dynamic and fragmented, particularly in areas such as sustainability reporting, digital governance, and consumer protection. This regulatory acceleration introduces compliance risks across industries.

This cluster is anchored in the **Legal** domain but interacts closely with **Political**, **Economic**, and **Technological** dimensions. Ambiguity regarding regulatory direction and enforcement further intensifies uncertainty for organizations operating across jurisdictions.

9. Supply Chain Disruption and Energy Insecurity

Supply chain and energy risks remain salient due to geopolitical tensions, climate impacts, and structural transformation of energy systems. Disruptions in logistics, critical materials, or energy supply can trigger widespread operational and financial consequences.

These risks primarily affect **Economic** and **Environmental** domains, with spillovers into **Political** and **Social** dimensions as governments intervene to stabilize markets. Complexity and interdependence within global supply networks heighten systemic vulnerability.

10. Reputational Risk and Sustainability Washing

Reputational risk associated with sustainability claims and ethical conduct represents a growing concern. Increased stakeholder scrutiny exposes organizations to backlash if sustainability commitments are perceived as superficial or misleading.

This risk cluster intersects **Social**, **Legal**, and **Economic** domains, reflecting its potential to affect market valuation, regulatory standing, and stakeholder relationships. Under VUCA conditions, reputational crises often emerge rapidly and with limited warning.

3.3 Discussion: Implications of the VUCA–PESTEL Risk Mapping

The identification of these ten risk clusters underscores the central argument of this study: **global risks in the 2026–2030 period are systemic, interconnected, and dynamically shaped by VUCA conditions**. Mapping these risks through the integrated VUCA–PESTEL framework reveals that no single risk domain operates independently, and that escalation pathways frequently cross sectoral and institutional boundaries.

From a strategic perspective, the findings highlight the limitations of traditional risk management approaches that focus on probability estimation and isolated mitigation measures. Instead, organizations require **risk governance capabilities** that emphasize anticipation, cross- domain coordination, and organizational resilience.

Importantly, while the risk clusters identified in this study are globally relevant, their specific manifestations will vary across industries and regions. This observation supports the use of the proposed framework as a **diagnostic and interpretive tool**, adaptable to sector-specific analysis—such as financial services, energy, or food systems—which constitutes a promising direction for future research.

Table 1 summarizes the mapping of the identified global risk clusters within the integrated VUCA–PESTEL framework, illustrating how dominant characteristics of uncertainty shape cross-domain risk propagation across industries

Table 1. Mapping Top 10 Global Risks (2026–2030) within the VUCA–PESTEL Framework

No.	Global Risk Cluster	Dominant VUCA Characteristics	Primary PESTEL Dimensions	Cross-Domain Implications
1	Climate-related systemic risk	Volatility, Complexity, Ambiguity	Environmental, Economic, Legal	Physical damage, asset impairment, regulatory tightening, social disruption
No.	Global Risk Cluster	Dominant VUCA Characteristics	Primary PESTEL Dimensions	Cross-Domain Implications
2	Food security and agricultural vulnerability	Uncertainty, Volatility	Economic, Social, Political	Inflationary pressure, social unrest, policy intervention
3	Geopolitical fragmentation and conflict	Volatility, Ambiguity	Political, Economic, Legal	Trade disruption, investment risk, regulatory divergence
4	Global economic slowdown and debt vulnerability	Uncertainty, Complexity	Economic, Political, Social	Fiscal stress, inequality, policy constraints
5	Technological disruption and AI-related risk	Complexity, Ambiguity	Technological, Social, Legal	Workforce displacement, governance gaps, ethical concerns

6	Cybersecurity and digital infrastructure vulnerability	Volatility, Uncertainty	Technological, Economic, Legal	Operational disruption, financial loss, trust erosion
7	Erosion of public trust and institutional legitimacy	Ambiguity, Complexity	Social, Political, Legal	Governance challenges, compliance issues, reputational damage
8	Regulatory acceleration and compliance complexity	Uncertainty, Complexity	Legal, Political, Economic	Rising compliance costs, cross-border inconsistency
9	Supply chain disruption and energy insecurity	Volatility, Complexity	Economic, Environmental, Political	Production delays, cost escalation, market instability
10	Reputational risk and sustainability washing	Ambiguity, Volatility	Social, Legal, Economic	Market value decline, stakeholder backlash, regulatory scrutiny

Note: VUCA is conceptualized as the operating environment shaping how risks emerge and interact, while PESTEL represents macro-environmental domains through which risks propagate across industries.

