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IMPLICATIONS OF CRISES ON START-UP MANAGEMENT AND WAYS TO INCREASE BUSINESS RESILIENCE AND SUSTAINABLE DEVELOPMENT

DRAGOMIR Camelia-Cristina

Transilvania University of Brasov, Romania

ZAMFIRACHE Alexandra

Transilvania University of Brasov, Romania

ALBU Ruxandra-Gabriela

Transilvania University of Brasov, Romania

FORIS Tiberiu

Transilvania University of Brasov, Romania

Abstract:

This paper aims to conduct an in-depth analysis of how recent crises have been experienced by Romanian start-ups from the perspective of their managers, through quantitative research. The authors also aimed to investigate the interest of entrepreneurs in sustainably developing their businesses and the actions they aim to take in this direction. Data were collected from a sample of 216 respondents, managers of start-ups operating in the Center and South-West Oltenia Regions. The results indicate that the COVID-19 health crisis and the international financial crisis, followed by the energy crisis, have had the greatest impact on the activity of start-ups and identify response measures that can be solutions to increase their resilience in times of crisis. The research can help managers of start-ups maintain business stability in complicated times and incorporate sustainability practices into their business strategy. Governmental, regional and local authorities, as well as entrepreneurship education providers, can also use the research results to initiate measures to support start-ups in their efforts to cope with current challenges and develop sustainably.

Key words: *start-up, crisis management, resilience, sustainable development*

1. Introduction

In recent years, the business environment has been going through a complicated period marked by uncertainties and turbulence caused by unpredictable situations - notably the COVID-19 health crisis and the Russian-Ukrainian war. These two major critical events amplified the financial, energy, social and geopolitical problems that already existed worldwide. The negative effects were strongly felt in national economies and

companies around the world. "Post-crisis crisis", a concept introduced as early as the pandemic crisis in scientific circles (Ioan-Franc & Diamescu, 2021), reveals a current multiple crisis that profoundly tests the ability of companies to withstand adversity and develop sustainably. With insufficient resources to manage events of the magnitude that have marked humanity in recent times and a less solid position in the market, start-ups have to adapt to new conditions and identify effective solutions that will enable them to overcome difficulties and set the business on a potentially sustainable development path. In the current context, the speed of response of policymakers at all levels of governance and the pace of implementation of support measures for small and medium-sized companies, including start-ups, as well as the interest of entrepreneurs in acquiring additional knowledge and skills in specific areas of crisis management are essential to maintain business stability and build sustainability in the future.

This research aimed to analyse the impact of the recent crises on the activities of start-ups in Romania, the Centre and South-West Oltenia Regions, from the perspective of their managers and to identify the measures they consider necessary to increase the resilience of their businesses in times of crisis, through quantitative research. We also aimed to investigate the interest of start-up entrepreneurs in the sustainable development of the companies they manage and the actions they aim to take in this direction. The paper is further structured in the following sections: literature review, description of the research methodology, analysis and discussion of the results obtained, and finally, conclusions of the study, limitations and future research directions.

2. Literature review

Crises that have affected start-ups

The crisis caused by the COVID pandemic and the Russian-Ukrainian military conflict are the two events in the first part of this century with a major disruptive effect on many regions around the globe (Badea & Ranf, 2023). Companies, especially those at the beginning of their activity, had to face numerous challenges related to the management of human resources involved in the activity, the satisfaction of customers and other categories of stakeholders, and last but not least, maintaining profit at an optimal level.

Start-ups account for around 20% of employment and create almost half of the new jobs on average in OECD countries. These are often a catalyst for innovation, which leads, among other benefits, to increased productivity. Even during the Covid crisis, start-ups reacted faster and more flexibly to the pandemic and helped many states implement digitalization processes in areas such as education or health (OECD, 2020). The reactions of entrepreneurs to the situation generated by the health crisis were different depending on the field of activity and the sector in which the company operates, the level of financial maturity and the degree of indebtedness before the pandemic (Velica Cârciunărescu, Belascu & Horobet, 2022).

Although crisis management has been studied by many researchers (Parsons, 1996; Coombs, 2000; Bundy et al., 2017; Fors Brandebo, 2020), the health crisis caused by COVID-19 and the many lockdowns during the pandemic have created a unique situation that could not be found in the entrepreneurship literature (Kuckertz et al., 2020),

this was forcing entrepreneurs to look for innovative ways out of the crisis. After 2020, several studies were published, many of them inspired by the best practices identified in the case of companies that managed to survive and even become stronger after the crisis period (Adamopoulos & Malik, 2021; Salamzadeh & Dana, 2021; Kariv, 2022).

