Start-ups in times of crises: the case of Tunisia

Aicha LABIADH, aichaikramlabiadh@gmail.com
Elleuch Fadoi; Elleuchfadoi@gmail.com
Sami BOUDABBOUS ; samiboudabbous2002@yahoo.fr

Abstract

The objective of this article is to describe the challenges faced by entrepreneurs following the crisis caused by Covid-19 and to show how they were able to manage its effects to protect their businesses. Thus, we used a qualitative approach based on semi-structured interviews with 12 actors in the Tunisian entrepreneurial ecosystem. The data collected is supplemented by information on government policy measures aimed at supporting entrepreneurship. The findings could suggest that if start-ups successfully exploit their available resources as a first response to the crisis, their potential for growth and innovation will be threatened. Therefore, policy measures should not only provide first aid to start-ups by alleviating the pressure caused by limited cash flow, but also involve long-term measures integrated and supported by the wider entrepreneurial ecosystem to ensure a rapid recovery and growth.

Keywords: Start-ups, crises, entrepreneurial crisis, resilience.
DOI Number: 10.48047/nq.2024.22.1.NQ24035 **NeuroQuantology 2024; 22(1):393-407**

Introduction

With the discoveries of corona-viruses, the world and the economies that make it up are experiencing exogenous shocks that are amplified by the measures taken by States to limit the spread of these viruses and their impacts (Verschuur et al., 2021).

Although the occurrence of a pandemic caused by a new virus is not surprising to virologists, infection control measures, such as health protocols (social distancing, stopping certain activities favoring contact, etc.), taken to curb the spread of Covid-19 are putting enormous pressure on a large part of the economy (Yilmazkuday, 2022). For many economic players, the Covid-19 pandemic is a surprising and unpredictable event with serious consequences on the economy, and which radically modifies the political and economic environment (Ozili & Arun, 2023).

Although such events can be interpreted as opportunities, the measures taken by governments to combat the pandemic have led to an unprecedented economic slowdown and an acute crisis situation (Kharel et al., 2022). The pandemic has placed a heavy burden on many health systems around the world, and infection control measures have caused an economic crisis by bringing many economic activities to an abrupt halt (Coccia, 2023). Furthermore, while many past crises hit humanity at a specific time (for example, frequent hurricanes that destroyed entire cities or towns) or developed over a more or less long period of time (the financial crisis of 2000s for example), Covid-19 has spread globally and the necessary countermeasures that have been put in place have harmed national economies (Khlystova et al., 2022).

Most of the political initiatives taken during the health crisis to protect national economies have mainly concerned established businesses, existing industrial sectors, and in doing so, these measures aim to protect

employment and the continuation of economic activity (Coccia, 2023). Currently, the focus is on protecting the present while the future of economic activity receives less attention. However, the innovative startups that will shape the future are one of the most vulnerable players in any economy (Mota et al., 2022). Even in "normal" times, innovative start-ups face constraints of novelty and smallness that threaten their survival. This situation is likely to worsen in times of crisis and the spread of Covid-19 threatens to reduce the innovation potential which has accumulated in recent years and which should generate economic and potentially societal and ecological value in a near future (Guckenbiehl et al., 2022).

The Covid-19 pandemic and the many constraints on economies around the world that its management has brought are combining to create a unique situation that has no documented equivalent in the literature on start-ups and entrepreneurship (Meahjohn & Persad, 2020). Nevertheless, there is a body of research on entrepreneurship and crisis management, which offers two lines of research (Zhang et al., 2023; Pattanayak & Padhy, 2021; Shulga et al., 2021). The first could be termed entrepreneurial crisis management and deals with how businesses respond to a crisis; much of the research in this stream concerns resilience (Sharma & Rautela, 2022). The second stream suggests what policies could promote the survival of a company during a crisis and what obstacles exist (Cucculelli & Peruzzi, 2020; Pedersen et al., 2020); this second stream could thus help decision-makers to develop appropriate interventions.

It is in this context that our research takes place, which aims to draw attention to a type of actor neglected in the current debate: innovative start-ups, these young companies with strong development potential have often been neglected.

In fact, we are trying to understand and describe the reactions to the health crisis and the opinion on the measures put in place to mitigate the economic effects of entrepreneurs belonging to the entrepreneurial system ecosystem of startups in Tunisia. Measures supported by the Tunisian government to mitigate the effects of the pandemic on businesses and startups have been taken and which have a tax and customs, financial, social, health and security nature. Many programs require applicant companies to be bankable, as they can be expected to be profitable within a reasonable period. The profit criterion is one that an innovative startup generally cannot satisfy shortly after its creation. Innovative startups are therefore clearly under pressure.

To do this, we conducted a qualitative study with an exploratory aim in an interpretive logic to understand and describe a phenomenon rather than explaining it. We thus seek to highlight three concerns linked to the management of entrepreneurial crises at the micro level and to political initiatives at the macro level. First, we were interested in determining the diversity faced by innovative start-ups in light of a sudden health crisis. Secondly, we sought to understand what adaptation strategies start-ups are using in the context of the health crisis. Third, we attempted to identify specific policy measures designed to protect start-ups during the Covid-19 crisis, whether announced or implemented.

After reviewing previous research on the crisis, entrepreneurship and startups, we provide answers to the questions posed in the specific context of Tunisia. For this, we have a mixed method (Leppens et al., 2023; Reyad et al., 2020). First, a qualitative analysis of interviews with 12 participants playing different roles in the Tunisian entrepreneurial ecosystem, i.e. entrepreneurial actors, resource providers and connectors (Brown & Mason, 2017), and an analysis of international public press coverage.

To achieve our objective, we first present the literature used to explain the relationship between the different research variables (1). Secondly, we justify our methodological choices (2). Thirdly, the results are presented (3) and discussed (4) to lead to the implications of our research.

1. Literature review

In this part, our theoretical and conceptual approach consists of presenting: the challenges of start-ups in times of crisis (1.1),

Start-ups and entrepreneurial crisis management (1.2) and economic policy responses to crises (1.3).

1.1. Challenges for start-ups in times of crises

The emergence of an unknown virus and the rapid spread of the "Covid-19" epidemic at the end of December 2019 forced the majority of world economies to shut down in mid-March 2020 (Coste, 2020). In the absence of a vaccine, it was necessary to urgently stem morbidity and mortality, overcome the obvious lack of medical resources and control a galloping global health crisis (Benassi, 2020). The socio-economic repercussions of this exogenous pandemic shock linked to the degradation of biodiversity by the "Anthropocene" were immediate and violent (Coste, 2020). They remind us that infectious diseases, like goods, travel around the earth and know no borders. The imagined and mapped risks rarely correspond to the real but unpredictable threats that must be deciphered and dealt with, most often without a pre-established script (Anoushiravani et al., 2020).