3.4 Managerial and Policy Implications

The integrated VUCA–PESTEL framework and the identified global risk clusters offer several important implications for organizational leaders and policymakers. Rather than prescribing sector-specific solutions, this section outlines **strategic principles** applicable across industries operating under heightened uncertainty.

3.4.1 Managerial Implications
From Risk Management to Risk Governance

The findings suggest that traditional risk management approaches—often focused on risk registers, compliance checklists, and probability-based assessments—are increasingly insufficient in a VUCA environment. The interconnected and systemic nature of the identified risk clusters requires organizations to transition toward **risk governance**, emphasizing strategic oversight, cross-functional coordination, and anticipatory decision-making.

Managers should therefore:
- integrate risk considerations into strategic planning processes;
- ensure board-level engagement in systemic risk oversight; and
- promote information flows across organizational silos to detect emerging risk interactions.

Building Organizational Resilience Rather than Predictive Precision

In highly volatile and ambiguous environments, predictive accuracy is inherently limited. The results of this study reinforce the importance of **organizational resilience**—the capacity to absorb shocks, adapt to changing conditions, and recover from disruptions.

From a managerial perspective, resilience-oriented strategies include:
- diversification of supply chains and critical resources;
- investment in digital and operational redundancy;
- development of adaptive leadership and decision-making capabilities.

Such measures shift the focus from attempting to forecast specific events to enhancing the organization's ability to respond effectively to a range of plausible scenarios.

Human Capital and Adaptive Capability Development

Several identified risk clusters—particularly technological disruption, cybersecurity, and erosion of trust—are closely linked to human and organizational factors. This underscores the strategic importance of **human capital development** in managing uncertainty.

Managers are encouraged to:
- prioritize continuous learning and reskilling initiatives;
- foster a culture of openness and psychological safety to encourage early risk reporting; and
- align performance incentives with long-term resilience objectives rather than short- term efficiency alone.

Reputation and Trust as Strategic Assets

The emergence of reputational and trust-related risks highlights the need to treat **credibility and stakeholder trust** as strategic assets. In a VUCA environment, reputational crises often escalate rapidly and can amplify the impact of other risk clusters.

Managerial actions in this area include:
- transparent communication with stakeholders;
- consistency between stated commitments and actual practices, particularly regarding sustainability and ethics; and
- proactive monitoring of stakeholder perceptions and external narratives.

3.4.2 Policy Implications

Toward Integrated and Adaptive Policy Frameworks

For policymakers, the results underscore the limitations of fragmented and static regulatory approaches. As risks increasingly span multiple PESTEL dimensions, effective governance requires **integrated and adaptive policy frameworks** capable of responding to rapid environmental change.

Policymakers should consider:
- cross-ministerial coordination mechanisms to address systemic risks;
- regulatory impact assessments that account for interaction effects across sectors; and
- flexible policy instruments that can be adjusted as risk conditions evolve.

Strengthening Institutional Capacity for Systemic Risk Oversight

The systemic nature of contemporary risks calls for enhanced institutional capacity to monitor, assess, and respond to emerging threats. This includes improved data-sharing

arrangements, scenario analysis capabilities, and strategic foresight functions within public institutions.

International organizations such as the **Organisation for Economic Co-operation and Development** have emphasized the role of anticipatory governance and policy coherence in managing global uncertainty, reinforcing the relevance of the framework proposed in this study.

Aligning Sustainability, Economic Stability, and Social Resilience

The intersection of climate risk, food security, and social stability highlights the need for policy alignment across sustainability, economic, and social objectives. Policymakers are encouraged to view sustainability not as a separate agenda, but as an integral component of risk mitigation and long-term stability.

