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MODERATING EFFECT OF THE ECONOMIC CRISIS AND MARKET TURBULENCE IN SMALL COMPANIES IN THE LEGAL AMAZON

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Abstract
Objective: To investigate the moderating effect of the economic crisis (CS) and market turbulence (MT) variables in the relationship between open-mindedness (OM) and entrepreneurial resilience (ER) of managers working in small companies located in the Legal Amazon.
Method/approach: Data analysis involved Exploratory Factor Analysis (AFE), Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) of 299 managers working in small businesses in the Legal Amazon.
Originality/Relevance: This article advances in the analysis of the relationship between the OM, ER, CS and TM variables during the Covid-19 pandemic period. In addition, the participation of managers of small companies in the Legal Amazon can contribute to decision-making in a region with resource asymmetry.
Main results: The empirical model demonstrates the moderating effect of the CS and TM variables on MA and RE in a resource-constrained environment further aggravated by the effects of the Covid-19 pandemic.
Theoretical/methodological contributions: First empirical evidence involving the moderating effect of the CS and TM variables in the relationship between OM and ER with the participation of managers of small companies located in the Legal Amazon. It is recommended that new theoretical and empirical models be tested in different regions, in order to advance the findings.
Practical implications: This article provides useful information for managers of small companies located in geographical regions with resource constraints, difficult access, social inequality and low population income, typical of developing countries.

Keyword: Economic crisis. Market turbulence. Legal Amazon. Entrepreneurial resilience. Open-mindedness.

EFEITO MODERADOR DA CRISE ECONÔMICA E DA TURBULÊNCIA DE MERCADO EM PEQUENAS EMPRESAS DA AMAZÔNIA LEGAL

Resumo
Objetivo: Investigar o efeito moderador das variáveis crise econômica (CS) e turbulência de mercado (TM) na relação entre mente aberta (MA) e resiliência empreendedora (RE) de gestores que atuam em pequenas empresas localizadas na Amazônia Legal.
Método/abordagem: A análise dos dados envolveu a Análise fatorial exploratória (AFE), Análise fatorial confirmatória (AFC) e Modelagem de equações estruturais (MEE) de 299 gerentes que atuam em empresas de pequeno porte na Amazônia Legal.
Originalidade/Relevância: Esse artigo avança na análise da relação entre as variáveis MA, RE, CS e TM no período de pandemia de Coronavírus (Covid-19). Além disso, a participação de gestores de pequenas empresas da Amazônia Legal pode contribuir para a tomada de decisão numa região com assimetria de recursos.
Principais resultados: O modelo empírico demonstra o efeito moderador das variáveis CS e TM sobre MA e RE em um ambiente de restrições de recursos agravado ainda mais pelos efeitos da pandemia de Covid-19.
Contribuições teóricas/metodológicas: Primeira evidência empírica envolvendo o efeito moderador das variáveis CS e TM na relação entre MA e RE com participação de gestores de pequenas empresas localizadas na Amazônia Legal. Recomenda-se que novos modelos teóricos e empíricos sejam testados em diferentes regiões, visando avançar nos achados.
Contribuições Sociais/Gerenciais: Este artigo fornece informações úteis para gestores de pequenas empresas instaladas em regiões geográficas com restrições de recursos, dificuldade de acesso, desigualdade social e baixa renda da população, típica de países em desenvolvimento.

Palavras-chave: Crise econômica. Turbulência de mercado. Amazônia Legal. Resiliência empreendedora. Mente aberta.

EFECTO MODERADOR DE LA CRISIS ECONÓMICA Y LA AGITACIÓN DEL MERCADO EN LAS PEQUEÑAS EMPRESAS DE LA AMAZONÍA LEGAL

Resumen
Objetivo: Investigar el efecto moderador de las variables de crisis económica (CS) y turbulencia de mercado (TM) sobre la relación entre mente abierta (MA) y resiliencia empresarial (RE) de gerentes que trabajan en pequeñas empresas ubicadas en la Amazonía Legal.
Método/enfoque: El análisis de datos involucró Análisis Factorial Exploratorio (AFE), Análisis Factorial Confirmatorio (CFA) y Modelado de Ecuaciones Estructurales (MEE) de 299 gerentes que trabajan en pequeñas empresas en la Amazonía Legal.
Originalidad/Relevancia: Este artículo avanza en el análisis de la relación entre las variables MA, RE, CS y TM en el período de la pandemia de Covid-19. Además, la participación de gerentes de pequeñas empresas en la Amazonía Legal puede contribuir a la toma de decisiones en una región con asimetría de recursos.
Resultados principales: El modelo empírico demuestra el efecto moderador de las variables CS y TM sobre MA y RE en un entorno de recursos limitados agravado aún más por los efectos de la pandemia Covid-19.
Aportes teóricos/metodológicos: Primera evidencia empírica que involucra el efecto moderador de las variables CS y TM en la relación entre MA y RE con la participación de gerentes de pequeñas empresas ubicadas en la Amazonía Legal. Se recomienda que se prueben nuevos modelos teóricos y empíricos en diferentes regiones, con el fin de avanzar en los hallazgos.
Contribuciones sociales/de gestión: Este artículo proporciona información útil para los administradores de pequeñas empresas ubicadas en regiones geográficas con limitaciones de recursos, difícil acceso, desigualdad social y bajos ingresos de la población, típico de los países en desarrollo.

Palabras clave: Crisis económica. Agitación del mercado. Amazon legal. Resiliencia empresarial. Mente abierta.

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Introduction

The war scenario caused by Covid-19 has certainly generated disproportionate consequences for the population, organizations and the economy (Bapuji et al., 2020; Guerra et al., 2021). As a result, researchers around the world are investigating the consequences of the pandemic, including for small businesses (Falaster et al., 2020).

Late industrialization of developing countries (Rivera-quiñones, 2021) further accentuated the inequality between regions within the Brazilian territory itself (Bhering, 2021). Despite the difficulties, the entrepreneurial mindset can be an alternative for the development of internal and external capabilities aimed at generating new ventures, especially in adversity (Maritz et al., 2020). Possible changes in customer consumption patterns and business models of companies may have been consequences of Covid-19 (Caiazza et al., 2021), impacting on the reduction of small business revenues in periods of economic crisis (Peric and Vitezic, 2016).

The Legal Amazon comprises nine states covering an area of approximately 60% of the national territory (IBGE, 2020). This extensive territorial strip is located in a vulnerable region, with low human development indices (HDI) and income of the population, high informality at work, social inequality and the presence of ethnic minorities (Guerra et al., 2021).

Small businesses are important for the regional economy of the Legal Amazon, as they generate employment and income for the population. In addition, this region suffers from an asymmetry of tangible and intangible resources, aggravated by logistical problems due to the geographic distance from the main producing and consuming centers of products.

