

## Environmental Turbulence and Entrepreneurship: A Systematic Review

Muhammad Hanif<sup>1</sup>, Mohammad Zulkifli bin Abdul Rahim<sup>2</sup>,  
Imran Munawar Qureshi<sup>3</sup>, Saiqa Sabeen Shahid<sup>4</sup>

<sup>1,2</sup> Faculty of Business and Management, University Sultan Zainal Abidin, Terengganu, Malaysia <sup>3</sup> Faculty of Management Sciences, International Islamic University, Islamabad, Pakistan. <sup>4</sup> Faculty of Management Sciences, National University of Modern Languages, Islamabad, Pakistan.

To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v13-i11/19798> DOI:10.6007/IJARBSS/v13-i11/19798

*Published Date: 23 November, 2023*

### Abstract

Environmental turbulence (ET) is an essential variable in the economic and business discourse. This paper focuses more on the incidence of ET in business studies, particularly in marketing and entrepreneurial studies. A systematic analysis is conducted using the 52 most relevant articles from 1991 till 2022. Textual analysis using a word crunching tool yielded essential terms in the complied papers. Results indicate that ET is connected with innovation, which entrepreneurship must indulge in performing well in markets. Most studies have considered ET as a moderator in affecting entrepreneurship and its marketing aspects. The second most common application has been as a mediator, followed by the role of an antecedent. From a purely theoretical basis, ET may have a much more significant role in fostering or eliminating entrepreneurship and keeping entrepreneurship focused on innovation. Future research can focus more on the service sector and study environmental turbulence's mediating and antecedent positions.

**Keywords:** Environmental Turbulence, Business, Marketing, Entrepreneurship, Entrepreneurial Marketing

### Introduction

Turbulence in the environment is an age old concern in every aspect of the human experience. In the economic a business realm is the tenat that changes in the system can be made but a comprehensive design that covers all aspects of the environment surrounding a system are almost impossible to encompass. Still it has been and will be a constant human endeavor to understand the causes of turbulence in the environment to improve forecasts and minimize the loss or maximize the benefit from turbulence in the environment. Entrepreneurship is an area characterized more so by risk, uncertainty and turbulence stemming form the environment. Environmental turbulence (ET) is a significant concern in the fields of economics and business particularly in the areas with uncertainty and risk exposure as a central part of

their discourse, for example, the study of business performance, strategy, and entrepreneurship (Wong, 2014; Samson, 2015; Turulja & Bajgoric, 2018; Rofiq & Promono, 2019). Studies on entrepreneurship are a relatively recent addition to the body of knowledge as compared to other areas, but research on environmental turbulence in the context of entrepreneurship is still at the early stages of development. There is a renewed interest in this area as well due to the current turbulence in the economic and political environment globally. In this context the current study is an effort to extract important aspects from published literature on the effect of Environmental Turbulence as a phenomenon discussed in business, marketing and entrepreneurship studies. Environmental turbulence is the rate of unpredictability in the environment caused by the highly varied events in which a particular industry operates (Wong, 2014; Tsai and Yang, 2014). Environmental turbulence can be classified to:

- “Market turbulence – the rate of change in the composition of customers or their preferences for products and services (Wong, 2014; Tsai and Yang, 2013a, b; Hartono and Sheng, 2016). In turbulent markets, firms’ customers often change their product preferences or tend to seek new products continually (Hanvanich et al., 2006).
- Technological turbulence – the rate of technological change in the industry (Huang and Tsai, 2014). Hanvanich et al. (2006) defined technological turbulence as “the degree of change associated with product and process technologies in the industry in which a firm embeds.”
- Competitive intensity – the degree of competition in an industry (Tsai and Yang, 2013). Competitive intensity relates to the activities of competing firms, including promotion competition, price competition, and new arrivals (Cui et al., 2005).”

Environmental turbulence is characterized by changes that are dynamic and complex, quick and unpredictable, and cause uncertainty (Volberda & Bruggen, 1997; Morris et al., 2002; González-Benito et al., 2009; Lee and Tang, 2018). The characteristics of changes trigger and demand businesses to take strategic steps and adjust business strategies. Some studies showed that environmental turbulence could support competitive strategies that achieve competitive advantage (Ward & Duray, 2000; Kuivalainen et al., 2004; Shalender & Sharma, 2022; Khourouh, Sudiro, Rahayu, & Indrawati, 2020). Some research findings differ from those of other studies that state that environmental turbulence negatively affects performance (Li & Atuahene-Gima, 2001; Lin & Germain, 2003; Power & Reid, 2005; Turulja & Bajgoric, 2018; Calantone, Garcia & Dröge, 2003).

Scholars believe environmental turbulence supports companies in developing an ability to overcome risks and see market opportunities. It also helps to build momentum and creative ability to take the opportunities and overcome the risks and uncertainty the turbulence provides and to channel and utilize internal efforts to achieve the goals to change opportunities into benefits (Morris et al., 2002; González-Benito et al., 2009). Environmental turbulence is considered an antecedent of innovation by some scholars (Witschel, Baumann & Voigt, 2022; Lee and Tang, 2018; Turulja & Bajgoric, 2018; Ojha, Struckell, Acharya C & Patel, 2020; Gemici & Zehir, 2021) and business performance (Witschel, Baumann & Voigt, 2022; Jaworski & Kohli, 1993; Huang and Tsai 2014; Wong 2014). In understanding the contribution of ET to business performance, the environmental context must be kept in clear focus (Tsai and Yang, 2014).