Crisis Response and Sustainable Start-up Growth

The entrepreneurial ecosystem is facing one of the toughest tests in recent decades and the current context forces companies, and especially start-ups, to be more resilient, more flexible and more creative (Foris et al., 2022). Although start-up performance was affected by the pandemic crisis, response measures, when influenced by the resilience characteristics of these companies, moderated this effect (Mota et al., 2022).

The analysis of the most appropriate strategic responses of small firms during crises is becoming an increasingly attractive topic for researchers. (Guckenbiehl & Corral de Zubielqui, 2022). The research conducted by Silva, Beirão and Torres (Silva, Beirão & Torres, 2023) investigates how the business processes of start-ups have been affected by COVID and how entrepreneurs have managed this change, highlighting that the most affected business processes were marketing and sales, logistics and operations and organizational support. The cited authors believe that to go through such crises well, companies need flexibility, agility and adaptability, with technological knowledge focused on digital channels to find new opportunities, innovate and resist against crises of this type. Some authors suggest that extensive support for innovation, combined with diversification, could mitigate risks and ensure the survival of SMEs in times of economic downturn and that SMEs can generate innovation by transforming their business model, rethinking existing processes and using the latest technology to create added value that helps ensure long-term survival (Waiganjo, Godinic & Obrenovic, 2021). Managing innovation and validating the business model is a challenge and many entrepreneurs develop start-ups to access new business opportunities and become more agile in the market they operate. In this sense, a series of methodologies have appeared, such as Lean Start-up (LS), to reduce uncertainties regarding innovation-based projects and to contribute to the validation of the business model (Silva et al., 2020).

Currently, the need to establish sustainable development strategies within companies is becoming more and more evident and can bring, in addition to indisputable competitive advantages, possible solutions to adapt to the effects of the various crises faced by the business environment, especially for newly founded companies. In terms of management systems, which can help small and medium enterprises (SMEs) to create sustainable competitive advantages, the following could be mentioned: ISO 9001, ISO 14001, OHSAS 18001 and SA 8000 (Tsai & Chou, 2009).

The financial impact caused by various crises (supply chain disruption, changing customer behaviour and the evolution of the business environment) can be counteracted by adopting a sustainable business solution. SMEs are dependent on a proactive leader, who can renew some of the business strategies, to strengthen the organization's financial position and agility. At the same time, SMEs must operate within the environmental, social and governance (ESG) sustainable business framework (Hu & Kee, 2022).

3. Research Methodology

Given the authors' aim of this study, we used quantitative market research. For this purpose, we used a survey (Toy & Guris, 2023), using a questionnaire as a data collection tool. The data were analysed to identify the opinions, attitudes and perceptions of start-up managers in two development regions of Romania regarding the impact of recent crisis periods on the activity of the companies analysed.

Research objectives and hypotheses

The main objective of the research was to identify the opinions, attitudes and perceptions of managers of start-ups operating in the Center and South-West Regions of Romania on how recent crisis periods have affected business activities and the measures they consider necessary to increase business resilience and sustainability. The following objectives were considered appropriate to achieve the proposed aim:

O1: Identify how the managers of the start-ups surveyed have been affected by recent crisis periods

O2: Measure managers' willingness to take several specific actions to increase business resilience in the face of challenges arising from recent crises

O3: Assess the sustainable growth actions of the analysed start-ups in the context of the analysed crisis periods

Questionnaire development

To achieve the objectives, data were collected using a questionnaire, which was developed based on a review of literature studies and the research experience of the authors of the paper.

A pre-testing stage was carried out on a sample of 7 people before the questionnaire was distributed to the research population. Pre-testing is designed to identify and eliminate any possible ambiguities (Alan Wilson, 2006). Following the pre-testing stage, two questions were reworded to be better understood by the respondents. The final version of the questionnaire (obtained after the pre-testing stage) consists of 23 items grouped in several sections, covering the topic under investigation and allowing the proposed purpose to be achieved. The questions included in the questionnaire aim to identify the study participants (Q13-Q23) and to achieve the research objectives (Q1-Q12).

The following hypotheses were defined to identify respondents' perceptions:

H_1 – There is no link between the existence of a sustainability strategy and the evolution of the start-ups analysed over the last 6 months (1st hypothesis).

