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Failing role models and the formation of fear of entrepreneurial failure: a study of regional peer effects in German regions

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Abstract

Entrepreneurial role models influence decisions to start firms. This effect is even stronger if peers and observers live in the same region. However, most studies remain silent about the role of entrepreneurial failure for the direction of role modeling. Failed role models can trigger a deterrence of entrepreneurship in others of the same region. We hypothesize that observing successful entrepreneurs reduces fear of failure, while observing business failure increases fear of failure. By using data on regional entries and exits, we find considerable support for our hypothesis and contribute to literature on regional entrepreneurship.

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1. Introduction

There is a growing body of entrepreneurship literature in economic geography [see Sternberg (2009) for an overview] and regional economics (for a recent overview and conceptualization, see Sorenson, 2017). We know from this research that entrepreneurship can be regarded as a 'regional event' (Feldman, 2001). That is, entrepreneurial behavior and the formation of entrepreneurial intention are deeply affected by the spatial context. One fundamental mechanism behind explaining spatial variation of entrepreneurial phenomena is social interaction with entrepreneurs at the local level. The entrepreneurial role model effect is attributed to positive demonstration and peer effects that lower fear of failure and increase entrepreneurial intentions (e.g., Hjalager, 1989; Sorenson and Audia, 2000; Fornahl, 2003; Minniti, 2005; Andersson and Larsson, 2016; Sorenson, 2017). Role models induce start-up activities and foster the social acceptance of entrepreneurship which implies a self-perpetuation of

entrepreneurship over time. Therefore, the role model effect is crucial for understanding the emergence of regional entrepreneurship cultures and distinct regional entrepreneurial ecosystems but also path-dependence of regional entrepreneurship levels and persistence of spatial differences thereof (e.g., Saxenian, 1994; Andersson and Koster, 2011; Bathelt and Glückler, 2014; Fritsch and Wyrwich, 2014, 2017; Stam, 2015; Stuetzer et al., 2016; Fotopoulos and Storey, 2017; Sorenson, 2017; Spigel, 2017).

Given the pivotal role of entrepreneurial role models for understanding regional differences in entrepreneurship, it is quite surprising that, to the best of our knowledge, little research was done on the impact of failed entrepreneurs on the perception of entrepreneurship among non-entrepreneurs in the local environment. The general regional dimension of failure and its potential effects are largely unexplored (for a few exceptions, see Cardon et al., 2011; Chan et al., 2011; Bosma and Schutjens, 2011). This lack of research is also surprising as most start-ups fail within the first years of their existence (Brüderl and Schüssler, 1990). Thus, observing a failed business in one's regional environment is very likely. These failed models could trigger an entrepreneurship–deterrence in observers. If successful models increase observers' self-confidence in the sense of 'If they can do it, I can, too' (Sorenson and Audia, 2000, 443), then unsuccessful models might have a similar effect in the sense of 'If they can fail, I can, too'. It is well known from other studies that fear of failure reduces entrepreneurial intentions and activity (Arenius and Minniti, 2005; Vaillant and Lafuente, 2007; Hessels et al., 2011; Wennberg et al., 2013; Kibler et al., 2014), but negative effects of failure on others as those just described are neglected in the literature with the exception of Nanda and Sørensen (2010). This paper aims to address this research gap by examining the effect of failed role models on the fear of failure among non-entrepreneurs. Such an analysis is warranted for two reasons. Firstly, if entrepreneurial failure substantially increases fear of failure, this might lead to a reduction in the supply of entrepreneurs. Since entrepreneurship and clusters of entrepreneurship can be crucial for regional development (Qian et al., 2013; Glaeser et al., 2015; Delgado et al., 2016; Fritsch and Wyrwich, 2017; Stuetzer et al. 2018), understanding the local feedback mechanism induced by failure is informative for the literature on the scope of entrepreneurship for regional growth. Secondly, an analysis on the determinants of fear of failure is also of interest from a scholarly point of view. In general, not knowing the sources of actual parameter values of a specific factor, which has been shown to have important consequences, leaves little starting points for potential policy instruments or guidance for practitioners. The determinants and effects of fear of failure are two sides of the same coin. Without having knowledge of both sides, our understanding of the phenomenon will be incomplete.

Our empirical investigation is based on combining individual-level data from the Global Entrepreneurship Monitor (GEM, for details see www.gemconsortium.org and Bosma et al., 2012a) project in Germany. We find that knowing a failed entrepreneur increases fear of failure among non-entrepreneurs. We also combine our individual data with regional-level data on firm failure and find that the prevalence of failing entrepreneurs at the local level is related to the perceived fear of failure among non-entrepreneurs.

We contribute to economic geography in several ways. First, we combine ideas from research on firm failure with literature on role models in order to illuminate the negative effect of these role models. Second, we introduce psychological theories into our spatial theory framework to understand local role model effects. Third, we contribute to the

topic of path-dependency in spatial development and to evolutionary economic geography by providing empirical evidence for how entrepreneurial failure affects fear of failure which is in turn a major determinant for whether or not people engage in entrepreneurship. In the case of failure leading to fear of failure, this can contribute to persistently low levels of entrepreneurship in regions. Against this background, we also show that role model effects depend on the degree to which the local context is supportive to entrepreneurship or inhibiting.

The remainder of this paper is as follows: first, we will present in Section 2 a theoretical framework that deals with social interaction at the local level and its implications for entrepreneurship. Section 3 introduces datasets, variables and methods. The results are presented in Section 4 while the paper closes in Section 5 with a discussion of the findings.

2. Theoretical framework

2.1. Social interaction at the local level: implications for entrepreneurship

There is a huge strand of literature on regional cultures of entrepreneurship, systems of entrepreneurship and entrepreneurial ecosystems (e.g., Gertler, 2004; Bathelt and Glückler, 2014; Stam, 2015; Stuetzer et al., 2016; Fritsch and Wyrwich, 2017; Spigel, 2017). Another stream of research focuses on case studies on fertile breeding grounds for entrepreneurship (e.g., Saxenian, 1994; Kenney and Patton, 2005; Feldman, 2001; Garnsey and Heffernan, 2005; Aoyama, 2009). There is also a literature on persistence and path-dependencies of entrepreneurship over time (Andersson and Koster, 2011; Fritsch and Wyrwich, 2014; Fotopoulos and Storey, 2017) as well as on legitimacy and social acceptance of entrepreneurship (Etzioni, 1987; Kibler et al., 2014). While there are differences between these strands of economic geography literature, they have in common that they acknowledge the social nature of entrepreneurial processes. By this, the literature is grounded in the strength of relational economic geography (Bathelt and Glückler, 2003) and evolutionary economic geography (Boschma and Frenken, 2006). Sorenson (2017) summarizes this empirical literature and states that regional factors are important because they shape (1) beliefs about the desirability of founding a firm, (2) opportunities to learn about entrepreneurship and (3) to build the abilities needed to succeed and the ease to acquiring critical resources.

