3 What drives locational choice?

This chapter examines key factors driving manufacturing to particular locations and classifies them into six broad groups that include i) natural resources ii) accessibility and infrastructure iii) input suppliers, markets, and competitors iv) skills and knowledge v) innovation, and vi) social capital. Analysis in this chapter reveals that there is no single determining factor that drives manufacturing performance in rural regions, highlighting the relevance of tailored, place-based approaches to support manufacturing activities. The chapter sets the scene for the following chapter which discusses how many of these are being influenced over time.

Chapter 1 highlighted the diversity of rural manufacturing activities in rural places that are shaped with the presence of artisanal, natural resources and industrial heritage. Chapter 2 provided trends in the manufacturing sector across rural OECD Territorial Level 3 (TL3) small regions (see Box 2.1) and discussed forces shaping these trends, including increased competition from emerging economies, the presence of natural resources or loss of skilled labour, among others. This section examines these factors in more depth as well as additional ones relevant to the context of manufacturing activities in rural areas. These include: i) natural resources; ii) accessibility and infrastructure; iii) input suppliers, markets, and competitors; iv) skills and knowledge; v) innovation and vi) social capital.

Whilst this section introduces many of these factors, Chapter 4 will discuss how many of these factors have been changing over time.

Natural resources

The presence of natural resources has historically played a major role in attracting firms to rural areas, especially when such resources are scarce and geographically concentrated. Marshall (1890[1]) attributed a prominent role to the natural resources of an area to explain the location of industries. In the 19th century, the physical attributes of a location – in terms of climate, access to waterways, mining and the like – determined industrial development in many regions, often located in rural areas (see Box 2.1) (Davis and Weinstein, 2002[2]).

When transportation costs were higher due to incipient infrastructure, manufacturing industries such as steelmaking were located close to natural resources (such as coal and iron ore) that were long used as inputs; this determined, to a considerable degree, the industrial and economic landscape. History also shows that industrial decline in those specialised regions built on natural resources went hand in hand with their overall economic decline in the last four decades. Belgium is a prime example (Buyst, 2018[3]). At the beginning of the 20th century, the southern region of Wallonia experienced extraordinary economic growth thanks to the availability of coal and the concentration of manufacturing activities. With technological change and the depletion of coal resources, Wallonia lost most of its economic power. For instance, the region of Hainaut, which in 1896 contributed about 21% to the Belgian gross domestic product (GDP), only contributed about 8% in 2010.

Estimates showed that in the United States, about 20% of the observed geographical concentration of industries can be explained by a small set of factors related to natural advantages, such as costs of electricity, natural gas, timber and agricultural and livestock products (Ellison, 1999[4]). This analysis suggests that more detailed sets of variables may explain up to 50% of industry concentration driven by natural endowments, as they can better capture natural advantages and their relevance to specific industries, for example a location with the right conditions for soybean production rather than a generic agricultural advantage.

Natural resources can represent an asset for wider forms of rural manufacturing today. Natural resource endowments have the potential to develop first- and second-stage manufacturing activities in rural regions in a broad number of areas, including forestry, mining, agriculture, or the bioeconomy, to name a few. Furthermore, the recent inflationary pressures driven by Russia's war of aggression against Ukraine are driving up transport and energy costs, making local value chains more competitive again and opening up new opportunities for manufacturing activities. When considering foreign direct investment (FDI), natural resource-seeking investments have often suffered from fewer local spillovers and the repatriation of profits (Dunning and Lundan, 2010[5]). Thus, FDI attraction policies of this kind must strongly consider the ways in which these firms would be embedded into the existing local environment.

