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Regional Trajectories of Entrepreneurship and Growth

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Published in:
From Industrial Organization to Entrepreneurship

DOI:
[10.1007/978-3-030-25237-3_16](https://doi.org/10.1007/978-3-030-25237-3_16)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2019

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):
Fritsch, M., & Wyrwich, M. (2019). Regional Trajectories of Entrepreneurship and Growth. In E. E. Lehmann, & M. Keilbach (Eds.), *From Industrial Organization to Entrepreneurship: A Tribute to David B. Audretsch* (pp. 149-162). Springer. https://doi.org/10.1007/978-3-030-25237-3_16

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Regional Trajectories of Entrepreneurship and Growth



Michael Fritsch and Michael Wyrwich

Abstract The development of regions is considerably shaped by their history. We review research that finds significant persistence of regional levels of entrepreneurship over longer periods of time. It is argued that the long term persistence of regional entrepreneurship indicates the presence and effect of a culture of entrepreneurship that is conducive to new business formation and regional growth. Hence, regional development is characterized by long term trajectories of entrepreneurship. We derive a number of policy implications and propose avenues for further research.

The Important Role of Entrepreneurship for Innovation and Growth

The effect of entrepreneurship on innovation and growth is a key topic on David Audretsch's research agenda. In our contribution to this Festschrift for David we reflect on our related work on regional trajectories of entrepreneurship, knowledge, and growth (Fritsch and Wyrwich 2019). Specifically, this includes the roles of history and culture in regional development. We review empirical work that shows the long-lasting effects of historical levels of self-employment and innovation on new business formation, innovation, and growth many decades later. It is argued that historical developments can cultivate certain cultural traits and personal attitudes in the local population that shape developments today.

In what follows we first review the empirical evidence on persistence of regional levels of entrepreneurship and growth (section “[The Long-Term Persistence of Regional Levels of Entrepreneurship](#)”). We then show how historical levels of

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entrepreneurship are related to the entrepreneurial attitudes of the regional population (section “[What Is a Regional Culture of Entrepreneurship?](#)”). This empirical assessment is linked to a conceptual distinction of different layers of entrepreneurship culture (section “[The Two Layers of Entrepreneurship Culture: Systemizing a Multifaceted Phenomenon](#)”). Section “[Persistence of Regional Innovation Activities](#)” reviews some recent empirical evidence of persistence of innovation activity across space. Finally, we draw policy implications (section “[Policy Implications](#)”), and discuss avenues for future research (section “[Avenues for Further Research](#)”).

The Long-Term Persistence of Regional Levels of Entrepreneurship

A key recognition of research about the role of entrepreneurship, innovation, and growth is that there is a rather pronounced variation of the relationship between these factors across regions (Audretsch and Fritsch 2002; Audretsch, Keilbach and Lehmann 2006; Fritsch and Wyrwich 2019). Clearly, region-specific factors play an important role and need to be accounted for in empirical analyses.

Region-specific determinants of entrepreneurship also remain relatively constant over time, or, as stated by Alfred Marshall (1920), *natura non facit saltum* (nature does not make jumps). Indeed, variables that have been shown to be conducive to the emergence of new firms, such as qualification of the regional workforce or employment share in small firms (Sternberg 2009), do tend to remain fairly constant over successive years (Fotopoulos 2013; Fritsch and Kublina 2019). This pattern is one reason for the pronounced persistence of regional differences in entrepreneurship rates that was found in prior research.¹ Even if the overall level of new business formation in a country is increasing or decreasing, the rank order of regions tends to remain rather constant (Fotopoulos and Storey 2017; Fritsch and Kublina 2019).

An alternative explanation for the persistence of entrepreneurship is the presence of an entrepreneurial culture. Such a culture may emerge due to a self-perpetuation process where past entrepreneurial activity induces further start-up activity in the future. Key elements of this type of self-perpetuation is demonstration and the peer effects of successful founders who act as role models (Andersson and Koster 2011; Fornahl 2003; Minniti 2005). The main idea behind this conjecture is that an individual’s perception of entrepreneurship, the cognitive representation, is shaped by observing entrepreneurial role models in the social environment. The presence of entrepreneurial role models in the social environment, particularly among one’s peers, reduces ambiguity for potential entrepreneurs and may help them acquire entrepreneurial skills and necessary information (Bosma et al. 2012). Observing successful entrepreneurs provides potential entrepreneurs with examples of how to

¹Fritsch and Mueller (2007), van Stel and Suddle (2008), Andersson and Koster (2011), Mueller, van Stel and Storey (2008), Fotopoulos (2013), Fotopolous and Storey (2017).