The comprehensive conceptualization that Sorenson develops surprisingly neglects the role of regional variation in fear of entrepreneurial failure which is also a pivotal outcome of the same micro-mechanisms behind the emergence of entrepreneurship culture, ecosystems, persistence and systems of entrepreneurship, namely social interaction at the local level determining the level of entrepreneurship. This mechanism is focused on in the present paper which is thus contributing to understanding a fundamental phenomenon of the entrepreneurship literature in economic geography and regional economics.

There is a particular strand of papers devoted to analyze the effect of social contact with entrepreneurs in the local environment on increasing entrepreneurial intention of individuals (e.g., Sorenson and Audia, 2000; Andersson and Larsson, 2016). This finding is explained by local entrepreneurial role model effects. Role models in a narrow sense imply having deep, dense connections with entrepreneurs (Spigel, 2017). Most of the empirical literature understands 'role models' in a wider sense as people

starting or running a firm that are known by other individuals in their social environment.

Knowing each other is an outcome of social interaction and it is well-established in the economic geography literature that social interaction is determined by spatial proximity between actors (e.g., Jacobs, 1969; Durlauf, 2004; Storper and Venables, 2004). Furthermore, knowledge flows between actors are more likely to take place at the local level (Jaffe et al., 1993; Breschi and Lissoni, 2009). Social interaction also implies knowledge flows between entrepreneurs and non-entrepreneurs. Guiso and Schivardi (2011) find that learning externalities at the local level determine spatial differences in entrepreneurial activity while Giannetti and Simonov (2009) demonstrate that people living in highly entrepreneurial neighborhoods are more likely to become entrepreneurs due to peer effects creating non-pecuniary benefits (e.g., social approval of entrepreneurs). They argue that entrepreneurship-facilitating norms imply high social status and prestige of entrepreneurs which, in turn, also increases the utility of being an entrepreneur. In line with this, Andersson and Larsson (2016) show that sharing residential neighborhood with established entrepreneurs is affecting entrepreneurial choice of other locals. The results indicate that social interactions at the local level are the prime mechanism driving this pattern.

The social interaction between entrepreneurs and non-entrepreneurs can be thought of a sender–receiver model (Denzau and North, 1994) where the entrepreneurial role model as sender transfers two signals about entrepreneurship to the receiver who is an observing non-entrepreneur. The first signal alludes to human capital formation as a consequence of observing the behavior of entrepreneurs. This so-called demonstration effect reduces the ambiguity non-entrepreneurs may feel about starting an entrepreneurial venture because the transferred knowledge fosters the development of entrepreneurial skills, such as organizing the resources required to successfully launch a business (Sorenson and Audia, 2000). On that ground, Minniti (2005) develops a model that predicts that the reduced ambiguity regarding entrepreneurship implied by social contact with entrepreneurs induces start-up activity among local peers. As mentioned above, the local neighborhood and community are the arena where social interaction takes place. So, the increase of start-up activity should be limited to this arena as well.

The second transferred signal is legitimation. Non-entrepreneurs may perceive entrepreneurship as a viable career option because their peers are entrepreneurs (Fornahl, 2003). In other words, observing entrepreneurial peers can increase social legitimacy of entrepreneurship in the observer (Etzioni, 1987; Kibler et al., 2014) and entrepreneurship-facilitating social capital (Westlund et al., 2014) that triggers entrepreneurial activity. Since founders typically start their venture in close proximity to their residence (Figueiredo et al., 2002; Michelacci and Silva, 2007; Stam, 2007), the spread of social legitimacy is a phenomenon of the region where the role modeling takes place and decays with distance.

This role model effect can set on feedback loops (Sorenson, 2017). Briefly summarized, entrepreneurs in the local environment provide opportunities to observe and learn about entrepreneurship (e.g., Minniti, 2005; Nanda and Sørensen, 2010; Bosma et al., 2012b). Observing successful entrepreneurs provides potential entrepreneurs with examples of how to organize resources and activities required for starting and running one's own venture more easily, and increases self-confidence in the sense of 'if they can do it, I can, too' (Sorenson and Audia, 2000, 443). Individuals who observe that one of their peers is a successful entrepreneur may perceive entrepreneurship as a

favorable career option (for a detailed exposition of this argument, see Fornahl, 2003). In addition, in regions where there is a positive attitude toward entrepreneurial activities more people might perceive entrepreneurship as a viable career option and start an own business. When the interplay of start-up activity, role model effects and social acceptance are found together in one area, a regional entrepreneurship culture is created that, once established, is self-perpetuating. Therefore, the persistence of entrepreneurship based on this self-perpetuation can be regarded as a path-dependent process (Andersson and Koster, 2011).

The findings of the literature on entrepreneurial role models show that role models contribute significantly to local entrepreneurship and its persistence. However, is there also a 'dark side' of entrepreneurial role model processes? The following section identifies several research gaps in the literature on the social nature of entrepreneurship and develops hypotheses that are subsequently addressed in the empirical part of the paper.

2.2. Failing entrepreneurial role models and their effect on fear of failure: a new perspective

Prior research on entrepreneurial role model effects is more or less silent about failed entrepreneurs. One of the few exceptions are Sørensen and Sorenson (2003) as well as Nanda and Sørensen (2010) who show that failed entrepreneurs in the workplace and the wider socio-local environment *can* spur entrepreneurial intention because people can learn from failure of others. There is, however, no theory-driven conceptual work on the link between observing failed entrepreneurs and the formation of fear of failure among non-entrepreneurs at the local level. Wennberg et al. (2013) run an analysis on the country level. They are not discussing the role model effect on the emergence of fear of failure and entrepreneurial choice. Vaillant and Lafuente (2007) and Kibler et al. (2014) deal with the effects of fear of failure on regional entrepreneurial activity but treat the presence of fear of failure as given.