A turbulent environment characterized by a high level of uncertainty unlocks opportunities for firms to break through traditional industry boundaries. In such a situation, the options available for firms it to embrace risk, develop new products and technologies, and enter new

markets (Calantone et al., 2003). Environmental turbulence's adverse effects can force firms to exit a market quickly. Firms have to remain current by monitoring relevant information and adapting to market changes otherwise, they face the risk of losing their competitive advantage (Dai et al., 2014).

### Methodology

The methodology used in this study started with searching the term "environmental turbulence" with Google Scholar. The result of this query obtained ranged from the year 1991 to 2022. Then, the keywords referring to "business studies," "marketing," and "entrepreneurship" was selected. This yielded a total of 52 papers which were then utilized to perform the analysis. A textual analysis was performed using the qualitative research software Atlas.ti. A word cruncher tool was also used to find the keywords utilized in these papers. Then, the key patterns and mechanisms of ET are identified.

### Results & Discussion

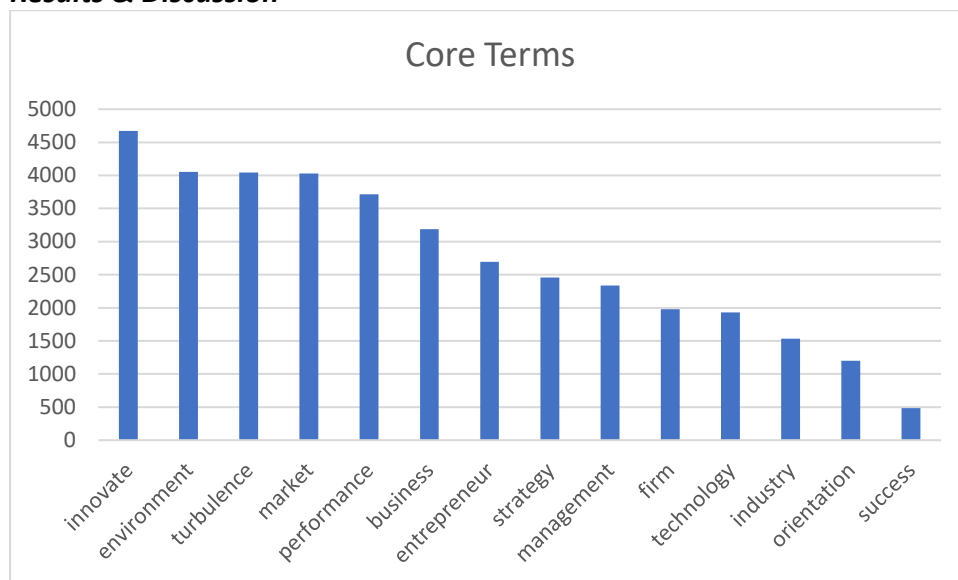


Fig 1: Core words connected with environmental turbulence

The results of the textual analysis are given in Fig 1.0. The core study is about turbulence and the environment. These two words appear the most in the selected studies. Interestingly, the root word innovate has the highest frequency of occurrence. This suggests that innovation has a strong connection with the environment and turbulence. As they say that 'necessity is the mother of invention'. The situation in which needs are mostly felt or exposed is a turbulent environment that is characterized by dynamism. 'Market' is the next root word that occurs most. It is pertinent to suggest here that for a business, the primary source of opportunity and the main source of turbulence is the market. Another interesting fact is that the 'market' is part of the immediate external environment for a business. From the opportunity side, the market is plain for innovation. From the side of risk, the market is the plain where competition exists and is the source of competitive intensity. The word performance is the next most occurring word, actually more than turbulence. This indicates that most studies have conducted the 'business' and 'entrepreneur' performance perspectives. Incidentally, these are the following two most recurring words. Moving forward, we see the next set of words: 'strategy,' 'management,' and 'firm.' It is crucial for

management to develop strategies in turbulent environments as this is the biggest challenge that managements face in their operative capacity. ‘Technology’ is the next word, which is connected and augments the idea of innovation. ‘Industry’ is associated with business and firm, while ‘orientation,’ based on most of the literature, is used in market orientation and entrepreneurial orientation. Eventually, all efforts of businesses and entrepreneurs were aimed at gaining success, which many of the studies have mentioned.