H_2 – There is no difference in the distribution of responses regarding the importance of sustainable development in the research population (2nd hypothesis).

Data collection and location of the survey

It was first necessary to delimit the respondents geographically to decide on the research population. Following a rigorous analysis, out of the 8 Development Regions into which Romania is divided, it was decided to choose two regions to be included in the research and statistical data were analysed to decide the target regions for the research (Table 1).

Table 1. Situation of newly created start-ups one year after their establishment in 2021 by development regions of Romania

Development regions	Year 2021
West Region	57.5%
South-West Oltenia Region	60.6%
South-Muntenia Region	62.5%
South-East Region	71.8%
North-East Region	76.8%
North-West Region	83.8%
Center Region	85.5%
BUCHAREST – ILFOV Region	91.2%
Total	77.2%

Source: Insse Tempo database

The extremes (Bucharest-Ilfov Region and West Region) were eliminated from the research and it was decided to keep the following two, Centre Region and South-West Oltenia Region, which were chosen as the most suitable for the research, which is why they were selected for the survey. Then, the rest of the regions, which recorded values in the middle of the range, were eliminated.

The next stage was to establish the research population, which is made up of relatively newly established companies (no more than 3 years old) that are in the development stage. Companies that meet the specific requirements of this research and have received funding from European funds were contacted. After analysis of resources and logistical possibilities, two projects of interest for the research topic were selected and the selection of participants was based on the list of beneficiaries of these projects. The main selection criterion was the Region where the two projects were implemented, followed by the start-up funding.

The first selected project, *Economic performance through entrepreneurship in the Centre Region*, co-financed by the European Union, supported entrepreneurs in setting up and managing 90 start-ups. The project was financed under the Human Capital Operational Programme 2014-2020, part of the European Social Fund, and was implemented in Romania, in the Centre Region, from January 2018 to May 2021. A total of 762 beneficiaries followed a vocational training programme - Entrepreneurial Skills - and were certified in this respect. They proposed business plans in a competition that selected the most relevant business ideas, and 90 business plans were selected to receive grants of €40.000 each for the establishment and development of start-ups in the urban area of the Centre Region. All 90 entrepreneurs were supported through internships and personalised business counselling services. 86 of the start-ups were operational at the end of the project's sustainability period.

The second selected project, entitled *Entrepreneur at the Start!*, was funded under the Human Capital Operational Programme 2014 - 2020, Priority Axis 6 - Education and Skills. This project has been implemented in Romania, in the Centre and South-West Oltenia Region, from 1 June 2022 to 1 June 2023. The target group was represented by

750 students who attended entrepreneurship courses. 24 businesses were funded with amounts ranging from 40.000-100.000 euros. The 6-month sustainability period started from July 2023, followed by 9 months of post-sustainability. During these 15 months, the 24 start-ups have committed to continue their business and maintain jobs and salaries at least at the same level.

The authors of the paper asked the partners of the two projects for a database containing the contact details of the managers of the 114 start-ups that received project funding.

Of the known non-probability sampling methods, the “snowball” sampling method (also known as *network survey*) was used, being a method that involves identifying individuals who meet the criteria for inclusion in the study and who are asked to recommend completing the questionnaire to other individuals they know who fit the criteria of the research population (Andrei, T., 2001; Emerson, RW., 2015). In this case, the managers of the 114 start-ups identified and recommended other companies with the same characteristics (generally suppliers or collaborators). Due to the sampling method used, it was not possible to determine the final sample size in advance. However, the aim was to obtain as many completed questionnaires as possible from as many start-ups as possible in the areas covered by the research. Even if the results obtained cannot be extrapolated to the whole population, they can be of real use to scientific knowledge on the assumed research direction (Berson, I., Berson, M., Berson, M., 2002).

The sample surveyed reflects the structure of the population in terms of relevant characteristics, such as the specific field of activity of the regions surveyed, the age of the start-up and the evolution in the last months of activity. The final sample comprised 216 respondents. We consider its size to be sufficiently large and to encompass a diversity of behaviours and attitudes.

Study sample

The final sample for the quantitative research comprised 216 respondents, managers of start-ups operating in the two Development Regions included in the study. The data collection period was May-July 2023.

Data Analysis Techniques

The data obtained were processed using SPSS software and various data analysis methods. The authors organized and supervised the entire research process.

