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Highway to hell: Cultural propensity and digital infrastructure gap as recipe to entrepreneurial death

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Abstract

This paper aims to shed light on the actual rate of new venture death in the context of a high level of digital entrepreneurship. Using three different country-level databases, it investigates how different combinations of socio-cultural propensity towards entrepreneurship, exposure to digital media, and digital infrastructure lead to entrepreneurial death. Longitudinal data on 23 European countries are analyzed employing fuzzy-set qualitative comparative analysis (fs-QCA). The findings suggest that, in a context characterized by the presence of high levels of socio-cultural propensity toward entrepreneurship and exposure to digital media and in the absence of high levels of technological and human digital infrastructure, the associated outcome will be a high level of entrepreneurial death for new ventures.

Keywords: digital transformation; digital entrepreneurship; digital infrastructure; socio-cultural propensity; entrepreneurial failure.

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1. Introduction

"*We were working on the Industry 4.0 transformation of our plants, but the already ungrounded optic fiber was around two hundred meters far from our factory … the cost for licenses, excavations, and installation of those few meters of optic fiber are so high that we simply moved our machinery in another location …"* (Entrepreneur)

"*What we have not understood yet is the central role of employee digital skills … digitization of business is useless if we don't own the right skills inside our organizations.*" (HR manager)

"*I have read on Social Media that we are living in the best moment for the human being to pursue entrepreneurial activities thanks to the digitization… I agree I am a digital entrepreneur, and this is what I want to do in my future.*" (Bachelor student in Management)

This study was inspired by the previous statements, which emerged during interviews with an Italian entrepreneur about Industry 4.0 transformation, an HR manager of a large fashion multinational about the role of HR in the digital revolution, and a bachelor student about digital business. Their statements highlighted the joint role of technological infrastructure, human capital, culture, and media in the current context of digital entrepreneurship.

The digital side of business models has become central over the past years, so much that 89% of the companies participating in the "State of Digital Business Transformation," have confirmed that they want to adopt a "digital-first strategy" (IDG, 2018). Furthermore, nine out of ten European companies consider digital technologies as an opportunity to create innovative business models and increase performance (Probst et al., 2018).

The digital transformation is also affecting new venture creation, as 95% of start-ups rely on a digital business plan (Arava, 2018). Moreover, in Europe, 45.8% of startups are working in industrial sectors (e.g., e-commerce, mobile application, software development) of the digital economy (Kollmann,

Stöckmann, Hensellek, & Kensbock, 2016), while those in other industrial sectors are also concerned by digitalization (Kollmann et al., 2016). Finally, the digital economy accounted for 6.9% of U.S. GDP in 2017 (BEA, 2019) and it will represent 4% of the European GDP by 2020 (EU Commission, 2019a).

From the above-cited data, digital entrepreneurship, defined as "a subcategory of entrepreneurship in which some or all of what would be physical in a traditional organization has been digitized" (Hull, Hung, Hair, Perotti, & DeMartino, 2007, p. 293), is playing a central role in new venture creation.

Digital entrepreneurship yielded several advantages that could enhance new business creation and growth, such as (1) ease of entry in the sector; (2) manufacturing, storing, and distributing of digital products or services (Hull et al., 2007); (3) entrepreneurial outcomes and processes are less bounded and more flexible; and (4) entrepreneurial agency is less predefined, and several actors could be involved such as in crowdfunding (Nambisan, 2017).

At the same time, the actual failure rate of new ventures after three years from opening is still high, at around 39% in 2016 both in Europe and the U.S. as per the Eurostat[1] and Bureau of Labor Statics[2].

Most previous studies on entrepreneurial firms' survival have focused on positive cases to uncover success determinants (e.g., Song, Podoynitsyna, Bij, & Halman, 2008; Stuart & Abetti, 1987). However, given that the causal factors that lead to negative outcomes are not simply the opposite of those that lead to positive outcomes (Ragin, 2008), analyzing entrepreneurial firms failure is "a crucial yet understudied aspect of the entrepreneurship process" (Jenkins & McKelvie, 2016, p. 176). Therefore, we explicitly focus on identifying factors that could lead to failure in the context of digital entrepreneurship.

Previous research on entrepreneurial firm failure has mainly focused on internal factors linked to the firm and owner (e.g., Bates, 2005), suggesting that the most relevant variables leading to failure are the individual (Rogoff, Lee, & Suh, 2004) and managerial (Gaskill, Auken, & Manning, 1993)

1 https://ec.europa.eu/eurostat/web/structural-business-statistics/entrepreneurship/indicators
2 https://www.bls.gov/bdm/us_age_naics_00_table7.txt

factors. Besides, entrepreneurial firms' failure could only be marginally attributed to technological and environmental factors (Rogoff et al., 2004).