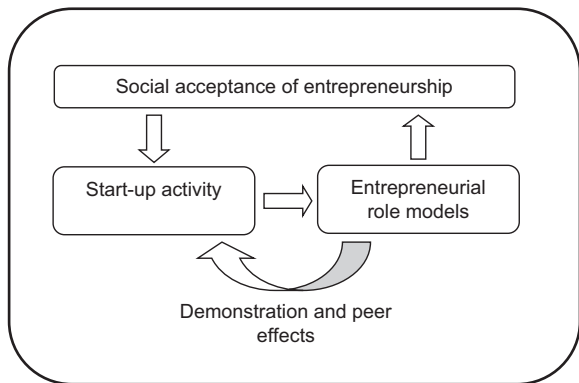
organize resources and activities, and increases self-confidence in the sense of ‘if they can do it, I can, too’ (Sorenson and Audia 2000, 443; see also e.g., Minniti 2005; Nanda and Sørensen 2010).

Based on these arguments one can assume that a high number of entrepreneurial role models in a region leads to widespread social acceptance or legitimacy (Etzioni 1987; Kibler et al. 2014) of self-employment in the local population. Figure 1 illustrates the self-perpetuation of entrepreneurship through demonstration and peer effects, as well as social acceptance of entrepreneurship.

An empirical challenge is to disentangle the effect of entrepreneurial culture on entrepreneurship levels from the influence of persistent structural determinants of entrepreneurship. The case of Germany that we analyzed in our previous work provides an appropriate “natural laboratory” to cope with this empirical challenge (see Fritsch and Wyrwich 2019). The basic premise is based on the reality that the development of Germany over the course of the twentieth century was marked by several disruptive changes to framework conditions: two lost World Wars, destruction of economic infrastructure, housing, and production facilities, occupation by Allied Powers, as well as several switches of the political regime, particularly in Eastern Germany. Thus, there is no persistence of structural determinants of entrepreneurship in Germany. Hence, if we find the persistence of entrepreneurship despite these devastating shocks, then the driving force behind the persistence pattern is probably a culture of entrepreneurship.

Our empirical analyses for Germany have shown that regional levels of entrepreneurship are indeed persistent despite disruptive changes to framework conditions (Fritsch and Wyrwich 2014, 2019). The case of East Germany is particularly interesting in this respect. After World War II a socialist state—the German Democratic Republic (GDR)—was founded in the eastern part of the country that implemented a rigorous anti-entrepreneurship policy that included massive socialization of private enterprises and the suppression of any remaining private-sector activity (for details, see Brezinski 1987; Pickel 1992). The socialist East German state collapsed in late 1989, and East and West Germany were reunified in 1990. The subsequent transformation process of the East German economy to a market economic system

Fig. 1 Self-perpetuation of regional levels of entrepreneurship



was a “shock treatment” where the ready-made formal institutional framework of the West German market economic system was adopted practically overnight (e.g., Brezinski and Fritsch 1995; Hall and Ludwig 1995).

Our empirical analyses for East Germany show that—despite these massive path-breaking shocks—those regions with high levels of self-employment at the outset of the twentieth century had relatively high start-up rates after the collapse of the socialist regime and seem to have managed the transformation to a market economic system relatively well.² For West Germany, we also find that places with relatively high levels of self-employment in the early twentieth century had high levels of self-employment and new business formation about 100 years later (Fritsch and Wyrwich 2014, 2019). The analyses showed an effect of today’s new business formation on employment growth that is explained by the historical pre-war level of entrepreneurship (Fritsch and Wyrwich 2017). Our main explanation for persistence of regional entrepreneurship, despite massive changes of the social and economic environment, is that regions with high levels of entrepreneurial activity in the past tend to be characterized by an entrepreneurial culture.

What Is a Regional Culture of Entrepreneurship?

An entrepreneurial culture can be thought of as an informal institution that is ‘in the air’, i.e., reflected in norms, values, and codes of conduct in a society (North 1994) that are in favor of entrepreneurship. An entrepreneurial culture should, at least to some degree, be independent of the factual socio-economic conditions and may, therefore, even survive considerable shocks to the socio-economic environment, such as serious economic crises, devastating wars, and drastic changes of political regimes (North 1994; Williamson 2000). According to Williamson (2000), culture belongs to the level of social structure that is deeply embedded in a population and that tends to change only very slowly. Research has indeed shown that informal institutions tend to change much more slowly than formal institutions, and only over rather long periods of time (North 1994; Nunn 2009; Williamson 2000).

An entrepreneurial culture is typically understood “as a positive collective programming of the mind” (Beugelsdijk 2007, 190). Etzioni (1987) argues that one important aspect of entrepreneurial culture is spatial variation in the social legitimacy of entrepreneurs and their activities. As a consequence, the more society views entrepreneurship as a legitimate activity, the higher its demand and the more resources are dedicated to such activity. A society’s acceptance of entrepreneurship can be regarded as part of the informal institutions of a community. Applying this argument to the regional level, the degree of societal legitimacy for entrepreneurship may be higher in some regions than in others (Kibler et al. 2014).