The Covid pandemic, a total social fact, is no exception. It shows the inextricable entanglement and interdependence of human and non-human systems (Coste, 2020). It reveals the deleterious consequences of a global systemic crisis which is also a crisis of temporality. It spares neither people nor their projects. It forces everyone to improvise immediate solutions in the present and to try to reinvent new futures despite the announcement of a climate catastrophe and the imminence of an unprecedented economic recession (Ozili & Arun, 2023; Karakosta et al., 2021; Prohorovs, 2020).

Beyond the humanitarian tragedy of the Covid-19 pandemic, the virus has also had an impact on local economies and the global economy (Ozili & Arun, 2023). Fears surrounding the unpredictable effects of Covid-19 have significantly influenced the world's major economies and many economists are now predicting a recession (Verschuur et al., 2021). A crisis such as the Covid-19 pandemic threatens the operation and performance of a business (Coccia, 2023; Ozili & Arun, 2023; Zhang et al., 2023; Meahjohn & Persad, 2020).

Turbulence that can affect businesses can come from the destabilization of structure, routines and capabilities (Bondeli & Havenvid, 2022). Unfortunately, to successfully manage a crisis, preparation is essential, and few startups were prepared for a crisis of the magnitude of the Covid-19 pandemic (Kuckertz et al., 2020). The limited number of studies on resilience in the context of entrepreneurship and crises focus primarily on the pre-crisis period and the skills or resources that entrepreneurs and organizations develop to resist or adapt to events imposed by the crisis (Truong & Tahar, 2023; Krishnan et al., 2022; Kuckertz et al., 2020).

Generally, the specificities of innovative startups should allow them to be better prepared to face the Covid-19 crisis than other types of businesses (Rezaeinejad & Chernikov, 2021). Being innovative is a prerequisite for resilience, as innovative companies tend to constantly, continuously anticipate, and adapt to a wide range of crises (Acciarini et al., 2021; Kuckertz et al., 2020). However, businesses do not always recognize the real threat that a potential crisis event entails and the majority of startups will not have been prepared for events related to combating the Covid-19 pandemic (Mota et al., 2022). We know from research into the effects of Hurricane Katrina and its aftermath that a failure to prepare for a crisis can have dramatic consequences, particularly for small businesses that are vulnerable to business interruption cash flow, lack of access to capital for recovery and problems accessing aid and, also, serious infrastructure problems (Haynes et al., 2019).

1.2. Start-ups and entrepreneurial crisis management

The advent of the Covid-19 pandemic has pushed scholars and practitioners to better understand the concept of crisis. Although there are different definitions of a "crisis", most studies define it as a disruptive event that occurs unpredictably and in a way that can significantly threaten the normal functioning of the actor (i.e. 'i.e. an individual, an organization and/or a community) (Lee et al., 2023).

Resilience is an essential concept in entrepreneurial crisis management (Salamzadeh et al., 2023). It describes not only the ability of an organization to continue operating throughout a disruptive event, but the conceptual aspect of the term also takes into account the resources that were accumulated before a crisis and then deployed during it in order to manage these consequences on the company (Van Der Vegt et al., 2015). Indeed, crisis management is used to foster resilience and will be of utmost importance in minimizing the impacts of a crisis and, if done well, can quickly restore the functionality of organizations suffering from the effects of disrupted systems or weakened (Greene, 2017).

The few studies on crisis management in entrepreneurship research primarily assess actions that entrepreneurs or organizations take to mitigate the potential negative consequences of a crisis, among them changes in sales, marketing and employment (Sharma & Rautela, 2022). Small businesses in particular tend to excel in adaptability and flexibility and we should expect them to demonstrate this in response to the Covid-19 crisis (Gorjian Khanzad & Gooyabadi, 2021; Evans & Bahrami, 2020). Crisis management in the entrepreneurial context is therefore closely linked to the concept of bricolage (Crupi et al., 2022), and rather than suggesting rigid processes to meet the challenges presented by Covid-19, it seems more appropriate for innovative startups to adopt iterative and flexible approaches such as that of effectuation (Kuckertz et al., 2020). Research findings on the 2012 Emilia earthquakes in Italy illustrate this view: resilient entrepreneurs were those who created change and opportunities with available resources and following an important effective principle (Martinelli & Tagliazzucchi, 2019).

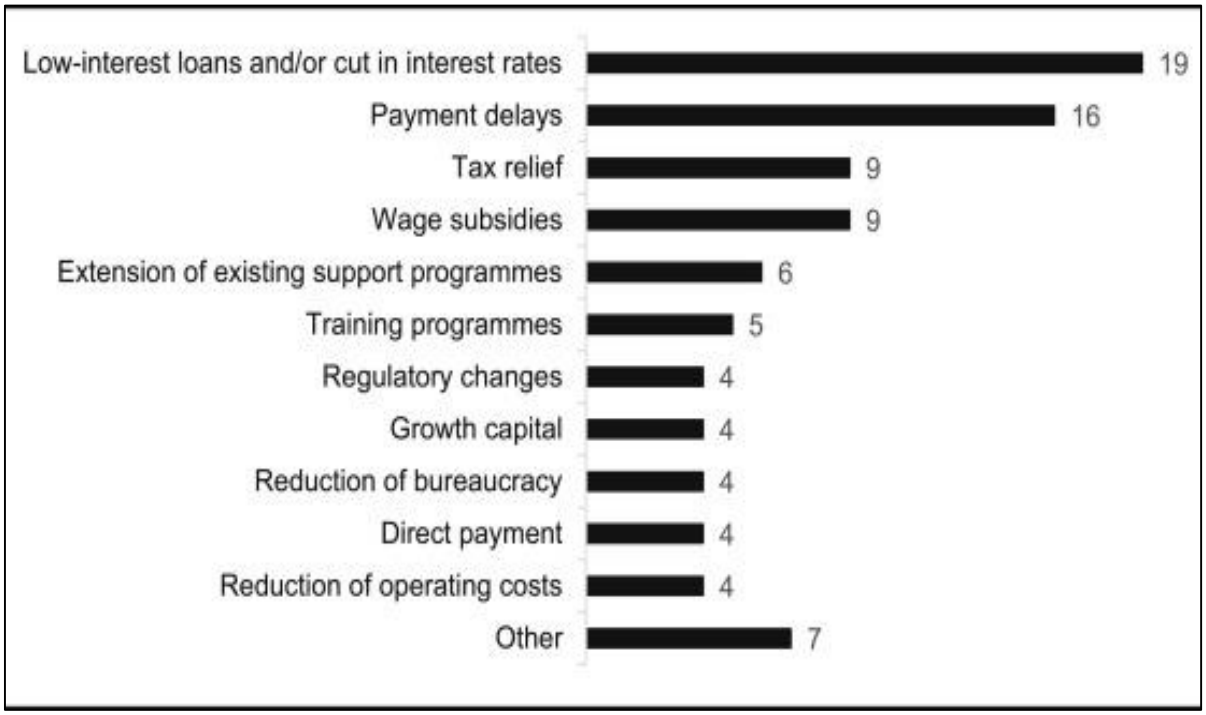
1.3. Economic policy responses to crises