Small businesses are more vulnerable to market adversities (Nassif, Armando, and La Falce, 2020). Thus, the Covid-19 pandemic further hampered the demand of small companies located in distant regions due to the worsening of market turbulence and the economic crisis. These tribulations may have affected the decision-making of small business managers, and it is necessary to encourage an open mind and entrepreneurial resilience in adverse periods.

Given the context of Covid-19, we intend to answer the following question: *What is the effect of the moderating variables market turbulence and economic crisis on the relationship between open-mindedness and entrepreneurial resilience?* Therefore, this article aims to investigate the moderating effect of the variables economic crisis and market turbulence on the relationship between open-mindedness and entrepreneurial resilience of managers working in small companies located in the Legal Amazon.

In addition to the introduction, this article is structured in five more sections. The second section refers to the theoretical framework, hypotheses and empirical model. The third section demonstrates the applied method. The fourth section concerns the investigation results. The fifth section reveals the discussion, main findings and theoretical and managerial implications. The sixth section presents final considerations, limitations and future research.

Theoretical review and hypotheses

Impact of the Covid-19 pandemic on small businesses

The Covid-19 pandemic has caused huge economic losses to thousands of companies around the world (Aifuwa, Musa and Aifuwa, 2020), especially in small businesses (Fabeil, Pazim and Langgat, 2020). Bartik et al. (2020) analyzed a sample of more than 5,800 small businesses in the initial period of the Covid-19 pandemic. The results reveal that a few weeks after the beginning of the crisis, there were already mass layoffs and the closing of several companies.

Falaster et al. (2020) encourage researchers in the area of strategy to understand the impact of the Covid-19 pandemic on organizations. Despite this, little is known about how small businesses will react to the effects of the coronavirus crisis (Alves et al., 2020). Fabeil, Pazim and Langgat (2020) point out that small businesses were directly affected by the effects of restrictions arising from Covid-19, especially in developing countries.

Although small businesses are important for job creation, these organizations are more susceptible to reduced demand (Nassif, Armando and La Falce, 2020). Problems in income distribution, job generation and low HDI (Human Development Index) rates can further exacerbate the effects of the Covid-19 pandemic on organizations (Guerra et al., 2021).

Wu and Olson (2020) claim that the impact of the Covid-19 pandemic affected the granting of bank loans to small and medium-sized companies. Wang et al. (2021) indicate that governments in several countries are looking for ways to mitigate the economic impact of Covid-19 on small and medium-sized companies.

In China, some factors made it easier for small businesses to obtain financial resources: more flexible loans during the pandemic; greater chances of extending the payment in the long term; lower costs, maturities and resources likely to be unsecured (Song et al., 2021).

Weiss, Schwarzenberg and Nelson (2020) claim the impact of the Covid-19 pandemic affected the global economy in a similar way to the Great Depression of the 1930s. Between the months of March and April 2020, governments of several countries announced measures in order to stop the extension of the global economic downturn. In Brazil, some measures taken by the government to facilitate access to obtaining financial resources by small and medium-sized companies, at the beginning of the Covid-19 pandemic, were the following:

> On March 16, 2020, the National Monetary Council (CMN) approved measures that will allow banks to (1) increase loans and offer better conditions for businesses and households over the next six months and (2) extend certain maturities. of loans for the next six months.
>
> On April 1, 2020, the Brazilian government announced: IOF cut in 90 days (this measure will cost R$ 7 billion reais); extension of the deadline for the submission of the 2019 base year net income report to June 30 from April 30. In addition, it will allow companies to defer payment of certain tax contributions for two months and reduce wages by up to 70% (or the minimum wage) for three months, among other measures (Weiss, Schwarzenberg and Nelson, 2020, p. 54).

Although all the factors mentioned are important to face the effects of the pandemic on organizations, these actions were not enough to reduce the damage caused by the coronavirus to the economy, especially to small businesses. Thus, it is essential that small companies rethink their business models and develop strategies based on an open mind and entrepreneurial resilience on the part of managers.

Relationship between open-mindedness (OM) and entrepreneurial resilience (ER)

Open-mindedness (OM) is a construct grounded in organizations that learn. The initial idea was spread by Senge (1992) and later improved by Sinkula (1994) and Sinkula, Baker and Noordewier (1997). For Senge (1992), open-mindedness is the ability of managers to review and question current management models, with the aim of improving and continuing the business in the long term. Therefore, it is necessary for the manager to renew learning from the change process, shared vision, information processes and an open-mindedness (Sinkula, Baker and Noordewier, 1997), aiming to create and absorb new ideas, especially in times of economic crisis and market turbulence (Jaworski and Kohli, 1993).

The power of the mind influences the decision-making process of managers (Fiol and O'Connor, 2004), contributing significantly to the managerial performance gradient of entrepreneurs (van Rensburg and Ogujiuba, 2020). The decision-making process is often flawed as it relies on interpretations, commitments to resilience, concerns about failure, reluctance to simplify, and under-specifications of structures. (Weick et al., 1999; Weick and Sutcliffe, 2011). This diversity of factors can contribute to the emergence of new failures, especially if decision-making is exercised by managers who work in adverse situations (Hertati et al., 2020). Therefore, resilience is needed on the part of organizational managers (Pashapour et al., 2019; Peric and Vitezic, 2016).

Entrepreneurial resilience is the ability of the decision maker to overcome challenges and persist in the entrepreneurial process in adverse scenarios and unexpected situations (Awotoye and Singh, 2017). Despite this, entrepreneurial resilience can still be influenced by the context of insertion, from different areas of knowledge (Cellini and Cuccia, 2019) and situational factors (Cooper, Flint-Taylor and Pearn, 2013).

Based on this, we intend to test the hypothesis:

H1: In small organizations in the Legal Amazon, there is a positive and significant relationship between the variables Open-Mindedness (OM) and Entrepreneurial Resilience (ER).

Market turbulence (MT)

The high competition in the market has accelerated the process of changes in products and services. Uncertainty has caused changes in demand patterns and market fluctuations (Kohli and

Jaworski, 1990), what made MT a common variable in the contemporary business environment (Senbeto and Hon, 2020).

MT can be related to changes in the purchase of products by customers (Kohli and Jaworski, 1990), difficulty in dealing with market uncertainties (Miller, 1992) or competitive strength (Jaworski and Kohli, 1993). The environment of instability has impacted the ability of managers to formulate strategies, aiming to overcome the challenges of MT (Senbeto and Hon, 2020). Therefore, the choice of organizational strategy must be aligned with the corporate environment (Porter, 1980).

Small companies are concerned with the development of strategic actions aimed at survival in the crisis scenario (Falaster et al., 2020). The Covid-19 pandemic has affected demand for products, especially from small businesses. Thus, it is necessary to develop regional public policies that are capable of promoting entrepreneurship, diversification and a more resilient economic capacity (Nassif, Armando and La Falce, 2020). This market instability harmed the organizations supply chain, influencing the consumption patterns of products and services. For this reason, it is necessary to rethink business models, especially for SMEs (Caiazza et al., 2021).