For understanding the link between social contact with (failed) entrepreneurs and fear of entrepreneurial failure in a local context, we use psychological theories that permit geographical interpretations. Integrating psychological aspects into economic geography is a new development. Recently, Huggins and Thompson (2019) offered a model for regional development building on culture, psychology and agency. The main advantage of integrating psychological aspects such as traits and emotions into economic geography is that they can enhance our understanding of decision-making processes of individual economic behavior under bounded rationality. So what is fear of failure and what is its regional dimension? Many researchers view fear of failure as an emotional state (see for a review Cacciotti et al., 2016). According to this view, fear of failure is an adaptive response to (among other things) events in the regional environment which are appraised by the individual (Lazarus, 1991). According to the seminal appraisal theory, people appraise or assess how perceived changes in the environment affect their abilities to accomplish a personally meaningful goal (Conroy, 2001). Key to this approach is the identification of the content of these appraisals which is usually done by examining the negative consequences of failing and not achieving that goal. In general, these consequences relate to having an uncertain future (Cacciotti et al., 2016), the loss of self-esteem, third-party punishment and the accompanying reduction in social value (Conroy, 2001)—in economic terms, failure comes with costs (both financial and psychological).

How high are these costs for failing entrepreneurs? A failed business no longer generates an income stream and the failure can deplete financial resources (Shepherd et al., 2009). This mirrors the threat of having an uncertain future. Often, there is a close emotional relationship between an entrepreneur and the business (Shepherd et al., 2009). A failed entrepreneur experiences grief and feels ashamed that he was unable to avoid the failure (Jenkins et al., 2014) which reduces her self-esteem. Third-party punishment alludes to the well-known fact that entrepreneurial failure is often stigmatized by the regulatory environment (bankruptcy laws) and by region-specific cultural norms (Cardon et al., 2011). In most cases, failure is related to a loss of reputation and status in the local community of the entrepreneur and they even earn lower wages when returning to paid employment (Landier, 2005). In sum, there are good reasons why people fear entrepreneurial failure.

One important implication of using fear of failure as an adaptive response is that fear of failure can change for example through learning as it can increase competence in one's skill (Bandura, 1977). Thus, fear of failure may not be evenly distributed over time and space. The insight that psychological characteristics can be unevenly distributed across regions has recently spurred a number of studies examining potential determinants of this variation (Stuetzer et al., 2016; Obschonka et al., 2017) and its socio-economic consequences (Rentfrow et al., 2015; Stuetzer et al., 2018). The recently published paper by Huggins and Thompson (2019) offers a conceptual model using the interrelation between regional psychological differences and culture as the behavioral base of regional development.

Regarding fear of failure, the regional dimension has two sources. Firstly, as discussed above social interactions with (failed) entrepreneurs are more likely in the local neighborhood. Therefore, fear potentially developing from the assessment of local failure is locally bounded too. Secondly, especially third-party punishment of failed entrepreneurs depends on the region-specific cultural norms. In regions with a stronger tolerance of failure such as Silicon Valley (e.g., Saxenian, 1994; Micklethwait and Wooldridge, 2000) or the Third Italy (Bathelt, 1998; Boschma and Lambooy, 2002), the social costs of failing are lower and there is less to fear about failure.

2.3. Hypotheses development

The psychological aspects of fear of failure imply a local feedback process affecting the learning and legitimation effects from observing entrepreneurs. Recall that observing successful entrepreneurs increases the attractiveness of entrepreneurship as a career option (legitimation). But what about failing entrepreneurs? At the local level, friends and acquaintances will witness the failing entrepreneurs' reduction in social standing and the accompanying negative socio-economic consequences (Jenkins, 2012). This should reduce the attractiveness of entrepreneurship. According to appraisal theory, threats of third-party punishment and social value are appraised and lead to high levels of fear of failure of the observing non-entrepreneurs (Conroy, 2001) because one might fail and suffer the same hardships.[1]

1 Such a reaction is also predicted by coping theory. This approach suggests that there are two main strategies how to cope with failure: motivation to work harder in order to avoid the failure event and not engaging in the activity that might lead to failure. For non-entrepreneurs observing failures of people they

Appraisal theory can be also applied to the learning effect from observing entrepreneurs that reduces the uncertainty non-entrepreneurs face, making the threat of failure less daunting and in economic terms less costly. A reduction in uncertainty should lead to lower levels of fear of failure among non-entrepreneurs (cf. Cacciotti et al., 2016). However, failing entrepreneurs presumably do not provide the same learning opportunities as successful entrepreneurs. Failed entrepreneurs might not even be aware of their mistakes and, if they are aware, remain silent about the true reasons for their failures (Jenkins, 2012). Moreover, observers, especially those without own entrepreneurial experience, might find it difficult to assess which practices led their peers to failure. If we take seriously the argument that demonstrating successful entrepreneurship reduces the ambiguity of the entrepreneurial task profile (Minniti, 2005), then demonstrating failure should increase the level of ambiguity. As non-entrepreneurs are left bewildered which reasons led to the failure, their belief of having the necessary skills will arguably be reduced (Bandura, 1977) which increases the uncertainty of starting-up. The appraisal theory predicts that an increase in the threat of having an uncertain future leads to higher fear of failure (Lazarus, 1991; Conroy, 2001).

Altogether, a non-entrepreneur can observe positive as well as negative role models in the local environment both transmitting signals demonstrating entrepreneurship and affecting legitimation thereof. Based on the above theory framework, we expect that knowing an entrepreneur reduces fear of entrepreneurial failure. Knowing a failed entrepreneur should increase fear of failure.

H1: Knowing an entrepreneur reduces fear of failure.
H2: Knowing a failed entrepreneur increases fear of failure.

People can simultaneously observe successes and failures in their local environment. Proximity to a high number of successful and failed entrepreneurs should increase the number of non-entrepreneurs having social interactions with and being aware of these role models. We assume that the positive signals sent by successful entrepreneurs are perceived with the same likelihood as the ones by failed entrepreneurs. Accordingly, if the number of failed entrepreneurs relative to successful entrepreneurs is high, then fear of failure among observing non-entrepreneurs should be high as well. Vice versa, if the number of successful entrepreneurs exceeds the number of failed entrepreneurs, then fear of failure among observing non-entrepreneurs should be low. Thus, we hypothesize that an individual's fear of failure is determined by the prevalence of exits relative to entries in the observer's regional environment. To test this, we construct an 'exit ratio' which is the number of failed entrepreneurs over the number of successful entrepreneurs in the local environment. We expect that the exit ratio in services affects fear of failure.

H3: An increase in the exit ratio has a positive effect on fear of failure among non-entrepreneurs.

An issue here is that entries and exits should be more important for the formation of fear of failure of an average observer the more the founder can understand the business of the entrepreneur. This might not be possible for all observable local entries and exits.

have social contact which could increase fear of failure which deters entry to avoid a similar failure experience.