While micro-level crisis management is largely the task of entrepreneurs themselves, policymakers are called upon to support entrepreneurs in their efforts to deal with crises such as Covid-19 (Batjargal et al., 2023). This means that policy makers conduct crisis management at the macro level, the objective of which is to strengthen the resilience of companies, including startups, and to support their individual crisis management actions (Leite & Hodgkinson, 2023).

Research has shown that regions with high levels of entrepreneurship before the crisis are well placed to cope with exogenous shocks (Mazzola & Pizzuto, 2020; Bishop, 2019). An entrepreneurial region is characterized by the resilience of its businesses and entrepreneurial activity can contribute to restructuring and adaptation in the aftermath of the crisis (Muñoz et al., 2020). Delilah Roque et al. (2020) investigation in the wake of Hurricane Katrina and tornadoes in Tuscaloosa, Alabama, and Joplin illustrates how post-disaster entrepreneurs helped restart business through actions such as providing needed resources to disaster victims while leveraging social capital to navigate uncertainty. These people are motivated by high attachment and pursue both business and societal goals (Delilah Roque et al., 2020). It is very likely that in the aftermath of the Covid-19 crisis we will see regions coping differently with the consequences of drastic lockdown measures, and some will benefit from their entrepreneurial potential (Kuckertz et al., 2020). It will depend on how innovative entrepreneurs can behave. From the point of view of decision-makers, however, it would not be wise to rely solely on entrepreneurial initiative to repair the economic damage caused by the measures taken by governments to manage the health crisis; instead, it should be a priority of policymakers in the short term during the Covid-19 crisis to ensure that innovative startups can draw on sufficient resources (Gorjian Khanzad & Gooyabadi, 2021; Evans & Bahrami, 2020).

However, new legislation might not be the method of choice; drawing on in-depth interviews with Greek entrepreneurs, Apostolopoulos et al. (2019) suggest that changes in institutions limited entrepreneurial activity rather than strengthening it and this effect was more pronounced in the midst of the crisis. In any case, external assistance to affected regions before, during and after measures taken to combat the Covid-19 pandemic is essential (Adam & Alarifi, 2021).

Figure 1: Number of countries where the identified policy measure was announced by the government



Source: Kuckertz et al. (2020)

2. Research methodology

Our aim is to describe the challenges that entrepreneurs are facing due to the health crisis, to show how entrepreneurs are managing the effects of the crisis and what they are doing to protect their businesses and to present measures that could be used by decision-makers to help entrepreneurs facing these challenges. For the first two questions, we relied on a qualitative methodology based on the case study. In general, qualitative research appears to dominate crisis research in the entrepreneurial context (Linnenluecke, 2017; Buchanan & Denyer, 2013) and case studies have been successfully applied to capture entrepreneurs' experiences (Herbane, 2010; Runyan, 2006) or to investigate crisis events and post-crisis business emergence (Williams and Shepherd, 2016). For the third question, we relied on documentary research.

To collect the data, we used an ecosystem perspective to select key informants (Kuckertz et al., 2020). Therefore, instead of focusing exclusively on entrepreneurs, we included all competent people such as investors and decision-makers in the sample. As a result, we triangulated the views we collected from entrepreneurs from different angles.

We invited 18 players from the entrepreneurial ecosystem but only 12 responded favorably to our invitation. Thus, our sample includes 9 founders of innovative start-ups in addition to 3 other actors. The start-ups cover different industries (Table 1). Our sampling is non-probability and the data was collected during the months of March and April 2023.

Table 1: Our sample

	Creation date	Number of employees	Sector of activity	Function	Role
1	2018	5	Business Software and services	Start-up	Actor
2	2018	12	Environment	Start-up	Actor
3	2016	6	Advanced Manufacturing & Robotics	Start-up	Actor
4	2017	6	Business Software and services	Start-up	Actor
5	2015	9	Environment	Start-up	Actor
6	2019	7	Advanced Manufacturing & Robotics	Start-up	Actor
7	2019	8	Commerce and shopping	Start-up	Actor
8	2017	10	Commerce and shopping	Start-up	Actor
9	2019	4	FoodTech & New Food	Start-up	Actor
10	2014	-	Finance	Investor	Resource Provider
11	-	-	Accompaniment	Facilitator	Linking
12	-	-	Public	Association	Linking / Information

We conducted semi-structured interviews with key ecosystem informants. The questions asked focused on different topics and were formulated as: “How is your start-up affected by the Covid-19 epidemic?” And “How is your start-up responding to these new challenges?”. We aimed to better understand the adversity in which our informants' businesses find themselves and the responses they provide. We adjusted the semi-structured interviews for different actors. For example, investors were asked the following questions: “How would you describe the atmosphere in your start-ups? and “Did your start-ups receive any support in this situation?”. The interviews were recorded and transcribed.

The data collected was supplemented by information on government policy measures aimed at supporting entrepreneurship. The first type of data (interviews) offers an account of the startups' adversity in the face of the crisis and how, using bricolage responses, they are coping. The second type of data was used to design support initiatives to protect startups from the consequences of the measures taken and to mitigate the effects of future crises. These data made it possible to work on the third question. In order to understand what immediate policy measures were called for, announced and implemented with the aim of protecting innovative startups during the Covid-19 crisis and the discussion that followed, we collected 85 articles for analysis.

To analyze the collected data, we applied the following processing protocol (Magnani & Gioia, 2023; Gioia, 2021; Shepherd et al., 2020):

- First, we used open coding focused on entrepreneurs' perceived adversity and resilience to create first-order categories.
- Second, we used second-round axial coding to generate second-order themes.
- Third, based on second-order themes, we constructed theoretical dimensions that resulted in the key dynamics graph. Based on grounded theory, codes emerge without a predefined coding scheme (Bryant & Charmaz, 2019).

