

Migration and regional development

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Abstract

Migrants move to improve their living conditions. In their search for a better place to stay and their final migration decision, migrants' trade-off between characteristics of the sending and receiving regions is crucial. However, regional profiles themselves also change due to migration flows. Some regions lose, and some win, because the number and type of incoming and outgoing migrants impact the development of both the sending and receiving region. While acknowledging the substantial heterogeneity of migrants, a topic covered in other contributions in this book, the current chapter mainly addresses the intriguing but complex interrelation between regional development and migration.

Key words

Regional development – internal and international migration – migration heterogeneity – interrelation – migration models

1. Introduction

Migrants move to improve their living conditions. They search for regions where they can find jobs, higher wages, better housing, a better standard of living, or simply for safety away from war-ridden areas. The characteristics of the sending and receiving regions are important determinants of the size and direction of migration flows. In chapters 15 and 16 the focus was on the relation between international and internal migration respectively and the unequal spatial distribution of population. This chapter addresses the regional dimension in inquiring how regional development interacts with migration to arrive at an uneven population distribution over space. Regional development and particularly its ossification in specific levels of regional development, is an important attractor of migration. In general, more developed regions are more attractive for migrants than less developed regions. But the relationship is not one-directional: migration has an impact on regional development too, both at the sending and the receiving end of the flow. Migrants may help to mitigate regional population decline in the receiving region, solve labor shortages, and give a boost to the local economy, but at the same time, the regions of departure see many of the most talented leave, thus eroding the basis for their development. The main goal of this chapter is to shed light on this interesting but complex interrelation between regional development and migration: people migrate because of regional development disparities, but in turn, over time migration flows impact a region's development.

At the outset of this chapter, we should make clear what we mean by the terms 'regions' and 'regional development'.

The term *region* is used at various geographical scales, from the global level, where a distinction between the Global South and Global North is often used, to the national and

subnational level. The smaller the geographical scale, the higher the level of interregional mobility, and the larger the impact of migration on regional population distributions. We might even zoom in at the local level of the city or town, since local development could be viewed as a special form of regional development. Regions will typically include areas with a specific geographical, functional or cultural identity, such as labor market areas, or areas defined by common language or history. Often, but not always, this regional identity coincides with administrative areas, such as municipalities or provinces, or even countries. This chapter focuses on internal as well as international migration, firstly because of this wide variation in the definition of what a region is. A second reason to incorporate both inter- and intranational regions, is that many drivers of migration at various geographical scales are surprisingly similar. Of course, at the national level there are important institutional differences, which lead to specific barriers to migrate across country borders. But from a behavioral point of view, international migration has much in common with interregional migration (Poot et al., 2009). As explained below in more detail, people strive to obtain a better life through migration, and this applies as well for rural migrants moving from the periphery of a country to the city as for migrants from the Global South to the North. A third reason to include multiple regional levels in this chapter is that country size is highly different. What is called interregional migration between states in the US or India, or provinces in China, the US or India, would be highly similar to international migration in the context of for instance Europe. Moreover, supranational entities, such as the European Union, allow free movement across international boundaries for its citizens.

The term *regional development* has evolved over time from a purely economic concept, based on indicators such as Gross Domestic Product (GDP) or unemployment, to a much broadly defined term, which in most interpretations is closely aligned with the idea of regional policies. The traditional conception of regional development is best expressed in the OECD definition: “*Regional development is a broad term but can be seen as a general effort to reduce regional disparities by supporting (employment and wealth -generating) economic activities in regions*” (OECD, 2014, p. 1). However, regional development is far more than economic development only – it is essentially about the quality of life. The broader understanding of regional development encapsulates ‘softer’ dimensions such as social, cultural, environmental and political characteristics of the region (Pike et al., 2016). This broader perspective surfaces in the following quote about developing prosperity, originating from the Ahwahnee Principles for Economic Development (Local Government Commission, 1997, p. 1) and cited in Pike et al. (2016, p.55):

“Prosperity in the 21st century will be based on creating and maintaining a sustainable standard of living and a high quality of life for all. To meet this challenge, a comprehensive new model is emerging which recognizes the economic value of natural and human capital. Embracing economic, social and environmental responsibility, this approach focuses on the most critical building blocks for success, the community and the region. It emphasizes community- wide and regional collaboration for building prosperous and livable places.”

What the OECD definition and the Ahwahnee Principles for Economic Development have in common is that regional development is viewed as a process of reducing inequalities between higher and lower developed regions, or by building livable places respectively. In practical usage of the term, the difference between *the process* of regional development and the *attained level* of regional development is not always clear. For instance, it could refer to growth in Gross Regional Product (GRP) (a process, a development) or the level of GRP reached over time (through growth, for instance a lower or higher GRP level than somewhere else). In both the traditional and broader perspective on regional development mentioned above, there is also the notion that development is a process that can be managed, in a general effort, either through policies (top-down) or collaboration (bottom-up).

For migrants, elements covered by the broader definition of regional development are highly relevant. Essentially, people move because they seek a better life, which should be defined in a much broader sense than only looking for a job or the highest wages, as the migration decision is also triggered by human capital dimensions, the natural environment, local housing market conditions, or the social community. Although labor induced migration is a major incentive for migrants, both internationally and internally, other motives are important as well, notably family or education reasons, or forced migration of refugees and asylum seekers. Short distance migration, or residential relocation, which may be relevant for local population dynamics, is often motivated by housing market motives (Thomas et al., 2019). It is important to note that by incorporating regional development, which is a source of exogenous information, as a driver of migration, we are outside the more descriptive time series tradition of demography, and much closer to regional economic, economic geography or regional science approaches to migration, which is characterized by explanatory research.