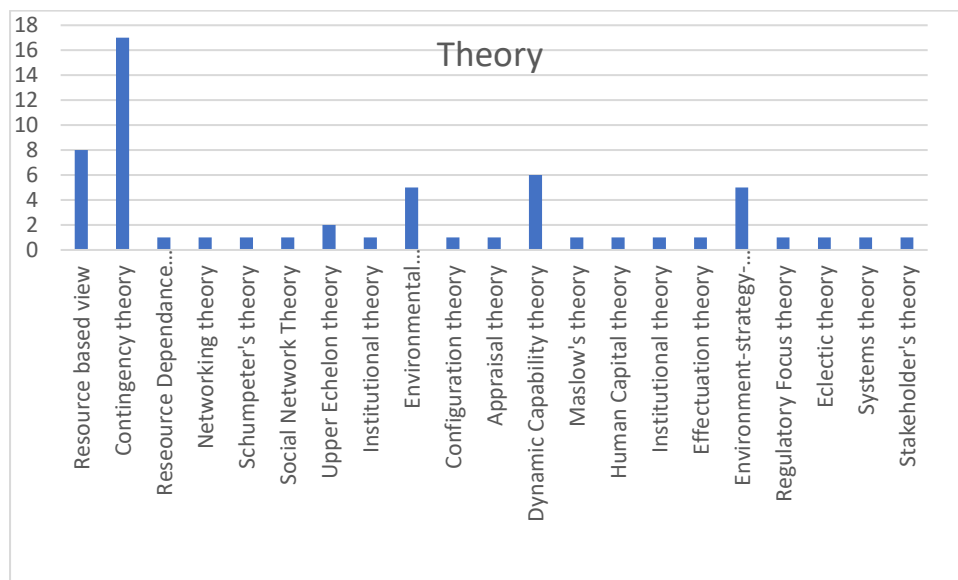


Fig 2: Theories used in Environmental Turbulence studies

For the theory used in this analysis, Fig 2.0 gives the frequencies of the ideas discussed in the studies. Most studies have used the contingency theory and the resource-based view as important theoretical constructs for managing environmental turbulence. The second group of theories providing important frameworks includes dynamic capability theory, environmental contingency theory, and environment-strategy-performance theory.

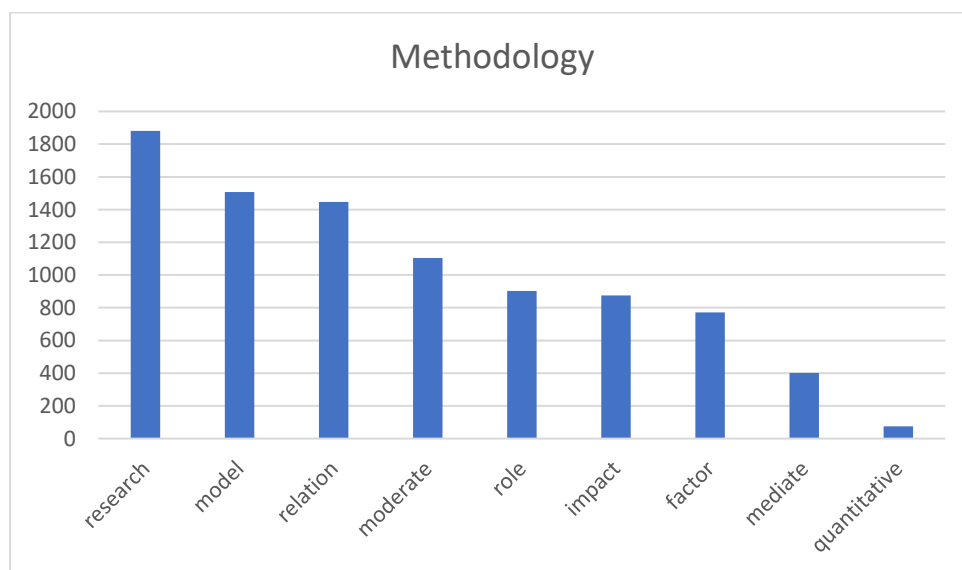


Fig 3: Methodology-related words in Environmental Turbulence studies

Regarding the methodology-related terms most frequently used in the studies, it is quite clear that as all the studies were research-based, 'research' is the most common term. Most studies have developed conceptual, theoretical or measurement models, so the root word 'model' is the second most occurring root word. Moving on, most of the studies were 'relational' studies that have studied the 'role' of environmental turbulence and the 'impact' of different 'factors' in the context of varying dependent variables. Most importantly, the role of ecological turbulence conceptualized in most studies in the business, market and entrepreneurial context is as a 'moderator,' which has the root word 'moderate.' Some studies also tried to investigate environmental turbulence as a 'mediator,' but these are much less than the moderator role. There is very little in the view of qualitative studies as most of the studies are quantitative in nature.