In this sense, the scenario of economic crisis and market turmoil requires entrepreneurial resilience on the part of small business managers. However, small business managers need to be able to keep an open-mindedness making business models more resilient in adverse times.

H2: In small organizations in the Legal Amazon, Market Turbulence (TM) positively and significantly moderates the relationship between Open-Mindedness (OM) and Entrepreneurial Resilience (ER).

Economic crisis (CS)

Economic crisis (CS) is a period of financial instability caused by interruptions or sudden changes that may compromise human or organizational survival. The economic crisis can give rise to several consequences, such as: natural disasters (Busch, 2011), disasters, pandemics, epidemics (Alwidyan, Trainor and Bissell, 2020), periods of economic recession and falling asset prices (Bluedorn, Decressin and Terrones, 2016) or damage to the supply chain (Elluru et al., 2019) that puts the community at risk.

A severe economic downturn can jeopardize a nation's development, causing dramatic consequences and implications over a long period of time (Kotz, 2008). The crisis can spread to regions not directly affected in the initial period and negatively influence production, consumption and international trade between countries. A long period of economic crisis can lead to unemployment, a drop in family income, a reduction in purchasing power and company bankruptcy (Stiglitz, 2000).

Even in times of recession, it is important to understand the variables and processes that make companies grow faster or with greater resilience than others (Peric and Vitezic, 2016). Small businesses

are vulnerable to times of crisis; however, little is known about how these organizations will react to the lasting effects of the crisis, such as the Covid-19 pandemic (Alves et al., 2020).

Based on this context, the following hypotheses should be tested:

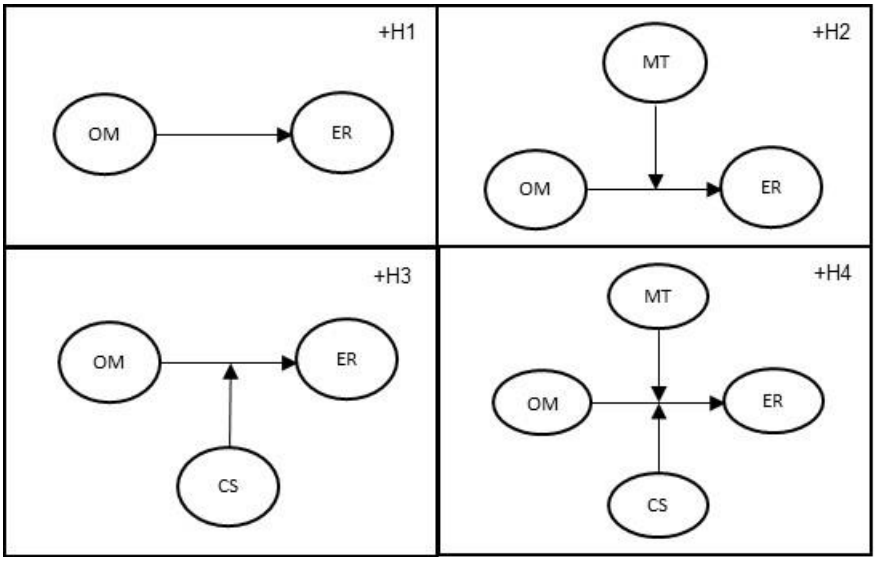
H3: In small organizations in the Legal Amazon, Economic Crisis (CS) moderates the relationship between Open-mindedness (OM) and Entrepreneurial Resilience (ER).

H4: In small organizations in the Legal Amazon, there is moderation of the variables Market Turbulence (MT) and Economic Crisis (CS) on Open-mindedness (OM) and Entrepreneurial Resilience (ER).

Figure 1 indicates the hypotheses and empirical relationships to be tested.

Figure 1

Proposed empirical model



Note: OM=Open-Mindedness, MT=Market Turbulence, CS=Economic Crisis, ER=Entrepreneurial Resilience.
Source: Prepared by the authors.

Method

This section is divided into six subtopics: the first concerns the investigation environment that brought together small companies located in the Legal Amazon. The second involves 299 small businesses in the investigated region. The third sub-item portrays the common method bias that can be a threat to quantitative research. The fourth subtopic demonstrates the measurement variables of the study. The fifth sub-item gives a brief explanation of single and double moderation. The sixth subtopic refers to the analysis of research data.

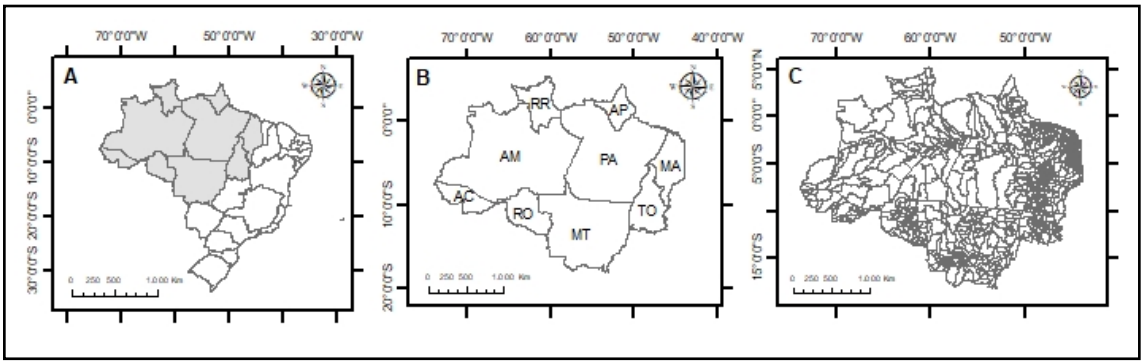
Research environment

Figure 2 presents the territorial delimitation of the Legal Amazon. Panel A demonstrates the geographic limit of the Legal Amazon from the perspective of the map of Brazil (cross hatched region). Panel B indicates the states belonging to the investigated region: Acre (AC), Amapá (AP), Amazonas (AM), Mato Grosso (MT), Pará (PA), Rondônia (RO), Roraima (RR) and Tocantins (TO), and part of Maranhão (MA). Finally, panel C presents the microregions of the Legal Amazon.

The present study involved companies located in the capitals, metropolitan regions or in the municipalities of the interior of the nine investigated states. In 2017, small businesses represented around 22.4% of the total number of organizations installed in the Legal Amazon, which is equivalent to 24.9% of formal jobs generated by the industrial sector (Portal da indústria, 2020).

Figure 2

Legal Amazon Area (A and B) and micro-regions covered (C)



Source: Prepared by the authors.

Data collect

The empirical model was built based on a survey measured by a five-point Likert-type scale (1-strongly disagree; and 5-strongly agree), adapted from Sinkula, Baker and Noordewier, 1997; Santoro, Messeni-Petruzzelli and Del Giudice, 2020; Jaworski and Kohli, 1993; Herbane, 2013). The investigated sample brought together 299 managers of different genders and ethnicities who work in decision-making in small businesses located in the Legal Amazon.