Accessibility and infrastructure

The ability to access markets with speed and relatively little cost is a critical advantage for influencing the location choice of firms and has often been considered a disadvantage for rural areas. At the same time greater accessibility is linked to increased competition and to induce possible "straw effects", with negative effects on the economy of rural areas (see Box 2.1). The literature provides mixed examples. For instance, in the case of Spain, municipalities that improved accessibility via motorway and were within the first 10 km from the motorway as a result of the motorway construction, witnessed a 12-94% increase in new manufacturing plants compared to those outside the 10-km transport corridors (Holl, 2004[6]). Audretsch et al. (2020[7]) provide comparable results, showing that the introduction of motorway tolls in Portugal negatively affected the number of firms and employment levels, especially in manufacturing. Holl (2016[8]) has indicated that better accessibility increases productivity growth at the firm level.

Such benefits appear to go at the expense of firms in adjacent areas. The same research (Holl, 2016[8]) found that semi-urban regions between 10 km and 20 km from motorways witnessed a decrease of 16% in productivity growth. Similarly, in the United States, economic activities were found to decrease in rural counties adjacent to those receiving a new highway (Chandra and Thompson, 2000[9]).[1] One explanation for this, especially when the connection to a larger city improves, is that activities in smaller towns and rural areas may be pushed to relocate. This has been referred to as the so-called "straw effect" (Kim and Han, 2016[10]; Behrens et al., 2007[11]).

Considering the industry composition of rural manufacturing is key to identifying the degree of benefits of accessibility. The impact of infrastructural improvements also differs between industries. Studies such as those led by Audretsch, Dohse and dos Santos (2020[7]) and Holl (2004[6]) found that industries like textile, metal products and wood and furniture suffered most from greater competition brought about by accessibility. Differently, industries such as food and beverage, paper and printing showed higher rates of firm creation when their locations became more reachable. The sectoral dimension also crucially comes into play for firms in rural regions: for example, Holl (2016[8]) finds that firms in traditional sectors (textile, clothing and printing) are shown to benefit from better accessibility, including in rural areas.

Local infrastructure, such as roads and railways, facilitates idea and knowledge circulation. Perlman (2015[12]) studied the effect on patenting of railroad expansion in the United States in the 19th century. Locations whose accessibility improved increased their patenting activity. Perlman explains this finding by linking greater accessibility to urbanisation and the greater availability of critical resources to inventors (e.g. lawyers, access to finance, etc.), demonstrating the possible value-added and win-win scenarios when strengthening urban and rural linkages. In a contemporary setting, the work by Agrawal, Galasso and Oettl (2017[13]) demonstrates that accessibility stimulates innovative activity in United States metropolitan areas. According to their estimates, an increase of 10% in the stock of highways leads to an increase in the amount of local patenting of 1.7%. Rural places in close proximity to cities enjoy stronger linkages in transportation networks, commuting flows, spatial planning and the provision of goods and services. Furthermore, these rural places can also benefit from good access to markets, services and agglomeration of talent present in urban areas. These benefits are often referred to as "borrowed" agglomeration effects.

Infrastructure projects should consider the utility of rural manufacturing. Infrastructural improvements focused on easing congestion or breaking bottlenecks can be expected to positively affect regional economic outcomes (Crescenzi, Di Cataldo and Rodríguez-Pose, 2016[14]), while untargeted and prestige-driven investments may have ambiguous effects at best (Crescenzi and Rodríguez-Pose, 2012[15]). The perception of the generally positive effects generated by higher accessibility has led over the years to investments in redundant or relatively unproductive infrastructure projects, such as ghost airports and parallel motorways (Rodríguez-Pose, Crescenzi and Di Cataldo, 2018[16]).

Input suppliers, markets and competitors

Although the distance to markets has become less of a concern for manufacturing activities in rural areas due to the increased use of digital tools and better road connectivity in many places, more recently, Russia's invasion of Ukraine is driving up transportation costs. This can be an opportunity to rethink activities. Co-location of customers and suppliers can lead to productivity benefits through reduced costs but also through knowledge sharing and the creation of sufficient demand for the development of specialised inputs. Proximity facilitates close and frequent interaction, promoting learning and innovation (Porter, 1990[17]). Studies have also found the importance of input-output linkages in the increased spatial concentration of industries over time (Diodato, Neffke and O'Clery, 2018[18]; Steijn, Koster and Van Oort, 2022[19]; Glaeser and Kohlhase, 2003[20]). For low-technology and low-skilled industries, input-output linkages are particularly important (Faggio, Silva and Strange, 2017[21]).