Observers might have difficulties to relate to high-technology industries or specialized manufacturing sectors (that are rather rare in an economy). It should be easier to relate the demonstrated information about entrepreneurship to oneself and understand the business context of service firms (that represent the majority of all new businesses). Furthermore, start-ups and exits in services are more visible to entrepreneurs (e.g., newly opened shops; closed store fronts). Therefore, we think that the exit ratio in services is a cleaner measure for the mechanisms we described in the theory section. Nevertheless, we also present empirical models including the general exit ratio. We expect this ratio to be insignificant but abstain to frame this as an additional hypothesis.

3. Datasets, variables and methods

3.1. Main dataset and dependent variable

We use two different datasets that were created by relying on GEM data. The individual level dependent variable—fear of failure—and many controls come from the representative Adult Population Surveys (APS) of the GEM project (see www.gemconsortium.org and Bosma et al., 2012a). In the APS people were asked whether or not they are engaged in entrepreneurship. Also, the APS cover several attitudes toward entrepreneurship in the general population. Because of its large-scale GEM data provide the opportunity to conduct analysis at the regional level in Germany as is demonstrated by other studies (e.g., Wyrwich et al., 2016). A detailed description of the GEM methodology and data can be found in Bosma et al. (2012a).

Our first analysis is based on data from the German APS from the years 2014 to 2017. These GEM waves include information on social contacts with failed entrepreneurs which has not been collected in previous years (and is not available in any other of the 50 to 70 countries participating in GEM each year). H1 and H2 are tested with this data.

Unfortunately, there is no information on the regional number of exits and entries for the years 2014–2017 to test H3. For the GEM waves 2003–2010, there is information on whether respondents have social contacts to successful entrepreneurs but not on knowing failed entrepreneurs. Therefore, we cannot run a combined analysis including both direct information on social contacts with failed entrepreneurs and the total number of exits per region. We will show that the results of the analysis for 2014–17 are in line with that of 2003–2010.[2]

Our sample is comprised of non-entrepreneurs only. We excluded all individuals who are entrepreneurs, all respondents who are in the process of setting up a new business and those respondents who quit a business in the past. The personal experience of entrepreneurship might shape fear of failure much differently than for non-entrepreneurs. We are particularly interested in drivers of fear of failure among respondents who are not already engaged in entrepreneurship. From an empirical point of view, the exclusion of actual and former entrepreneurs allows isolating the effect of peers' entrepreneurial experience on observers' fears of failure from the confounding effects of observers' own levels of experience.

Not all respondents of the group of non-entrepreneurs are potential entrepreneurs. Therefore, we focus on individuals between the age of 18 and 55 years who are

2 Germany did not take part in the GEM 2007 cycle.

economically active at the time of the interview. We did not consider respondents who were older than 55 years at the time of the interview because older respondents are less likely to enter entrepreneurship (Obschonka and Stuetzer, 2017). In an additional test, we limit the age range to 30–45 years because entrepreneurs in Germany are on average around 40 years old when entering their business. Therefore, people around this age might be particularly sensitive to entrepreneurship-relevant signals in their local environment such as the prevalence of entries and exits. Furthermore, the aforementioned peer effect should be stronger for this group because there should be more peers of the same age who are in entrepreneurship.

Our dependent variable is the revealed fear of failure regarding entrepreneurship. This is measured with the GEM question of whether fear of failure would prevent the respondent from starting a firm (binary variable: 1 = yes, 0 = no). The GEM fear of failure question is, to the best of our knowledge, the only available measure of fear of failure in large-scale datasets and has already been successfully used in previous studies (Arenius and Minniti, 2005).

3.2. Independent variables[3]

With respect to testing H1, we capture direct social contact with successful entrepreneurs with a dummy variable indicating whether the respondent personally knew someone who started a business in the past 2 years prior to the interview (1 = yes, 0 = no). This information is used in the first analysis for the 2003–2010 period and for the second analysis for the years 2014 and 2015. In order to capture direct contacts with failed entrepreneurs for testing H2, we include a dummy variable whether the respondent personally knew an entrepreneur who failed.

Entries and exits in the regional environment are used to construct our main independent variable to test H3 for the 2003–2010 period. For later time periods no data on exits and entries were available to us. As we believe that the peer mechanism works on a very narrow spatial scale, we use districts (406 'Kreise' or 'kreisfreie Städte', in Germany equivalent to NUTS3 regions) as spatial level in our analysis. Data on firm exits and start-ups are drawn from the Establishment History Panel of the Institute for Employment Research, Nuremberg. These data are based on information from the German Social Insurance Statistics and comprise every establishment with at least one employee obliged to pay social insurance contributions (Fritsch and Brixy, 2004). The panel allows the identification of entries and exits based on worker flow data (Hethey and Schmieder, 2010). At this point, we should note that, in principle, not all exits represent failed businesses. Successful entrepreneurs might, for example, sell a business for a good price or hand over their firm to relatives because of retirement (Stam et al., 2010). In order to separate failure exits from success exits, we do not count cases of succession, takeovers and restructuring as failure exits. Additionally, changes of the legal form of a firm—which would be treated as exit and subsequent re-entry—are not counted as failure exits. Thus, we are confident that the variable captures truly failed businesses that have not fulfilled the owner's goals. Failure exits make roughly 90% of all exiting establishments (Hethey and Schmieder, 2010). In the main analysis, we make use of the lagged exit ratio ($t-1$) because becoming aware of start-ups and exits requires

3 See Online Appendix Tables A.1–A.3 for definitions of variables and a correlation matrix.

some time. The average exit ratio exceeds the value of 1 (see Online Appendix Table A.2). This may suggest a shrinking region because the number of firms is getting smaller. However, a shrinking number of firms can also imply growth if the remaining firms grow in size. It is controlled for regional conditions to rule out that local growth prospects drive the results (see Section 3.3).

The number of exiting and entering firms is highly correlated at the regional level (Fritsch et al., 2006). Thus, using the total number of failure exits or the share of exiting firms in a given year provides a noisy signal for an observer as it mingles the positive signal of entering businesses with the negative signal of failure exits.[4] Therefore, we construct our main independent variable as a ratio between the annual number of exits in non-agricultural, private-sector industries and the respective number of start-ups (henceforth: exit ratio).[5] The higher the exit ratio, the more the negative signal of exits as failure dominates the positive signal of entries. We hypothesized in H3 that individuals are more likely to fear entrepreneurial failure the higher the exit ratio in the region in which they live. We use the general exit ratio and the exit ratio in services. The latter ratio should be a cleaner measure (for details, see Section 2.3).