Conversely, this study argues that, in the actual entrepreneurial context, characterized by a vast diffusion of digital entrepreneurship, the presence of cultural (Hull et al., 2007) and digital infrastructures, comprised by their technological and human components (Nambisan, 2017; Sussan & Acs, 2017), has a critical importance for entrepreneurial success , vice versa the absence of those infrastructures may have a crucial role in the failure. Furthermore, Woolley (2014) suggests that to enhance the survival of new ventures, there is a need for alignment between infrastructures and firms. However, no studies have, to the best of our knowledge, investigated if misalignment between infrastructural variables, especially in terms of digital infrastructures, could lead to entrepreneurial failure; this study thus aims to fill this gap.

Following the intuition from the above-mentioned interviews, the literature on digital entrepreneurship, and the empirical evidence that the average entrepreneurial death rate is still high despite the advantages of digital entrepreneurship, we investigate the following research question: *what are the combinations, if any, of infrastructural and cultural factors related to digital entrepreneurship that lead to the entrepreneurial death of newly created firms?*

Relying on a theoretical framework based on three main streams of the entrepreneurship literature, namely on (1) the environmental and infrastructural factors that support or hinder new firms' creation and survival (e.g., Bull & Winter, 1991; Dubini, 1989; Woolley, 2014), (2) the cultural factors affecting entrepreneurial intention (e.g., Davidsson, 1995; Thornton, Ribeiro-Soriano, & Urbano, 2011), and (3) the role of media in the discourse about entrepreneurship (e.g., Boyle & Magor, 2008), we show that some combinations of these factors could lead to entrepreneurial death in the actual context of digital entrepreneurship. The remainder of the paper is organized as follows. Section 2 introduces the theoretical framework and our theoretical proposition; Section 3 describes the research methodology; Section 4 shows the results; and Section 5 presents the discussion and conclusions.

2. Theoretical framework

2.1. Infrastructures and entrepreneurial firms' survival and death in the digital context

From the beginning of entrepreneurship research, several studies have highlighted the critical role of individual factors on entrepreneurial intention and success (e.g., Duchesneau & Gartner, 1990; Hornaday & Aboud, 1971). This attitude of focusing mainly on individual characteristics can be explained, on one hand, by the critical role of the individual entrepreneur in the success and growth of a firm's value (e.g., Lee & Tsang, 2001) and, on the other hand, in the longstanding ambiguity that characterizes the "external environment" (Castrogiovanni, 1991) and the conflicting empirical results about its impact (Solymossy, 2000).

However, understanding how the environment is conceptualized affects the entrepreneurial process and has been a longstanding issue, even if it is secondary to entrepreneurial individual-level factors. Initially, the environment was simply considered a "push" factor that could modify the individual behaviors and attitudes (again, individual-level variables) of prospective entrepreneurs (Brockhaus & Nord, 1979). Furthermore, the empirical evidence is not consistent with a significant presence of push environmental variables (Brockhaus & Nord, 1979).

The weight of environmental forces over firms' survival gains has gained prominent attention in the population ecology approach to organizations (Hannan & Freeman, 1977), but in the entrepreneurship literature, it does not receive the same level of attention. Indeed, this issue could be a consequence of the evidence identified by the Bruderl, Preisendorfer, and Ziegler (1992), who were the first to apply a population ecology approach to new firm survival, showing that the most prominent factors are again those linked with entrepreneurs' individual-level characteristics and environmental variables only play a residual role.

The contrasting results in entrepreneurship research also hindered the development of a robust research stream on environmental factors, especially infrastructures, which is the main focus of this study. On one hand, research has highlighted the importance of environmental variables and infrastructures as leading factors in the entrepreneurial location choice for a new venture (e.g., Bull

& Winter, 1991; Dubini, 1989). On the other hand, other empirical evidence has suggested that access to infrastructure does not affect new firm survival (Lyles, Saxton, & Watson, 2004). Considering entrepreneurial failure, which is the main focus of our study, previous research has again highlighted that entrepreneurial firms' failure is only marginally attributed to technological and environmental factors (Rogoff et al., 2004) and that most relevant variables leading to failure are linked to the individual (Rogoff et al., 2004) and managerial (Gaskill et al., 1993) factors. Additionally, "role of context in entrepreneurship cannot be overstated" in relationship to entrepreneurship and infrastructures (Woolley, 2014, p. 721), while there exist longitudinal evidence that the "configuration of infrastructure" enhances entrepreneurship even if it is only a necessary but not sufficient condition.