The selected data analysis techniques were chosen following the objectives of the study. For this purpose, the IBM SPSS Statistics 21 program was used for estimating descriptive analysis, making contingency tables, illustrating respondents' characteristics, performing analyses on statistical indicators, applying the Kolmogorov-Smirnov test and the χ^2 test (Howitt, D. et al., 2006; Malhotra, 2004; Constantin, C., 2006).

Table 2. The sample structure.

		Sample structure					
Criteria	Sample (216 respondents)	Men 45.8%				Women 54.2%	
	Age of start-up	Less than 1 year 25.0%		1-2 years 33.3%		2-3 years 41.7%	
	Evolution in the last 6 months	Positive 20.8%		Constant 66.7%		Negative 12.5%	
	In the future, during this year, the business will:	Develop 45.8%		Maintain 41.7%		Restructure 12.5%	
	Position	Administrator 45.8%		Manager 45.8%	Financial manager 4.2%		They didn't want to declare 4.2%
	The last school graduated	High school/vocational 20.8%		Bachelor's studies 54.2%	Master's studies 20.8%		PhD studies 4.2%
	Field of activity	Industry 8.3%	Research, development, high tech 4.2%	Agriculture, fishing, fish farming 4.2%	Constructions 8.3%	Services 33.3%	Trade, tourism 41.7%

Source: Author's calculation based on collected data.

4. Results and discussions

The results are presented and grouped according to the three research objectives, and the analyses carried out are presented in a logical sequence, allowing for relevant results that are easy to follow and understand.

Objective 1: Identify how the managers of the surveyed start-ups have been affected by recent crisis periods

To identify the impact that recent crises have had on the activity carried out in the start-ups investigated, the effects of Covid-19 pandemic, the Russian-Ukrainian military conflict, the international financial crisis, the energy crisis in the EU, and the food crisis have been analysed and identified in the literature as crises whose consequences have deeply affected the business activities of companies of all sizes (Olszewski, 2022; Fritsch, Greve and Wyrwich, 2021; Deloof and Vanacker, 2018; Ebersberger and Kuckertz, 2021; Kézai and Kurucz. 2023). The results show that the effects of the COVID-19 pandemic and the international financial crisis had the greatest influence, with 79.2% affirmative responses each, followed by the EU energy crisis (66.7%). Half of the respondents gave the affirmative option for the Russian-Ukrainian military conflict (54.2%) and the food crisis (54.2%).

A semantic differential scale was used to assess respondents' perceptions of how they felt the impact of recent crises on their business activities. The response variants comprised 5 levels, with the intermediate level indicating a neutral attitude (neither/nor). The not significant and insignificant variants were not chosen by any respondent. The

response of a significant impact felt by the recent crises registers 70.8%, followed by the very significant level with 20.8%. The middle variant, neither/nor, was chosen by 8.3% of the respondents participating in the survey.

The degree to which the impact of the crises was felt for the four areas analysed (Financial challenges, Supply chain management and Human resources management (occupational safety and employee protection), and market) is shown in Table 3, using a numerical scale.

Table 3. Measurement of the impact felt by managers on business activities for the areas analysed

	1 – least felt impact	2	3	4	5 – most commonly felt impact
<i>Financial challenges</i>	4.2%	8.3%	29.2%	16.7%	41.7%
<i>Supply chain management</i>	4.2%	4.2%	25%	33.3%	33.3%
<i>Human resources management (occupational safety and employee protection)</i>	4.2%	16.7%	16.7%	29.2%	33.3%
<i>Market</i>	8.3%	8.3%	12.5%	41.7%	29.2%

Source: Author's calculation based on collected data.

There is a balanced distribution of values obtained in terms of the total number of responses recorded. The area of financial challenges recorded the highest percentage for the maximum level, 5, with the most frequently felt impact. Equal percentages of 33.3% each are recorded for the same maximum level in the areas of supply chain management and human resources management (occupational safety and employee protection), while the market records 29.2% for the same response variant.

The question Have periods of crisis (Covid-19 pandemic, Russian-Ukrainian conflict, etc.) created uncertainties for the activity of the start-up you manage? received 70.8% affirmative answers and 29.2% negative answers. This was a filter question, meaning that only respondents who ticked yes were asked to provide answers to the next question.