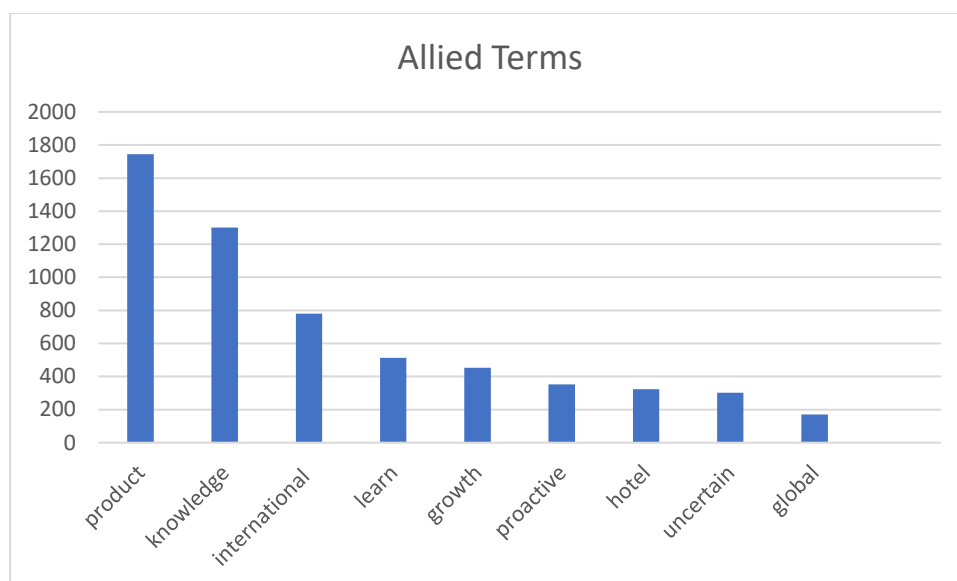


Fig 4: Allied words connected to Environmental turbulence

A few allied terms are also used that have been used in most studies. Their analysis will give some insights. The word that occurs the most is 'product.' Most studies dealt with products rather than services in business and entrepreneurship. Next, an important word is 'knowledge,' which is entirely in the context of tackling environmental turbulence. Another set of meaningful words is 'international' and 'global,' as most of the studies are done in various international contexts. 'Learn' and 'growth' are connected with environmental turbulence as such situations provide learning opportunities and open avenues for a firm's growth. 'Proactive' shows that some studies have looked at proactive strategies to prepare for turbulent situations triggered in the environment. The industry where most studies are done is the 'hotel' industry and in 'uncertain' environmental concerns.

### ***Environmental Turbulence and Entrepreneurship***

The environment is a universal construct that has a lot of influence during the formation and throughout the life cycle of entrepreneurship. A particular state of the environment, environmental turbulence, also carries the same influence in the formation stage of entrepreneurship and throughout its life cycle. Whichever industry shows good potential for growth becomes the focus of entrepreneurs and studies on entrepreneurs. Based on the review, about twenty-seven studies have used environmental turbulence as a moderator.

Two studies have studied a mediating effect of ecological turbulence, while nineteen studies have utilized environmental turbulence as an antecedent or determinant. Most recent studies on the variable of environmental turbulence in entrepreneurship have focused on micro, small, and medium enterprises (MSME's) and SMEs. The studies range from IT industries (Kuankuan & Zhang, 2022; Havakhor, Sabherwal, Steelman & Sabherwal, 2019; Weingarh, Richter & Rosenkranz, 2018) to the culinary industry (Waty, So, Indrajit & Abdinagoro, 2022; Panjaitan, 2022). Febriyantoro, Nasuredin & Rashid (2022) have studied the moderating effect of environmental turbulence on the relationship between entrepreneurial marketing and business performance for MSMEs in Batam city, Malaysia. Environmental turbulence has also gained some attention in the context of entrepreneurship in Pakistan. Sajjad, Ibrahim, and Shamsuddin (2022) found in their study that environmental turbulence plays an essential role in translating learning orientation into the performance of SMEs in the manufacturing sector of Pakistan. Mokhtarzadeh, Mahdiraji, and Jafarpanah (2022) investigated the role of environmental turbulence on firm innovation in the context of car OEMs in Iran. The results indicate that environmental turbulence improves an organization's innovation performance. Stock, McDermott, and McDermott (2022) studied the effect of environmental turbulence, strategic blur, and strategic focus on performance in developing entrepreneurial performance. Results suggest that the interaction between environmental turbulence and strategic blur significantly affects firm performance. A study by Omar (2022) reconfirms that environmental turbulence strongly affects entrepreneurial orientation in the context of firms in Bahrain.

### ***Measuring Environmental Turbulence***

Volberda & Van Bruggen (1997) did a detailed analysis of the dimensions of environmental turbulence, where dynamism, predictability, and complexity were taken as the critical dimensions. This variable has been used in multitudes of studies as it is a universal phenomenon. Jaworski and Kohli (1993) used a scale for environmental turbulence with the market and technological turbulence as dimensions. Kmiecik, Michna, and Meczynska (2012) modified the scale and added a third dimension: competitive intensity. This scale has been used in further studies like the one by Turulja and Bajgoric (2019), analyzing the effect of environmental turbulence on innovation and firm performance.

Environmental turbulence is found to have a significant causal impact on the level of entrepreneurship and the marketing orientation of the firm (Davis, Morris & Allen, 1991). The effect of environmental turbulence has also been studied in conjunction with EO in many entrepreneurship studies. Environmental turbulence strongly affects all three dimensions of EO (innovativeness, proactiveness, and risk-taking) (Wong, 2014). Multiple studies confirm this effect. Recent studies focus on the application of environmental turbulence as an element in the system to achieve sustainable competitive advantage (Shalender & Sharma, 2022); corporate social responsibility, and disruptive innovation (Wang, Qureshi, Guo & Zhang, 2022); Eco-innovation and sustainable business (Larbi-Siaw, Xuhua, Owusu, Owusu-Agyeman, Fulgence & Frimpong, 2022).

