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Patterns of personality: An explanatory approach to innovation in lagging regions?

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Summary

In the innovation process of lagging regions, which are typically characterized by low levels of private research and development (R&D) and the absence of large firms, interactive learning within and across regional borders serves as an important compensatory mechanism for small and medium-sized enterprises (SMEs). An analysis of the role of aggregated personality traits for regional innovation capacity sheds light on this issue. We find that extraversion has a positive effect on patenting in German regions. This effect is particularly pronounced in lagging regions.

Policies to strengthen the innovation capacity of lagging regions must take into account that SMEs with low R&D intensity are often the only innovators in these areas. The innovation processes of these companies are particularly characterized by interactive learning, external collaboration, and cooperation (Hervas-Oliver et al. 2021; Filippopoulos & Fotopoulos 2022). To explore this phenomenon further, the study by Reher et al. (2024) examines the variability of regional innovation processes by using a personality approach.

Background

Previous research has shown that regionally aggregated personality traits can be understood as a measure of differences in entrepreneurial culture at the regional level (e.g., Audretsch et al. 2017). In the study by Reher et al. (2024), we pursue this idea from an innovation perspective. We use aggregated values of individual Big Five personality traits (Extraversion, Conscientiousness, Neuroticism, Openness, Agreeableness) from the German Socio-Economic Panel (SOEP) and the Big Five Project (https://www.thebigfiveproject.com/), as well as patent data from the German and European patent and trademark offices.

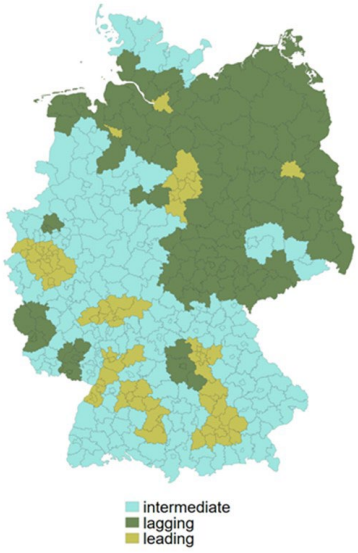
Based on the "Interactive Model of Innovation", it can be argued that the aggregated extraversion scores of a region are expected to have an impact on regional innovation activity. Extraverted individuals have a higher number of social relationships with others. Therefore, a higher level of extraversion in a region is likely to be associated with more frequent communication, cooperation, and knowledge sharing.

This effect is likely to be particularly strong in lagging regions. Due to the low intensity of business R&D, SMEs in these regions often rely on informal learning practices that are strongly rooted in the so-called DUI innovation mode (Learning by Doing, Using, Interacting). This suggests that interactive learning (and thus extraversion) serves as a compensation mechanism for the lack of internal R&D resources and plays a crucial role in the innovation process of lagging regions.

Regional innovation typology

In order to examine the presumed relationship, it is necessary to classify regions in Germany from an innovation perspective and also to take into account DUI-related indicators. For this purpose, we used data on the regional importance of non-R&D-related innovation expenditure and the regional role of the vocational education and training system. This is supplemented by other innovation-relevant variables such as the level of R&D expenditure by different regional actors, regional GDP, or the number of university graduates in a region.

Classification of German regions taking into account DUI-related innovation indicators



Source: Reher et al. (2024)

The results presented in the figure show that, from an innovation perspective, three basic types of regions can be distinguished in Germany: leading regions, which are often urban and economically strong and clearly dominant in terms of R&D-intensive innovation. Lagging regions, on the other hand, lag on all the indi-

cators used, with the exception of DUI-related measures, and are often rural or peripheral. The third group of regions lies between these two extremes.

The extraversion effect in lagging regions

Based on this regional typology, the regression results of Reher et al. (2024) show that the relationship between the aggregated Big Five personality traits and regional innovation capacity does indeed depend on the type of region, as expected. Only for extraversion, and only in lagging regions, is there a consistent positive association with patenting activity, while no significant extraversion effect is found for the other two types of regions. This is confirmed by a number of robustness tests.

Our study thus supports the research of Hervas-Oliver et al. (2021) and Filippopoulos & Fotopoulos (2022), which suggests that interactive learning within and across regional borders is an important driver of innovation for SMEs in lagging regions. Our results can be interpreted as suggesting that the aggregated amount of extraversion promotes interactive learning in lagging regions, which in turn serves as a compensatory mechanism for the lack of R&D-related innovation resources. Future studies can build on this by not using patent activity as the dependent variable, but by measuring regional innovation output more directly through the degree of product or process innovation introduced.

Implications for policy

This means that an innovation policy approach for lagging regions should go beyond a narrow focus on R&D and take into account the strong interactive component of innovation activities in this specific type of region. One possible approach is to better link the many SMEs with low R&D intensity in lagging regions, whose innovation activities are often strongly rooted in the DUI mode, within and across the boundaries of their regional innovation system. Ideally, this should take place within a broad spectrum of regional and supra-regional actors, bringing together their different competencies, resources, and perspectives.

The policy objective should be to stimulate interactive learning in a region between representatives of different learning and innovation environments in order to avoid a too narrow focus on specific areas of the regional innovation system and to jointly address the challenge of innovation-driven regional development. This can, for example, take the form of (cross-sectoral) partnerships between enterprises, public authorities, non-profit organisations, civil society and research institutions. A key challenge lies in the place-specific characteristics of regions, as interactive knowledge flows are often strongly embedded in local and regional contexts. For this reason, a bottom-up policy approach to promoting innovation-based development in lagging regions – such as that currently being pursued by the German government's WIR! funding programm, which focuses on the formation of new regional alliance structures – has the potential to strengthen the innovation capacity of lagging regions.

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