For the degree of agreement or disagreement about how they felt about the uncertainties, 153 responses were recorded due to the filter question above. The distribution of responses can be seen in Annex 1. A majority distribution towards the area of agreement and total agreement is observed for all 4 statements based on the evolution of the recorded responses. The highest percentage of respondents (more than half) indicated total agreement (61.6%) with the statement *We were not prepared to deal with crises of this magnitude*. The agreement variant (55.6% of respondents) is recorded with a comparable percentage, which shows that respondents felt a high vulnerability. A similar result is observed for the respondents' agreement (50%) on how difficult it was for respondents to cope with the uncertainties created by times of crisis. Lacking experience in crisis management, start-up managers faced major challenges and risks that proved

difficult to manage, a fact confirmed by other studies in the literature (Salamzadeh, 2021; Lu et al., 2020).

Objective 2. Measure managers' willingness to take several specific actions to increase business resilience in the face of challenges arising from recent crises

For several actions included in the research on increasing business resilience, managers were asked to indicate the extent to which they would choose to use them.

The extent to which respondents would turn to Financial support mechanisms and instruments (European and government funding) saw almost half of the responses for the level to a large extent (45.8%). The middle level, 3, is recorded for a quarter of the respondents (25%), followed by 16.7% for level 4. To a small extent (8.3%) and level 2 (4.2%) responses were indicated with relatively lower percentages. It is concluded that almost half of the respondents consider the use of various financial support mechanisms and instruments (European and governmental funding) as a measure to increase business resilience to critical events, which is also confirmed by the results of other studies in the literature (Salamzadeh, & Dana, 2021).

Collaboration with business partners is a measure that the managers surveyed are willing to use to a large extent with 45.8%, followed by level 4 with 33.3%. The middle level is chosen by 12.5% of respondents, followed by levels 2 and 1 - to a small extent, both variants having equal percentages of 4.2%. The results indicate that managers participating in the study understand the importance of expanding and strengthening collaboration with business partners as a beneficial measure for increasing companies' resilience in the face of business turbulence. This is confirmed by other studies that indicate greater resilience in crises and increased growth potential for start-ups that increase collaboration with established companies in the market that have resources and experience in crisis management (Bishop, 2019; Obal & Gao, 2020).

The application of different strategies in human resource management is level 4 (with 45.8%) and level 5 - to a large extent (29.2%). The middle level is chosen by 12.5% of the respondents, followed by level 2 with the same percentage. Level 1 - to a small extent - is not chosen by any manager.

Mutual support in the start-up community was the next area examined in the research. Respondents would call on this action, with the percentages recorded showing level 4 for 41.7% of managers, level 5 – to a very large extent for 29.2%, and mid-level for 16.7%. Significantly lower percentages are recorded for the response variants to a small extent (8.3%) and level 2 with 4.2%. Therefore, the results clearly highlight the willingness of the managers participating in the study to draw on their entrepreneurial ecosystem to share knowledge, ways of working and experiences to increase their resilience to future challenges, which is also confirmed for entrepreneurs in other European countries (Kuckertz et al., 2020).

One topic discussed and analysed in the study was the extent to which the managers surveyed intend to develop their skills in the area of crisis management through specific entrepreneurship education programmes. The most frequent responses were given at levels four and five of the scale. A total of 54.2% of the respondents gave the highest level, 5, which is the response to a large extent, while 29.2% of the respondents

indicated level four. The fewest responses, representing 16.7%, are indicated by the middle variants (level 3 of the scale). Very importantly, levels 2 and 1 did not record any response, which confirms that all respondents have a future desire to participate in such educational programmes that can develop specific managerial skills to adapt to critical events in times of crisis of this magnitude.

For several development resources (knowledge, technological resources, financial resources, human resources, expertise), the managers surveyed indicated their intention to expand them in the coming period.

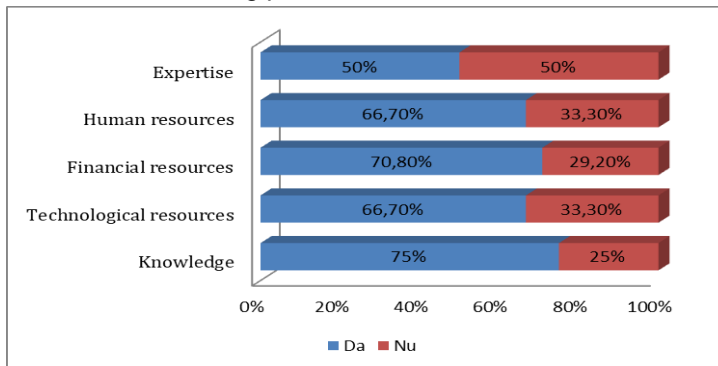


Figure 1. Graphical representation of the main results on managers' intentions on expanding resources for development

Source: Prepared by the authors based on research data

The results confirm the high interest of the managers participating in the study in acquiring new knowledge (75%), suggesting their intention to invest more in education and training sessions to improve their knowledge and skills necessary for effective business management in crises. Recent studies (Alves et al., 2020; Bishop, 2019; Ivanov, 2020) show greater resilience in the face of market turbulence and faster recovery possibilities for companies whose managers and employees accumulate knowledge and develop skills to deal with the complex uncertainties associated with crises.