3.3. Controls

We control for an array of variables at the level of the individual observer and the region she lives in. Starting with the regional level, we control for the prevalence of start-ups and exits (turbulence), which is the number of start-ups plus exits divided by total employment in a region. The turbulence measure controls for the absolute level of start-up and exit activity.[6]

We also control for the economic prospects of regions (growth vs. decline) because this might affect the level of entrepreneurial opportunities. Thus, we include the regional unemployment rate, the level of GDP per capita and GDP growth in the regressions. We also consider regional industry structure as (1) regional exit and start-up activity might be driven by differing entry and exit conditions across industries, which, in turn, might explain fear of failure (e.g., fear to master entry barriers that are significantly different between industries) and (2) as the assessment of the prospects of an entrepreneurial career might depend on the regional industry portfolio. To this end, we controlled for employment shares of 28 out of 29 industries according to the NACE classification.

To err on the side of caution, we also include dummies that indicate the year of the observation to account for the potential impact of changing economic conditions on fear of failure. We also include dummies that indicate the planning region in which districts are located in order to capture unobserved regional differences like an

4 Indeed, using the exit rate (number of exits in relation to all establishments) with and without controlling for the regional start-up rate performs poorly compared with using the exit ratio.

5 The exit ratio would yield values that are not symmetrically distributed around 1 if we interchange enumerator and denominator. Therefore, we 'normalize' the exit ratio. Thus, one gets the same results when dividing entries by exits. An example clarifies the normalization procedure. If there are three exits and two entries, dividing exits by entries yields a value of 1.5 whereas dividing entries by exits yields 0.66. The distance to 1 is not similar. So, the choice of enumerator and denominator matters for the estimates. We use the average distance to 1 to overcome this issue. Thus, the exit ratio in the example is not 1.5 but 1.47 due to $[(1-0.66)+(1.5-1)]/2$.

6 Controlling for the exit rate along with the start-up rate would imply multicollinearity.

entrepreneurship climate in the broader regional environment (Fritsch and Wyrwich, 2017). Planning regions represent functionally integrated spatial units comparable to labor market areas in the USA. Every Federal State of Germany comprises of several planning regions. Therefore, the dummies indirectly capture unobserved differences on the level of Federal States as well. As a final regional control, we consider population density, which we captured through four dummy variables indicating the degree of agglomeration and centrality of regions. These are meant to be 'catch-all' variables for agglomeration (dis)economies that might influence the availability and access of resources and, therefore, the evaluation of whether or not entrepreneurial projects can be successful.

At the individual level we control for the level of education attainment (four dummy categories)[7] as an indicator for human capital (Obschonka and Stuetzer, 2017). Furthermore, individual control variables are gender (1 = female, 0 = male), whether respondents are currently in employment (1 = yes, 0 = no), being non-German (1 = yes, 0 = no), and age of the individual (in years) (Obschonka and Stuetzer, 2017). We also consider the level of household income as measured by different categories. We argue that the relationship of income to fear of failure is non-linear. People with low incomes have nothing to lose, whereas individuals with high incomes have high opportunity costs for entrepreneurship. For the analysis we could make use of up to 10,022 non-entrepreneurs, as defined above, for whom we had information on fear of failure and individual level control variables.

For a test of the hypotheses H1 and H2, we use the more recent GEM data from 2014 to 2017 which comes at the expense of not having the wealth of regional controls. In these regressions, we rely on the time and regional dummies to capture variations in socio-economic variables over time and space (see Online Appendix Tables A.1–A.3 for definition of variables and summary statistics and correlation matrices).

3.4. Method

We run logit regressions and cluster the standard errors on the district level in order to control for spatial autocorrelation and heteroscedasticity. Because of the nested structure of our data (individuals in regions), multi-level models would be an alternative regression technique. However, likelihood ratio tests comparing multilevel models to standard logistic regressions reject the hypothesis of random effects, recommending the use of standard logistic regressions. Moreover, results from multi-level models do not differ substantially from those of logistic regression.[8] We, thus, use primarily standard logistic regressions throughout the paper. Since odds ratio yielded by this method is difficult to understand, we report marginal effects at mean values of our variables of interest. This shows how a marginal change in these variables from their mean value affects fear of failure.[9]

7 We had to aggregate some degrees in order to keep results comparable. For definitions, see Online Appendix Table A.1.

8 Additionally, the test statistic provides a strong indication that the between-district variance is zero. Therefore, we decided to present logit regressions.

9 We checked the robustness of the main results of the logistic regressions by applying linear probability models which are based on ordinary least squares (OLS) estimations. The results resemble the ones for the logistic regressions which are our model of choice due to the binary character of the outcome variable (see Online Appendix Tables A.4 and A.5).

4. Results

4.1. Individual analysis: test of H1 and H2

In the GEM information on social contacts with failed entrepreneurs is available for the most recent waves of the APS of German GEM data (2014–2017). Every person who indicated to know somebody who started a firm in the last 2 years before the interview (which we considered as knowing a successful entrepreneur) was also asked about whether she also knows somebody who discontinued a business in the same period. Therefore, an analysis of these waves allows testing H1 and H2.

According to the sample including 2014–2017 out of 10,915 respondents 23.1% know an entrepreneur who has started a business during the preceding 2 years. Of those knowing such an entrepreneur, 20.7% know an entrepreneur who failed with her business during the preceding 2 years. Due to missing values, we can only exploit a sample of 10,742 observations in total. As mentioned earlier, there is no available information on the regional prevalence of entries and exits for the years 2014–2017 when this study was conducted.

In Models I–III of Table 1, we compare respondents who (1) do not know entrepreneurs with those who (2) know entrepreneurs but no failed entrepreneurs and

Table 1. Fear of failure and knowing persons that failed in the recent past by age groups

	I	II	III	IV	V	VI
		All		Knowing an entrepreneur = 1		
	18–55 years	30–45 years	35–50 years	18–55 years	30–45 years	35–50 years
1 = Knowing an entrepreneur and no recent failure	−0.049***	−0.047**	−0.075***	Ref	Ref	Ref
	(0.014)	(0.019)	(0.020)			
1 = Knowing an entrepreneur and recent failure	0.000	0.032	−0.006	0.064***	0.098**	0.088**
	(0.022)	(0.034)	(0.033)	(0.023)	(0.040)	(0.042)
1 = Not knowing an entrepreneur	Ref	Ref		—	—	—
1 = Female	0.118***	0.092***	0.094***	0.130***	0.077**	0.110***
	(0.010)	(0.017)	(0.016)	(0.021)	(0.038)	(0.034)
Age in years	0.029***	0.027	0.017	0.033***	0.014	0.100
	(0.003)	(0.032)	(0.031)	(0.008)	(0.070)	(0.070)
Age squared	−0.000***	−0.000	−0.000	−0.000***	−0.000	−0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
1 = Not born in Germany	−0.055***	−0.099***	−0.076**	0.019	−0.004	−0.017
	(0.019)	(0.028)	(0.033)	(0.039)	(0.057)	(0.059)
Regional controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,755	4319	4747	2476	1070	1016
McKelvey and Zavoina's Pseudo-R^2	0.0440	0.0610	0.0480	0.0770	0.106	0.106