The research questionnaire was translated from English into Portuguese by two professionals with skills in both languages. Reverse translation was used to ensure the original meaning of the statements.

Data collection was carried out through two sending waves to 953 target companies between March and June 2020. The electronic link to the questionnaire was generated by Google Forms and made available to participating companies. Despite this, it was necessary to make telephone calls to obtain a return on 299 small businesses, which corresponds to a return rate of 31.38%. This percentage already excludes outliers, blank or biased answers. There were no severe extreme cases.

Common Method Bias (CMB)

The common method bias (CMV) can be a threat to the results obtained in research in several areas of knowledge, including administration (Jakobsen and Jensen, 2015; Fuller et al., 2016). CMB can happen when the dependent and independent variables are obtained by the same response method (Kock, Berbekova and Assaf, 2021). The occurrence of CMB can cause problems in measuring constructs due to Type I and Type II errors (Chang, van Witteloostuijn and Eden, 2010), harmful to the validity and reliability of the research (MacKenzie and Podsakoff, 2012). One of the problems that the CMB can generate is when respondents have a low level of cognition, demonstrating a greater propensity for similar and/or neutral responses (Podsakoff, MacKenzie and Podsakoff, 2012).

To avoid CMB, data collection was performed in two waves. The first collection was carried out in March and April (valid sample of 183 cases). The second wave was applied between May and June 2020 (valid sample of 116 cases). The two collections did not show significant variations in relation to descriptive statistics, being considered adequate.

In addition, Harman's single factor test was used (Fuller et al., 2016) and the following procedures (Podsakoff et al., 2003; Kock, Berbekova and Assaf, 2021): the respondents were qualified for being managers of SMEs; the language of the statements was clear and concise; the questions were alternated (no labels), making it difficult to establish a causal link between the questions; the number of assertions was not extensive (only 12 specific questions); and, the anonymity of the respondents was guaranteed.

Finally, the database was analyzed by different researchers, aiming to compare the results obtained in relation to the variables analyzed. Furthermore, it can be seen the use of control and statistical procedures to avoid CMB before and after data collection (ex ante and ex post). Thus, it can be said that this research is free from common method bias.

Measurement of variables

Independent variable: Open-mindedness is the ability of managers to review and/or question current management models, with the aim of acting specifically in the long term (Senge, 1992). This research measured the open-mindedness construct through three questions adapted from Sinkula, Baker and Noordewier (1997).

Dependent variable: Entrepreneurial resilience is a measure of capacity related to the response time to a troubled or adverse situation that jeopardizes the survival of enterprises (Branicki, Sullivan-Taylor and Livschitz, 2018; Herbane, 2019). This research made use of entrepreneurial resilience based on three assertions adapted from Santoro, Messeni-Petruzzelli and Del Giudice (2020).

Moderator variables: This research used two moderating variables: market turbulence (MT) and economic crisis (CS) (Appendix A). To measure TM, three assertions were used, adapted from

Jaworski and Kohli (1993). The economic crisis was measured by three other items adapted from Herbane (2013).

Control variables: The variables gender, age, state, income, sector and ethnicity were used.

Single and double moderation

Moderation can influence an empirical model in several ways. In general, the action of an indirect variable happens in a single or double way. Simple moderation exists when an indirect variable (W) systematically modifies the strength of the relationship between the predictor variable (X) and the criterion variable (Y) (Sharma, Durand and Gur-Arie, 1981). Double moderation, on the other hand, occurs from the intervention of indirect variables (W and M) in the X→Y relation (Baron and Kenny, 1986; Preacher, Rucker and Hayes, 2007).

Thus, the analysis of moderation can be complex depending on the relationships established and the number of variables inserted in the model (Hayes and Rockwood, 2017). Despite the particularities of this type of relationship, inconsistent results are often seen in previous research (Vieira, 2009). In this sense, moderation must be understood more clearly, aiming at the correct application and analysis (Preacher and Hayes, 2004).

In summary, moderation is demonstrated by Equations 1, where: i is the intercept of the regression; e_Y is the error when estimating Y; b_1, b_2 and b_3 correspond to the main effect of the independent variable X on Y; W indicates the moderating variable; and, the indirect effect is represented by the XW interaction.

$$Y = i + b_1X + b_2W + b_3XW + e_Y \quad (1)$$

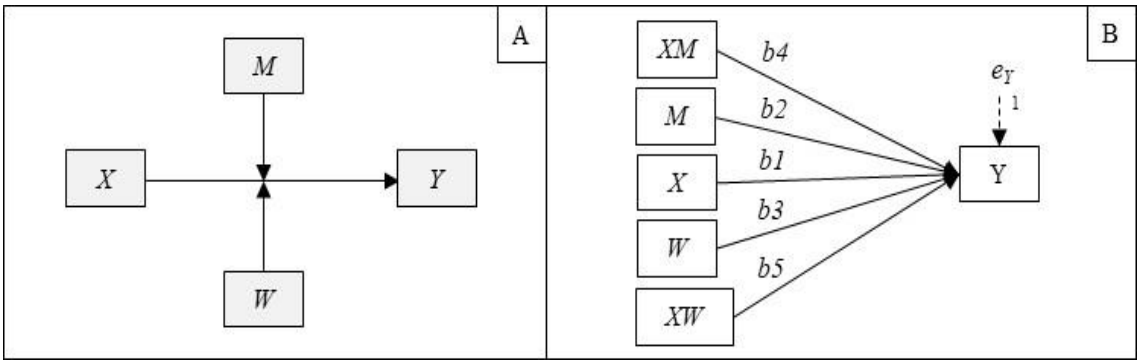
In case of double moderation (Figure 3), Equation 2 must be used:

$$Y = i + b_1X + b_2M + b_3W + b_4XM + b_5XW + e_Y \quad (2)$$

Figure 3 presents a panel composed of two images. Panel A demonstrates the direct relationship of X to Y, in addition to the moderating variables M and W. Panel B indicates the relationship between variables X, M and W over Y, and their respective interactions (XM and XW).

Figure 3

Direct effect of X on Y with double moderation of M and W (A) and paths in a double moderation model (B)



Source: Adapted from Hayes (2017)

Data analysis

In addition to descriptive statistics (means, standard deviations and asymmetry and kurtosis tests of the constructs), Exploratory Factor Analysis (EFA) was used due to the originality of the model. After confirming the normality of the data, confirmatory factor analysis (CFA) was applied to verify the convergent and discriminant validity and internal reliability of the questionnaire.

Having met these requirements, the multiple hierarchical regression and SEM were started, aiming to verify the moderating effect of the MT and CS variables on OM→ER. The hypothesis test was applied to confirm the proposed relationships. All statistical procedures were performed with the help of software IBM SPSS® and Amos®, versions for Windows.