²Analyses for the former region of Kaliningrad, which now belongs to the Russian Republic (Fritsch et al. 2019a), and for former German regions of Poland (Fritsch et al. 2019c) also show high levels of persistence despite long periods of an anti-entrepreneurial socialist regime.

Taking the conceptualization of an entrepreneurial culture a step further is to characterize it as an “aggregate psychological trait” (Freitag and Thurik 2007, 123) in the regional population that favors core entrepreneurial values such as individualism, independence, and motivation for achievement. A way of capturing such a conceptualization of entrepreneurship culture is to assess what share of people in the regional population have an entrepreneurship-prone personality profile. Applying the Big Five concept of personality measurement, entrepreneurial people score high on extraversion, conscientiousness, and openness, but have low scores in agreeableness and neuroticism (Obschonka and Stuetzer 2017). According to Rentfrow, Gosling and Potter (2008), regional differences in the share of people with an entrepreneurial mindset today may be explained by social influences within the region as people respond, adapt to, or become socialized according to regional norms, attitudes, and beliefs. Another phenomenon that could reinforce an entrepreneurial culture is that people with an entrepreneurial mindset may tend to migrate to places where the local population has similar personality characteristics (see also Obschonka et al. 2013, 2015).

Empirical analyses for Germany (Fritsch et al. 2019b), the UK (Stuetzer et al. 2016), and the US (Rentfrow et al. 2008) have revealed significant differences in the entrepreneurial personality profile of regional populations. In the case of Germany, we have shown that an entrepreneurial personality profile is particularly pronounced in the population of those regions that had historically high levels of self-employment at the outset of the twentieth century (Fritsch et al. 2019b). This may reflect an effect of long periods of high levels of regional self-employment.³

There is considerable overlap between the idea of an entrepreneurship culture and the concept of social capital that has been put forward by Coleman (1988), Putnam (2000) and others (Fritsch and Wyrwich 2016). In essence, social capital refers to the social acceptance of certain values and respective behaviors, as well as trust and particularly the networks of social relationships between actors, both public and private (for an overview, see Westlund and Bolton 2003). It includes information channels such as role models that can have a considerable effect on individual behavior. An important element of an entrepreneurship culture may be the acceptance of not only the founding of new businesses but also of business failure. A low stigma of failure in a region may encourage people to give entrepreneurship a try because the psychological costs of failure are lower than elsewhere (e.g., Wyrwich et al. 2016). In short, there are many aspects of the regional environment that may be, to different degrees, conducive to new business formation (Dubini 1989).

³Quite interestingly, we also find a rather pronounced entrepreneurial personality structure of the regional population in some regions that had high levels of historical self-employment but are characterized by low levels of self-employment and new business formation today (e.g., the region of Stuttgart). This finding suggests that the relationship between entrepreneurial tradition and current entrepreneurial culture is rather complex. One explanation in the case of the Stuttgart region may be that a number of regional enterprises have grown into rather large firms, and that employment opportunities in these firms make self-employment relatively unattractive. Quite remarkably, the regional entrepreneurial culture, in terms of the local population’s personality structure, still prevails.

The Two Layers of Entrepreneurship Culture: Systemizing a Multifaceted Phenomenon

A regional culture of entrepreneurship may need more than societal legitimacy of entrepreneurial behavior, individuals able and willing to become entrepreneurs, entrepreneurial role models, networks, and peer effects. An infrastructure of supporting services may also be necessary, particularly the availability of competent consulting as well as appropriate financial institutions. It is not farfetched to expect that regions characterized by high levels of new business formation and a pronounced entrepreneurship culture may develop such a supporting infrastructure over time.

In earlier work, we developed a framework that is helpful in understanding the interplay between different elements of an entrepreneurial culture (Fritsch and Wyrwich 2016). The basic idea is to distinguish between a political and a *normative-cognitive* layer of a regional culture of entrepreneurship (Fig. 2). The normative-cognitive layer of an entrepreneurship culture is a largely informal institution that represents the social acceptance of self-employment and a widespread positive attitude toward entrepreneurial activity among the population. Specifically, this includes:

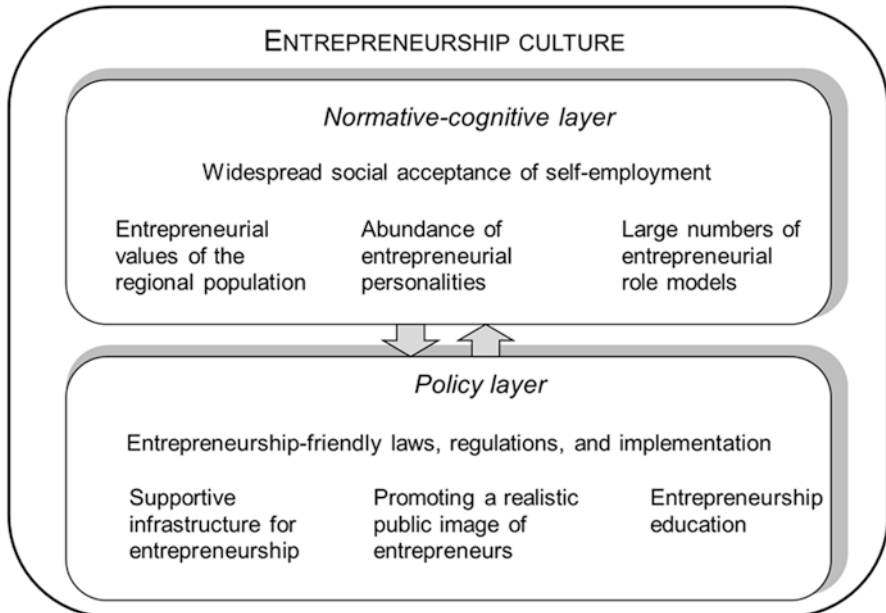


Fig. 2 Elements of an entrepreneurship culture

- *Entrepreneurial values of the regional population* such as individualism, autonomy, achievement, and mastery are widespread.
- *Abundance of entrepreneurial personalities*, i.e., a high share of persons with an entrepreneurial personality profile, which is characterized by traits such as extraversion, openness to experience, conscientiousness, and the ability to bear risk.
- *Large numbers of entrepreneurial role models who generate demonstration and peer effects*: high levels of self-employment in the region.

The *political layer* consists of formal institutions and mechanisms to create and support a regional culture of entrepreneurship. This may include:

- *Entrepreneurship-friendly laws and regulations* such as low barriers to entry and exit, high freedom of establishment and trade, a competition policy that controls for abuse of market power, low tax levels, an appropriate social security system, and, last but not least, a low level of corruption (Elert, Henrekson and Stenkula 2017).
- *A supportive infrastructure for entrepreneurship* such as training and consulting services for business founders, as well as good access to financial resources for start-ups and small businesses.
- *Promoting a realistic public image of entrepreneurs*: awareness campaigns, programs for encouraging contact with entrepreneurial role models.
- *Entrepreneurship education* particularly at universities, but also at lower levels of the education system.

The two layers are, of course, interdependent. Policy can and does influence the beliefs and experiences of the regional population, and the preexisting culture can and does influence the design and implementation of policy. Empirical evidence, however, clearly suggests that the normative-cognitive layer of a regional entrepreneurship culture plays the dominant role. The survival of regional pockets of entrepreneurial activity that endured the anti-entrepreneurial policies of the socialist regime of East Germany (Fritsch and Wyrwich 2014, 2019) demonstrates that these entrepreneurial norms and values are able to withstand even severe policies aimed at their elimination.

It is quite debatable as to how far policy may be able to ‘create’ a culture of entrepreneurship. Perhaps it is more realistic to delegate policy to the role of supporting the preconditions for self-employment and promoting an awareness of successful entrepreneurial role models. Nevertheless, given the merits of an entrepreneurial culture, other policy measures in the form of a strategic management of places (Audretsch 2015) that attempt to promote such a culture may be a significant step toward creating fertile conditions for the cultivation of an entrepreneurial society (Audretsch 2007).

Persistence of Regional Innovation Activities

Entrepreneurship in its very core includes behaviors such as creativity, recognition of opportunities, taking initiative, readiness to assume risk, and introducing new ideas, products, and services to the market. These behavioral elements are not only conducive to setting up one's own business, but should also be relevant for innovation activity—the process of transforming new ideas and knowledge into concrete products and services.

The transformation of ideas and knowledge into commercial application is at the core of the knowledge spillover theory of entrepreneurship (Acs et al. 2009, 2013). This theory regards the regionally available knowledge, particularly new knowledge, as an important source of entrepreneurial opportunities. Accordingly, a large and dynamically growing knowledge base should have the potential to provide rich opportunities for start-ups. This should be especially true for innovative new businesses as they are critically dependent on knowledge inputs. Consistent with these considerations, research has documented a pronounced relationship between indicators of regional knowledge and new business formation (particularly with start-ups in innovative and knowledge-intensive industries), such as the presence of academic institutions and the level of R&D activities (Audretsch et al. 2006; Fritsch and Aamoucke 2013, 2017).

It follows that an analysis of the persistence of entrepreneurship should be complemented by investigating the persistence of regional innovation activity. This necessarily starts with an assessment of the determinants of innovation activity. Accordingly, Audretsch and Feldman (1996), in their seminal contribution to the discussion of knowledge spillover and the geography of innovation, stress that innovation and technical change depend upon new knowledge much more than other kinds of economic activities. Theory and evidence suggest that spatially limited knowledge spillovers are of crucial importance for innovation and economic growth (e.g., Romer 1986). In particular, tacit knowledge, which is bound to specific people and only transmitted via face-to-face contacts, makes knowledge and parts of the regional knowledge base “sticky.”