Following Strauss (2017), a large number of categories were identified, although the first research question directed our attention in the coding process. We looked for signs of adversity facing respondents' businesses and attempted to elicit the responses

implemented. In order to allow respondents to express themselves and make their perceptions known as closely as possible, we used in vivo coding when possible (Magnani & Gioia, 2023; Gioia, 2021; Bryant & Charmaz, 2019).

Following the process of Shepherd et al. (2020), we used three interviews with entrepreneurs to identify the key issues of the research question and constructed a first version of the codes by aggregating the similarities. Next, we used the code list to code the unprocessed interviews.

In a subsequent iterative approach, constantly comparing data, codes and categories, we finalized the list of codes (Bryant and Charmaz, 2019). Based on the evolving understanding of our codes and theory, we adjusted the semi-structured questionnaire (Charmaz & Thornberg, 2021).

We then created and evaluated a first version of aggregate codes and first-order categories leading to second-order themes. The second-order themes were then oriented towards global dimensions linked to existing theory (Gioia, 2021). We completed data collection once we reached theoretical saturation (Strauss, 2017).

For the secondary data collected, a codebook was created to analyze media clips regarding policy measures to support SMEs or startups (Hruschka et al., 2004). In the absence of suitable concepts due to the uniqueness of the Covid-19 crisis, we developed a codebook applying inductive content analysis as opposed to a deductive approach which requires established concepts.

The unit of analysis concerned all policy measures explicitly and specifically mentioned in the reviewed articles. Across the 85 news articles, we identified 147 non-unique policy measures across 42 countries because different media reports could have reported the same measure. For each political measure, we identified its type (16 different categories and others for free text), the country concerned, the actor calling for or announcing the measure, the status (requested or announced by the government or the central bank), the types of companies eligible to benefit from the measure (all companies, start-ups, SMEs, self-employed people), if the access conditions have been explicitly and specifically mentioned, the time horizon for implementing the measure (short/medium or long term) and the targeted territory of the mentioned political measure (regional/national/international).

3. Search results

3.1. Adversity for innovative Tunisian start-ups following the measures taken to respond to the Covid-19 crisis

For many startup founders interviewed, the business climate is currently not favorable enough for innovation. However, the start-up ecosystem is improving day by day.

The interviewee (12) expresses himself: *"We can say that this is a very good start and that the government has been able, on a crucial issue, to be reactive and ensure that Tunisia can be seen as a reference in Africa regarding the creation of a legal framework for innovative companies. Personally, I think that the ecosystem will be built slowly; part of the law will have to be promoted to encourage investors to be interested in start-ups. Also, time-limited tax incentives for innovative companies must still continue because a start-up is different from an SME."*

In the context of the health crisis experienced, the main partners, customers and investors have themselves been fully committed to responding to the crisis and the uncertainty as to how the crisis has developed discourages any experimentation. When markets are blocked, start-ups are forced to engage in what is known as "plateaued growth" (Huffman et al., 2023), which, combined with barriers to access financing, can harm their growth trajectories. Adversity resulting from a crisis can generate both opportunities and threats, as it creates external pressure to adapt to (Kuckertz et al., 2020). Respondents reported being forced to take alternative actions and engage in alternative behavior, that is, some exhibit behavioral capabilities (Bin et al., 2021). Startup founders have been forced to adjust their organizational infrastructure as value creation processes are on hold and supply chains are affected by the crisis (Kuckertz et al., 2020). At the same time, some start-ups have not been affected by the Covid-19 crisis, either because their

companies have continued to be relevant despite the crisis or because companies have implemented measures before the crisis that strengthens their survival (Mota et al., 2022). This means that these start-ups are resilient, although this resilience will most likely be limited in time (Sreenivasan et al., 2023).

3.2. Entrepreneurial crisis management of innovative start-ups during Covid-19

To cope with the Covid-19 crisis, start-ups have reported relying heavily on so-called relational capabilities (Gueguen et al., 2021). As a result, their response to adversity was primarily based on intentional bricolage by combining available internal resources and drawing on external resources (Kuckertz et al., 2020) of their network (Mota et al., 2022), which included goodwill among partners, mutual support in the startup community, and access to social capital through brokers (Guckenbiehl et al., 2022). Additionally, founders reported attempting to strengthen the financial capabilities of their companies by raising capital through internal measures and seeking government support (Pilloni et al., 2022; Kuckertz et al., 2020).

However, when it comes to government support, startup founders reported a perceived mismatch between the support services offered by government policy and the characteristics of their organizations, in that startups are excluded from policy measures because, for example, they are unbankable, or that support programs are plagued by bureaucratic hurdles that outweigh the benefits (Maime & Rambe, 2023). Therefore, startups' initial response to the crisis was not based on securing immediate government support (Pilloni et al., 2022; Kuckertz et al., 2020). Finally, the founders said they are very aware of the changing needs of their customers due to the Covid-19 crisis. Given the above conditions, startups have gone bricolage to solve new problems, identifying and pursuing new entrepreneurial opportunities and establishing new directions for their businesses (Kuckertz et al., 2020; Tsilika et al., 2020).

3.3. International policy responses to the Covid-19 pandemic

The international media reports we identified cover policy measures called or implemented to support SMEs and start-ups in 42 countries. We distinguish between measures requested by stakeholders such as entrepreneurs, academics or lobbyists and policy measures announced by the government or central banks (Junk et al., 2022; Kuckertz et al., 2020). Interestingly, the latter outweigh the former, suggesting that most governments have responded quickly and decisively to the Covid-19 crisis. We find a plethora of immediate responses to the Covid-19 crisis specifically to help SMEs deal with the current threats of falling revenues, rising costs and illiquidity (Forster & Heinzel, 2021; Comfort et al., 2020).

Overall, most measures represent short-term assistance; The most popular policy measure announced or implemented by governments around the world is to improve a company's financial capital by reducing loan interest rates or improving loan availability (Schularick et al., 2020; Kuckertz et al., 2020).

The speed of the outbreak and spread of the Covid-19 pandemic meant that most countries sought measures to provide immediate relief and few progressed beyond this stage (Imane & Mohamed, 2023). Nevertheless, the first calls for long-term measures to address more fundamental systemic problems are emerging. One example is the Chinese call to generally secure the accessibility of financial capital for innovative startups (Brown & Rocha, 2020; Kuckertz et al., 2020). Among the measures called for, some American opinion leaders have advocated not losing sight of the Sustainable Development Goals and suggested that government economic aid be linked to compliance with measures aimed at mitigating climate change (Shulla et al., 2021). If governments can provide immediate relief to entrepreneurs under pressure, in a way that remains consistent with the long-term goals of promoting health, equity and environmental protection, the Covid-19 crisis could even contribute to a better future (Stegeman et al., 2020). In all countries, we observe that the political measures discussed or announced are generally accessible to businesses in general. In most countries we found measures designed to specifically address the needs of

SMEs (Kuckertz et al., 2020). However, few countries have announced policy measures explicitly targeting startups (Naudé, 2020).