### ***Conclusions***

Environmental turbulence is an essential phenomenon with many applications in many fields. The primary purpose of this study was to evaluate the literature on the phenomenon of environmental turbulence in the areas of business, marketing, and entrepreneurship, which are the subfields of economics. For this purpose, a compilation of papers was obtained

through searches in Google Scholar. The key search terms used were 'environmental turbulence,' 'business,' 'marketing,' and 'entrepreneurship.' A collection of 52 papers was selected based on their relevance to the search criteria. The year range of the articles is from 1991 to 2022. A qualitative research tool Atlas.ti was used to analyze the studies. A word crunching tool was used in the software and frequency analysis was applied to extract critical terms used in the study. The terms obtained were then divided based on their applicability in the studies. The first set was the core terms: innovation, environment, turbulence, business, entrepreneur, strategy, and management. Then all the studies were analyzed for the theories that have been used. Results suggest that the widely used theories are the contingency theory, followed by the resource-based view, dynamic capability view, environmental contingency theory, and the environment-strategy-performance theory. The third set of terms is related to methodology. The most used terms include research, model, relation, moderate, role, impact, factor, mediate, and quantitative. Some related allied terms include product, knowledge, learning, growth, proactive, hotel, uncertain, and global. . Industries on which these recent studies focused include entrepreneurs in IT and MSMEs.

The study's core findings suggest that environmental turbulence is fundamental in entrepreneurship and marketing. Environmental turbulence is very much connected to innovation which is a requirement for the performance of a firm in such environments. The market is the source of innovation caused by turbulence as it brings out innovation and technology development efforts by businesses and entrepreneurs. Contingency and environment-focused theories are mainly applicable in studies utilizing the construct of environmental turbulence. In terms of methodology, most studies have focused on the moderating role of environmental turbulence in cause and effect-based relationships and models. In the context of entrepreneurship, environmental turbulence has been studied in multiple international and global settings. Most studies have entrepreneurship and environmental turbulence in the context of products. Future studies can focus more on the service sector. Further studies can be carried out on proactive approaches to manage environmental turbulence. In methodological terms, more investigations are needed to examine environmental turbulence's mediation and antecedent roles. The key contribution of this study is to extract the key terms associated with environmental turbulence in published research in the context of business, marketing in general and entrepreneurship in particular. Further contribution is to determine the key theories that have been used to develop the constructs related to environmental turbulence.

## References

- Cui, A. S., Griffith, D. A., & Cavusgil, S. T. (2005). The influence of competitive intensity and market dynamism on knowledge management capabilities of multinational corporation subsidiaries. *Journal of International Marketing*, 13(3), 32-53.
- Calantone, R., Garcia, R., & Dröge, C. (2003). The effects of environmental turbulence on new product development strategy planning. *Journal of product innovation management*, 20(2), 90-103.
- Dai, L., Maksimov, V., Gilbert, B. A., & Fernhaber, S. A. (2014). Entrepreneurial orientation and international scope: The differential roles of innovativeness, proactiveness, and risk-taking. *Journal of business venturing*, 29(4), 511-524.

- Davis, D., Morris, M., & Allen, J. (1991). Perceived environmental turbulence and its effect on selected entrepreneurship, marketing, and organizational characteristics in industrial firms. *Journal of the Academy of Marketing Science*, 19(1), 43-51.
- Gemici, E., & Zehir, C. (2021). High-performance work systems, learning orientation and innovativeness: the antecedent role of environmental turbulence. *European Journal of Innovation Management*.
- González-Benito, Ó., González-Benito, J., & Muñoz-Gallego, P. A. (2009). Role of entrepreneurship and market orientation in firms' success. *European Journal of Marketing*.
- Havakhor, T., Sabherwal, R., Steelman, Z. R., & Sabherwal, S. (2019). Relationships between information technology and other investments: A contingent interaction model. *Information Systems Research*, 30(1), 291-305.
- Hanvanich, S., Sivakumar, K., & Hult, G. T. M. (2006). The relationship of learning and memory with organizational performance: the moderating role of turbulence. *Journal of the Academy of Marketing Science*, 34(4), 600-612.
- Hartono, R., & Sheng, M. L. (2016). Knowledge sharing and firm performance: the role of social networking site and innovation capability. *Technology Analysis & Strategic Management*, 28(3), 335-347.
- Huang, C. T., & Tsai, K. H. (2014). Synergy, environmental context, and new product performance: A review based on manufacturing firms. *Industrial Marketing Management*, 43(8), 1407-1419.
- Jaworski, B. J., & Kohli, A. K. (1993). Market orientation: antecedents and consequences. *Journal of marketing*, 57(3), 53-70.
- Kmieciak, R., Michna, A. and Meczynska, A. (2012), "Innovativeness, empowerment and IT capability: evidence from SMEs", *Industrial Management & Data Systems*, 112(5), 707-728.
- Kuivaleinen, O., Sundqvist, S., Puumalainen, K., & Cadogan, J. (2004). "The effect of environmental turbulence and leader characteristics on international performance: are knowledge-based firms different? *Canadian Journal of Administrative Sciences*, 21, 35–50.
- Larbi-Siaw, O., Xuhua, H., Owusu, E., Owusu-Agyeman, A., Fulgence, B. E., & Frimpong, S. A. (2022). Eco-innovation, sustainable business performance and market turbulence moderation in emerging economies. *Technology in Society*, 68, 101899.
- Lee, R. P., & Tang, X. (2018). Does it pay to be innovation and imitation oriented? An examination of the antecedents and consequences of innovation and imitation orientations. *Journal of Product Innovation Management*, 35(1), 11-26.
- Li, H., & Atuahene-Gima, K. (2001). Product innovation strategy and the performance of new technology ventures in China. *Academy of management Journal*, 44(6), 1123-1134.
- Lin, X., & Germain, R. (2003). Organizational structure, context, customer orientation and performance: lessons from Chinese state-owned enterprises. *Strategic Management Journal*, 24, 1131–1151.
- Mokhtarzadeh, N. G., Mahdiraji, H. A., Jafarpanah, I., & Cao, D. (2022). Examining the Influence of Environmental Turbulence on Firm Innovation Performance in Emerging Markets: Using an Environment-Strategy-Performance Framework. *International Journal of Innovation Management*, 26(04), 2250028.



