

# URBAN-RURAL INTERACTIONS IN EUROPE

a Spatial assessment at multiple levels

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## 1 INTRODUCTION

Single settlements, being towns or cities, often have their own policies and strategies. However, they cannot and should not be seen as independent economies. Even the largest cities cannot ‘single-handed generate agglomeration benefits and endogenous growth’ (Partridge et al., 2010, p. xx). This became evident during the recent economic crisis, when especially large (capital) cities were hit. In many countries, the intermediate and accessible rural regions displayed the most resilience (Dijkstra et al., 2015).

Many differences between urban and rural areas in developed countries have disappeared nowadays. Rural areas have become less dependent on agriculture and some (intensive) types of agricultural activities take place in intermediate and urban regions: in several countries, the difference between the urban and rural share of labour in agriculture is only a few percentual points (van Leeuwen, 2015). At the same time, there are several important trends that intensify urban-rural interactions. An example is the increasing flexibility in terms of workplace due to increased mobility and information technology, which allows more people to live in the countryside and stay connected to the urban world. Increased communication through social media and other online applications decreases urban-rural cultural differences, in particular under the younger residents. This leads to ‘symmetrical rather than asymmetrical influences between urban and rural areas’ (Lichter and Brown, 2011). The nature of such influences, however, as well as the circumstances under which they emerge have received little attention. This creates an important gap since urban development would clearly benefit from a more regional approach to optimize wider agglomeration effects.

In this study, we consider the relationship between urban-rural interaction and economic performance. Using an explicitly spatial modelling approach, we show that proximity to regions of different nature and degree of urbanity is associated with higher growth rates of GDP, employment, and population. We do this by comparing the effect of different regional neighbouring configurations on the performance of a given area. To gain further insight under which spatial circumstances growth takes place, we also develop bespoke indicators to characterize the landscape at finer spatial resolution than the region. Unlike most of the literature in the field, we take a pan-European (EU27) approach, which allows us to compare different countries and development stages, obtaining a more complete picture that summarizes a large and important part of the World. Our results show that, when only looking at population growth, spread effects from urban to rural regions are significant, but we also find population effects from rural to urban areas. In addition, we

find positive effects of having rural neighbours on GDP and employment growth in both urban and intermediate regions.

The remainder of the paper is organized as follows: in Section 2 we elaborate on different types of urban-rural interactions, which is followed by our theoretical framework and main hypotheses in Section 3. Section 4 describes our empirical strategy to assess the role of proximity and spatial context in urban-rural interaction. In Section 5 we show our model results and findings. We conclude the paper with a discussion of the relevance of our contribution and future extensions in Section 6.

## 2 URBAN-RURAL INTERACTIONS

Rural and urban areas have traditionally enjoyed a relationship of interdependence through which rural areas clearly contributed to the prosperity of cities, and viceversa. Nowadays, urbanization is slowing down in the developed world, partly because of suburbanization (OECD, 2015). Negative external effects, such as congestion, pollution and urban heat island effect, get more and more attention and make cities less attractive to certain businesses and population groups (Benson and O'reilly, 2009).

Studying urban-rural interactions is at the core of economic geography and regional science. In 1826 von Thünen published his seminal work that explained higher land rents near the (urban) market because of lower transport costs (Thünen, 1826). This explains why high yielding agricultural activities are often concentrated in and close to urban regions. Therefore, GVA in agriculture (and indirect regional GDP) in accessible rural areas is supposed to be high compared to rural areas without urban neighboring regions. More recently, Roback (1982) showed that 'goods' should not only be interpreted as man-made commodities but also include eco-system services like green landscapes and clean/fresh air. Studies focusing on urban-rural interactions generally take into account four types of interactions: flows of people (commuting and migration), flows of products (intermediary products), flows of jobs/firms and flows of money (investments, consumer spending) (Barkley et al., 1996; Partridge et al., 2010; van Leeuwen 2015). Additionally, less tangible flows of knowledge and technology (Rigg, 1998), and flows of ecosystem services are important (Bolund and Hunhammer, 1999).

In many developed countries, commuting ties between rural and urban areas are increasing (Renkow 2003). Partridge et al (2010) found that, in Canada, new rural residents often had a job in the nearby urban area. These residents enjoy the rural amenities, while still benefiting from urban job opportunities. However, the extent to which people (need to) commute differs greatly between countries. A European study on small-and medium sized towns showed that around 60 percent of the people living in small and medium sized towns in France, England or the Netherlands commute for more than 16 km, often to the nearby city. At the same time, in Poland and Portugal, with still many jobs in the local area, almost 90 percent had a job in town, often in the public sector (van Leeuwen, 2010). In most countries, governmental budget cuts resulted in lower employment levels in the public sector. Thus, the decision to commute can result from both push- and pull factors (from urban and rural areas). In both cases, commuting tends to increase GDP per capita in those regions where people are employed and reduce the GDP per capita of those regions where commuters reside (OECD, 2010). However, when (rural) residents would otherwise have been unemployed,

commuting will have a moderating effect on local expenditures, resulting in a smaller decline in GDP in the rural areas.