Before the conceptualization of digital entrepreneurship, Van de Ven (1993) suggests that, in an innovative context, the less are developed the infrastructural elements related to entrepreneurial activities, the higher is the chance of failure. Additionally, more recent contributions highlight that infrastructure plays a central role in the level of entrepreneurial failure because a lack of infrastructures "can significantly hinder entrepreneurs" (Mcquaid, 2002, p. 915) and infrastructures are critical for reducing new venture failure in the start-up phase (Rothaermel & Thursby, 2005). Moreover, in the actual digital entrepreneurship context, the role of infrastructure has regained its critical role because of it "facilitates connectivity and linkages among people" (Audretsch, Heger, & Veith, 2015, p. 219) and the so-called digital infrastructure that links "systems and networks at the global, national, regional, industry, and/or corporate levels" (Sussan & Acs, 2017, p. 59). As such, the digital infrastructure defined as a "socially embedded mechanical system that includes technological and human components, network, systems, and processes" (p. 59) is fundamental for creating digital entrepreneurial ecosystems (Sussan & Acs, 2017) able to develop digital entrepreneurship (Kraus, Palmer, Kailer, Kallinger, & Spitzer, 2019).

While the need for adequate technological infrastructures is straightforward in the digital entrepreneurship context, it is less clear why considering human components as part of the overall

digital entrepreneurship ecosystem is important. The "human competence pool" is considered part of the necessary infrastructures for entrepreneurship from the beginning of the study of entrepreneurial infrastructures: "A pool of competent human resources is another essential resource necessary […]. New technologies mean that new competencies are required to perform essential tasks" (Van De Ven, 1993, p. 216). Furthermore, this issue is even more critical in the actual context characterized by the rise of digital entrepreneurship (Galindo-Martín, Castaño-Martínez, & Méndez-Picazo, 2019) and, at the same time, digital skill gaps among individuals and workers (Leeflang, Verhoef, Dahlström, & Freundt, 2014; Martínez-Cantos, 2017). Given that new skills "are required to perform the essential task" in the context of new technologies (Van De Ven, 1993, p. 216), it is reasonable to hypothesize that the absence of digital skills would lead to failure in the digital entrepreneurship context.

Therefore, infrastructures, both in terms of technological and human components, play a central role in digital entrepreneurship, and can positively impact the success rate of new ventures. Therefore, the presence of a high level of digital infrastructure should be associated with the absence of a high level of entrepreneurial death in the actual context of digital entrepreneurship and vice versa.

2.2. Cultural factors and entrepreneurial firms' survival and death in the digital context

The third remark at the start of in the introduction was drawn from several conducted with students interested in developing a new venture in the digital entrepreneurship context. This is but one among several examples providing enlightening insights about the central role of perceptions about entrepreneurship in shaping entrepreneurial intentions in the actual digital transformation context. The access to "infrastructure or services is not a sufficient condition for a dynamic economy, particularly if there is not a culture of support for entrepreneurship" (Mcquaid, 2002, p. 915). Entrepreneurship studies beyond individual-level analysis recognize that social and cultural factors such as social status and personal network (Carsrud & Johnson, 1989) are critical in promoting new venture creation. Social and cultural factors "enter into the formation of entrepreneurial events are most felt through the formation of individual value systems" (Shapero & Sokol, 1982, p. 83).

Therefore, the more a socio-cultural system high values the development of new ventures, the more the individuals embedded in those systems will consider an entrepreneurial activity (Davidsson, 1995). Several longitudinal empirical analyses have been hitherto conducted to investigate the role of the socio-cultural system in enhancing or hindering entrepreneurship, in particular in the context of the Global Entrepreneurship Monitor research, which developed a longitudinal dataset and several research outputs over time (Reynolds et al., 2005; Sternberg & Wennekers, 2005), including in the digital entrepreneurship context (Galindo-Martín et al., 2019).

The studies identifying the central role of socio-cultural elements in new venture creation essentially argue that social and cultural factors are conducive for entrepreneurship, such as high individualism and low uncertainty avoidance (Baughn & Neupert, 2003) or the high social status of successful entrepreneurs (Carsrud & Johnson, 1989; Davidsson, 1995; Reynolds et al., 2005), leading to higher individual intention to start a new venture. Indeed, the presence of socio-cultural factors favorable to entrepreneurship will lead to an increase in the level of entrepreneurial intention (Solesvik, Westhead, & Matlay, 2014; Thornton et al., 2011). At the same time, the level of success of a new venture born due to this increase in entrepreneurial intention is linked to several other factors (Castaño, Méndez, & Galindo, 2015), and, in the context of digital entrepreneurship, the presence of the necessary digital infrastructures (Sussan & Acs, 2017). Following the literature, it could be argued that a high level of socio-cultural factors favorable to entrepreneurship in combination with the absence of high levels of technological and human digital infrastructure should be associated with a high level of entrepreneurial death.