Notes: Logit regressions. Standard errors in parentheses (clustered on district level)/***$p<0.01$, **$p<0.05$, *$p<0.1$. The coefficients in the tables are marginal effects at means. That is, how fear of failure would change when there is a marginal unit change of the respective independent variable at the mean while holding all other independent variables at means. It is not controlled for education and household income as in some of the other models presented later in this paper because this would lead to a severe drop in the case numbers. On the side of regional characteristics, only dummies for the planning regions are included due to the low case number in some models. Year dummies are included as well.
Source: GEM Adult Population Survey Germany 2014–2017.

those who (3) know entrepreneurs and somebody who recently failed. For our main age groups (18–55 years in Column I and 30–45 years in Column II) it turns out that belonging to group 2 decreases the probability to fear failure when compared with respondents not knowing an entrepreneur. In a robustness check, we shift the age group toward older respondents (35–50 years in Column III) to find even stronger effects. This supports H1. Interestingly, respondents knowing a failed entrepreneur *and* a successful entrepreneur at the same time have no different level of fear of failure when compared with people not knowing an entrepreneur. Thus, the positive effect of knowing an entrepreneur seems to be offset by knowing an entrepreneur who failed. Altogether, this is in line with H2. This pattern also shows, albeit not perfectly, that our assumption that the effects of entries and exits on observers' fear of failure are similar in size is empirically supported. This assumption was made when computing the 'exit ratio' measures for testing H3 later on.

One caveat of Models I–III is that respondents who indicated that they do not know an entrepreneur were not asked whether they have social contact with a failed entrepreneur. Thus, the reference group in Models I and II may include people who know a failed entrepreneur. It is likely that this implies a downward bias of the estimate for the dummy variable that indicates respondents knowing a successful and a failed entrepreneur. The models in the right part of Table 1 (Columns IV–VI) include only respondents knowing an entrepreneur. Thus, it is known for all observations whether they had contact with a failed entrepreneur. Respondents knowing a failed entrepreneur are compared with those ones not knowing a failed entrepreneur. For all age groups there are statistically significant differences with respect to fear of failure. We can conclude from the results in Columns IV–VI that knowing a failed entrepreneur along with a successful one increases fear of failure when compared with people who only know a successful entrepreneur which supports H2. Summing up, social contact with failed business owners leaves an imprint on the individually perceived fear of failure.

4.2. Regional extension of individual analysis: test of H3

The Columns of Table 2 show the results of the analysis of GEM data for the period between 2003 and 2010 where we can assess the impact of the general regional exit ratio on fear of failure, the regional exit ratio in services, and whether knowing an entrepreneur reduces fear of failure. Unfortunately, there is no information for the 2003–2010 waves on whether respondents know a failed entrepreneur. So, we can only test H1 and H3 in the models of Table 2. Recall that confirmation of H3 implies indirect support for H1 and H2.

The models in Table 2 include the general exit ratio (Columns I and III) and the respective ratio in the service sector (Columns II and IV) along with individual characteristics, region-specific characteristics and year-fixed effects. Recall, since exits are in the enumerator, the exit ratio increases when the level of exits is high and/or the level of entries is low. Thus, the more exits relative to entries the higher is the exit ratio. The results in Columns I and II show that the exit ratio in services increases the likelihood of fear of failure while there is no effect for the general exit ratio. The results are robust when restricting the analysis to those respondents aged between 30 and

Table 2. Individual and regional determinants of fear of failure by age groups

	I	II	III	IV
	Age 18–55 years		Age 30–45 years	
Exit ratio	0.044		0.123*	
	(0.050)		(0.072)	
Exit ratio service		0.110**		0.190***
		(0.048)		(0.065)
1 = Knowing entrepreneurs	−0.046***	−0.047***	−0.036**	−0.037**
	(0.011)	(0.011)	(0.016)	(0.016)
Start-up+exit rate (turbulence)	0.003		0.007	
	(0.005)		(0.007)	
Start-up+exit rate service (turbulence)		0.001		0.001
		(0.004)		(0.005)
1 = Female	0.127***	0.127***	0.115***	0.115***
	(0.010)	(0.010)	(0.014)	(0.014)
Age in years	0.027***	0.027***	−0.023	−0.023
	(0.004)	(0.004)	(0.034)	(0.034)
Age squared	−0.000***	−0.000***	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
1 = Not born in Germany	−0.022	−0.023	−0.006	−0.006
	(0.022)	(0.022)	(0.032)	(0.032)
Dummy variables household income ($n = 13$)	Yes	Yes	Yes	Yes
Dummy variables educational degree ($n = 4$)	Yes	Yes	Yes	Yes
GDP per capita	0.657	0.594	2.283	2.034
	(1.061)	(1.049)	(1.628)	(1.615)
GDP per capita growth	−0.273	−0.276	−0.207	−0.224
	(0.190)	(0.190)	(0.278)	(0.276)
Unemployment rate	0.001	0.001	0.002	0.003
	(0.003)	(0.003)	(0.004)	(0.005)
Dummy variables for agglomeration ($n = 4$)	Yes	Yes	Yes	Yes
Regional employment shares ($n = 28$)	Yes	Yes	Yes	Yes
ROR dummies ($n = 96$)	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Observations	9934	9934	4968	4968
McKelvey and Zavoina's Pseudo-R^2	0.0805	0.0811	0.0866	0.0878

Notes: Logit regressions. Displaying marginal effects at mean values. Standard errors in parentheses (clustered on county level). $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. The case numbers are a bit lower than in Table 3. This is explained by perfect predictions when including dummy variables for all household income categories. Since Table 3 is based on OLS regressions, perfect predictions are not an issue.

45 years who are in the prime age of starting a firm (Columns III and IV) who are more likely to consider starting a firm than respondents of other age groups.[10] The results are also robust when employing OLS instead of logit regressions. The marginal effects from the logit analyses resemble the coefficients from OLS (see Table A5 in the

10 Table A4 in the Online Appendix shows models without endogenous individual controls (income, education) and presents models without regional controls. Graphs showing the probability of fear of failure at different values of the exit ratio can be obtained upon request.

