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# Regional inclusiveness: Institutional factors and the innovative effects of cultural diversity in European regions

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## Introduction

In the light of increasing migration on the one hand (McAuliffe & Khadria, 2019) and the relevance of innovation in today's knowledge-based economy on the other (P. Cooke & Leydesdorff, 2006), the impact of *cultural diversity* on regional innovation has received considerable attention (Kemeny, 2017; Ozgen, 2021). Cultural diversity within a region describes not only the number of immigrants but also the heterogeneity (e.g. in terms of countries of birth) represented among the population. Theoretically, it is argued that this variety entails a greater range of knowledge, information and skills, which allow for more creative problem-solving, ideas and, therefore, innovation (Hong & Page, 2004; Nooteboom, 2000; van Knippenberg et al., 2004). However, there may also be negative effects of diversity on innovation: communication barriers, conflict and intergroup biases, for example, may pose hurdles for cooperation and increase transaction costs (Lazear, 2000; van Knippenberg et al., 2004). So far, research overall suggests a positive net effect of cultural diversity on innovation, but empirical results are far from clear-cut (A. Cooke & Kemeny, 2017; Kemeny, 2017; Ozgen, 2021) raising questions about moderating factors in the relationship between diversity and innovation. In previous literature, the focus has often been on immigrants' characteristics as a determining factor of this net effect e.g., in terms of level of education. In this study, we instead focus on the role of the regional characteristics, and specifically the institutional setting as a moderating (i.e., supporting or hindering) factor in the relationship between cultural diversity and innovation.

## Theoretical background

The evidence regarding the impact of cultural diversity on innovation on the regional or city level is mixed, with researchers finding positive effects (e.g. Niebuhr, 2010), varying effects across countries (e.g. Dohse & Gold, 2014; Ozgen et al., 2014) or no statistically significant evidence (e.g. Lee, 2015). This ambiguity is often suggested to lie in the heterogeneity of migrants regarding characteristics such as their skill level, cultural proximity or language (Ozgen, 2021). In contrast, the role of the host community remains largely neglected in empirical analyses. Yet, paying more attention to regional institutional characteristics that influence innovation processes might help explain the inconclusive results. Indeed, researchers such as Alesina and La Ferrara (2005) have long argued that varying effects of diversity on economic outcomes might be explained through different institutional settings (such as policies that increase or decrease the integration of immigrants (Alesina & La Ferrara, 2005, p. 795)). Dohse and Gold (2014), furthermore, observe effect heterogeneity of cultural diversity on innovation across European regions and interpret this to be due to varying institutional characteristics. And still, despite the theoretical awareness of its relevance, there is little empirical research investigating the interaction between institutional characteristics and cultural diversity explicitly.

There is little doubt regarding the importance of institutions for innovation and regional development generally (Morgan, 1997; North, 1991; Rodríguez-Pose, 2013). Given that the quality of social contacts influences the success of knowledge exchange (Westlund, 2006) and that innovation processes are inherently interactive (Morgan, 1997), local institutions and especially the social context precondition the processes of knowledge sharing and innovation fundamentally. Indeed, the innovative benefit of diversity is often ascribed to the potential of recombining diverse knowledge and ideas. This implies that the pure presence of diversity may not be sufficient for innovation – it also needs to be integrated into knowledge exchange and innovation processes. In this sense, *inclusive institutions*, supporting contact and exchange among heterogeneous actors, may facilitate knowledge sharing and mutual understanding, which may reduce costs of diversity while allowing to utilise its potential. Despite the clear theoretical relevance of institutions in diverse regions, little empirical evidence on this topic exists.

Some pioneering work in this regard has been presented not for innovation but productivity by addressing the role of trust, social capital and inclusive formal institutions as moderators of cultural diversity for Norwegian regions (Haus-Reve & Cooke, 2019) and US metropolitan areas (Kemeny, 2012; Kemeny & Cooke, 2017). These studies hypothesise that trust and (other) inclusive institutions can mitigate higher transaction costs by acting as lubricant to (economic) transactions and, indeed, found significantly higher positive effects in regions with more trust towards foreigners and more inclusive (in)formal institutions. Moreover, the results from Haus-Reve and Cooke (2019) suggest that regions with strong bonding social capital fail to significantly benefit from cultural diversity whereas the opposite is the case for regions with low bonding social capital. This may imply that tightknit communities are too closed-off towards "outsiders" to benefit from them – a common criticism towards bonding social capital (Malecki, 2012). Buchholz (2021), studying the effect of diversity on productivity in the US finds that the diversity effect is higher in cities which are less residentially segregated. Based on his findings, he argues that "[b]irthplace diversity generates productivity externalities by exposing people to new ways of thinking and approaching problems, but for this to occur, (…) this requires some degree of social integration and inclusion" (ibid., p. 281).