2.3. Media influence and entrepreneurial intention

In the previous section, we have highlighted how socio-cultural variables supportive of entrepreneurship lead to an increase in entrepreneurial intention. However, the mechanisms beyond the development and diffusion of these socio-cultural variables is an underdeveloped topic, particularly in the actual context of digital entrepreneurship (Kraus et al., 2019) where the Internet

and social media play central roles in socio-cultural opinion formation and diffusion (Quattrociocchi, Caldarelli, & Scala, 2014). The literature on the role of media in influencing the socio-cultural perception of entrepreneurs and entrepreneurship is scarce, but the few existing studies agree on the fact that media plays a central role in creating “a climate of opinion within which ideas about the entrepreneurial activity are becoming increasingly legitimised and indeed normalised within society” (Boyle & Magor, 2008, p. 125). Traditional media, such as television and newspapers, has recently lead to a shift in the perception of entrepreneurship, particularly the spread of the concept of the "new economy." In this new economy and under a digital-based context, entrepreneurship is seen as accessible to all, in particular to the young, underfinanced, but technologically-smart individuals (Boyle & Magor, 2008). In this sense, media plays a critical role in changing the social-level discourse about entrepreneurship, "providing a carrier promoting entrepreneurial practices, and by encouraging an entrepreneurial spirit in the society” (Hang & Van Weezel, 2007, p. 1). Additionally, social media and the Internet play critical roles in promoting and enhancing the socio-cultural perception of entrepreneurs as a high-status role and the importance of entrepreneurs in generating a nation's wealth (Boyle & Magor, 2008). Therefore, in the presence of exposure to digital media and the Internet, the cultural propensity towards digital entrepreneurship would be high as would be the entrepreneurial intention of individuals. In sum, a high level of exposure to digital media and the Internet, combined with the absence of high levels of the necessary technological and human infrastructures, could be associated with a high level of entrepreneurial death.

2.4. (Possible) recipe for entrepreneurial death in the digital context

The previously developed theoretical framework aims to identify the role of four elements that could interact and affect the entrepreneurial failure rate in the context of digital entrepreneurship: (1) technological components of digital infrastructure, (2) human components of digital infrastructure, (3) socio-cultural factors, and (4) exposure to digital media. Following this theoretical framework, we also conceptualize the possible interactions among the considered variables and between them

and outcomes. The Internet and, more generally, digital media are supportive of a positive perception of entrepreneurship; therefore, they bolster the socio-cultural factors favorable to entrepreneurship and, thus, individuals' entrepreneurial intention. In the actual context of digital entrepreneurship, the technological and human components of digital infrastructure are critical for successfully managing newly created in digital business ventures or those with a digital side to their business models. Therefore, we summarized our theoretical reasoning in the following proposition.

Proposition. *In a context characterized by a high level of exposure to digital media and/or high levels of the social-cultural factors favorable to entrepreneurship in combination with the absence of high levels of technological and/or human components of digital infrastructure, the associated outcome will be a high level of entrepreneurial death of new ventures.*

To verify this theoretically based proposition, we developed a custom longitudinal database of 23 of the 28 European countries to identify the time that socio-cultural and infrastructural factors require to affect entrepreneurial success or failure. In the next section, the data and methodology are presented in detail.

3. Methodology

3.1. Data collection and structure

To verify the impact of socio-cultural and digital infrastructural variables on entrepreneurial failure, we developed a longitudinal database based on a specific timing structure that would reflect the process of venture creation, development, and success/failure in as realistically as possible. Particularly, we construct the database under the following time logic:

- in t, individuals start a new venture, taking this decision under a context of socio-cultural conditions that influence their entrepreneurial intention;

- in t + 1, the founded new ventures, after the start-up phase, face a digital infrastructural context;
- in t + 3, following the Eurostat approach that measures entrepreneurial survival three years from creation, we collected data on entrepreneurial death.

As this study relies on secondary data to empirically test our proposition, we collected data from different existing databases; the selected years (2013, 2014, and 2016) are based on the most recent and available data.

Socio-cultural factors: we use Global Entrepreneurship Monitor data from 2013 to measure the socio-cultural factors favorable for entrepreneurship, choosing only the three most representative conditions: "High status to successful entrepreneurs" (HSE), "Entrepreneurship as a good career choice" (ECC), and "Cultural and social norms" (CSN) (see Reynolds et al., 2005).