Results

Descriptive statistics

Respondents are characterized as 51.8% women and 48.2% men; the responding managers with the highest participation claimed to be between 36 and 45 years old (n=94, 31.4%), the minimum age was 24 (n=46, 15.4%) and the maximum age was over 56 years old (n= 38, 12.7%). The states of the Legal Amazon with the highest participation were, respectively: Pará (n=96, 32.1%), Amazonas (n=90, 30.1%) and Maranhão (n=31, 10.4%). The state with the lowest number of responses was Roraima (n=5, 1.7%).

With regard to income, it can be seen that the salary reported is, on average, less than R$ 2,811.00. The sector of activity with the highest number of respondents was service (n=131, 43.8%), followed by industry (n=168, 56.2%). The trade sector was not investigated. Regarding ethnic-cultural origin, respondents declared themselves to be indigenous (n=185, 61.9%), Afro-descendants (n=101, 33.8%) and Europeans (n=13, 4.3%).

The investigated sample was quite diversified, covering the following activities: petroleum products and biofuels (n=53, 17.7%), beverages (n=52, 17.4%), information technology, electronics and optics (n=51, 17.1%), extraction of non-metallic minerals (n=37, 12.4%), pulp and paper (n=29, 9.4%), rubber and plastic material (n=28, 9.4%), extraction of metallic minerals (n=20, 6.7%), construction (n=20, 6.7%) and food (n=9, 3.0%). Most companies reported operating in the market for less than 10 years (n=277, 92.6%).

Table 1

Descriptive statistics results

Variables	Sample	Minimum	Maximum	Average	SD	sk	ku
Gender	299	1.00	2.00	1.482	0.500	0.074	-2.008
Age	299	1.00	5.00	2.870	1.231	0.164	-0.848
State	299	1.00	9.00	4.562	2.195	0.832	-0.455
Income	299	1.00	4.00	1.846	0.800	0.324	-1.254
Sector	299	1.00	2.00	1.562	0.497	-0.251	-1.950
Ethnicity	299	1.00	3.00	1.425	0.577	0.985	-0.021
OM	299	4.00	15.00	11.020	2.655	-0.350	-0.652
ER	299	3.00	15.00	11.635	2.365	-0.827	0.610
MT	299	4.00	15.00	11.756	2.314	-0.451	-0.127
CS	299	3.00	15.00	10.194	3.010	-0.379	-0.581

Note(s): SD= Standard deviation, sk=Asymmetry, ku=Kurtosis, OM=Open-mindedness, ER= Entrepreneurial resilience, MT=Market turbulence, CS=Economic crisis.
Source: Survey data (2020)

The results of descriptive statistics were analyzed by the values in Table 1, being considered acceptable. The asymmetry (|sk|<3) and kurtosis (|ku|<10) tests suggest normal distribution, since they oscillated within an acceptable range. (Pestana and Gageiro, 2005; Marôco, 2010). Obtaining data normality is a prerequisite for AFC (Hair Jr. et al., 2009).

Exploratory Factor Analysis (EFA) and Correlation

The AFE was applied because the empirical proposal was original (Appendix A). The uniqueness of the model is due to the fact that the proposed relationship has never been combined before. Despite this, the relationships tested still require adherence to the theory (Hair Jr. et al., 2009).

Cronbach's alpha was 0.832, ranging from 0.717 to 0.771 per construct (Pestana and Gageiro, 2005). The value of the KMO test (Kaiser-Meyer-Olkin) close to 0.8 indicates that the EFA should be continued. Factor loadings greater than 0.7 indicate acceptability, since they exceeded the minimum value of 0.5. In this line of reasoning, the commonality indices (h^2>0.5) suggest acceptance. The TVE (total variance extracted) showed a perfect grouping of the variables into four factors, attesting to an explanation percentage of 68.29% (Appendix A).

Table 2

Correlation matrix between variables

Variables	Gender	Age	State	Sector	Ethnicity	OM	ER	MT	CS
Gender	1	.119*	-.024	.123*	-.281**	.010	-.086	.001	.158**
Age		1	.020	.021	.040	-.045	.025	-.134*	.002
State			1	.070	.174**	-.102	-.053	-.083	-.161**
Sector				1	.066	-.026	.049	-.090	-.013
Ethnicity					1	-.056	-.034	-.118*	-.101
OM						1	.392**	.327**	.294**
ER							1	.447**	.306**
MT								1	.330**
CS									1

Note(s): OM=Open-mindedness, ER=Entrepreneurial resilience, MT=Market turbulence, CS=Economic crisis, * p<0,05, ** p< 0,01.
Source: Survey data (2020)

Correlation results indicate a small to moderate effect (Cohen, 1988) or low to small (Hinkle, Wiersma and Jurs, 2003) for the correlation coefficients obtained. The absence of multicollinearity was evidenced by the results of the VIF (Variance Inflation Factor) being less than 10 (Pestana and Gageiro, 2005). The results of correlations between the variables were satisfactory, ranging from 0.294 to 0.447 (Table 2).

Confirmatory factor analysis (CFA)

The AFC allows attesting the reliability, internal consistency, convergent and discriminant validity of the data (Hair Jr. et al., 2009). Reliability is an indicator of convergent validity, and must be analyzed together, for example: associated with Cronbach's alpha and CR (*Composite Reliability*) (Hair Jr. et al., 2009). Convergent validity is verified by AVE (*Average Variance Extracted*). High reliability indicates that the questionnaire measures what it purports to measure (Hair Jr. et al., 2009; Souza, Alexandre and Guirardello, 2017).

Hair Jr. et al. (2009) recommend that CVA values be ≥ 0.5, CR and Cronbach's alpha ≥ 0.7. The square root of the AVE indicates that the values of the diagonal in bold (Table 3) are higher than those of the respective row and column, which presupposes the reach of discriminant validity (Fornell and Larcker, 1981).

Discriminant validity is confirmed by the individual results of each construct being equal to or greater than the reference values (Table 3). For Hair Jr. et al. (2009, p. 592), “discriminant validity is the degree to which the construct is truly different from the others”. Internal consistency is confirmed by Cronbach's alpha and CR indexes being ≥ 0.7.

Table 3

Construct, Cronbach's Alpha, AVE, CR and Correlation

Construct	Items	Cronbach's Alpha	AVE	CR	1	2	3	4
1. OM	3	0.763	0.54	0.77	**0.73**			
2. ER	3	0.717	0.51	0.75	.392**	**0.71**		
3. MT	3	0.771	0.54	0.78	.351**	.484**	**0.73**	
4. CS	3	0.744	0.52	0.76	.351**	.344**	.352**	**0.72**
	Average	**0.749**	**0.53**	**0.76**				

Note(s): OM=Open-mindedness, ER=Entrepreneurial resilience, MT=Market turbulence, CS=Economic crisis, AVE=*Average Variance Extracted*, CR=*Composite Reliability*.
Source: Survey data (2020)

Structural equation modeling (SEM)

SEM has been widely used in solving problems in the area of social sciences (Jöreskog and Sörbom, 1982). SEM is considered a multivariate data analysis technique (Hair Jr. et al., 2009) that brings together concepts of regression, factor analysis and path analysis (Vieira and Ribas, 2011).