Table 3. Individual and regional determinants of fear of failure by age groups: robustness checks

	I	II	III	IV	V	VI
	Germany		West Germany		East Germany	
	Age 18–55 years	Age 30–45 years	Age 18–55 years	Age 30–45 years	Age 18–55 years	Age 30–45 years
Exit ratio service	0.159***	0.259***	0.138**	0.283***	0.111	1.258***
	(0.051)	(0.067)	(0.057)	(0.076)	(0.186)	(0.373)
Start-up+exit rate service (turbulence)	−0.003	0.003	−0.004	0.004	0.024	0.029
	(0.004)	(0.007)	(0.005)	(0.008)	(0.014)	(0.027)
Controls Table2	Yes	Yes	Yes	Yes	Yes	Yes
Controls Table 2×year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,022	5008	8219	4169	1803	839
McKelvey and Zavoina's Pseudo-R^2	0.150	0.231	0.154	0.237	0.324	0.577

Notes: OLS regressions. Standard errors in parentheses (clustered on county level). ***$p<0.01$, **$p<0.05$, *$p<0.1$.

Online Appendix). Overall, we conclude that H3 is largely supported. The dummy indicator for knowing an entrepreneur has a significant negative effect on fear of failure. This again confirms H1. For brevity, we are not commenting the results on control variables.

The explanatory power of our models exceeds the one of the GEM study by Arenius and Minniti (2005) on perceptual variables and nascent entrepreneurship but is somewhat lower than in a similar study on opportunity entrepreneurship (Arenius and De Clercq, 2005). Nevertheless, we have to explicitly acknowledge that the general pseudo-R^2 values in our analysis and the previous literature are very low. This is a reason for concern. However, it should be noted that the pseudo-R^2 increases strongly when considering interactions between socio-economic and regional control variables with year dummies (Table 3, Columns I and II). We rely on OLS regressions here because logit models are incapable in cases with many controls.[11] The explanatory power is also higher when distinguishing between East and West Germany. This suggests that the model fits better in certain regional contexts. The fit for East Germany is twice as high. The size of the coefficient for exit ratio is particularly high. Wyrwich et al. (2016) argue that post-socialist East Germany can be regarded as an entrepreneurship-inhibiting regional environment. The results suggest that high rates of unsuccessful entrepreneurship confirm the ex ante negative perception of entrepreneurship implying a much higher effect size when compared with respondents in Western Germany. Furthermore, tolerance of failure might be lower in East Germany.

11 There are losses in case of numbers due to perfect predictions which imply that the maximum-likelihood estimations are not converging.

4.3. Regional extension of individual analysis: size, age and timing of failed businesses

In additional analyses we investigate whether size, age and timing of exits play a role in the formation of fear of failure. The results are shown in the Online Appendix. In a nutshell, the failure of small firms with less than five employees in services (see Online Appendix Table A.6) and the failure of firms older than 5 years in services particularly drive the formation of fear of failure (see Online Appendix Table A.7). Regarding timing, the results suggest that distant exits in the regional environment seem to be not related to fear of failure when compared with recent failure and entries (see Online Appendix Tables A.8 and A.9). We also conducted a 'placebo' test to check whether our exit ratio is not capturing some general regional conditions which seems not to be the case (see Online Appendix Table A.10).

4.4. Extensions of the analysis at the aggregate regional level

In a final analysis, we rerun the analysis presented in Table 2 at the regional level. The outcome variable is the share of non-entrepreneurs that stated that fear of failure would prevent them to start a firm over all non-entrepreneurs of a county over all years. The main independent variable is the exit ratio in services. The model includes the same regional controls as in the previous analyses. We consider the regional average of the socio-economic controls of the regional sample population aged between 18 and 55 years old. We find a significant negative effect of the general exit ratio and the exit ratio in services on *regional* fear of failure (see Table 4, Columns I and II).

In an additional step, we analyze how the share of people fearing to fail affects the local start-up rate and the local start-up rate in services in the period between 2003 and 2010. We again consider the same regional and individual controls except of the turbulence measure which is defined very similar to the start-up rate and obviously is not a suited variable for the right-hand side of a model when start-up rate is the outcome variable.[12] We find a statistically significant negative relationship between the share of people fearing failure and the start-up rate in services (Table 4, Columns III and IV). The results are robust when regressing the average start-up rate in the 2007–2010 period on the share of people fearing to fail in the period 2003–2006 (Table 4, Columns V and VI).

5. Discussion, conclusion and limitations

5.1. Discussion of the results and contributions to the literature

This paper presents empirical results that entrepreneurial failure in the social and regional environment relates positively to fear to fail in regional observers. This pattern can be observed for the service sector where the majority new businesses emerge and failures takes place. For the service sector it is also more likely that local observe

12 An IV approach with the exit ratio as instrument would be inappropriate because the start-up rate is related to the exit ratio by construction. Apart from that, the measurement of the exit ratio is much related to the start-up rate which implies a pseudo-correlation between both variables. Thus, any regression of the start-up rate on the exit ratio would lead to results that cannot be reasonably interpreted.

Table 4. The regional share of respondents indicating fear of failure and the regional start-up rate

	I	II	III	IV	V	VI
	Share of respondents with fear to fail (2003–2010)		Start-up rate (2003–2010)		Start-up rate (2007–2010)	
			Total	Service	Total	Service
Exit ratio (2003–2010)	0.378***	—	—	—		—
	(0.113)					
Exit ratio service (2003–2010)	—	0.334***				
		(0.117)				
Share of respondents with fear to fail (2003–2010)	—	—	−0.560***	−0.990***		—
			(0.214)	(0.327)		
Share of respondents with fear to fail (2003–2006)	—	—		—	−0.619***	−1.084***
					(0.197)	(0.286)
1 = Knowing an entrepreneur	0.0717	0.075	0.435*	0.712*	0.230	0.456
	(0.0660)	(0.066)	(0.256)	(0.378)	(0.169)	(0.305)
Controls Table2	Yes	Yes	Yes	Yes	Yes	Yes
Observations	406	406	406	406	369	369
R^2	0.404	0.406	0.895	0.824	0.879	0.804

Notes: OLS regressions. Displaying marginal effects at mean values. Robust standard errors in parentheses. $^{***}p<0.01$, $^{**}p<0.05$, $^{*}p<0.1$. Results are based on standard OLS regressions. The turbulence measure is not included in Columns III–VI because its definition is very close to the dependent variable. There are some few regions where there are no respondents for the period 2003–2006. Therefore, these regions cannot be considered in Models V and VI.

failures due to the higher visibility of business closures (e.g., closed shops, disappearing store fronts). Also, knowing a failed entrepreneur is negatively related to fear of failure when compared with knowing an entrepreneur in general. We also show that the effect of failed role models on fear of failure is more pronounced in entrepreneurship-inhibiting environments like post-socialist East Germany. Finally, we demonstrate that a high share of people stating that fear of failure prevents them from starting a firm is negatively associated with the local start-up rate.