Due to this stickiness of tacit knowledge, it tends to remain in the local population and may be transferred across generations. This characteristic, as well as the continuity of well-established institutions of higher education and research (such as universities), shapes the persistence and scope of regional knowledge levels and knowledge profiles over longer periods of time. Hence, there are significant differences in the amount and the character of the available knowledge across regions.

In our own analyses we measured the historical knowledge of a region by a high employment share in science-based industries at the outset of the twentieth century, or by the local presence and geographic proximity to a technical or classical university founded before the year 1900. We find that these indicators of the historical knowledge base are positively related to the levels of R&D inputs and patenting more than 100 years later (Fritsch and Wyrwich 2018, 2019). In particular, German regions with a technical university in the year 1900 have high levels of start-ups in

technology-intensive industries today. These results clearly indicate the persistence of regional knowledge that constitutes an important source of entrepreneurial opportunities. This persistence of regional innovation activity is currently only incompletely understood.

Policy Implications

Regions do not only differ in their current levels of entrepreneurship and innovation, but also with regard to the role of entrepreneurship and innovation in their history. These differences clearly confirm the recognition that a ‘one size fits all’ policy approach that might be appropriate for all regions does not exist. Hence, different policy measures and strategies may be needed to account for regional histories, cultures, and the psychological dispositions of the regional population.

The recognition that regional levels of self-employment and new business formation tend to be rather persistent over time means that regions with high levels of entrepreneurship today are likely to have also relatively high levels of entrepreneurship in the future, while regions with currently low levels of entrepreneurship may expect correspondingly low levels in the coming decades. Hence, policies that aim at raising the level of regional entrepreneurship and stimulating an entrepreneurial culture may require rather long periods of time before significant changes can be noticed. Clearly, creating an entrepreneurship culture is a long-term strategy. However, once such a culture is created it may generate long-lasting positive effects.

In regions that already have a pronounced culture of entrepreneurship, policy might play the distinctive role of preserving this culture and opening avenues to overcome development bottlenecks. Regions where a culture of entrepreneurship is more or less lacking may require considerably more attention and effort by policy-makers to build such a culture. As a first step, any policy approach should try to identify the reasons for the relatively low levels of regional entrepreneurship. In a second step, the results of such an analysis can then serve as a basis for the development of a region-specific strategy to improve the level of entrepreneurial activity.

It has been shown that entrepreneurship in innovative industries (a type of entrepreneurship that can be regarded as particularly important for regional growth) is closely related to the regional knowledge base (Fritsch and Wyrwich 2018, 2019). Hence, strengthening the regional knowledge base may be an important way of raising especially the number of innovative new businesses. This pertains to all levels of education, as well as to research. Our own research shows that a historically grown knowledge base is likely to imply a long-lasting impact on the spatial distribution of patenting activity and the regional employment share in R&D-related activities. Thus, there is a long-term dividend of investing in this regional resource that endures. Altogether, it is important to keep in mind that any place-based policy that aims at fostering entrepreneurship and innovation activities as a conduit for regional growth needs a long-term orientation.

Avenues for Further Research

Although we have shown that there is a persistence of regional entrepreneurship and innovation activity, we still know very little about the reasons for the pronounced regional differences of historical self-employment rates and innovation activity. An important avenue for further research is, therefore, to investigate those factors that contributed to the emergence of a regional culture of entrepreneurship in the past. What explains these regional differences? What is the role of natural conditions such as location and a region's accessibility, of climate conditions, of quality of the soil and soil resources in the emergence of an entrepreneurial culture? Do social practices such as the prevailing modes of inheritance play a role here? What is the specific effect of formal institutions, such as region-specific barriers to entry, or a legal framework that allowed for a relatively high level of economic freedom?

The question about the legal framework conditions points to the relationship between formal and informal institutions. Although the diverse studies that show persistence of regional levels of entrepreneurship confirm the common conjecture that informal rules tend to be much more persistent than formal ones (Williamson 2000), there is also solid empirical evidence that certain formal rules can stimulate the level of entrepreneurship, and hence, the emergence of an entrepreneurial culture. It is, therefore, important to inquire more deeply into the effect that formal institutions have on informal ones, such as a regional entrepreneurial culture. It would also be important to know more about possible effects in the opposite direction, i.e., how an informal institution like an entrepreneurial culture might impact the design and formation of formal institutions? Do high levels of entrepreneurship and a positive attitude of the regional population towards entrepreneurship lead to the implementation of more entrepreneurship-friendly formal rules?

Another key issue that requires further investigation is how a regional culture of entrepreneurship is able to be transferred across generations despite severe disruptive shocks of the social, political, and economic framework conditions. A primary mechanism for the transmission of an entrepreneurial spirit over time that has been well investigated is the transfer from parents to their offspring (e.g., Chlosta et al. 2012; Lindquist et al. 2015). Much less is known about the potential contribution of spatial mobility of people to the persistence of a regional entrepreneurial culture. If, for example, people with an entrepreneurial mindset are particularly attracted to regions that are already characterized by high levels of entrepreneurship, this would support the persistence of a regional culture of entrepreneurship. A further mechanism—already mentioned above—that may contribute to persistence of an entrepreneurial culture is the effect of such a culture on the formal institutions. There may also be an effect of collective memory about the historical success of entrepreneurship that leads to persistence of entrepreneurship, e.g., the knowledge that entrepreneurship has been successful in former times (Fritsch et al. 2019a, 2019c).