- Morris, M. H., Schindehutte, M., & LaForge, R. W. (2002). Entrepreneurial marketing: a construct for integrating emerging entrepreneurship and marketing perspectives. *Journal of marketing theory and practice*, 10(4), 1-19.
- Panjaitan, R. (2022). Towards Resilient MSMEs: The Role of Organizational Resilience and Entrepreneurial Resilience. *Jurnal Manajemen dan Keuangan*, 11(1), 97-111.
- Power, B., & Reid, G. (2005). "Flexibility, firm-specific turbulence and the performance of the long-lived small firm. *Review of Industrial Organization*, 26, 415–443.
- Sajjad, A., Ibrahim, Y., & Shamsuddin, J. (2022). The Moderating Role of Environmental Turbulence between Learning Orientation and SME Performance in the Manufacturing Sector of Pakistan. *Journal of Distribution Science*, 20(5), 1-11.
- Shalender, K., & Sharma, N. (2022). Integrating strategic flexibility and marketing system to achieve sustainable competitive advantage: conceptual refinement and framework. *World Review of Entrepreneurship, Management and Sustainable Development*, 18(1-2), 175-194.
- Tsai, K. H., & Yang, S. Y. (2014). The contingent value of firm innovativeness for business performance under environmental turbulence. *International Entrepreneurship and Management Journal*, 10(2), 343-366.
- Tsai, K. H., & Yang, S. Y. (2013). Firm innovativeness and business performance: The joint moderating effects of market turbulence and competition. *Industrial Marketing Management*, 42(8), 1279-1294.
- Turulja, L., & Bajgoric, N. (2019). Innovation, firms' performance and environmental turbulence: is there a moderator or mediator? *European Journal of Innovation Management*. 22(1), 213-232.
- Volberda, H., & Van Bruggen, G. (1997). Environmental turbulence: A look into its dimensionality. *NOBO-onderzoekdag*, 137-145.
- Wang, C., Qureshi, I., Guo, F., & Zhang, Q. (2022). Corporate Social Responsibility and Disruptive Innovation: The moderating effects of environmental turbulence. *Journal of Business Research*, 139, 1435-1450.
- Ward, P. T., & Duray, R. (2000). Manufacturing strategy in context: environment, competitive strategy and manufacturing strategy. *Journal of operations management*, 18(2), 123-138
- Waty, E., So, I. G., Indrajit, R. E., & Abdinagoro, S. B. (2022). Achieving Business Resilience through Environmental Turbulence in Indonesian Culinary SMEs. *Hong Kong Journal of Social Sciences*.
- Wong, S. K. S. (2014). Impacts of environmental turbulence on entrepreneurial orientation and new product success. *European Journal of Innovation Management*, 17(2), 229-249

**Review Papers**

- Abbas, M. W., & Ul Hassan, M. (2017). Moderating impact of environmental turbulence on business innovation and business performance. *Pakistan Journal of Commerce and Social Sciences (PJCSS)*, 11(2), 576-596.
- Arifiani, L., Prabowo, H., Furinto, A. F., & Kosasih, W. (2021). Respond to environmental turbulence sparks firm performance by embracing business model transformation: an empirical study on the internet service provider in Indonesia. *foresight*.
- Balodi, K. C. (2019). Strategic orientations and performance of young ventures: moderating role of environmental turbulence. *Management Decision*.