Technological components of digital infrastructure: we use 2014 data from the Digital Economy and Society Index (DESI) and consider only the most representative condition of technological infrastructure, that is, "Connectivity" (CON) or the level of broadband diffusion in each European country (see EU Commission, 2019b).

Human components of digital infrastructure: this condition is also measured using 2014 DESI, specifically the "Human capital" (HCA) index, which measures the level of digital competence and skills of users in each European country (see EU Commission, 2019b).

Exposure to digital media: given that data about exposure to digital media in 2013 does not exist we employed the "Use of Internet" (UOI) from the 2014 DESI dataset as a proxy of the exposure to digital media, whuch measures users' intensity of the use of Internet in each European country (see EU Commission, 2019b).

Entrepreneurial death: to measure our outcome, entrepreneurial death (END), we employed the index of new ventures' survival three years after creation in each European country (the most recent is for 2016) from the Eurostat Entrepreneurship Indicators Program; we reversed the index as 100% - the percentage of survival rate in t + 3.

3.2. Missing data and final dataset

As we used data from three different databases, some data are missing; here, we explain how we account for thus. First, not all 28 European countries are represented in the databases; in fact, five are missing from at least in one of the considered databases, namely Bulgaria, Cyprus, Czech Republic, Malta, and Greece.

Second, 6% of the overall amount of data is missing for the remaining countries. As we intend to perform a set-theoretic configurational analysis (see next paragraph), we require a complete dataset. In our case, listwise deletion would lead to considerable loss of empirical cases and it is generally a deprecated method to manage missing data (Newman, 2014). Therefore, we applied a reasonable process for the imputation of missing data, as explained below. As we longitudinal databases, when a country's data is missing in t, we employed the mean of the values in t - 1 and t + 1 after having checked if it is coherent with t - 1 multiplied by the growth rate derived from the previous three years, when available. The final dataset includes 23 European countries with all observations for each considered condition.

3.3. Analysis

3.3.1. Set-theoretic configurational analysis and calibration

To analyze our empirical data, we applied a set-theoretic configurational approach. This approach is particularly suited for analyzing complex, non-linear, and non-additive interactions among macro-environmental and cultural variables (Greckhamer, 2011). Specifically, we applied fs-QCA (Ragin,

2000, 2008) to focus on the empirical cases (i.e., European countries) and their belonging to different sets of "causal recipes" (Woodside, 2013). Those causal recipes are made by combinations of the presence/absence of the considered conditions (Fiss, 2011). Therefore, the outcome may be reached through different and multiple paths, which are not necessarily symmetrical as in correlation analysis (e.g., multiple regression). The fs-QCA is an asymmetrical analysis based on finding both the necessary and sufficient conditions associated with a chosen outcome (Ragin, 2008; Woodside, 2013). The following analyses are performed employing the open-source software fs-QCA 3.0 developed by Professor Ragin.

One of the critical steps in the fs-QCA approach is the calibration of the selected conditions; this phase determines which are the cut-off points for membership in each case (i.e., European countries). We employ the direct calibration method (Ragin, 2000, 2008) based on the empirical values of each condition. We also apply the widely accepted threshold of 0.9 or higher for full membership, 0.1 or lower for full non-membership, and 0.5 as cross-over point (e.g., Alofan, Chen, & Tan, 2020; Felício, Duarte, & Rodrigues, 2016). The theoretical proposition of our study suggests that the presence of a high level of socio-cultural propensity towards entrepreneurship and exposure to digital media, combined with the absence of high level of digital infrastructure, could be associated with a high level of entrepreneurial death. As there exists no theoretical basis that defines the "high level" value for the chosen conditions, we consider the relative level of each case in respect to the overall European population. Therefore, for each condition, we assign the empirical value of the 75th percentile to 0.9, the value of the mean to 0.5, and the value of the 25th percentile to 0.1. As a result, a country displays full membership for high levels of a given condition (e.g., UOI) when the empirical value of the considered condition is equal or above the 75th percentile and full non-membership when the value of the given condition is equal or below the 25th percentile. The same rationale is employed for calibrating the outcome (i.e., END).

3.3.2. Analysis of necessary conditions

The second step in fs-QCA is performing the analysis of the necessary conditions, which highlights if any of the selected conditions is necessary for the outcome. In our context, this means verifying if the membership (or non-membership) for the cases with high levels of any condition is also included in the cases with a high level of END. When a condition is necessary, in the absence of this condition, a case will not display the outcome. The threshold level to consider a condition as necessary is 0.9 (Fiss, 2011; Ragin, 2008); none of our conditions has a consistency equal or above 0.9 (see Table 1). Therefore, none of the chosen conditions is necessary, so that the outcome of a high level of entrepreneurial death occurs.