4. Discussion and conclusion

Human life is undoubtedly more valuable than economic activity, and this research should not be read as a criticism of the measures taken to control the spread of Covid-19. We have illustrated how the economic crisis caused by infection control measures - and in particular the blocking of economic activity - have affected innovative startups and the measures that could be taken to protect them (Pilloni et al., 2022). Unlike, for example, the crisis caused by the dotcom boom and bust, the Covid-19 crisis has threatened the potential for innovation that might have been viable in normal times (Ardito et al., 2021). When it comes to the fall in Internet stock prices around the turn of the millennium, one could argue that this was an upheaval in which unsustainable business models were eliminated (Ramelli & Wagner, 2020). The Covid-19 crisis seems different and the situation is not only about state intervention and protecting innovative startups.

For the set of challenges, our results into actionable measures for both entrepreneurs and decision-makers can be translated in the following:

- Avoid immediate failure of the start-up
  Indeed, declining sales and increasing operating costs lead to illiquidity, which leads entrepreneurs to perceive existential fear.
  In this case, start-ups can draw on available resources to create solutions to new problems (e.g., creatively combine existing technology and human capital), and, in particular, activate network resources (e.g. flexible payment options, joint sales initiatives, flexible staff rotation, etc.).
  However, it is important not to sanction late payments, wage subsidies, direct payments, and of course, communicate community feeling to stimulate mutual aid.
- Adapting due to disruptions in the startup's core infrastructure
  These include the interruption of value creation processes, supply chain disruptions and increasing obstacles to recruitment and management of personnel.
  In this case, start-ups can resort to internal restructuring with a focus on channeling resources only to recently viable and value-generating activities, and reducing other activities (retaining the possibility of increasing them again later).
  The government, for its part, can offer employee development programs (e.g., for digitalization) and support the reduction of time-based workforces (e.g., through wage subsidies).
- Continuing startup growth against all odds
  These include reservations about innovation experienced in a hostile climate for innovative products and services (with the exception of crisis response solutions) as well as additional obstacles to start-up financing.
  In this case, start-ups can discover value-creating opportunities to resolve the consequences of the crisis (e.g., develop hygiene or digital working solutions), and proactively engage in broader opportunities that may arise in the aftermath of the crisis (e.g. example, evolution of trends and behaviors after the crisis - acceleration of digitalization).
  The government, for its part, can ensure future innovation through medium or long-term policy measures linked to broader policy objectives (e.g. sustainability and/or digital transformation), lay the foundations for post-crisis recovery (e.g. incentivize investors to provide additional growth capital), nurture knowledge diversity and entrepreneurial culture in the ecosystem and stimulate a business climate favorable to consumption and innovation.
- Addressing the inadequacy of initial policy measures
  It concerns the first policy support services experienced as not being aimed at startups ("we're stuck in the middle") and various additional obstacles in applying for and implementing policy support services specifically for startups -ups.
  In this case, start-ups can collect information and best practices through entrepreneur networks (e.g. exchange

information in online crisis groups, learn about the application and implementation of similar startup support services) and support lobbying initiatives of (business) associations to be included in policy decisions and programs.

The government, for its part, can provide information and support services addressing specific startup challenges (e.g. hotlines), quickly communicate the intent of startup-specific support, and decrease startup-specific barriers in applying startup-specific support (for example, considering future growth trajectories instead of past revenues) and reducing red tape.

In particular, the qualitative part of this research suggests that some businessmen in the entrepreneurial ecosystem already perceive entrepreneurial opportunities in a positive sense, that is, they see an opportunity to solve current problems by using entrepreneurial measures. We have identified seven factors linked to adversity and adaptation strategies, which constitute elements for understanding the reactions of startups to crises in general and to the Covid-19 crisis in particular. The first four are linked to adversity induced by the crisis and which are: failure (illiquidity, threat of existence), non-development (potential for innovation and growth, growth factors), pressure to adaptation (disruption of internal infrastructure, disruption of infrastructure external to the company) and pre-disaster resilience (a priori resilience). The three others concern tinkering with responses to the crisis, namely: relying on relational capacities (Goodwill of commercial partners, consultation of the business network, support for brokers), strengthening financial capacities (capital accumulation thanks to internal measures, capital accumulation through government support) and mismatch among aid recipients (political support, mismatch and barriers to the use of policy support services).

Indeed, the quality of an organization's response to a crisis is generally associated with resilience and depends on the ability to improve improvisation, coordination, flexibility and endurance (Ma & Zhang, 2022). These are qualities that are closer to the routine behavior of innovative startups than of large, more established companies (Fehrer & Bove, 2022; Kariv, 2022; Kuckertz et al., 2020). Additionally, small businesses are often more creative than large businesses, and this creativity could help ensure that these businesses remain viable in the face of adversity (Campagnolo et al., 2022). Many entrepreneurs adopt the role of tinkerers when attempting to drive change and create opportunities with available resources (Martinelli & Tagliazzucchi, 2019). Bricolages enthusiasts demonstrate that crises can fuel the development of new opportunities (Francisco, 2023), innovation and alternative products/services (Kuckertz et al., 2020). As crises can also encourage the exploitation of new opportunities (Elali, 2021), they can encourage innovation and the development of alternative products and services (Kuckertz et al., 2020).

In the short term, there will be opportunities arising from the Covid-19 crisis, such as the development of hygiene or digital working solutions (He et al., 2021). The long-term consequences of the Covid-19 pandemic are, however, not yet predictable, but it seems inevitable that broader opportunities will present themselves. The literature suggests that for entrepreneurs, facing uncertainty and failure is a normal part of business operation (Brown & Rocha, 2020), even when uncertainty is caused by a crisis like the Covid-19 pandemic (Bryce et al., 2022). Entrepreneurs can therefore be expected to be flexible and adapt their business models in response to a crisis. This suggests that startups are better prepared for crises than any other economic actor. Some researchers will no doubt suggest that the flexibility of startups and the relatively small number they employ means that excluding them from government aid programs will not have a critical impact on the economy, but letting startups go to the wall puts potentially jeopardizing a state's future innovation (Rezaeinejad & Chernikov, 2021; Kuckertz et al., 2020).