- Bodlaj, M., & Čater, B. (2019). The impact of environmental turbulence on the perceived importance of innovation and innovativeness in SMEs. *Journal of Small Business Management*, 57, 417-435.
- Davis, D., Morris, M., & Allen, J. (1991). Perceived environmental turbulence and its effect on selected entrepreneurship, marketing, and organizational characteristics in industrial firms. *Journal of the Academy of Marketing Science*, 19(1), 43-51.
- Ermaya, S. K., & Wibowo, L. A. (2020, February). The Impact of Environmental Turbulence and Dynamic Capabilities Toward Business Unit Performance (Case Study at Communication Organization Industries). In *3rd Global Conference On Business, Management, and Entrepreneurship (GCBME 2018)* (pp. 275-278). Atlantis Press.
- Faisal, M., Maarif, M. S., Fahmi, I., & Yulianto, B. (2022). Business Environment Turbulence and Industrial Connections Instruments as Determinants of Firm Performance Mediated by an Industrial Connections Climate. *Sustainability*, 14(19), 12150.
- Gyedu, S., Heng, T., Menyah, M. V., & Oti-Frimpong, J. (2021). The Moderating Effect of Environmental Turbulence on the Relationship Between Customer Relationship Management and Business Performance.
- Hilal, O. A., & Tantawy, A. A. (2021). Entrepreneurial marketing and bank performance in Egypt: is environmental turbulence a missing link?. *Journal of Entrepreneurship in Emerging Economies*, 14(2), 252-273.
- Ho, J., & Plewa, C. (2020). Recipes for new product success: the interplay between orientations and environmental turbulence. *Journal of Business & Industrial Marketing*.
- Ikhlaq, K., & Raza, S. (2022). A Theoretical Brand Equity Model for Marketing In Presence of Environmental Turbulence. *Journal of Marketing Strategies*, 4(1), 73-99.
- Iqbal, Q., Ahmad, N. H., & Li, Z. (2021). Frugal-based innovation model for sustainable development: Technological and market turbulence. *Leadership & Organization Development Journal*.
- Kemper, J., Schilke, O., & Brettel, M. (2013). Social capital as a microlevel origin of organizational capabilities. *Journal of Product Innovation Management*, 30(3), 589-603.
- Khourouh, U., Sudiro, A., Rahayu, M., & Indrawati, N. (2020). The mediating effect of entrepreneurial marketing in the relationship between environmental turbulence and dynamic capability with sustainable competitive advantage: An empirical study in Indonesian MSMEs. *Management Science Letters*, 10(3), 709-720.
- Kolade, O., Egbetokun, A., Rae, D., & Hussain, J. (2020). Entrepreneurial resilience in turbulent environments: the role of spiritual capital. In *Research Handbook on Entrepreneurship in Emerging Economies*. Edward Elgar Publishing.
- Kolade, O., Egbetokun, A., & Obembe, D. (2020). Skilled Hands in Turbulent Winds: Entrepreneurial Skills and New Venture Performance in Conflict-Ridden Northern Nigeria. *Journal of International Business Education*, 15, 27-54.
- Kowalik, I., Danik, L., & Pleśniak, A. (2022). Entrepreneurial marketing orientation of the Polish and Finnish SMEs and its environmental determinants. *Journal of Business & Industrial Marketing*, (ahead-of-print).
- Kuivalainen, O., Sundqvist, S., Puumalainen, K., & Cadogan, J. W. (2004). The effect of environmental turbulence and leader characteristics on international performance: are knowledge-based firms different?. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration*, 21(1), 35-50.

- Lichtenthaler, U. (2009). Absorptive capacity, environmental turbulence, and the complementarity of organizational learning processes. *Academy of management journal*, 52(4), 822-846.
- Liu, Y., Deng, P., Wei, J., Ying, Y., & Tian, M. (2019). International R&D alliances and innovation for emerging market multinationals: Roles of environmental turbulence and knowledge transfer. *Journal of Business & Industrial Marketing*.
- Ma, C., Liu, H., Gu, J., & Dou, J. (2018). How entrepreneurs' Zhong-yong thinking improves new venture performance: The mediating role of guanxi and the moderating role of environmental turbulence. *Chinese Management Studies*.
- Mohammed, A. R. J., Zahari, M. S. M., Hanafiah, M. H., & Rahman, A. R. A. (2021). Foreign tourist satisfaction, commitment and revisit intention: exploring the effect of environmental turbulence in the Arab region. *Journal of Islamic Marketing*.
- Mokhtarzadeh, N. G., Mahdiraji, H. A., Jafarpanah, I., & Cao, D. (2022). Examining the Influence of Environmental Turbulence on Firm Innovation Performance in Emerging Markets: Using an Environment-Strategy-Performance Framework. *International Journal of Innovation Management*, 26(04), 2250028.
- Morić-Milovanović, B. (2022). Exploring direct and non-linear effects of entrepreneurial orientation and its dimensions on firm performance in a small, open, transitional economy. *Strategic Management*, 27(3), 26-38.
- Morris, M. H., & Lewis, P. S. (1995). The determinants of entrepreneurial activity: Implications for marketing. *European journal of marketing*.
- Murphy, R., & Seriki, O. (2021). The impact of environmental turbulence on the strategic decision-making process in Irish quantity surveying (QS) professional service firms (PSFs). *Construction Management and Economics*, 39(9), 739-758.
- Naheed, K., Aamir, M., & Ahmad, N. (2019). Mediation of firm innovativeness and moderation of environment turbulence on entrepreneurial orientation and firm performance. *Journal of Law & Social Studies*, 1(1), 13-26.
- Naman, J. L., & Slevin, D. P. (1993). Entrepreneurship and the concept of fit: A model and empirical tests. *Strategic management journal*, 14(2), 137-153.
- Ngunjiri, E. B. O. (2021). *Strategic Response to Environmental Turbulence in the Hotel Industry: A case of Golf Hotel & Country Clubs in Nairobi City County* (Doctoral dissertation, United States International University-Africa).
- Ojha, D., Struckell, E., Acharya, C., & Patel, P. C. (2020). Managing environmental turbulence through innovation speed and operational flexibility in B2B service organizations. *Journal of Business & Industrial Marketing*.
- Onamusi, A. B., Makinde, G. O., & Akinlabi, B. H. (2020). Entry Mode Strategy, Firm-Level Capability, Environmental Turbulence, and Organisational Performance: A Moderated Analysis. *Management and Economics Review*, 5(2), 278-290.
- Pratono, A., & Mahmood, R. (2014, June). Moderating Impact of Environmental Turbulence in the Relationship between Entrepreneurial Management and Firm Performance. In *Pratono, AH, & Mahmood (2014). "Moderating Impact of Environmental Turbulence in the Relationship between Entrepreneurial Management and Firm Performance" Presented for The 3rd International Conference on Social Science and Business*.
- Reed, J. H. (2020). Strategic agility and the effects of firm age and environmental turbulence. *Journal of Strategy and Management*.
- Rofiq, A., & Pramono, S. (2019). The role of strategic planning and flexibility in shaping SMEs market orientation in turbulence business environment.