Table 1
Necessary conditions analysis

	Entrepreneurial death	
	Consistency	Coverage
Technological and human digital infrastructure		
Connectivity (present)	0.53	0.52
Connectivity (absent)	0.58	0.53
Human capital (present)	0.39	0.41
Human capital (absent)	0.71	0.61
Exposure to digital media		
Use of Internet (present)	0.59	0.58
Use of Internet (absent)	0.48	0.44
Socio-cultural factors		
High status to successful entrepreneurs (present)	0.50	0.48
High status to successful entrepreneurs (absent)	0.58	0.54
Entrepreneurship as a good career choice (present)	0.63	0.60
Entrepreneurship as a good career choice (absent)	0.50	0.47
Cultural and social norms (present)	0.60	0.58
Cultural and social norms (absent)	0.44	0.41

3.3.3. Analysis of sufficient conditions

The third and fundamental step in any configurational analysis, such as fs-QCA, is the analysis of sufficient conditions. When a case is inside the set of cases displaying the sufficient condition, the same case is also included the set of cases displaying the outcome (Ragin, 2008). Therefore, a sufficient condition is a condition that will produce the outcome when present, while its absence does not imply the absence of the outcome. Previous studies and published research suggest that a combination of the presence/absence of conditions can be considered if consistency is equal or higher

than 0.75 (Fiss, 2011; Ragin, 2008), which means that the cases with this specific combination of conditions are in the set of the cases displaying the outcome. We first analyze the sufficient conditions associated with our main outcome, the high level of entrepreneurial death (see Table 2), and find that all combinations of causal conditions above 0.75 are at the same time above 0.9 in our empirical data; namely, our overall consistency is 0.96. To verify the robustness of our empirical results, we have also analyzed the sufficient conditions for the opposite of our original outcome, namely the set negating high entrepreneurial death. In this instance, the outcome is “not belonging” to the set of countries with a high level of entrepreneurial death (see Table 3). In this second analysis, the overall solution consistency is 0.84, which is slightly lower than the previous ones, but still higher than the suggested threshold of 0.75 (Fiss, 2011; Ragin, 2008) and in line with other studies (e.g., Felício et al., 2016; Frambach, Fiss, & Ingenbleek, 2015). The other value to take into consideration is the coverage of the solution, which indicates the percentage of empirical cases considered by the found solution; the other cases do not have the right level of consistency to be considered inside the outcome set.

All the results of our sufficient condition analysis are based on both the *parsimonious* and *intermediate* solutions (see Ragin, 2008), as suggested by the literature on fs-QCA (Felício et al., 2016; Fiss, 2011; Frambach et al., 2015). The parsimonious solution "involves all simplifying assumptions, regardless of whether they include easy or difficult counterfactuals” and the intermediate solution “involves simplifying assumptions by including easy counterfactuals” (Mas-Verdú, Ribeiro-Soriano, & Roig-Tierno, 2015, p. 794). The results are displayed following the notation proposed by Fiss (2011) and widely employed in research based on fs-QCA methodology (see Tables 2 and 3). The conditions that are both present in the parsimonious and intermediate solutions, being labeled as “core conditions.” The core conditions are visualized as "●” when they should be present to generate the outcome or “⊗” when they should be absent to lead to the outcome. The black and cross-out circles have the same meaning, but they indicate conditions present only in the intermediate solution, named "peripheral conditions” (Fiss, 2011).

4. Results for the sufficient condition analysis

This section presents the results of the sufficient conditions analyses for the two different outcomes above. The first outcome is being part of the set with a high level of entrepreneurial death, “END” (see Table 2). The second outcome is not being in the set with a high level of entrepreneurial death, “~END” (see Table 3), where the tilde stands for the Boolean negation operator, that is, "not being in the set of a high level of entrepreneurial death." The two models provide as possible causal conditions all factors mentioned above and can be written as follows:

END = f(CON, HCA, UOI, HSE, ECC, CSN),

~END = f(CON, HCA, UOI, HSE, ECC, CSN).

The sufficient condition analysis with END as an outcome (see Table 2) leads to a solution with a high consistency of 0.96 and a relatively low coverage of 0.34, which means that the solution represents 34% of the cases, but this is consistent with the chosen calibration of the outcome (high level of entrepreneurial death), which has an overall rate of 39% for European firms.