Appendix B presents the adjustment of the SEM indices in relation to each of the tested hypotheses. In general, all models showed good adjustments in relation to the proposed indicators.

Table 4 indicates the result of the hypothesis test. **Confirmation of H1** ($\beta = 0.261$, $t = 5.3170$, $p<0.001$, $R^2 = 0.210$) suggests a direct effect of OM→ER. The positive and significant result is relevant due to the originality of the empirical model and practical implications for the area of organizational strategy and entrepreneurship.

Open-mindedness can be associated with the regional environment, which can contribute to innovation, creativity, competencies, intrinsic abilities and a higher level of individual resilience (Cellini and Cuccia, 2019). To develop innovation, in scenarios of uncertainty, it is necessary to have an open-mindedness and be in a learning environment (Al-abrrow et al., 2021). Thus, the entrepreneurial mindset can be developed through measures of emotional intelligence, determination, assessment of empathy, ideation, interest and use of emotion with the help of education focused on entrepreneurship (Kwapisz et al., 2021).

Hypothesis H2 was accepted ($\beta = 0.056$, $t = 10.240$, $p<0.001$). This finding indicates that the MT variable moderates the relationship between OM→ER. The intensity of moderation is reflected in the strength of the coefficient of determination ($R^2=0.480$). Similarly, **hypothesis H3 was also supported** ($\beta = -0.047$, $t = -8.475$, $p<0.001$), and it is possible to infer that CS significantly moderates OM→ER; however, with less intensity when compared to hypothesis H2. Despite this, the coefficient of determination of H3 is considered satisfactory ($R^2=0.360$) (Table 4).

Table 4

Hypothesis test result

Hypotheses	Effect	β	S.E.	t	p-value	R^2	Supported?
H1 (OM→ER)	Direct	0.261	0.049	5.317	***	0.210	Yes
H2 (OM*MT→ER)	Moderator	0.056	0.005	10.240	***	0.480	Yes
H3 (OM*CS→ER)	Moderator	-0.047	0.006	-8.475	***	0.360	Yes
H4 (double moderation)	Moderator	0.024	-	5.954	**	0.610	Yes

Note(s): OM=Open-mindedness, ER=Entrepreneurial resilience, MT=Market turbulence, CS=Economic crisis, *p<0,10, **p<0,05, ***p<0,001.
Source: Survey data (2020)

Resilience focused on entrepreneurship can be associated with values and behavior in facing shocks, crises and challenges, especially in communities managed by ethnic minorities (Kawharu, Tapsell and Woods, 2017). Sharma and Rautela (2021) analyzed the entrepreneurial resilience and self-efficacy of small business founders in India in times of global turbulence. The results suggest actions for the formulation of strategies, aiming at the survival of small businesses in times of crisis.

However, open-mindedness and entrepreneurial resilience need to be analyzed with caution, especially in adverse situations, since the Covid-19 pandemic has affected psychological aspects and the work environment, impacting the learning level of the team (Giorgi et al., 2020; Al-abrrow et al., 2021).

Hypothesis H4 was accepted ($\beta = 0.024$, $t = 5.954$, $p<0.001$). Thus, it is possible to affirm that there is double moderation of the variables MT and CS over OM→ER. The coefficient of determination ($R^2=0.610$) indicates a strong explanatory power of the model.

The value of the coefficient of determination (R^2) indicates the explanatory power of the dependent variable *X* over an independent variable *Y* (Hair Jr. et al., 2009; Fávero et al., 2009). The explanatory power of R^2 measures the size of the effect. Values between 0.020 and 0.150 indicate a small effect; R^2 variations that range from 0.151 to 0.350 suggest a medium effect; and, values equal to or greater than 0.351 presume strong explanatory power of the coefficient of determination on the analyzed model (Cohen, 1988).

The result of H4 was obtained through the PROCESS macro. This tool must be coupled to IBM SPSS®, being used to measure the effect of moderation, mediation and/or moderated-mediation (Hayes and Rockwood, 2017). Despite this, moderation using the PROCESS macro still requires greater understanding on the part of academics and researchers.

Vieira (2009) alert to the presence of possible distortions in previous research involving the measurement of moderation, mediation and/or moderated-mediation. Preacher and Hayes (2004), state that moderation should be analyzed with caution, aiming at the correct application and analysis of the results. Despite the apparent complexity, the use of SEM can minimize possible errors and distortions in calculations (Iacobucci, Saldanha and Deng, 2007).

Hierarchical regression can also be applied to verify the existence of moderating variables. Tremblay and Roger (2004) used hierarchical regression and identified double moderation. Appienti and Chen (2019) applied both hierarchical regression and SEM to identify the moderating effect.

Multiple hierarchical regression

Appendix C presents the results of multiple hierarchical regression using IBM SPSS® statistical software. The statistical procedure was performed using three models: model 1 (control variables), model 2 (model 1 plus independent variable OM and indirect variables MT and CS centered on the mean) and model 3 (model 2 plus moderating variables MT and CS).

In summary, model 1 shows significance of the control variables gender ($p<0.05$) and income ($p<0.1$) in relation to the dependent variable ER. Model 2 suggests the significance of the control variables gender ($p<0.05$), age ($p<0.06$) and sector ($p<0.03$). Furthermore, the variable OM ($p<0.01$) and moderators CS ($p=0.05$) and MT ($p<0.01$) indicate a positive relationship on the dependent variable ER. Model 3 demonstrates the significance of the variables gender ($p<0.08$), age ($p<0.02$), OM ($p<0.02$), moderators CS ($p<0.01$) and MT ($p<0 .01$) on ER.

Thus, the multiple linear regression procedure (Appendix C) confirms the four tested hypotheses, that is, it demonstrates the direct effect of OM on ER (H1); indicates the isolated moderating effect of the MT and CS variables in the OM→ER relationship (H2 and H3); and, suggests the double moderation of MT and CS on OM→ER (H4).

Discussion

In general, the results obtained demonstrate a positive and significant influence of OM on RE, even when the relationship is influenced by the moderator variable MT and CS. The strength of the OM→ER relationship depends on the intensity of the moderator variables MT and CS. Therefore, it was necessary to identify the range of moderators from the result of the 95% confidence interval for $p<0.05$. The values belonging to the variation ranges represent MT and CS with gradients of high and low intensity (Figure 4).