Our results suggest that failing role models influence others by inducing fear of failure in observing non-entrepreneurs. As we know from other papers that fear of failure is associated with not starting a business (Arenius and Minniti, 2005; Hessels et al., 2011), this might prevent them from trying to start a business. Rephrasing and extending Sorenson and Audia (2000): 'If they can fail, I can, too. Thus, I'm better off not trying.' Thus, the empirical regularities that we observe in our paper help understanding the sources of fear of failure. We show that fear of failure does not come out of 'thin air' but is mediated by the observation of entries and exits in the local environment. This fear, in turn, has implications for start-up activity as the abovementioned literature shows.

It is tempting to interpret fear of failure that is induced by failure of others as a valuable learning effect as observers see businesses fail, for example, as a consequence of bad economic conditions in which entry does not pay. In this instance, it would be a good thing to have fear of failure. However, recall that we controlled for the economic conditions in the regressions (GDP, unemployment rate) which should capture all covariance between economic conditions, entrepreneurial failure and fear of failure in

others. So, the effect of entrepreneurial exits on fear of failure in our analysis is above and beyond what can be attributed to bad economic conditions.

Our results differ from those of Nanda and Sørensen (2010) who find that exposure, on average, even to failed entrepreneurs increases the likelihood of becoming an entrepreneur. One possible explanation is the different context of contacts with failed entrepreneurs. Nanda and Sørensen (2010) examine the role model effect in the workplace where contact to entrepreneurs is more intense and learning opportunities are more tangible. Perhaps the information effect can sometimes outweigh the fear effect. So, fear may reduce attempts at becoming entrepreneurs but information increases the success rate of those few attempts even more.

Our research also makes several contributions to the literature in economic geography, for example, to the research on the effect of entrepreneurial role models on others (e.g., Minniti, 2005; Bosma et al., 2012b). The ongoing debate largely ignores the entrepreneurship-deterring effect of observing failure in the local environment. Our findings suggest a feedback loop from failed entrepreneurs to others via less opportunities to learn and de-legitimizing entrepreneurship as a career option. Against this background, we also contribute to economic geography by applying the psychological appraisal theory to explain this feedback loop. This enhances the understanding of the socially embedded nature of entrepreneurship (Sorenson, 2017).

We also contribute to the debate on historically grown path-dependencies of regional entrepreneurship levels (e.g., Andersson and Koster, 2011; Fotopoulos, 2014; Fritsch and Wyrwich, 2014; Kibler et al., 2014; Andersson and Larsson, 2016; Stuetzer et al., 2016). This research is grounded in evolutionary economic geography (Boschma and Frenken, 2006) and research on path-dependence in spatial development (Martin and Sunley, 2006). The respective entrepreneurship papers argue that there are local externalities, for instance, due to successful entrepreneurial role models encouraging and supporting entrepreneurial activities of others which implies the emergence and self-perpetuation (path-dependence) of an entrepreneurship culture. The role of failed entrepreneurs was largely ignored in this literature. Our results suggest that failed entrepreneurs can discourage entrepreneurial intentions. This may severely limit the emergence of an entrepreneurship culture. Since entrepreneurship can be crucial for regional development (Qian et al., 2013; Glaeser et al., 2015; Delgado et al., 2016; Fritsch and Wyrwich, 2017; Stuetzer et al., 2018) understanding the local feedback mechanism induced by failure is warranted.

Finally, our assessment shows that the effect of the local exit ratio on fear to fail in post-socialist East Germany was much higher than in West Germany which could have to do with a lower tolerance of failure. The East–West differences we detect can be viewed as one of the first empirical confirmation of a recent conceptual model by Huggins and Thompson (2019) which bases individual economic behavior on psychological variables and the socio-spatial culture. The observed pattern is also in line with relational economic geography which emphasizes the role of context for economic agents (Bathelt and Glückler, 2003). In general, this calls for the integration of psychological elements in this domain as it can for instance enrich the conception of space with a psychological layer. Our results can be also carefully interpreted as evidenced that the interplay of local conditions and fear of failure is not only visible in exceptional entrepreneurial hotspots like Silicon Valley in the USA or Cambridge in the UK which are well known for their tolerance of failure (e.g., Saxenian, 1994; Garnsey and Heffernan, 2005).

5.2. Limitations

We acknowledge that this study has limitations. Firstly, due to the cross-sectional nature of our dataset, the results have to be interpreted as correlations. Secondly, the GEM survey often measures constructs such as fear of failure with a single item instead with a series of items. Furthermore, fear of failure is measured as a binary variable and it is clear that an ordinal measure would be better. A further concern is that the GEM offers only few individual-level control variables. Consequently, our models also have only a relatively low explanatory power which is a clear limitation of our analysis.

Another limitation is that not every economically active non-entrepreneur in working age is a potential entrepreneur based on her personal characteristics. We restricted the analysis to respondents who are presumably more likely to become an entrepreneur to partially account for this pattern. A further limitation is that we had to assume that the negative effect of non-failed entrepreneurs on observers' fear of failure is similar to the positive effect of a failed entrepreneur in terms of size when computing the exit ratio. The results are robust when this assumption is relaxed (see Online Appendix Tables A.6–A.9). Finally, our preferred model would have been one where we can combine information on knowing failed entrepreneurs and regional data on entries and exits. However, it was not asked about social contacts to failed entrepreneurs in the GEM waves before 2014. The information on regional entry and exits is only available until 2010. This limitation has to be acknowledged as well. Finally, we might underestimate the effects of failure on others since we are not able to disentangle entrepreneurial failures within the group of succession, takeovers and restructuring. We can only clearly identify failure exits in our analysis.

We can conclude that the prevalence of failing peers in the region affects fear of failure. Whether these people have been role model with deep, dense connections remains unfortunately unclear. We also do not exactly know how respondents understood 'fear'. It could mean to them an emotional encoding laden with affect but may also represent a rational Bayesian calculation of the odds of success, updating appropriately with observations from the environment. Thus, we clearly acknowledge that the dataset at hand does not allow to distinguish between fear of failure as an emotional response as opposed to a rational calculation. Future research is warranted to address the limitations of our pioneering study on the relationship between failing role models and the formation of fear of entrepreneurial failure.

Supplementary material

Supplementary data for this paper are available at *Journal of Economic Geography* online.

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