Therefore, medium- to long-term policy measures targeting future innovation, although unlikely to be the first responses to such a crisis, nevertheless seem essential (Ebersberger & Kuckertz, 2021). This finding is

consistent with previous research suggesting that entrepreneurial responsiveness to crises is determined by factors such as entrepreneurial culture and knowledge diversity, which cannot be addressed by measures in the short term, but which are the result of coherent policies favoring entrepreneurship (Kuckertz et al., 2020; Bishop, 2019; Doern et al., 2019). Just as the resilience of the health systems of different states is currently proving essential to their ability to respond to the Covid-19 pandemic, countries that have established resilient entrepreneurial ecosystems will be able to resume their level of activity of before the crisis more quickly than those who did not do so (Haldane et al., 2021). The interviews conducted in support of this research show that startups will rely heavily on the support of their entrepreneurial ecosystem to manage the crisis (Kuckertz et al., 2020; Bishop, 2019; Doern et al., 2019). Policy measures are therefore only likely to succeed if they are complemented by the broader attributes of an entrepreneurial ecosystem (Stam & Van de Ven, 2021). Incentivizing investors to provide growth capital despite the crisis could be an appropriate way to combine both providing short-term liquidity to pay salaries and bills while laying the foundation for a promising future.

Analysis of the international press, for example, has illustrated the numerous opportunities to protect the innovation potential of start-ups. Although it is unclear which specific measures will be most effective, it seems clear that programs specifically targeting innovative startups should be mandatory. Assuming that measures targeting SMEs will also benefit innovative startups would be a mistake that policymakers must avoid (Kuckertz et al., 2020; Bishop, 2019; Doern et al., 2019). Unlike many other crises, the Covid-19 crisis did not hit all countries at the same time. At least in health, many African countries have been able to learn from the experiences of China and Italy and respond proactively. While the time frame of the economic crisis hitting countries may disappear in the long term, policymakers can still observe how measures taken to protect startups are unfolding and adopt or reject them, as appropriate, to improve knowledge from startups crisis situations (Kuckertz et al., 2020).

References

Acciarini, C., Boccardelli, P., & Vitale, M. (2021). Resilient companies in the time of Covid-19 pandemic: a case study approach. Journal of Entrepreneurship and Public Policy, 10(3), 336-351.

Adam, N. A., & Alarifi, G. (2021). Innovation practices for survival of small and medium enterprises (SMEs) in the COVID-19 times: the role of external support. Journal of innovation and entrepreneurship, 10(1), 15.

Anoushiravani, A. A., O'Connor, C. M., DiCaprio, M. R., & Iorio, R. (2020). Economic impacts of the COVID-19 crisis: an orthopaedic perspective. The Journal of bone and joint surgery. American volume.

Apostolopoulos, N., Newbery, R., & Gkartzios, M. (2019). Social enterprise and community resilience: Examining a Greek response to turbulent times. Journal of Rural studies, 70, 215-224.

Ardito, L., Coccia, M., & Messeni Petruzzelli, A. (2021). Technological exaptation and crisis management: Evidence from COVID-19 outbreaks. R&d Management, 51(4), 381-392.

Batjargal, B., Jack, S., Mickiewicz, T., Stam, E., Stam, W., & Wennberg, K. (2023). Crises, COVID-19, and entrepreneurship. Entrepreneurship theory and practice, 47(3), 651-661.

Benassi, C. (2020). Unions' responses to the Covid-19 crisis in Europe. Social Europe.

Bin, E., Andruetto, C., Susilo, Y., & Pernestål, A. (2021). The trade-off behaviours between virtual and physical activities during the first wave of the COVID-19 pandemic period. European Transport Research Review, 13, 1-19.

Bishop, P. (2019). Knowledge diversity and entrepreneurship following an economic crisis: an empirical study of regional resilience in Great Britain. Entrepreneurship & Regional Development, 31(5-6), 496-515.

Bondeli, J. V., & Havenvid, M. I. (2022). Bouncing back in turbulent business environments: Exploring resilience in business networks. Industrial Marketing Management, 107, 383-395.

Brown, R., & Rocha, A. (2020). Entrepreneurial uncertainty during the Covid-19 crisis: Mapping the temporal dynamics of entrepreneurial finance. Journal of Business Venturing Insights, 14, e00174.

Brown, R., Mason, C. (2017). Looking inside the spiky bits: a critical review and conceptualisation of entrepreneurial ecosystems. Small Bus. Econ. 49, 11–30.

Bryant, A., & Charmaz, K. (Eds.). (2019). The SAGE handbook of current developments in grounded theory. Sage.

Bryce, C., Ring, P., Ashby, S., & Wardman, J. K. (2022). Resilience in the face of uncertainty: Early lessons from the COVID-19 pandemic. In COVID-19 (pp. 48-55). Routledge.

Buchanan, D. A., & Denyer, D. (2013). Researching tomorrow's crisis: methodological innovations and wider implications. International Journal of Management Reviews, 15(2), 205-224.

Campagnolo, D., Laffineur, C., Leonelli, S., Martiarena, A., Tietz, M. A., & Wishart, M. (2022). Stay alert, save businesses. Planning for adversity among immigrant entrepreneurs. International Journal of Entrepreneurial Behavior & Research, 28(7), 1773-1799.

Charmaz, K., & Thornberg, R. (2021). The pursuit of quality in grounded theory. Qualitative research in psychology, 18(3), 305-327.

Coccia, M. (2023). Effects of strict containment policies on COVID-19 pandemic crisis: lessons to cope with next pandemic impacts. Environmental Science and Pollution Research, 30(1), 2020-2028.

Comfort, L. K., Kapucu, N., Ko, K., Menoni, S., & Siciliano, M. (2020). Crisis decision-making on a global scale: Transition from cognition to collective action under threat of COVID-19. Public Administration Review, 80(4), 616-622.

Coste, J. H. (2020). Bricolage entrepreneurial et start-up en temps de crise Covid-19: modèle artisanal et «pensée sauvage» Essai à partir du livre d'Amiel Kornel (2017), Spinning into Control, Improvising the Sustainable Startup, Palgrave. Entreprendre & innover, (3), 78-88.

Crupi, A., Liu, S., & Liu, W. (2022). The top-down pattern of social innovation and social entrepreneurship. Bricolage and agility in response to COVID-19: cases from China. R&D Management, 52(2), 313-330.

Cucculelli, M., & Peruzzi, V. (2020). Post-crisis firm survival, business model changes, and learning: evidence from the Italian manufacturing industry. Small Business Economics, 54, 459-474.

Delilah Roque, A., Pijawka, D., & Wutich, A. (2020). The role of social capital in resiliency: Disaster recovery in Puerto Rico. Risk, Hazards & Crisis in Public Policy, 11(2), 204-235.

Doern, R., Williams, N., & Vorley, T. (2019). Special issue on entrepreneurship and crises: business as usual? An introduction and review of the literature. Entrepreneurship & Regional Development, 31(5-6), 400-412.