The solution is created by three possible configurations (1a, 1b, and 1c) of the causal conditions. Configuration 1a suggests that, when HCA and CON are absent, and two of the three socio-cultural factors are present (ECC and CSN), even if there is no exposure to digital media (UOI absent) and the entrepreneur is not perceived as high status (HSE absent), the outcome of high END still occurs. Configuration 1b similarly entails that when HCA and CON are absent, even if two socio-cultural factors from the three are absent (ECC and CSN), high END occurs when UOI and HSE are present. Finally, the third configuration 1c implies that, when CON is present but HCA is absent, and almost all the other conditions and both the exposure to digital media and the socio-cultural factors are present, except for HSE, the outcome will occur.

Table 2
Sufficient conditions analysis for the presence of a high level of entrepreneurial death

	Solutions		
Configuration	**1a**	**1b**	**1c**
Technological and human digital infrastructure			
Connectivity (CON)	⊗	⊗	●
Human capital (HCA)	⊗	⊗	⊗
Exposure to digital media			
Use of Internet (UOI)	⊗	●	●
Socio-cultural factors			
High status to successful entrepreneurs (HSE)	⊗	●	⊗
Entrepreneurship as a good career choice (ECC)	●	⊗	●
Cultural and social norms (CSN)	●	⊗	●
Consistency	0.98	0.94	0.96
Raw coverage	0.14	0.08	0.15
Unique coverage	0.11	0.06	0.12
Solution coverage	0.34		
Solution consistency	0.96		

Legend

● = Peripheral causal condition present ● = Core causal condition present
⊗ = Peripheral causal condition absent ⊗ = Core causal condition absent

The sufficient conditions analysis with ~END as the outcome (see Table 3) leads to a solution with an adequate consistency of 0.84 and relatively low coverage of 0.27. Both values are consistent with the fact that our study is explicitly focused on entrepreneurial death and on the combination of conditions that lead to a high END; therefore, those conditions could not be empirically associated with the opposite outcome (~END). We perform the analysis as a verification of the results' robustness of the sufficient condition analysis in case of a high END.

The solution is made by three possible configurations (2a, 2b, and 2c) of the causal conditions. Configuration 2a suggests that when HCA and CON are absent, if all the socio-cultural factors are also absent (HSE, ECC, and CSN absent), and exposure to digital media is absent (UOI absent) then outcome ~END occurs. Configuration 2b implies that when both HCA and CON are present, and the others are absent except for ECC, ~END takes place. Finally, configuration 2c entails that when both

HCA and CON are present, HSE is absent, and all the other socio-cultural factors (ECC and CSN) and exposure to digital media (UOI) are present, ~END takes place.

Table 3
Sufficient conditions analysis for the absence of a high level of entrepreneurial death

	Solutions		
Configuration	**2a**	**2b**	**2c**
Technological and human digital infrastructure			
Connectivity (CON)	⊗	●	●
Human capital (HCA)	⊗	●	●
Exposure to digital media			
Use of Internet (UOI)	⊗	⊗	●
Socio-cultural factors			
High status to successful entrepreneurs (HSE)	⊗	⊗	⊗
Entrepreneurship as a good career choice (ECC)	⊗	●	●
Cultural and social norms (CSN)	⊗	⊗	●
Consistency	0.77	0.93	0.88
Raw coverage	0.14	0.10	0.09
Unique coverage	0.09	0.04	0.08
Solution coverage	0.27		
Solution consistency	0.84		

Legend

● = Peripheral causal condition present ● = Core causal condition present
⊗ = Peripheral causal condition absent ⊗ = Core causal condition absent

5. Discussion and conclusions

Having observed that the rate of new ventures' death after three years from creation is still high, even with all the advantages of the current digital entrepreneurship context, this study identifies the cultural and infrastructural conditions that lead to a high level of new ventures' death. Based on our theoretical framework, we have highlighted the critical roles of technological and human digital infrastructure in supporting the creation, development, and survival of new ventures in the actual digitalized context. The entrepreneurship literature also suggests that other environmental variables, which could affect entrepreneurial success and failure, are linked with socio-cultural conditions. These socio-cultural factors are also related to the mass media discourse about entrepreneurship and individuals'

exposure to such media, especially in the actual context, characterized by the extensive diffusion of the Internet and social media. Therefore, we argue that four main elements interact in the digital entrepreneurship context: (1) technological components of digital infrastructure, (2) human components of digital infrastructure, (3) socio-cultural factors, and (4) exposure to digital media. Finally, we develop our theoretical proposition based on these elements and their interaction, as suggested by the theoretical framework. To verify if our proposition can be supported by empirical data, we develop the analysis described above; in the following, we compare the results of the empirical analysis with the theoretical proposition.