Building on this research, we explore the role of *regional inclusive institutions* as moderator in the relation between cultural diversity and innovation. It is apparent that the concept of inclusive institutions is a broad one and could comprise a plethora of aspects. In our conceptualisation of regional inclusiveness, we focus on the prevalence of social relations between natives and immigrants as well as the public attitude towards immigrants. Social relations between migrants and natives, as argued before, are central to knowledge transfer and thus an important mechanism through which the benefits of diversity can be transmitted. Yet, it must be considered that such relations need not be equal in quality. Simply considering the amount of social relations might not capture the reality, not least given that an increasing share of migrants likely increases contact between migrants and natives regardless of regional inclusiveness. Hence, the public attitude towards immigrants is additionally considered. This allows to differentiate regions that might well show a high prevalence of social relations between natives and immigrants but are in aggregate still rather hostile towards them from those regions that are actively embracing the potential of immigrants.

**Research approach and data**

This study explores how regional inclusiveness influences the relationship between cultural diversity and innovation across European NUTS1 and NUTS2 regions. Due to the lack of an existing comprehensive indicator to measure inclusive institutions, this paper follows an exploratory quantitative approach. The necessary data are derived from *Eurobarometer* surveys from 2006 until 2019, which have previously been used in regional analyses (e.g., Van de Walle & Migchelbrink, 2020). Answers to survey questions (e.g., *Do you have friends or acquaintances who are of a different ethnic origin? How much do you agree with the statement 'Immigrants contribute a lot to our country'?*) are then used to

derive regional mean parameters for a cluster analysis. This allows us to identify groups of regions which are similar to each other regarding these parameter values. Drawing on a pool of questions attenuates the issue of socially desired answers while also capturing more nuances than simply using individual survey questions as previous research has done (e.g., Volha, 2018). Using these clusters, we examine how such differing regional institutional conditions interact with the relationship between diversity and innovation.

For measuring regional cultural diversity, the microdata version of the *European Labour Force Survey* (LFS) is used. The LFS contains regionally representative individual level data on the labour force including the respondents' country of birth[1]. This allows us to include the share of foreigners as well as commonly used diversity indices such as the fractionalisation index or the Theil index (e.g., Niebuhr, 2010). To proxy innovation activity on the regional level, inventor-based patent application data from the *RISIS Patent* database is used. Using patents as proxies for innovation, of course, entails several shortcomings. Not all innovations are patentable or patented and the propensity to patent differs among firms and industries (Archibugi & Planta, 1996). Given that cultural diversity is argued to increase innovation among the general workforce, it is likely to lead to innovation processes that are difficult to capture by patents given the costly process of getting a patent approved (Nagaoka et al., 2010). The effects of cultural diversity on innovation might, thus, not be fully captured. They, nevertheless, represent the best option given its high temporal and geographic resolution.

A particular strength of the named data sources is their availability across several European NUTS1 and NUTS2 regions. This gives sufficient geographical variation across institutional measures to allow analysing their effects. These data are then be used for the following analysis: first, the effect of cultural diversity on innovation is analysed via OLS with patent applications as dependent variable and a range of standard control variables for regional innovativeness obtained from Eurostat, ARDECO and OECD. Subsequently, the moderating role of inclusive institutions is tested. This is achieved by utilising the previously defined clusters and adding interaction effects between the diversity index and a categorical variable indicating the region's cluster membership to the equation.

This paper thereby contributes to the literature in three ways: first, it conceptualises, explores and tests measures for inclusive institutions and, in doing so, addresses the challenge of measuring this intangible concept. Second, it adds to the limited research on the role of institutions when studying the innovative effects of cultural diversity. Third, it sheds more light on the mechanisms underlying the regional variability of the effect of cultural diversity, which has so far often been analysed in within-country studies, by focusing on sub-national regions across the European Union.

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