Figure 4 was divided into two panels. Panel A reveals a greater amplitude of MT, which may suggest differences in the behavior of managers in relation to the moderator variable MT over ER. The high and low MT results indicate a contrast of gradients and a possible influence on entrepreneurial resilience on the part of managers. A group of respondents indicated that market turbulence slightly interferes with ER (low MT).

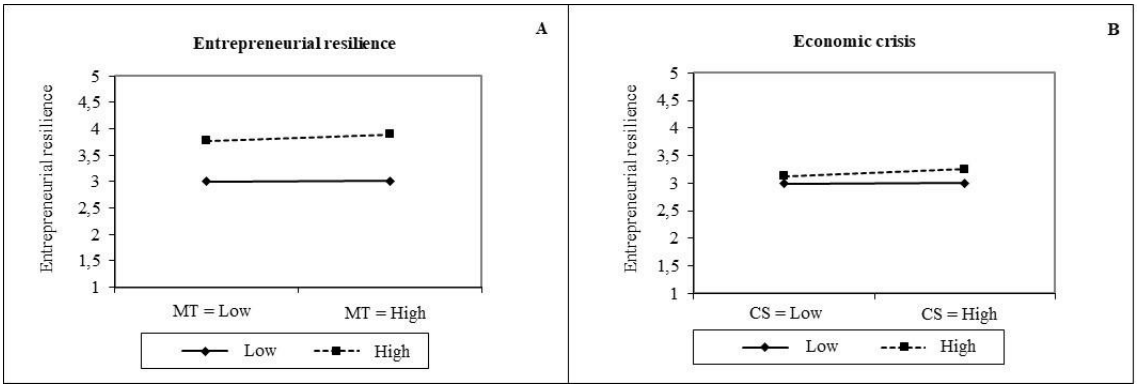
In contrast, other managers (high MT) outlined a greater impact of MT on ER, which may have influenced the creation of entrepreneurial action in times of high market turbulence. This difference in the behavior of managers, in relation to periods of market tribulation, can interfere with decision-making, especially in small companies located in regions with difficulties in obtaining resources. The

confirmation of H2 (β = 0.056, t = 10.240, p<0.001) also reveals a strong explanatory power of the model (R^2=0.480) (Table 4).

Panel B (Figure 4) suggests that the economic crisis is a constant from the perspective of managers of small companies located in the Legal Amazon, since the discrepancy between the high and low CS ranges is smooth. This result may indicate that managers exposed to a scenario of economic crisis demonstrated stability of entrepreneurial resilience in an adverse situation. The tenuous difference between high and low CS may not have been enough to positively influence the development of strategic actions that change the trajectory of the organization in circumstances of economic crisis.

Figure 4

Moderating variables MT and CS



Source: Survey data (2020)

In summary, periods of economic crisis do not seem to influence the behavior of entrepreneurial resilience on the part of managers of small companies located in the Legal Amazon. The result of H3 confirms this understanding, since the moderating effect of CS is negative on OM→ER, despite being significant (β = -0.047, t = -8.475, p<0.001).

In view of the results obtained, it is clear that MT interferes with greater intensity in ER compared to CS. Thus, the managers participating in the research revealed that the MT is perceived with greater intensity, due to the greater range, than the economic crisis. A possible justification for this is that, in the respondents' perception, MT generates a greater impact on small business managers than CS, which, in order to be identified, should have greater intensity. One reason for this may have been the data collection period, carried out in the early phase of the Covid-19 pandemic. Therefore, the effect of the economic crisis may not have been perceived by the respondents. In other words, MT can be punctual and fluctuate at different levels and regions prior to the economic crisis.

Initially, the order of variables may influence the model. The MT is an antecedent variable of the CS, which justifies the initial perception on the part of the managers compared to the economic crisis. Second, the economic crisis may emerge as a consequence of the intensity of MT. CS appears in cyclical periods, and when perceived by managers, it can worsen the intensity of MT.

Third, CS can severely influence domestic and international markets. Economic crisis is understood as a period of financial instability that can harm the development of a nation due to its consequences and intensity. MT, on the other hand, directly affects the acquisition of products, generating business instability by increasing the strength of competition.

The economic crisis generates periods of recession (Bluedorn, Decressin and Terrones, 2016), could harm the development of a nation (Kotz, 2008). Stiglitz (2000) states that the economic crisis can accentuate unemployment, fall in family income, reduce purchasing power and accelerate the bankruptcy of companies. In turn, market turbulence is related to the acquisition of products by customers (Kohli and Jaworski, 1990), market uncertainties (Miller, 1992) and the strength of competition (Jaworski and Kohli, 1993).

Theoretical and managerial implications

This research generated theoretical and managerial implications. The main theoretical contributions were the following: First, little has been done to analyze companies located in the Legal Amazon. No previous research associated the variables OM, ER, MT and CS simultaneously. Thus, the originality of the model is a relevant contribution to the field of Administration, since new research can advance in relation to the association of variables through the application of the research questionnaire (Appendix A), including in other regions, sectors of activity and cultural influence.

Second, there are few studies that make use of double moderation. Vieira (2009) emphasizes the need to use complex models involving moderating variables. However, care must be taken in the analysis of the effects, aiming at a correct analysis of the results (Preacher and Hayes, 2004).

Third, few empirical studies have analyzed the variables of market turbulence and economic crisis. Therefore, this research is considered relevant for making use of these variables simultaneously. Future studies should improve and further expand the variables of the survey questionnaire (Appendix A).

The main managerial implications were as follows: First, the Covid-19 pandemic scenario is still little explored in the area of management and business, mainly involving managers of small companies located in regions with asymmetry of resources. Thus, this research contributes to the decision-making of small business managers with difficulty in accessing a broad base of resources. Hertati et al. (2020) assert that decision-making must be quick in times of economic crisis, in order to minimize the negative effects on the organization's operations.

Second, the cultural factor may have influenced the results of this research. The Legal Amazon is predominantly influenced by states in the northern region of the country. For this reason, the findings of this study are restricted to the managers of the small companies investigated in this territorial region. This research is relevant for managers of small companies in the Legal Amazon due to the scarcity of other research and the findings obtained.

Third, Table 2 can help managers to identify which control variables can influence (or not) the analyzed constructs. Panel A (Figure 4) demonstrates that the variation of high and low MT on ER can help small business managers anticipate the development of entrepreneurial actions, aiming to strategically guide the organization.

Fourth, panel B (Figure 4) reveals the low amplitude in the perception of managers in relation to high and low economic crisis. This finding may reveal the difficulty for small business managers to identify, at the beginning of the Covid-19 pandemic, the interference of the economic crisis. Thus, it is recommended that these managers develop mechanisms to predict future decisions in adverse periods.