A significant share was also recorded for the intention to increase financial resources (70.8%). It is noted that human resources and technology recorded equal percentages (with 66.7% intending to expand in the coming period).

Objective 3. Assess the sustainable growth actions of the analysed start-ups in the context of the analysed crisis periods

The results showed that 95.8% of the respondents were aware of the principles of sustainable development, while 4.2% said they were not.

The extent to which respondents would use sustainable growth actions records the values shown in Figure 2.

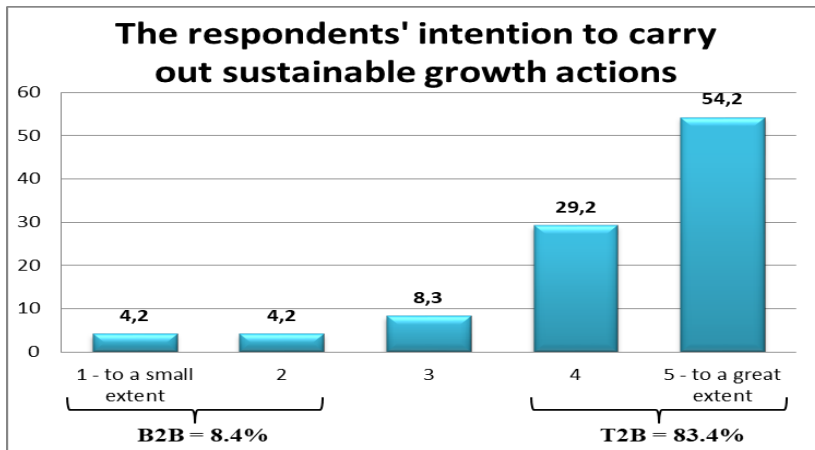


Figure 2. Respondents' intention to carry out sustainable growth actions
Source: Prepared by the authors based on research data

The most frequent responses are given at levels four and five of the scale. More than half of the respondents (54.2%) indicated level five, while 29.2% of them indicated level four. The fewest responses, representing 4.2%, are indicated by levels 1 and 2 of the scale.

The response variants for scales four and five are combined, accounting for the Top Two Box (T2B) score which accounted for 83.4% of the responses given. At the other end of the spectrum, the score called Bottom Two Box (B2B) totals 8.4%. It can be said that the vast majority of the managers surveyed are serious in their intentions to carry out sustainable growth actions in the future.

The question How important do you think sustainable development is for your start-up? showed a mean of 4.58 and a median of 5, which leads to the conclusion that sustainable development is very important for research start-ups. The results are: very important 66.7%, important 29.2% and unimportant 4.2%. It can be seen that the middle variant (neither important nor unimportant) and the extreme variant - totally unimportant - were not selected by any respondent, confirming once again the major importance given by managers to sustainable development.

The following statistical hypotheses are tested:

H_0 – There is no difference in the distribution of responses on the importance of sustainable development in the population surveyed.

H_1 – There is a difference in the distribution of responses on the importance of sustainable development in the population surveyed.

Table 4. Application of the Kolmogorov-Smirnov test

One-Sample Kolmogorov-Smirnov Test

		V11_the importance of sustainability for start-ups
N		216
Uniform Parameters ^{a,b}	Minimum	2
	Maximum	5
Most Extreme Differences	Absolute	.667
	Positive	.042
	Negative	-.667
Kolmogorov-Smirnov Z		9.798
Asymp. Sig. (2-tailed)		.000

a. Test distribution is Uniform.

b. Calculated from data.

