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Ron Boschma

Regional Diversification and Inequality between and within Regions

KEY MESSAGES

- **The relationship between diversification and wage inequality in regions is still poorly understood**
- **Related diversification is crucial for economic growth of regions**
- **Related diversification in more complex industries tends to increase wage inequality between regions**
- **Related diversification in less complex industries tends to reduce wage inequality**
- **It remains a policy challenge to combine smart and inclusive growth in regions**

Regional inequality is on the rise again (Terzidis et al. 2017). Income inequality across NUTS-2 regions in the EU has risen substantially in the last decades. The same applies to the US, where inequality in income per capita between metropolitan areas has increased. Scholars often attribute rising regional income disparities to technological change and globalization (Moretti 2012; Iammarino et al. 2019). Technological change has decreased trade costs, which makes knowledge-intensive activities concentrate in large cities where the highly paid high-skill jobs are found to an increasing extent. Other (often manufacturing) regions are stagnating economically, due to trade and automation of routine tasks (Autor 2019).

Besides affecting inter-regional inequality, concentration of innovation in certain cities also goes hand in hand with intra-regional inequalities. A prime example is Silicon Valley, whose huge innovative success has been accompanied by crowding out of low-income people due to lack of affordable housing. Florida (2006) claimed that the most innovative cities in the US are also the most unequal. Lee (2011), and Lee and Rodríguez-Pose (2013) found a positive relationship between innovation and wage inequality in European regions. Large cities draw in relatively high amounts of both high- and low-skilled workers (Eeckhout et al. 2014) where the high-skilled workers increase the demand for local services, resulting in an employment multiplier for low-wage jobs (Moretti 2010; Lee and Clarke 2019).

REGIONAL DIVERSIFICATION

However, there is little understanding of the extent to which the entry of new industries in regions affects inequality between and within regions. There is a large body of literature on regional diversification that has focused on the development of industries in regions and how they build on local capabilities from related industries. This literature claims that regions diversify into new activities that are related or close to what they have been doing in the past (Neffke et al. 2011). Many studies have shown that this so-called principle of relatedness (Hidalgo et al. 2018) indeed holds when explaining the entry of new technologies, industries, products, occupations, and scientific fields in regions (Boschma 2017).

Besides showing that regions tend to diversify in related rather than unrelated activities, this literature claims that regions should move into activities that are more complex. Complex activities are of high value and are considered to bring high economic returns to a region because they combine many capabilities that are very hard to master by other regions (Hidalgo and Hausmann 2009). Balland et al. (2019) found that many regions have the ambition to diversify into complex activities, but only some of them have the capabilities to do so.

REGIONAL INEQUALITY

The regional diversification literature suggests that related diversification in complex industries is likely to increase inter-regional inequality. This is not because high-income regions necessarily diversify more than low-income regions, but because high-income regions have a stronger capacity to diversify into complex activities (Pinheiro et al. 2022) that also bring higher economic benefits to the region (Rigby et al. 2022).

There is a significant amount of evidence that complex activities concentrate in high-income cities, and there is a positive association with their economic performance (Balland and Rigby 2017; Balland et al. 2020; Rigby et al. 2022). This implies that inter-regional inequality is likely to increase, as high-income regions have a greater capacity (i.e., a wide range of relevant capabilities) to

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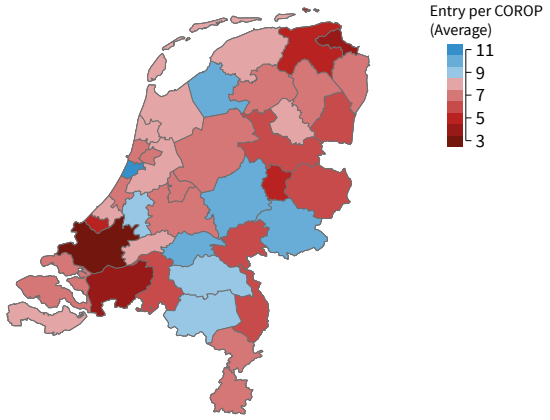
Figure 1

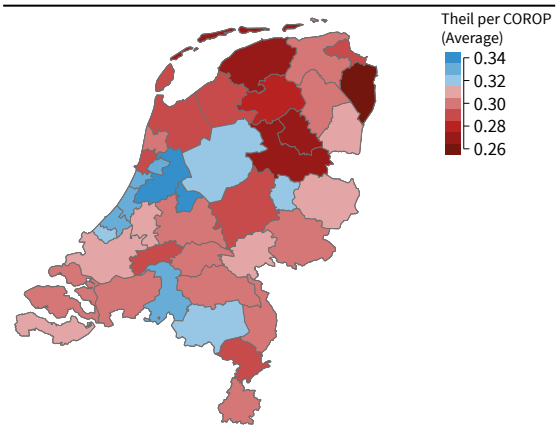
Map of the Average Number of Entries in Dutch Regions



Source: Cortinovis et al. (2022). © ifo Institute

Figure 2

Map of Average Wage Inequality (Theil Index) in Dutch Regions



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diversify into complex activities that bring higher economic benefits. Pinheiro et al. (2022) found that advanced regions in Europe have the best opportunity to diversify into high-complex activities, while lagging regions focus mainly on the development of low-complex activities. Their study showed that high-income regions (with a high GDP per capita) not only enter more complex technologies and industries, but also have the highest potential to continue to do so in the years to come, given their strong local capabilities.