Ebersberger, B., & Kuckertz, A. (2021). Hop to it! The impact of organization type on innovation response time to the COVID-19 crisis. Journal of Business Research, 124, 126-135.

Elali, W. (2021). The importance of strategic agility to business survival during corona crisis and beyond. International Journal of Business Ethics and Governance, 1-8.

Evans, S., & Bahrami, H. (2020). Super-flexibility in practice: Insights from a crisis. Global Journal of Flexible Systems Management, 21, 207-214.

Fehrer, J. A., & Bove, L. L. (2022). shaping resilient service ecosystems in times of crises–a trans-Tasman perspective. Journal of Services Marketing, 36(4), 489-498.

Forster, T., & Heinzel, M. (2021). Reacting, fast and slow: how world leaders shaped government responses to the COVID-19 pandemic. Journal of European Public Policy, 28(8), 1299-1320.

Francisco, J. P. (2023). Bricolage and the Entrepreneurial Process in Times of Crisis: Insights from New Ventures in an Emerging Economy. Available at SSRN 4440244.

Gioia, D. (2021). A systematic methodology for doing qualitative research. The Journal of Applied Behavioral Science, 57(1), 20-29.

Gorjian Khanzad, Z., & Gooyabadi, A. A. (2021). Development of strategic resilience framework for small businesses Post-COVID-19. Businesses, 1(3), 127-141.

Greene, R. R. (2017). Risk and resilience theory: A social work perspective. In *Human*

behavior theory and social work practice (pp. 315-342). Routledge.

Guckenbiehl, P., & Corral de Zubielqui, G. (2022). Start-ups' business model changes during the COVID-19 pandemic: Counteracting adversities and pursuing opportunities. International Small Business Journal, 40(2), 150-177.

Gueguen, G., Delanoë-Gueguen, S., & Lechner, C. (2021). Start-ups in entrepreneurial ecosystems: the role of relational capacity. Management Decision, 59(13), 115-135.

Haldane, V., De Foo, C., Abdalla, S. M., Jung, A. S., Tan, M., Wu, S., & Legido-Quigley, H. (2021). Health systems resilience in managing the COVID-19 pandemic: lessons from 28 countries. Nature Medicine, 27(6), 964-980.

Haynes, G. W., Danes, S. M., Schrank, H. L., & Lee, Y. (2019). Survival and success of family-owned small businesses after hurricane Katrina: Impact of disaster assistance and adaptive capacity. Journal of Contingencies and Crisis Management, 27(2), 130-144.

He, W., Zhang, Z. J., & Li, W. (2021). Information technology solutions, challenges, and suggestions for tackling the COVID-19 pandemic. International journal of information management, 57, 102287.

Herbane, B. (2010). Small business research: Time for a crisis-based view. International small business journal, 28(1), 43-64.

Hruschka, D. J., Schwartz, D., St. John, D. C., Picone-Decaro, E., Jenkins, R. A., & Carey, J. W. (2004). Reliability in coding open-ended data: Lessons learned from HIV behavioral research. Field methods, 16(3), 307-331.

Huffman, A., Ijaz, Z., & Kaza, D. (2023). How the Demise of SVB and Its VC Affiliates May Impact Startups. American Bankruptcy Institute Journal, 42(9), 28-51.

Imane, A., & Mohamed, D. Y. (2023). Analyse de l impact de la crise de COVID-19 et des mesures prises par la BCT sur le secteur bancaire tunisien Analysis of the impact of the COVID-19 crisis and the measures taken by the BCT on the Tunisian banking sector. Journal of Contemporary Business and Economic Studies Vol, 6(02).

Junk, W. M., Crepaz, M., Hanegraaff, M., Berkhout, J., & Aizenberg, E. (2022). Changes in interest group access in times of crisis: no pain, no (lobby) gain. Journal of European Public Policy, 29(9), 1374-1394.

Karakosta, C., Mylona, Z., Karásek, J., Papapostolou, A., & Geiseler, E. (2021). Tackling covid-19 crisis through energy efficiency investments: Decision support tools for economic recovery. Energy Strategy Reviews, 38, 100764.

Kariv, D. (2022). Startups and Crisis Management. Taylor & Francis.

Kharel, M., Sakamoto, J. L., Carandang, R. R., Ulambayar, S., Shibanuma, A., Yarotskaya, E., ... & Jimba, M. (2022). Impact of COVID-19 pandemic lockdown on movement behaviours of children and adolescents: a systematic review. BMJ global health, 7(1), e007190.

Khlystova, O., Kalyuzhnova, Y., & Belitski, M. (2022). The impact of the COVID-19 pandemic on the creative industries: A literature review and future research agenda. Journal of Business Research, 139, 1192-1210.

Krishnan, C. S. N., Ganesh, L. S., & Rajendran, C. (2022). Entrepreneurial Interventions for crisis management: Lessons from the Covid-19 Pandemic's impact on entrepreneurial ventures. International Journal of Disaster Risk Reduction, 72, 102830.

Kuckertz, A., Brändle, L., Gaudig, A., Hinderer, S., Reyes, C. A. M., Prochotta, A., & Berger, E. S. (2020). Startups in times of crisis–A rapid response to the COVID-19 pandemic. Journal of Business Venturing Insights, 13, e00169.

Leite, H., & Hodgkinson, I. R. (2023). Examining resilience across a service ecosystem under crisis. Public Management Review, 25(4), 690-709.

Lee, Y., Kim, J., Mah, S., & Karr, A. (2023). Entrepreneurship in Times of Crisis: A Comprehensive Review with Future Directions. Entrepreneurship Research Journal, (0).

Leppens, M., Chatteur, F., & Perkins, P. (2023). Mixed methods studies in design practice and suggestions for business and management research. In Handbook of Mixed Methods Research in Business and Management (pp. 394-410). Edward Elgar Publishing.

Linnenluecke, M. K. (2017). Resilience in business and management research: A review of influential publications and a research agenda. International Journal of Management Reviews, 19(1), 4-30.

Ma, B., & Zhang, J. (2022). Tie strength, organizational resilience and enterprise crisis management: An empirical study in pandemic time. International Journal of Disaster Risk Reduction, 81, 103240.

Magnani, G., & Gioia, D. (2023). Using the Gioia Methodology in international business and entrepreneurship research. International Business Review, 32(2), 102097.

Maime, R., & Rambe, P. (2023). Exploring Potentialities and Limits of Internationalisation of High-Technology Family-Owned Start-Ups in Africa: A PESTEL Perspective. In The Future of Entrepreneurship in Africa (pp. 69-84). Productivity Press.