Source: Prepared by the authors using SPSS software based on research data

It is observed that the largest difference in absolute value between the values of the cumulative distributions is $D_{calc} = 0.667$, which compares to $D_{\alpha} = 0.09$. Comparing the two values, the alternative hypothesis H_1 is accepted. It can therefore be guaranteed with a 95% probability that the distribution of the variable under analysis (the assessment of the importance of sustainable development for the activity of the companies under analysis) is different from the uniform distribution of the total population. The same decision is also confirmed by the analysis of the minimum significance level for H_1 , where $Asymp. Sig. (2-tailed) = 0.000 < 0.05$, which leads to the acceptance of the alternative hypothesis. However, the managers surveyed understand the importance and necessity of sustainable business development, with more than half (58.3%) indicating that they have already adopted a sustainable development strategy. The results indicate that there is room for growth in this area, and it is important for start-up managers not only to know the principles of sustainability and to want sustainable growth but also to implement it. Although the integration of sustainability practices into business activities is currently being intensively discussed, this requires consistent efforts from companies. Managers of smaller companies are also reluctant to take action on sustainable development, citing the difficulty of the process and the high costs. According to the study conducted by Ogorean and Herciu (2021), traditionally, concern for sustainable development is not a priority for Romanian SMEs because it does not bring immediate benefits and is costly. On the other hand, there are even negative effects that can occur due to superficial approaches.

To identify whether there is a link between the question included in the questionnaire (Does your start-up have a defined sustainable development strategy?) and the evolution in the last six months, a contingency table was first used, followed by a non-parametric test to show whether the differences are significant or not.

Table 5. Contingency table on the existence of sustainability strategies and the evolution of the companies analysed in the last 6 months

		Q. Evolution in the last 6 months:			Total
		Positive	Constant	Negative	
Q. Does the start-up have a defined sustainable development strategy?	Yes	40.0%	62.5%	66.7%	58.3%
	No	60.0%	37.5%	33.3%	41.7%
	Total	100.0%	100.0%	100.0%	100.0%

Source: Prepared by the authors based on research data

It can be seen that the percentage of companies that do not have a defined sustainable development strategy is higher (almost double) for positive evolution in the last 6 months, compared to constant evolution (37%, respectively negative 33%). For companies where there is a sustainability strategy, the percentage is reversed, almost equal percentages of 60% are recorded for negative, respectively constant evolution, compared to 40% for positive evolution.

To use the χ^2 test, the following hypotheses are assumed:

H_0 – There is no link between the existence of a sustainability strategy and the evolution of the start-ups analysed over the last 6 months.

H_1 – There is a link between the existence of a sustainability strategy and the evolution of the start-ups analysed over the last 6 months.

Table 6. Critical report for the Chi-Square analysis

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.023 ^a	2	.018
Likelihood Ratio	7.938	2	.019
Linear-by-Linear Association	6.404	1	.011
N of Valid Cases	216		

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 11.25.

Source: Prepared by the authors using SPSS software based on research data

Since $\chi^2_{calc} = 8.023 > \chi^2_{0.05;2} = 5.99$ the hypothesis H_1 is accepted, which means that it can be guaranteed with a 95% probability that there is a link between the existence of a sustainability strategy and the evolution of the start-ups analysed over the last 6 months. The same decision can also be made based on the minimum significance level of 0.018 which is lower than $\alpha=0.05$, confirming once again the existence of a link between

the two variables analysed. The test is considered valid because none of the cells contains expected values less than 5 (0 cells (0.0%) have an expected count of less than 5).

To support and confirm the results obtained, the characteristics of the respondents should be taken into account, i.e. start-ups, of which 12.5% are companies in the age range of less than 6 months. Due to their recent presence on the market, they have not had the time to feel the long-term beneficial effects of adopting a strategy that incorporates sustainability principles in their business activities. The finding confirms the results of other studies reported in the literature that indicate improved long-term economic performance for companies that have taken such an approach, while there may be stagnation or even a decline in profitability in the short term (Jha & Rangarajan, 2020; Raza et al., 2021).

The extent to which respondents feel they understand the benefits of cooperation for sustainability is rated as: good by 45.8%, neither/nor by 29.2%, very good and satisfactory by 12.5% each. The mean of the responses is 3.58 and the median is 4. Most of the managers participating in the study are open to cooperation for sustainable development to a large extent (66.7%) and to a very large extent (25%). The response variant neither/nor is recorded for 4.2% and the same percentage (4.2%) is also obtained for the respondents' reluctance on this issue. Therefore, a majority of managers understand the importance of collaboration to solve sustainability issues and want it. In most cases, sustainability partnerships have a beneficial effect on companies' long-term performance and can bring about positive changes in the entrepreneurial ecosystem, as studies reported in the literature show (Fobbe, 2020; Lozano, 2018).