The distance of rural areas can be advantageous for some forms of high-technology manufacturing. Whilst proximity can spur efficiency and innovation (Porter, 1990[17]), knowledge spill overs associated with proximity are not always beneficial for R&D and innovation purposes (Iammarino and McCann, 2006[22]). This is particularly the case where R&D-related investments are very significant and over long time-periods, underpinning very fundamental research-led innovation processes. In such settings, the risks associated with unintended knowledge outflows due to proximity can be more significant than the potential benefits associated with unintended knowledge inflows (Iammarino and McCann, 2006[22]) (Iammarino and McCann, 2013[23]). Firms are often concerned about risks of knowledge leakage (e.g. a competitor learning and adopting the newly developed feature of a product) and labour poaching (e.g. a competitor hiring an employee with inside knowledge on products and process of the firm) (Alcácer and Chung, 2007[24]). In these types of situations there is a rationale for innovative firms to be located outside of, or even far away from, core agglomeration regions (Simmie, 1997[25]), precisely in order to help preserve the secrecy and security of any emerging intellectual or scientific breakthroughs which are to be embodied in subsequent innovations and manufacturing activities

These innovations however, which emerge from relatively isolated but R&D-intensive locations can be pioneering innovations and change the shape or trajectory of a whole sector, market or technological field. Such innovations will typically be on the national and regional technological and productivity-related frontiers. However, at the rural regional scale, although these investments will display the fundamental types of pathbreaking innovation which are new to national markets, these are unlikely to directly drive wider local technological spill overs, for precisely the same reasons as to why they are located in these rural regions, which is to avoid unintended knowledge outflows. firms are often concerned about risks of knowledge leakage (e.g. a competitor learning and adopting the newly developed feature of a product) and labour poaching (e.g. a competitor hiring an employee with inside knowledge on products and process of the firm) (Alcácer and Chung, 2007[24]). This latter effect is especially strong for technologically advanced firms that tend to avoid locations with similar industrial activity and distance themselves from competitors.

Skills and knowledge

Historically, manufacturing has been located in areas with lower wage and non-wage labour costs, such as lower likelihood of unionisation (Hayter, 1997[26]; Herod, 2017[27]). The lower wage costs and lower cost of land in the past represented a comparative advantage of rural regions to attract manufacturing activities. Globalisation and declining transport costs has led to delocalisation of production, where different areas can contribute towards the development of a final product. Rural economies specialised in these activities have then faced fierce competition from emerging economies. Such competition along with a greater flow of information and ideas contributes to innovation. Furthermore, participation in GVCs open opportunities for firms to access foreign knowledge and technology and share practices with other markets. In this

context, skills and knowledge in rural regions will be critical elements for manufacturing activities to compete globally.

The gap in skill levels between rural regions and cities imply that the former are less well-prepared to face the changing labour demand. Skill differences between rural regions and cities are already visible at school age (OECD, 2019[28]). Developing relevant skills can help rural communities harness new economic opportunities associated with technological innovation and expanding digital infrastructure. A skilled workforce is also key for rural regions to transition towards higher-value-added activities in manufacturing.