A further point that deserves attention is the design of appropriate political strategies. What policies can be recommended for regions that have a pronounced cul-

ture of entrepreneurship? What policy measures are appropriate if such a culture is missing? How can policy support the emergence and the development of an entrepreneurial culture? Do regions with a strong entrepreneurial culture respond differently to certain policy measures than regions lacking, or with a weaker, entrepreneurial culture? Little is by known about such questions.

Since entrepreneurship has a close relationship with innovation activity, we also need to understand the historical sources of persistent regional differences with respect to regional knowledge bases and how they remain a source for innovation activity and for the recognition of entrepreneurial opportunities. This also provokes the question of how to stimulate regional innovation and its exploitation via entrepreneurship. Is a regional culture of entrepreneurship important, if not required, to commercialize regional knowledge?

Analyses of long-term regional development trajectories requires historical data. This may particularly include indicators for historical entrepreneurship, a detailed assessment of the regional knowledge base, information about government policies towards entrepreneurship and the supporting infrastructure for entrepreneurs such as the local banking system, information on social practices (e.g., modes of inheritance), as well as information about social values and attitudes of the regional population. This type of more comprehensive data would not only lead to a better description of historical entrepreneurship and related issues, but could also allow researchers to identify those elements of the historical entrepreneurship system that are of key relevance for persistence over longer periods of time.

References

- Acs, Z. J., Zoltan, J., Braunerhjelm, P., Audretsch, D. B., & Carlsson, B. (2009). The knowledge spillover theory of entrepreneurship. *Small Business Economics*, *32*, 15–30. <https://doi.org/10.1007/s11187-008-9157-3>.
- Acs, Z. J., Zoltan, J., Audretsch, D. B., & Lehmann, E. E. (2013). The knowledge spillover theory of entrepreneurship. *Small Business Economics*, *41*, 767–774. <https://doi.org/10.1007/s11187-013-9505-9>.
- Andersson, M., & Koster, S. (2011). Sources of persistence in regional start-up rates—evidence from Sweden. *Journal of Economic Geography*, *11*, 179–201. <https://doi.org/10.1093/jeg/lbp069>.
- Audretsch, D. B., & Feldman, M. P. (1996). R&D spillovers and the geography of innovation and production. *American Economic Review*, *86*, 630–640. <https://www.jstor.org/stable/2118216>.
- Audretsch, D. B., & Fritsch, M. (2002). Growth regimes over time and space. *Regional Studies*, *36*, 113–124. [10.1080/00343400220121909](https://doi.org/10.1080/00343400220121909).
- Audretsch, D. B., Keilbach, M., & Lehmann, E. E. (2006). *Entrepreneurship and economic growth*. Oxford: Oxford University Press.
- Audretsch, D. B. (2007). *The entrepreneurial society*. Oxford: Oxford University Press.
- Audretsch, D. B. (2015). *Everything in its place—entrepreneurship and the strategic management of cities, regions, and states*. Oxford: Oxford University Press.
- Beugelsdijk, S. (2007). Entrepreneurial culture, regional innovativeness and economic growth. *Journal of Evolutionary Economics*, *17*, 187–210. <https://doi.org/10.1007/s00191-006-0048-y>.