5.1. Theoretical implications

The empirical results of the sufficient condition analysis support our theoretical proposition. The absence of digital technology infrastructure associated with the presence of a high level of socio-cultural factors leads to entrepreneurial death in two configurations (1a and 1b). Moreover, the absence of the digital competence of human capital (HCA) is a core condition associated with END in all three configurations. Additionally, the exposure to media seems to behave as expected, with two over three configurations associating the high level of exposure to digital media with END, when CON and HCA are absent (see configuration 1b), or even when CON is present and HCA absent.

These empirical results are also supported by the analysis of the sufficient conditions concerning the negation of the previous outcome, that is, “not being” in the set characterized by a high level of entrepreneurial death. The presence of technological and human digital infrastructure leads to ~END in two configurations; furthermore, the digital competence of human capital is a core condition. The behavior of socio-cultural factors needs to be analyzed in more detail. First, not considering the entrepreneur's job as a high-status one is a core condition that leads to ~END in all configurations. Second, the absence of CSN is associated with ~END in two of the three configurations, as is exposure to digital media (UOI). Finally, configuration 2a suggests that, in the absence of

technological and human digital infrastructure, ~END can be reached if also all socio-cultural factors and exposure to digital media are absent.

The theoretical position of this study argues that, in the presence of a misalignment between the socio-cultural factors favorable to entrepreneurship, which are often boosted by individuals' exposure to digital media, and the actual technological and human digital infrastructure, the outcome of a high level of new venture death will occur. This rationale seems supported by the results of our empirical analyses in that: (1) when technological and human digital infrastructure are absent and socio-cultural factors and/or exposure to digital media are partially present, the associate outcome is a high level of new ventures' death; (2) when technological and human digital infrastructure are present and socio-cultural factors and/or exposure to digital media are partially absent, the absence of a high level of entrepreneurial death will occur; (3) when technological and human digital infrastructures are absent, as are all socio-cultural factors and exposure to digital media, the absence of a high level of entrepreneurial death will occur.

This study contributes to the literature in three ways. First, it highlights the importance of investigating the role of infrastructures in the current context of digital entrepreneurship, which is an undeveloped field of study. Second, it points out the importance of studying the combinations of causal recipes that lead to entrepreneurial death as a distinct topic, not merely considering what causes entrepreneurial death as the opposite of what generates success. Finally, we propose the conceptualization and empirical verification of possible combinations of causal conditions in terms of digital infrastructure and the socio-cultural factors that lead to a high level of new venture entrepreneurial death.

5.2. Practical implications

Practically, this study identifies a causal recipe by different configurations of conditions that lead to a high level of new venture death. The results can help not in creating new venture success, as what leads to success is never simply the opposite of what generates failure, but in reducing the rate of

entrepreneurial death at the country level. We can argue that the present study stresses the importance of avoiding a misalignment between the actual entrepreneurial digital infrastructures and socio-cultural factors at the country level. For instance, our study suggests that, in countries where strong support for entrepreneurship in terms of socio-cultural factors exists, such as considering entrepreneurial activity as having a high status or being a good career choice, together with high exposure to digital media and the absence of technological and human digital infrastructures, a high rate of new venture death will occur. Therefore, the individuals pursuing entrepreneurial activity or involved in entrepreneurship policymaking have to consider the misalignment between the level of socio-cultural support for entrepreneurship and the level of technological and human digital infrastructures present in a country. Countries in which this misalignment is present have a higher rate of new venture death because individuals develop a high level of entrepreneurial intention at time t due to socio-cultural climate and exposure to media, but then, in t + 1, they find themselves facing a context characterized by an inappropriate level of technological and human digital infrastructures.

To conclude with a practical example, our study should discourage countries from investing in socio-cultural factors favorable to entrepreneurship, such as incentivizing students to pursue an entrepreneurial career, before having invested in an adequate level of technological and human digital infrastructures.

5.3. Limitations and further research

Clearly, our study is not free from limitations and it should be considered as an explorative first step in studying the interactions between socio-cultural factors, digital media, digital infrastructure, and the rate of new venture death. One limitation of this study is having considered only 23 countries of the 28 in the EU. This issue is due to the data availability on digital infrastructure, which is harmonized at the European level through the DESI and its longitudinal data collection. Therefore, our results do not preclude the existence, for example, of other possible empirical causal combinations of conditions that could lead to a high level of new ventures' death in other countries. Another

limitation is linked with the absence of data from 2013 on the exposure to digital media, an issue that is overcome by using the t + 1 data; other data sources should thus be used to strengthen the results. Future research should also focus on identifying other country-level variables that could act as proxies of technological and human digital infrastructures for non-European countries as well. Further research could also deepen both at the theoretical and empirical levels of the concept of alignment/misalignment of entrepreneurship-related factors, also considering further conditions and their impact on the success and failure of new ventures.

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