The complexity literature (Hidalgo and Hausmann 2009) has investigated the relationship between economic complexity and intra-regional inequality. At the country level, studies have shown that the higher the complexity of an economy, the lower the wage inequality (Hartmann et al. 2017). This finding at the national scale stands in contrast with studies done at the regional scale that show there is instead a positive relationship between economic complexity and inequality at the sub-national scale (Marco et al. 2022; Hartmann and Pinheiro 2022). New York and San Francisco are examples of complex cities that show the highest inequalities. According to Hartmann and Pinheiro (2022), the positive relationship may be attributed to the co-existence of simple and complex activities in large cities, where relatively little job opportunities exist for middle-income people in semi-complex activities.

However, no study yet exists that has examined the relationship between industrial diversification on intra-regional wage inequality, let alone what such a relationship looks like in case of complex entries. It is also not that straightforward what relationship to expect. Entries in more complex industries are likely to pay higher average wages than entries in less complex industries. Entries in related industries share similar skill requirements with other related industries in the region. Therefore, related entries need to compete for labor with other related local industries, so they might have to offer higher wages to their employees. This may also increase wage levels in the other related industries in the region. This may imply that we can also expect a positive relationship between related complex entries and intra-regional inequality, as complex entries are expected to pay higher wages on average.

Examining the relationship between regional diversification and intra-regional wage inequality requires detailed data on the entry of industries in regions and linking them to wages of individuals within those regions. At the European level, these regional data are very hard to get, which makes it almost impossible to investigate this relationship for all European regions.

Cortinovis et al. (2022) did such an analysis in one single country (the Netherlands) using linked employer-employee micro-data from the Central Bureau of Statistics. These data link industry categories to wages of individuals and their work location in 40 NUTS-3 regions. Figure 1 presents the distribution of the average number of entries across 40 regions in the Netherlands. An industry enters a region when the region becomes specialized in that industry, based on location quotients and applying a bootstrapping technique (Cortinovis et al. 2022). Figure 1 shows that the highest number of entries occur outside the most urbanized regions. The lowest number of entries are recorded in regions like Groot-Rijnmond, West Noord-Brabant, Delft and Westland, Delfzijl en Omgeving, and Overig Groningen.

Figure 2 shows a map of the Theil-index in the 40 NUTS-3 regions in the Netherlands. The Theil index is an entropy measure of inequality widely used in research on regional inequality. Wage inequality levels are highest in the northern part of the Randstad area: Groot-Amsterdam and its neighboring regions such as Gooi en Vechtstreek show the highest scores. Relatively high levels of inequality are found also in Midden Noord-Brabant (in the south). Low levels of wage-inequality can be found in the northern part of the Netherlands in particular.

Cortinovis et al. (2022) regressed the Theil index on the number of entries in each region for 7 overlapping 3-year periods during 2010–2019 and differentiated between different types of entries in terms

of relatedness and complexity. Related entries were defined as entries in industries that are skill-related to other industries (with whom they share similar skill requirements) in which the region is specialized. Complex entries were defined as entries in industries that are complex, using the eigenvector method to compute complexity (Balland and Rigby 2017). Cortinovis et al. (2022) found a negative relationship between entry and levels of inequality: the higher the number of entries in a region, the lower the wage inequality. This was true for related but not for unrelated entries. They also found that less complex entries reduce the level of wage inequality, especially when it concerns related entries. However, the Dutch study did not find a positive relationship between related complex entries and intra-regional inequality, in contrast to expectation, which was based on the assumption that complex entries pay higher wages on average, especially when they have to compete with other related industries in the region. Overall, their findings suggest that related diversification in low-complex industries enhances inclusive growth at the regional level.

POLICY CONCLUSIONS

Many regions have the ambition to combine smart growth and inclusive growth. The smart growth objective means that regions aim to develop new activities that build on local capabilities, as promoted by Smart Specialization policy in the European Union (Foray 2015). However, not every region has the same capacity to diversify into new industries (Neffke et al. 2011; Balland et al. 2019). McCann and Ortega-Argiles (2015), among others, have raised concerns more than once that the more advanced regions have a strong capacity to do so, while backward and peripheral regions lag behind in this respect. If so, smart growth could lead to increasing regional income disparities, at the expense of inclusive growth.

Recent studies on European regions show that this indeed might be a likely scenario. Related diversification seems to favor both high-income and low-income regions, but high-income regions will tend to do that in more complex activities, as opposed to low-income regions that have a stronger capacity to develop low-complex activities (Pinheiro et al. 2022). Because more complex activities on average pay higher wages and bring higher economic benefits to regions in terms of GDP growth (Rigby et al. 2022), this is likely to contribute to widening disparities between regions. This is not easy to correct by policy (see Boschma 2022). At the same time, it might actually be very good that some complex activities (like artificial intelligence) are heavily concentrated in the European space, because this might enable Europe to acquire leadership and compete globally. Having said that, the challenge remains of how to develop more complex activities in peripheral regions and how policy can make a difference in terms of promoting investment from elsewhere, lifting the research and innovation capacity of local firms, and establishing collaborations with other regions, among other policy actions.

While such concerns about these possible effects have been acknowledged and discussed in Smart Specialization policy in the European Union, this is far less the case for intra-regional inequality. The findings of the Dutch study indicate that entry in low-complex industries that are skill-related to existing local industries tends to reduce wage inequality in a region. In other words, related diversification in low-complex industries might be good for inclusive growth in regions, while Rigby et al. (2022) showed that related diversification in high-complex industries is best for smart growth in European regions. This implies that the challenge remains of how to combine and align the two objectives of smart growth (as addressed by Smart Specialization policy) and inclusive growth (the main focus of the Cohesion policy). However, we must be cautious not to draw strong conclusions concerning policy implications at this stage, which is based on few studies so far, and also because many of the unresolved issues are still poorly understood, such as the role of (national and regional) institutions.

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