Final considerations

This article aimed to investigate the moderating effect of the variables economic crisis and market turbulence on the relationship between open-mindedness and entrepreneurial resilience of managers working in small companies located in the Legal Amazon. The research result confirmed the four tested hypotheses, revealing: direct effect of OM on ER (H1); isolated moderating effect of MT on OM→ER (H2) and of CS on OM→ER (H3); and, the moderating effect of MT and CS on the relationship between OM and ER (H4). As a contribution, this article fills the research gap involving the isolated and simultaneous moderating effect of MT and CS on the relationship between OM and ER in a sample of 299 small companies located in the Legal Amazon.

Small companies located in the Legal Amazon have been little explored in the field of Administration. This neglect can be explained by several reasons: initially, due to the difficulty of obtaining respondents who work in small companies. Secondly, because it involves managers of small companies concentrated in a very extensive territorial range and with logistical peculiarities. Thirdly, the Legal Amazon is a geographical area far from the main research centers, mainly in the south and southeast regions of Brazil.

In addition, there is still a lack of research involving, simultaneously, the variables open-mindedness and entrepreneurial resilience. Thus, further studies should make use of Appendix A and test the model in medium and large companies, in addition to expanding the number of observable variables per construct. Market turbulence and economic crisis are variables little used in relevant research in the area of Administration. In addition, the findings that contribute to small businesses in the period of the Covid-19 pandemic are still recent. New research should analyze the effect of the coronavirus in relation to the psychological aspects, work environment and level of learning of the team.

The novelty of the investigated model can contribute to the decision-making of managers who work in small companies, especially in regions with restrictions on tangible and intangible resources, which reinforces the need for further research in other regions of the country. Further investigations are recommended using more complex models that can provide original findings for administrative science.

Future investigations should examine whether differences in gender, culture, and ethnicity can significantly vary among small business managers.

Some constructs that can make sense in times of uncertainty, economic crisis, and market turmoil are dynamic capabilities, entrepreneurial orientation, organizational ambidexterity, and entrepreneurial mindset. Thus, future empirical research should delve deeper into the association between the constructs.

The main limitation of this study was that the sample was restricted to small companies in the Legal Amazon. The investigation environment may have generated response biases, as the data collection took place during the pandemic period. The gradients of the moderating variables may have been a reflection of the entrepreneurial behavior and different levels of knowledge of the managers of the small companies investigated.

Appendix A - AFE Summary

Variables	Component				h^2
	1	2	3	4	
MT1: There are many promotion wars in the market	.748				.690
MT2: Anything a competitor can offer other companies will be able to readily match.	.792				.679
MT3: Price competition is a hallmark of the market.	.810				.723
CS1: In the last 3 years. the company has experienced natural disasters such as floods or storms.		.717			.550
CS2: In the last 3 years. the company has gone through economic crises caused by economic recession or loss of a major customer.		.871			.783
CS3: In the last 3 years. the company has faced reputation crises such as malicious rumors or negative publicity.		.761			.665
OM1: The company critically reflects on the shared assumptions we make about our customers.			.792		.753
OM2: The company realizes that the market must be continually questioned.			.776		.633
OM3: The company rarely collectively questions its biases about the way managers interpret customer information.			.793		.745
ER1: The company actively looks for ways to replace losses with customers.				.773	.774
ER2: The company can grow when it helps me in difficult situations.				.659	.543
ER3: The company looks for creative ways to change difficult situations.				.793	.657
Cronbach's alpha	0.771	0.744	0.763	0.717	
VTE	18.18%	35.57%	52.42%	68.29%	**KMO** = 0.792
Average	11.76	10.19	11.02	11.64	
Standard deviation	2.31	3.01	2.65	2.37	

Note: h2=Commonality. OM=Open-Mindedness. ER=Entrepreneurial resilience. MT=Market turbulence. CS=Economic crisis. VTE=Total variance extracted. KMO=Kaiser-Meyer-Olkin

Source: Research data (2020)

Appendix B - Results of the hypothesized models

Indexes	Reference*	+**H1** (OM→ER)	+**H2** (MT Moderator in OM→ ER)	+**H3** (CS Moderator in OM→ ER)	+**H4** (Double moderation in OM→ER)
$\chi 2$	The smaller the better	32.363	46.222	37.914	81.559
gl	The smaller the better	8	12	12	17
p-value	<0.001	<0.001	<0.001	<0.001	<0.001
$\chi 2$/gl	< 5.0	4.045	3.852	3.160	4.798
CFI	≥ 0.9	0.952	0.949	0.954	0.910
GFI	≥ 0.9	0.966	0.958	0.966	0.937
IFI	≥ 0.9	0.953	0.950	0.955	0.911
TLI	≥ 0.9	0.911	0.911	0.920	0.852
AGFI	≥ 0.9	0.912	0.902	0.921	0.866

Note: $\chi 2$=Chi-square. gl=degrees of freedom. p-value=significance. $\chi 2$/gl=Chi-square divided by the degrees of freedom. CFI=Comparative Fit Index. GFI=Goodness of Fit Index. IFI=Incremental Fit Index. TLI=Tucker-Lewis Index. AGFI=Adjusted Goodness of Fit Index. *Values obtained from the theoretical review.

Source: Survey data (2020)

Appendix C - Multiple Hierarchical Regression

Dependent variable = ER	Model 1			Model 2			Model 3		
Variables	B	t	p	B	t	p	B	t	p
Control variables									
(Constant)	13.010		0.000	3.828		0.000	6.996		0.000
Genre	-0.628	-2.153	0.032	-0.703	-2.890	0.004	-0.335	-1.800	0.073
Age	0.085	0.768	0.443	0.179	1.925	0.055	0.173	2.444	0.015
State	-0.057	-0.908	0.365	0.022	0.420	0.675	0.064	1.581	0.115
Income	-0.303	-1.759	0.080	-0.208	-1.441	0.151	0.026	0.232	0.817
Sector	0.314	1.130	0.259	0.510	2.208	0.028	0.190	1.074	0.284
Ethnicity	-0.252	-1.003	0.317	-0.029	-0.141	0.888	-0.039	-0.244	0.807
Direct effect									
OM				0.197	4.177	0.000	0.087	2.361	0.019
Media centered moderator									
CS				0.122	2.853	0.005	1.220	9.873	0.000
MT				0.379	6.914	0.000	-1.281	-8.844	0.000
Moderating effect									
CS*OM→ER							-0.100	-9.574	0.000
MT*OM→ER							0.132	11.547	0.000
Double moderation							0.024	5.954	0.003
R									
R^2	0.173			0.588			0.792		
ΔR^2	0.030			0.345			0.627		
F	-			0.325			0.612		
ΔF	1.507			16.933			43.781		
p	-			46.380			108.113		

Note: Dependent variable=ER, β=Beta, t=t-statistic, p=significance, VIF=Variance Inflation Factor; R=correlation coefficient, R^2=determination coefficient; ΔR^2=difference between the determination indices of the models; F=F statistic, ΔR^2=difference between the coefficients of determination of the models, OM=Open-mindedness; MT=Market turbulence, CS=Economic crisis.
Source: Research data (2020)

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