- Sajilan, S., & Tehseen, S. (2015). Cultural orientations, entrepreneurial competencies and SMEs business success: The contingent roles of environmental turbulence and network competence. *Review of Integrative Business and Economics Research*, 4(2), 20.
- Samson, A. T. (2015). The impact of entrepreneurial orientation, reconfiguring capability and moderation of environmental turbulence on export performance of SMEs in Nigeria. *Journal of Economics and Behavioral Studies*, 7(3 (J)), 76-87.
- Selamet, T., Mursitama, T. N., Furinto, A., & Heriyati, P. (2022). An Exploratory Study Of Environmental Turbulence Moderates The Influence Of Important Factors On Sustainable Business Growth: Empirical Evidence From Indonesian Multi-Level Marketing Company. *Journal of Positive School Psychology*, 1286-1305.
- Shabbir, S., Danish, R. Q., Rehman, M., Hasnain, M., & Asad, H. (2021). An empirical investigation of environmental turbulence and fear in predicting entrepreneurial improvisation. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(2), 157.
- Turulja, L., & Bajgoric, N. (2018). Innovation, firms' performance and environmental turbulence: is there a moderator or mediator?. *European Journal of Innovation Management*.
- Wardi, Y., Susanto, P., Abror, A., & Abdullah, N. L. (2018). Impact of entrepreneurial proclivity on firm performance: The role of market and technology turbulence. *Pertanika J Soc. Sci. & Hum*, 26, 241-250.
- Waty, E., So, I. G., Indrajit, R. E., & Abidinagoro, S. B. (2022). Achieving Business Resilience through Environmental Turbulence in Indonesian Culinary SMEs. *Hong Kong Journal of Social Sciences*.
- Weingarth, J., Richter, J., & Rosenkranz, C. (2018). Information Technology-Enabled Enterprise Agility and Environmental Turbulence "A Configurational Literature Review.
- Witschel, D., Baumann, D., & Voigt, K. I. (2022). How manufacturing firms navigate through stormy waters of digitalization: The role of dynamic capabilities, organizational factors and environmental turbulence for business model innovation. *Journal of Management & Organization*, 28(3), 681-714.
- Wilden, R., & Gudergan, S. P. (2015). The impact of dynamic capabilities on operational marketing and technological capabilities: investigating the role of environmental turbulence. *Journal of the Academy of Marketing Science*, 43(2), 181-199.
- Wong, S. K. S. (2014). Impacts of environmental turbulence on entrepreneurial orientation and new product success. *European Journal of Innovation Management*.
- Yang, J., Ma, J., Zhao, H., Cater, J., & Arnold, M. (2019). Family involvement, environmental turbulence, and R&D investment: evidence from Listed Chinese SMEs. *Small Business Economics*, 53(4), 1017-1032.
- Yulianto, E. (2021). The role of inbound and outbound open innovation on firm performance in environmental turbulence era: Mediating of product and marketing innovation. *Management Science Letters*, 11(9), 2347-2358.
- Zaidi, S. S. A., & Zaidi, S. S. Z. (2021). Linking Entrepreneurial Orientation and Innovation Intensity: Moderating Role of Environmental Turbulence. *Journal of Entrepreneurship, Management, and Innovation*, 3(2), 202-236.
- Zhang, C. X., & Bang, H. Y. (2021). The Relationship between Dynamic Capabilities, Marketing Capabilities, and Environmental Turbulence: An Empirical Study from China. *The Journal of Asian Finance, Economics and Business*, 8(12), 529-540.
- Zimuto, C., Sandada, M., Chuchu, T., & Ndoro, T. (2018). The Impact of Environmental Turbulence on Product Innovation in Small to Medium Enterprises in Harare, Zimbabwe. *Journal of Economics and Behavioral Studies*, 10(6A (J)), 56-63.