Advancements in digitalisation opens up new ways to foster adult basic education through distance learning sector (OECD, 2021[29]). Vocational education and training can be another key vehicle for developing relevant rural skills. However, rural sectors may face specific challenges associated with the provision of training opportunities, such as transportation. The balance between costs and benefits of offering apprenticeships depends on the size of the firms, for instance, because larger firms are to a greater extent able to retain former apprentices as skilled workers as a return on their investment in training. It is therefore key to foster strong co-ordination between rural firms, not-for-profit organisations and government programmes to ensure that investments in training provision are worthwhile for both smaller and larger companies. Smaller employers can, for instance, be supported by policies to encourage the development of models allowing them to share risks and responsibilities related to apprenticeship provision, structures to support with the administrative burden and training delivery itself (OECD, 2018[30])

Public-private partnerships can help avoid the adverse effects in terms of underinvestment in skills by local firms due to risks of labour poaching. Similarly, universities and firms have different incentives to share knowledge, which may hamper university-industry collaborations if left unchecked (Partha and David, 1994[31]). Fernández Guerrero (2020[32]) found that firms in rural regions were more likely to collaborate with universities when they hired graduates. This is despite the fact that rural regions have fewer universities (Charles, 2016[33]) and, thus, firms have to overcome a larger geographical distance to collaborate with universities (Johnston and Huggins, 2015[34]). Alcácer and Chung (2007[24]) found that technologically advanced firms select regions with high levels of academic activity but avoid regions with industrial activity to avoid knowledge spillovers to competitors.

Grillitsch and Nilsson (2015[35]) and Avermaete et al. (2004[36]) find innovation in small and medium-sized enterprises (SMEs) in peripheral and rural areas to depend on the firm's skill and commitment to knowledge as well as access to external knowledge sources. Social proximity between actors, like having a shared past at the same firm or being part of the same professional community, is very helpful to learn from others, no matter whether you are located close or far from each other (Breschi, 2001[37]).

Chapter 4 looks into a range of policy measures that can help rural manufacturing improve their skills and knowledge given the changing environment such as increased digitalisation.

Innovation

Rural regions can benefit from specialisation for their innovation. These regions do well in the exploitation of existing technologies (Duranton and Puga, 2001[38]). New industries and technologies are more likely to enter a region when they are related to existing industries/technologies in a region (Neffke, Henning and Boschma, 2011[39]). Cortinovis, Crescenzi and van Oort (2020[40]) find that these can be positively associated with higher employment levels. Relatedness also enhances the performance of local firms. Neffke and Henning (2012[41]) found that plants benefit more from being located close to plants in related industries than plants in their own industry.

Broadly, local access to (scientific) knowledge has become a crucial input for (knowledge-intensive) manufacturing. Diversity of knowledge is also considered crucial for innovation but only when there is some degree of relatedness between local activities. Regional innovation policy that focuses on increasing

research and development (R&D) investment may not deliver in regions where the capacity of SMEs to benefit from R&D is limited (Hervas-Oliver et al., 2021[42]), unless partners in regional innovation systems create incentives and facilitate research linkages between research partners and local rural firms (OECD, 2023[43]). Relatedness may offer many benefits, such as higher performance of local firms and more opportunities for regions to diversify. One reason is that tacit knowledge or knowledge that is hard to codify is believed to matter in particular, as it is perceived not to travel well over large distances (Gertler, 2003[44]).

To the benefit of rural regions with smaller labour pools, the relevance of having a larger labour pool for innovation is falling. At the same time access to knowledge spill overs, as an agglomeration force, is increasing through improved digital infrastructure. The labour market in many rural areas is facing a relative decline due to ongoing demographic changes. However, Faggio, Silva and Strange (2017[21]) show that primarily low-technology or low-educated industries value labour market pooling more strongly. This is true, particularly for industries that rely on symbolic knowledge (in the case of creative industries) and synthetic knowledge bases (in the case of engineering industries). In the case of regions that are increasingly adopting new technologies, lower dependence on large pools solves challenges related to labour access. However, in many rural places that still have very large low-technology industries and low-educated workers, the challenge of access to labour remains. Furthermore, industries in rural regions that depend on analytical knowledge (such as high-technology industries) are increasingly able to benefit from knowledge spillovers over larger geographical distances, especially as the digital gap between metropolitan and rural areas is reduced (OECD, 2023[45]).