5. Conclusions

The effects of the recent crises, which have unfortunately overlapped, have profoundly affected the evolution and future of companies of all sizes. The contribution of this paper is based on the results of quantitative research and reflects the perception of start-up managers in Romania, Centre and South-West Regions, on the challenges generated by the recent crises and the impact felt on business activities, as well as the measures they consider necessary to increase the resilience of companies in the face of challenges and to develop business sustainably.

The results show that among the recent crises, the COVID-19 health crisis and the international financial crisis had the biggest impact on the activity of start-ups, followed by the energy crisis. The majority of study participants rated financial challenges as the most acutely felt, followed by human resource management, declining sales volume and supply chain management. An important finding of the study was that a majority of managers felt that they were not prepared to deal with challenges of this magnitude. This is a wake-up call for all responsible parties, government and local authorities, consultancy organisations and education providers, who can support start-ups to build resilience to crises and support their sustainable development efforts.

Concerning the measures that the managers included in the study choose to use to increase business resilience, the results indicate that half of the respondents are considering accessing various financial support mechanisms and instruments (European and government funding). The majority of respondents also highlighted an interest in

human resource management and a concern to channel energy and resources in this direction. Given the current context, the increased attention paid to human resource management is more than necessary in most companies. Attracting valuable employees, maintaining their trust and loyalty and motivating them to increase productivity and performance are actions that start-up managers need to focus on as a priority today.

Developing collaboration with business partners is another measure that a significant proportion of respondents intend to use. Similarly, mutual support in the start-up community is seen by most respondents as a beneficial way to mitigate the pressures and risks induced by crises in business activities.

Developing skills in the area of crisis management is one of the future intentions of the managers participating in the study. The results we obtained underline their interest in adding to the set of knowledge and skills needed to make the best decisions under uncertainty and risk. The role of education providers, who can provide training and advice on how to manage crises, becomes significant in the current context, as does the willingness of entrepreneurs to improve their knowledge and skills to be prepared to respond to the critical issues that crises generate.

As far as sustainable development is concerned, its principles are known by the managers surveyed, with the majority of respondents expressing a willingness to adopt sustainability practices in their business strategy, which is also confirmed by their willingness to work together to solve sustainability issues. However, even if things look positive in terms of willingness to integrate sustainable development principles into the business model, only half of the respondents have already adopted a sustainable development strategy. Accelerating the integration of sustainability principles into the business strategies of start-ups is only possible if public authorities at local, regional and national levels support this approach through concerted actions that take into account the specificities and needs of start-ups. Another possible solution is to set up business hubs that could facilitate interaction and collaboration between start-up entrepreneurs and between them and potential financiers, and where managers could benefit from mentoring, training and advice on issues relating to crisis management and sustainable business development.

Accordingly, we believe that our paper contributes to the current state of knowledge on the implications of crises on the management of start-ups in terms of how they have been perceived by managers, but also the measures they consider necessary to increase the resilience of businesses in the face of adversity and to guide them on a sustainable development trajectory. The results of the research can also be useful to governmental, regional and local authorities, as well as to actors involved in entrepreneurship education, to initiate measures to support start-up managers in their efforts to cope with current and future crises and to foster the development of resilient and sustainable entrepreneurship in Romania.

Beyond the results obtained, this research also has certain limitations, primarily since the sampling method was an implausible one, which means that the data cannot be extrapolated to the whole population, although the sample size was significantly large. The population investigated was Romanian entrepreneurs from the Centre and South-West Regions who were included in EU-funded projects. The authors intend to extend future

research at the national level among managers who were not beneficiaries of similar projects. Future studies could further examine how recent crises are handled by start-up entrepreneurs in other European countries facing similar problems to those investigated. Research could also aim at an in-depth study of the real needs of managers of start-ups in the area of educational programmes aimed at developing entrepreneurial skills specific to crisis management, including the use of qualitative methods.

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Annex 1.

Research results on respondents' agreement or disagreement with the statements surveyed

	1 – total disagreement	2 - disagreement	3 – neither/nor	4 - agreement	5 – total agreement
"Hard to control"	0%	11.1%	16.7%	50%	22.2%
"We weren't ready for them"	5.6%	0%	16.7%	16.7%	61.1%
"I felt very vulnerable"	0%	0%	16.7%	55.6%	27.8%
"Fear of the unknown and lack of experience in managing stress led me to make irrational managerial decisions"	0%	11.1%	33.3%	38.9%	16.7%

Source: Author's calculation based on collected data.