Policy measures in this domain include:
- integrating climate and environmental risks into economic planning;
- supporting resilient food and energy systems; and
- ensuring that transition policies consider distributional and social impacts to maintain public trust.

3.4.3 Implications for Cross-Industry Collaboration

Finally, the results indicate that many of the identified risks—such as cyber threats, supply chain disruptions, and reputational crises—cannot be effectively addressed by individual organizations acting alone. This underscores the importance of **cross-industry and public– private collaboration** in managing systemic risk.

Collaborative initiatives may include:
- shared risk intelligence platforms;
- industry-wide standards and best practices; and
- joint crisis response and contingency planning mechanisms.

Synthesis

Overall, the managerial and policy implications of this study point to a common conclusion: **managing risk in a VUCA environment requires a shift from reactive control toward proactive, integrated, and resilience-oriented governance**. The proposed VUCA–PESTEL framework provides a structured basis for such a shift, offering guidance for both organizational leaders and policymakers navigating an increasingly uncertain global landscape.

3.4.4 Limitations and Directions for Future Research

Despite its contributions, this study is subject to several limitations that should be acknowledged. First, the research adopts a **conceptual–analytical approach** and does not employ primary empirical data or statistical testing. As a result, the framework does not quantify the probability or magnitude of individual risks, nor does it test causal relationships between risk variables. This limitation is consistent with the study's objective to provide **strategic interpretation and systemic understanding**, rather than predictive precision.

Second, the analysis relies on **secondary data from global institutional reports** and selected academic literature. While these sources are methodologically robust and widely recognized, they may reflect institutional perspectives and global-level generalizations that do not fully capture regional, sectoral, or organizational specificities. Consequently, the manifestation of the identified risk clusters may vary across different contexts.

Third, the proposed VUCA–PESTEL framework emphasizes **cross-industry applicability**, which necessarily entails a trade-off between breadth and depth. Sector-specific dynamics— such as those in financial services, energy, healthcare, or food systems—are not explored in detail within this study.

These limitations provide several directions for future research. First, empirical studies could operationalize the VUCA–PESTEL framework using survey data, case studies, or mixed- method approaches to examine its applicability within specific industries or regions. Second, longitudinal research could assess how identified risk clusters evolve over time and how organizations adapt their governance structures accordingly. Third, sector-focused studies— particularly in systemically important sectors such as banking and financial services—could extend the framework to analyze regulatory, operational, and resilience implications in greater depth.

4. CONCLUSION

This study set out to address the growing need for integrative and forward-looking risk analysis in an increasingly volatile, uncertain, complex, and ambiguous global environment. By adopting a **conceptual–analytical approach**, the research mapped ten dominant global risk clusters expected to shape cross-industry contexts over the period **2026–2030**.

The central contribution of this study lies in the development of an **integrated VUCA– PESTEL conceptual framework**, which positions VUCA as the operating environment shaping the manifestation and interaction of macro-environmental risks across political, economic, social, technological, environmental, and legal domains. This integration advances existing literature by moving beyond static environmental analysis and offering a dynamic, systemic interpretation of contemporary global risks.

The findings underscore that global risks are increasingly **interconnected and non-linear**, rendering traditional, silo-based risk management approaches insufficient. In response, the study highlights the importance of **risk governance**, organizational resilience, and anticipatory decision-making for both managers and policymakers. Rather than attempting to predict specific risk events, organizations are encouraged to enhance their adaptive capacity and cross- domain coordination.

Overall, this research contributes to strategic management and policy-oriented literature by providing a structured framework for medium-term, cross-industry global risk mapping. While exploratory in nature, the proposed framework offers a robust foundation for empirical validation and sector-specific extension, supporting more resilient and informed responses to global uncertainty in the years ahead.

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APPENDICES

Figure 1. Integrated VUCA–PESTEL Conceptual Framework

Table 1. Mapping Top 10 Global Risks (2026–2030) within the VUCA–PESTEL Framework