Social capital

Factors like entrepreneurial culture and social capital are particularly relevant for rural areas and their manufacturing. Bonding social capital in rural regions can build exclusive networks but may discourage the development of new activities. Formal institutions are important enablers of development and attractors for firms. By providing clear and enforceable rules, suitable incentives and assets, the quality of institutions can stimulate firm location and growth through networks and collaborations in ways different and complementary to social capital and other informal institutions. Thus, the recently approved OECD Recommendations on SME and Entrepreneurship Policy1 and on Social and Solidarity Economy and Social Innovation[2] provide important recommendations to support entrepreneurial culture and social capital in rural regions, which are, in turn, relevant to manufacturing activities.

Rural areas with industrial districts can benefit from the specific local culture of trust, enabling small firms to interact, co-operate and learn from each other (Becattini, Bellandi and De Propris, 2009[46]). In the 1970s and 1980s, industrial districts were presented as an alternative organisational model to big corporations with a focus on internal economies of scale. SMEs could compete economically on global markets despite their smallness because their embeddedness in such local culture provided a basis for external economies of scale. It resulted in the local provision of collective goods to which local firms contributed collectively, such as supportive local services in R&D, training, infrastructure and export facilities. This local culture of trust enabled knowledge diffusion and joint learning; it facilitated a deep division of labour (due to lower transaction costs) that enhanced productivity and favoured the flexibility and resilience of local firms. The “Third Italy” is one of the known examples of industrial districts located in mostly rural areas and often specialised in design-intensive industries (like ceramic tiles, fashion, etc.).

Being able to combine local and external resources is crucial for the survival and growth of rural manufacturing. While social capital stresses the importance of local networks, the concept of regional “network capital” (Huggins, Johnston and Thompson, 2012[47]) is complementary and focuses on external linkages of regions. This interpretation is in line with the findings of Fitjar and Rodríguez-Pose (2013[48]; 2016[49]) that indicate that connections outside the local context are important for firm-level innovation in peripheral areas where local assets matter less. Balland and Boschma (2021[50]) showed that peripheral

regions in Europe increased their ability to develop new activities when connected to other regions through collaborations between inventors that gave them access to relevant (i.e. related) capabilities they were lacking themselves.

Summary

Manufacturing activity tends to concentration in specific geographies within countries. Chapter 1 identified some regional assets that drive manufacturing activities such as natural resources, artisanal and industrial heritage. Chapter 2 displayed quite a diverse picture in the distribution of rural manufacturing activities, with strong pockets concentrating in former Easter European regions and Germany confirming the importance of geographic location to spur manufacturing activities. In addition to these, this chapter delves a deeper in the role that natural resources, accessibility and infrastructure, input suppliers, markets and competitors, skills, innovation and social capital have on rural manufacturing activities. Some studies show that up to 50% of industry concentration is driven by natural endowments and these in turn can facilitate the emergence of first and second stage manufacturing activities including forestry, mining, agriculture or the bioeconomy. The presence of natural resources will be critical for future manufacturing opportunities related to the climate change transition further discussed in Chapter 4. Remoteness from markets in some cases can also represent advantages, particularly to preserve the secrecy and security of any emerging intellectual or scientific breakthroughs.

Chapter 2 also showed the transformation of rural manufacturing towards more capital-intensive forms due to the ongoing international production fragmentation and growing competition of emerging economies. In this regard, rural regions can no longer rely on low labour-cost competitiveness but will need to embrace skills and knowledge upgrading to move up in the value chain. In this regard benefiting from advancements in digitalisation, which open new ways to foster adult basic education and fostering strong co-ordination between rural firms, not-for-profit organisations and government programs are warranted to deliver vocational and training provision and to enhance innovation. Skills upgrading are also critical to mitigate risks automation and benefit from new opportunities emerging in the green transition (further discussed in Chapter 4).

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Notes

[1] See https://www.oecd.org/cfe/smes/oecdrecommendationonsmeandentrepreneurshippolicy/.

[2] See https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0472.