Several studies on innovation and start-ups highlight the incubator advantages of urban areas. Following Jane Jacobs (1969), the heterogeneity of people, experiences and knowledge in cities provide a good milieu for creativity (Glaeser et al., 1992; Florida, 2002). However, while comparing firms in urban and rural areas, Keebe and Tyler (1995), found that in terms of employment growth, new firm formation and innovation was the highest among firms in accessible rural areas. These firms took advantage of lower starting costs, cheaper floor-space and a nicer place to live in. Together with good Internet connections and demand for specialized and customized products, accessible rural areas seem to attract the most successful entrepreneurs (Keebe and Tyler, 1995). However, they also reported a lack of skilled labour force (Keebe and Tyler, 1995). This implies that when those start-ups become more mature, they move (closer) to the city to take advantage of the skilled labour pool. In this way, the rural areas can function as a breeding place for innovative start-ups. Cities are also known as “nursery” places for new firms, due to their richness of people and ideas (Duranton and Puga, 2001). In a later life-cycle stage, when in particular manufacturing firms grow and switch to mass-production, they are likely to relocate to areas with lower land-rents, i.e. smaller cities or rural areas (Duranton and Puga, 2001). Duranton and Puga (2001) stress that local and regional specialization and diversification are both important and complement each other. In particular, when the local industrial base is appropriate, a shift from the core to the hinterland can be successful (Fotheringham, 1985). In terms of employment growth, it is expected that larger firms that relocate from the urban to more rural areas will result in a positive effect on the receiving (rural) regions.

Accessible rural regions are known to allow residents to benefit simultaneously from urban and rural amenities. Rural regions in Western Europe have been experiencing faster rates of population growth since 2002 (Dijkstra et al., 2015). At the same time, the less accessible areas often lose in particular the younger population (Stockdale, 2004). Youngsters that want to follow higher education or search for high skilled jobs move to urban regions. Of course, not only inter-regional interactions are relevant, but also intra-regional interactions. The presence of a (small) city within an otherwise rural territory may provide a critical mass of population that attracts all kinds of (public) services and networks, providing access to important information and skills (Shkaruba et al., 2016). On the other hand, when population has sprawled over the region, disadvantages can arise through increasing congestion and air-pollution, as well as decreasing landscape amenities (Glaeser and Kahn, 2004).

### 3 THEORETICAL FRAMEWORK: ASSESSING URBAN-RURAL INTERACTIONS

Studies focusing on urban-rural interactions often refer to so-called trickle-down effects. The *spread-backwash* concept was introduced in the late 1950's by Myrdal (1957) and Hirschman (1958). These studies focus on interactions – often in terms of labour and capital flows- between urban and rural areas that can be both positive (spread) and negative (backwash). For example, migrating urbanites who are attracted by the scenery of the countryside are revered to as ‘spread effects’, while people that move to cities to find a job are revered to as ‘backwash effects’. It is generally expected (Patridge et al., 2007) and shown (Ganning et al., 2013; Veneri and Ruiz, 2016) that the positive

spread effects trickle down in the closer accessible rural areas, while the negative backwash effects prevail to the more remote rural areas, often beyond the daily commuting distance (Partridge et al., 2007). Most of these studies (i.e. Henri et al., 2001; Partridge et al., 2007; Ganning et al., 2013 and Veneri and Ruiz, 2016) use the rural area as the viewpoint, often ignoring the opposite direction in the bilateral interaction: effects of rural on urban areas. Kahn et al. (2001), who do not focus on a central city and its surroundings, but instead look at any community and its neighbors, find that complementary growth (i.e. spread effects) generally appears in all (types of) nearby neighboring regions; while competitive growth (i.e. backwash effects) prevail outside a three-county radius (Kahn et al., 2001).

In this paper, our aim is to reveal the effect of urban-rural proximity on population, employment, and GDP growth in urban and rural European regions. Based on insights from the literature, we expect that urban-rural proximity will have a positive on *population growth* in (nearby) rural regions. On the other hand, rural regions with no urban neighbours and that are further away from a larger city are expected to witness population decline. Regarding *employment growth*, we expect urban-rural proximity to have a positive impact in both regions. Providing suitable locations for firms in different development stages, as well as allowing space intensive and extensive production processes to locate near each other is expected to be advantageous to both types of regions. Finally, we also expect a positive impact on *GDP growth* in urban regions, as well as a moderating effect in rural regions. Commuting is supposed to have a positive effect on the GDP growth in the area where the jobs are. However, when commuting is a result from high unemployment levels in the area of residence, the local spending of the employed commuters will have a moderating effect on an otherwise declining GDP level.

In the literature different estimation methods are used, ranging from general equilibrium models (Roback, 1982), to partial-adjustment models (Veneri and Ruiz, 2016; Ganning et al., 2013; Partridge et al., 2007) and instrumental variables (Kahn et al., 2001). They all explain population growth out of the base-level of the dependent variable, as well as additional socio-economic and physical characteristics at the base year of both the region under study and its neighboring regions. The contribution of this paper is that next to the complementary and competitive effects of urban population growth on rural areas, we also look at the effects of rural population growth on urban areas. We assess the impact of intra- and interregional spatial characteristics on changes in regional income and employment levels for all NUTS3 levels regions in the EU-27.

## 4 RESEARCH FRAMEWORK

### 4.1 QUANTIFYING REGIONAL PERFORMANCE

The explicitly spatial nature of urban-rural interactions requires a geographically detailed unit that can capture them in their entire extent. Combining such need with data availability and the goal of providing evidence that can be extrapolated to a large part of the European continent converts the choice of the unit of analysis in a delicate decision in which a trade-off between scope and detail is at work. We solve this puzzle by using the small region level of the Nomenclature of territorial units