- Bosma, N., Hessels, J., Schutjens, V., Van Praag, M., & Verheul, I. (2012). Entrepreneurship and role models. *Journal of Economic Psychology*, 33, 410–424. <https://doi.org/10.1016/j.joep.2011.03.004>.
- Brezinski, H. (1987). The second economy in the GDR—Pragmatism is gaining ground. *Studies in Comparative Communism*, 20, 85–101. [https://doi.org/10.1016/0039-3592\(87\)90017-2](https://doi.org/10.1016/0039-3592(87)90017-2).
- Brezinski, H., & Fritsch, M. (1995). Transformation: The shocking German way. *MOCT-MOST: Economic Policy in Transitional Economies*, 5, 1–25.
- Chlosta, S., Patzelt, H., Klein, S. B., & Dormann, C. (2012). Parental role models and the decision to become self-employed: The moderating effect of personality. *Small Business Economics*, 38, 121–138. <https://doi.org/10.1007/s11187-010-9270-y>.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology (Supplement)*, 94, 95–120. <https://www.jstor.org/stable/2780243>.
- Dubini, P. (1989). The influence of motivations and environment on business start-ups: Some hints for public policies. *Journal of Business Venturing*, 4, 11–26. [https://doi.org/10.1016/0883-9026\(89\)90031-1](https://doi.org/10.1016/0883-9026(89)90031-1).
- Elert, N., Henrekson, M., & Stenkula, M. (2017). *Institutional reform for innovation and entrepreneurship—an agenda for Europe*. Cham: Springer Nature. <https://doi.org/10.1007/978-3-319-55092-3>.
- Etzioni, A. (1987). Entrepreneurship, adaptation and legitimation. *Journal of Economic Behavior and Organization*, 8, 175–199. [https://doi.org/10.1016/0167-2681\(87\)90002-3](https://doi.org/10.1016/0167-2681(87)90002-3).
- Fornahl, D. (2003). Entrepreneurial activities in a regional context. In D. Fornahl & T. Brenner (Eds.), *Cooperation, networks, and institutions in regional innovation systems* (pp. 38–57). Cheltenham: Elgar.
- Fotopoulos, G. (2013). On the spatial stickiness of UK new firm formation rates. *Journal of Economic Geography*, 14, 651–679. <https://doi.org/10.1093/jeg/lbt011>.
- Fotopoulos, G., & Storey, D. J. (2017). Persistence and change in interregional differences in entrepreneurship: England and Wales 1921–2011. *Environment and Planning A*, 49, 70–702. <https://doi.org/10.1177/0308518X16674336>.
- Freytag, A., & Thurik, R. (2007). Entrepreneurship and its determinants in a cross-country setting. *Journal of Evolutionary Economics*, 17, 117–131. <https://doi.org/10.1007/s00191-006-0044-2>.
- Fritsch, M., & Mueller, P. (2007). The persistence of regional new business formation-activity over time – assessing the potential of policy promotion programs. *Journal of Evolutionary Economics*, 17, 299–315. <https://doi.org/10.1007/s00191-007-0056-6>.
- Fritsch, M., & Aamoucke, R. (2013). Regional public research, higher education, and innovative start-ups – an empirical investigation. *Small Business Economics*, 41(4), 865–885. <https://doi.org/10.1007/s11187-013-9510-z>.
- Fritsch, M., & Wyrwich, M. (2014). The long persistence of regional levels of entrepreneurship: Germany 1925 to 2005. *Regional Studies*, 48, 955–973. <https://doi.org/10.1080/00343404.2013.816414>.
- Fritsch, M., & Wyrwich, M. (2016). Does persistence in start-up activity reflect persistence in social capital? In H. Westlund & J. P. Larsson (Eds.), *Edward Elgar handbook on social capital and regional development* (pp. 82–107). Cheltenham: Elgar. <https://doi.org/10.4337/9781783476831.00009>.
- Fritsch, M., & Aamoucke, R. (2017). Fields of knowledge in higher education institutions, and innovative start-ups – an empirical investigation. *Papers in Regional Science*, 96(S1), 1–27. <https://doi.org/10.1111/pirs.12175>.
- Fritsch, M., & Wyrwich, M. (2017). The effect of entrepreneurship for economic development – an empirical analysis using regional entrepreneurship culture. *Journal of Economic Geography*, 17, 157–189. <https://doi.org/10.1093/jeg/lbv049>.
- Fritsch, M., Sorgner, A., Wyrwich, M., & Zazdravnykh, E. (2019a). Historical shocks and persistence of economic activity: Evidence on self-employment from a unique natural experiment. *Regional Studies*, 53, 790–802. <https://doi.org/10.1080/00343404.2018.1492112>.