Martinelli, E., & Tagliazzucchi, G. (2019). Entrepreneurs' resilience to natural disasters: a survey in the retail sector. Sinergie Italian Journal of Management, 37(1), 43-62.

Mazzola, F., & Pizzuto, P. (2020). Resilience and convergence: Short vs. long-run regional effects of economic crises and macroeconomic policies. Scienze Regionali, 19(3), 431-452.

Meahjohn, I., & Persad, P. (2020). The impact of COVID-19 on entrepreneurship globally. Journal of Economics and Business, 3(3).

Mota, R. D. O., Bueno, A., Gonella, J. D. S. L., Ganga, G. M. D., Godinho Filho, M., & Latan, H. (2022). The effects of the COVID-19 crisis on startups' performance: the role of resilience. Management Decision, 60(12), 3388-3415.

Muñoz, P., Naudé, W., Williams, N., Williams, T., & Frías, R. (2020). Reorienting entrepreneurial support infrastructure to tackle a social crisis: A rapid response. Journal of Business Venturing Insights, 14, e00181.

Naudé, W. (2020). Entrepreneurial recovery from COVID-19: Decentralization, democratization, demand, distribution, and demography.

Ozili, P. K., & Arun, T. (2023). Spillover of COVID-19: impact on the Global Economy. In Managing inflation and supply chain disruptions in the global economy (pp. 41-61). IGI Global.

Ozili, P. K., & Arun, T. (2023). Spillover of COVID-19: impact on the Global Economy. In Managing inflation and supply chain disruptions in the global economy (pp. 41-61). IGI Global.

Pattanayak, K. P., & Padhy, C. (2021). A Review on Entrepreneurial Crisis Management during Coronavirus (Covid-19) Pandemic. Indian Journal of Natural Sciences, 12(67), 32863-32867.

Pedersen, C. L., Ritter, T., & Di Benedetto, C. A. (2020). Managing through a crisis: Managerial implications for business-to-business firms. Industrial Marketing Management, 88, 314.

Pilloni, M., Kádár, J., & Abu Hamed, T. (2022). The impact of COVID-19 on energy start-up companies: The use of global financial crisis (GFC) as a lesson for future recovery. Energies, 15(10), 3530.

Prohorovs, A. (2020). Getting ready for recession: How SMEs prepared for Covid-19 pandemic and economic recession. Forbes (Latvian edition) No, 11, 46-49.

Ramelli, S., & Wagner, A. F. (2020). Feverish stock price reactions to COVID-19. The Review of Corporate Finance Studies, 9(3), 622-655.

Reyad, S., Madbouly, A., Chinnasamy, G., Badawi, S., & Hamdan, A. (2020). Inclusion of mixed method research in business studies: Opportunity and challenges. In Proceedings of the European Conference on Research Methods for Business & Management Studies (pp. 248-256).

Rezaeinejad, I., & Chernikov, S. U. (2021). Impact of Covid-19 on Iran startups at biotech, pharmaceutical, engineering and other innovative industries. In SHS Web of Conferences (Vol. 114, p. 01018). EDP Sciences.

Runyan, R. C. (2006). Small business in the face of crisis: identifying barriers to recovery from a natural disaster 1. Journal of Contingencies and crisis management, 14(1), 12-26.

Salamzadeh, A., Mortazavi, S., Hadizadeh, M., & Braga, V. (2023). Examining the effect of business model innovation on crisis management: the mediating role of entrepreneurial capability, resilience and business performance. Innovation & Management Review, 20(2), 132-146.

Schularick, M., Steffen, S., & Tröger, T. H. (2020). Bank capital and the European recovery from the COVID-19 crisis.

Sharma, S., & Rautela, S. (2022). Entrepreneurial resilience and self-efficacy during global crisis: study of small businesses

in a developing economy. Journal of Entrepreneurship in Emerging Economies, 14(6), 1369-1386.

Shepherd, D. A., Saade, F. P., & Wincent, J. (2020). How to circumvent adversity? Refugee-entrepreneurs' resilience in the face of substantial and persistent adversity. Journal of Business Venturing, 35(4), 105940.

Shulga, O., Nechyporuk, L., Slatvitskaya, I., Khasanov, B., & Bakhova, A. (2021). Methodological aspects of crisis management in entrepreneurial activities. Academy of Entrepreneurship Journal, 27, 1-7.

Shulla, K., Voigt, B. F., Cibian, S., Scandone, G., Martinez, E., Nelkovski, F., & Salehi, P. (2021). Effects of COVID-19 on the sustainable development goals (SDGs). Discover Sustainability, 2, 1-19.

Sreenivasan, A., Suresh, M., & Tuesta Panduro, J. A. (2023). Modelling the resilience of start-ups during COVID-19 pandemic. Benchmarking: An International Journal, 30(6), 2085-2109.

Stam, E., & Van de Ven, A. (2021). Entrepreneurial ecosystem elements. Small business economics, 56, 809-832.

Stegeman, I., Godfrey, A., Romeo-Velilla, M., Bell, R., Staatsen, B., Van der Vliet, N., & Costongs, C. (2020). Encouraging and enabling lifestyles and behaviours to simultaneously promote environmental sustainability, health and equity: Key policy messages from inherit. International Journal of Environmental Research and Public Health, 17(19), 7166.

Strauss, A. L. (2017). The discovery of grounded theory: Strategies for qualitative research. Routledge.

Truong, Y., & Tahar, Y. B. (2023). Times of crisis and new entrepreneurial opportunities in highly regulated environments: the case of mRNA-biotechs during COVID-19 pandemic. International Journal of Entrepreneurial Behavior & Research.

Tsilika, T., Kakouris, A., Apostolopoulos, N., & Dermatis, Z. (2020). Entrepreneurial bricolage in the aftermath of a shock. Insights from Greek SMEs. Journal of Small Business & Entrepreneurship, 32(6), 635-652.

Van Der Vegt, G. S., Essens, P., Wahlström, M., & George, G. (2015). Managing risk and resilience. Academy of Management Journal, 58(4), 971-980.

Verschuur, J., Koks, E. E., & Hall, J. W. (2021). Global economic impacts of COVID-19 lockdown measures stand out in high-frequency shipping data. PloS one, 16(4), e0248818.

Yilmazkuday, H. (2022). Coronavirus disease 2019 and the global economy. Transport Policy, 120, 40-46.

Zhang, L., Sindakis, S., Dhaulta, N., & Asongu, S. (2023). Economic crisis management during the COVID-19 pandemic: The role of entrepreneurship for improving the Nigerian mono-economy. Journal of the Knowledge Economy, 1-32.