- Fritsch, M., & Wyrwich, M. (2018). Regional knowledge, entrepreneurial culture and innovative start-ups over time and space—an empirical investigation. *Small Business Economics*, *51*, 337–353. <https://doi.org/10.1007/s11187-018-0016-6>.
- Fritsch, M., & Kublina, S. (2019). Persistence and change of regional new business formation in the national league table. *Journal of Evolutionary Economics*. <https://doi.org/10.1007/s00191-019-00610-5>
- Fritsch, M., & Wyrwich, M. (2019). *Regional trajectories of entrepreneurship, knowledge, and growth—the role of history and culture*. Cham: Springer. <https://doi.org/10.1007/978-3-319-97782-9>.
- Fritsch, M., Pylak, K., & Wyrwich, M. (2019c). *Persistence of entrepreneurship in different historical context*. Jena Economic Research Paper #2019-003, Friedrich Schiller University Jena, Germany. https://zs.thulb.uni-jena.de/receive/jportal_jparticle_00684973
- Fritsch, M., Obschonka, M., & Wyrwich, M. (2019b): Historical roots of entrepreneurial culture and innovation activity—An analysis for German regions. *Regional Studies*. <https://doi.org/10.1080/00343404.2019.1580357>
- Hall, J., & Ludwig, U. (1995). German unification and the “market adoption” hypothesis. *Cambridge Journal of Economics*, *19*, 491–507. <https://doi.org/10.1093/oxfordjournals.cje.a035327>.
- Kibler, E., Kautonen, T., & Fink, M. (2014). Regional social legitimacy of entrepreneurship: Implications for entrepreneurial intention and start-up behaviour. *Regional Studies*, *48*, 995–1015. <https://doi.org/10.1080/00343404.2013.851373>.
- Lindquist, M. J., Sol, J., & Van Praag, M. (2015). Why do entrepreneurial parents have entrepreneurial children? *Journal of Labour Economics*, *33*, 269–296. <https://doi.org/10.1086/678493>.
- Marshall, A. (1920). *Principles of economics* (8th ed.). London: MacMillan.
- Minniti, M. (2005). Entrepreneurship and network externalities. *Journal of Economic Behavior and Organization*, *57*, 1–27. <https://doi.org/10.1016/j.jebo.2004.10.002>.
- Mueller, P., van Stel, A., & Storey, D. J. (2008). The effect of new firm formation on regional development over time: The case of Great Britain. *Small Business Economics*, *30*, 59–71. <https://doi.org/10.1007/s11187-007-9056-z>.
- Nanda, R., & Sorenson, O. (2010). Workplace peer effects and entrepreneurship. *Management Science*, *56*, 1116–1126. <https://doi.org/10.1287/mnsc.1100.1179>.
- North, D. (1994). Economic performance through time. *American Economic Review*, *84*, 359–368. <https://www.jstor.org/stable/2118057>.
- Nunn, N. (2009). The importance of history for economic development. *Annual Review of Economics*, *1*, 65–92. <https://doi.org/10.1146/annurev.economics.050708.143336>.
- Obschonka, M., Schmitt-Rodermund, E., Gosling, S. D., & Silbereisen, R. (2013). The regional distribution and correlates of an entrepreneurship-prone personality profile in the United States, Germany, and the United Kingdom: A socioecological perspective. *Journal of Personality and Social Psychology*, *105*, 104–122. <https://doi.org/10.1037/a0032275>.
- Obschonka, M., Stuetzer, M., Gosling, S. D., Rentfrow, P. J., Lamb, M. E., Potter, J., & Audretsch, D. B. (2015). Entrepreneurial regions: Do macro-psychological cultural characteristics of regions help solve the “knowledge paradox” of economics? *PLoS One*, *10*, e0129332. <https://doi.org/10.1371/journal.pone.0129332>.
- Obschonka, M., & Stuetzer, M. (2017). Integrating psychological approaches to entrepreneurship: The entrepreneurial personality system (EPS). *Small Business Economics*, *49*, 203–231. <https://doi.org/10.1007/s11187-016-9821-y>.
- Pickel, A. (1992). *Radical transitions: The survival and revival of entrepreneurship in the GDR*. Boulder: Westview Press.
- Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. New York: Simon & Schuster.
- Rentfrow, J. P., Gosling, S. D., & Potter, J. (2008). A theory of the emergence, persistence, and expression of geographic variation in psychological characteristics. *Perspectives on Psychological Science*, *3*, 339–369. <https://doi.org/10.1111/j.1745-6924.2008.00084.x>.

- Romer, P. (1986). Increasing returns and long-run growth. *Journal of Political Economy*, 94, 1002–1037. <https://www.jstor.org/stable/1833190>.
- Sorenson, O., & Audia, P. G. (2000). The social structure of entrepreneurial activity: Geographic concentration of footwear production in the United States, 1940–1989. *American Journal of Sociology*, 106, 424–462. <https://doi.org/10.1086/316962>.
- Sternberg, R. (2009). Regional dimensions of entrepreneurship. *Foundations and Trends in Entrepreneurship*, 5, 211–340. <https://doi.org/10.1561/03000000024>.
- Stuetzer, M., Obschonka, M., Audretsch, D. B., Wyrwich, M., Rentfrow, P. J., Coombes, M., Shaw-Taylor, L., & Satchell, M. (2016). Industry structure, entrepreneurship, and culture: An empirical analysis using historical coalfields. *European Economic Review*, 86, 52–72. <https://doi.org/10.1016/j.eurocorev.2015.08.012>.
- van Stel, A., & Suddle, K. (2008). The impact of new firm formation on regional development in the Netherlands. *Small Business Economics*, 30, 31–47. <https://doi.org/10.1007/s11187-007-9054-1>.
- Westlund, H., & Bolton, R. (2003). Local social capital and entrepreneurship. *Small Business Economics*, 21, 77–113. <https://doi.org/10.1023/A:1025024009072>.
- Williamson, O. E. (2000). The new institutional economics: Taking stock, looking ahead. *Journal of Economic Literature*, 38, 595–613. <https://www.jstor.org/stable/2565421>.
- Wyrwich, M., Stuetzer, M., & Sternberg, R. (2016). Entrepreneurial role models, fear of failure, and institutional approval of entrepreneurship: A tale of two regions. *Small Business Economics*, 46, 467–492. <https://doi.org/10.1007/s11187-015-9695-4>.