In the migration literature addressing the migration-regional development nexus, the various motives behind migration decision brings with it the use of different terminologies. There is also a body of literature on migration and development, that addresses the issue of how (international) migration may foster development of countries in the Global South, using concepts as remittances or brain drain and brain circulation (see e.g. Skeldon, 2008; UNDP, 2009; De Haas, 2010, 2012; Bastia and Skeldon, 2020). Apart from this strand of literature the term regional development is hardly used in migration studies. Instead, here terms as regional attractiveness, or push- and pull factors, are used to link migration to the characteristics of specific regions. They cannot directly be equated with regional development. They do not have the connotation of being a process, which is central to the regional development definition. Nevertheless, whether used in a dynamic or static sense, they come closest to the concepts broadly categorized under the heading of regional development.

Development levels of both migrants' origin and destination region interact with spatial migration selectivity. The fundamental question of economic geography is why certain regions grow faster than others, and applied to this chapter this might be translated to: why migrants favor some regions more than others, based on the regions' level of development? This question is addressed in Section two. Section three discusses the

reverse process: how migration may impact regional development, and the consequences of this feedback loop. The fourth section concludes.

2. The influence of regional development on migration

As indicated in the introduction, regional development is a multi-dimensional concept, relating to factors from diverse economic, social, environmental, cultural and political domains. There is a vast body of academic research showing how these factors influence migration.

In making a connection between migration and regional development, it is key to distinguish between theories and models in the literature. Where theories are well-confirmed explanations of -or rationales behind- found patterns or processes, models try to capture these arguments in generalizable formulas. This is also apparent in the discussion below. Crucial for all these approaches is that migration is considered (or modelled) as a function of a range of explanatory variables¹. We will first discuss key theories, and next applications in the international and internal migration literatures. While below we first focus on migration flows in general, we want to emphasize that selectivity of migration of course is substantial. Migrants hugely differ in gender, age, educational and cultural background, and in traits (Bernard & Borsellino, this book). These characteristics strongly relate to their migration motives and as a result, migration destinies and regional development of the receiving regions. However, in the same vein, specific regional characteristics will attract specific types of migrants – this is addressed at the end of next section.

2.1 Theories and models

One of the earliest migration theories was the push- pull theory. The push-pull theory simply states that people move because they are pushed out of their origin region and attracted to a destination region. The theory was formalized by Lee (1966), but the original ideas were already introduced by Ravenstein (1889), in his laws of migration. Push factors are related to negative stimuli, to escape an unpleasant environment, whereas pull factors are attractors to more pleasant surroundings. Despite its attractiveness as a rough model of migration, it fails to address the full complexities of the migration process, where not only push factors, but also keep-factors are present in the origin region. Moreover, immigration and emigration can occur at the same time between two regions. The push-pull theory was already close to a gravity formulation of migration flows, and this line of thinking resulted in more advanced spatial interaction theories, such as formulated by Wilson (1974), or Alonso (1978), where the size of the flow is a function of the attractiveness of the destination and origin region, with a distance decay cost function added. This can also be incorporated in gravity type spatial interaction models (see e.g. Wilson, 1974; Alonso, 1978), where the size of the flow is a function of the difference in the attractiveness of the destination and origin region, with a distance decay cost function added. Alonso (1978) used the terms

¹ It should be noted here that there are many other migration theories, often at a higher level of abstraction, where the link between migration and regional development is less obvious. See e.g. Massey et al. (1999), for an overview.

opportunities that are available from an origin, and the degree of competition that exist at the destination, to determine the size of the migration flow between two regions. The Alonso model is given by:

$$T_{ij} = A_i^{1-\alpha} V_i B_j^{1-\beta} W_j F_{ij} \quad (1)$$

Where T_{ij} is the migration flow between region i and j , opportunities are represented by $A_i^{1-\alpha}$, competition by $B_j^{1-\beta}$, and F_{ij} is a distance function. The parameters α and β express the strength of the role of opportunities and competition and are bounded between 0 (maximum effect) and 1 (no effect). The terms V_i and W_j express the attractivity of the origin and destination zone respectively, or the stage of regional development, if appropriately specified. The parameters of these models are estimated using observed migration flows. However, while they reflect the structure of the migration process, they fail to include the dynamics of migration (Beyer et al., 2022).

Spatial interaction theories and models are specified on a macro level, but subsequent developments have formulated micro-level theories. Micro-level theories are often specified in terms of the utility, or attractivity an individual attaches to living in a specific location. The original formulations were also in terms of economic drivers. The trade-off for an individual potential migrant to move or to stay is most clearly summarized in the equation used by Massey et al. (1993):

$$ER(0) = \int_0^T [P_1(t)P_2(t)Y_d(t) - P_3(t)Y_o(t)]e^{-rt} dt - C(0) \quad (2)$$

Where $ER(0)$ is the expected net return from the migration move, at time 0, before the move, $P_1(t)$ is the probability of deportation from the destination at time t , $P_2(t)$ is the probability of finding a job at the destination, and $Y_d(t)$ is the expected earnings at time t in the destination. Similarly, $P_3(t)$ is the probability of finding a job in the origin region at time t , and $Y_o(t)$ the expected earnings in the origin. r is the discount factor considering that time points further away have less weight in the trade-off. $C(0)$ is the generalized cost of moving, that includes distance, but also other costs. If ER is positive, the person migrates, since the benefits of the destination outweigh the benefits of the origin, while taking into account the moving costs. Migration is viewed here as an investment decision of the individual, considering the discounted return to investment.

Massey's theory (which builds on Sjaastad's (1962) theory of migration) is a trade-off between the origin and the potential destination. But migrants potentially consider multiple destinations. A unified modelling framework for the trade-off between multiple destinations is given by the random choice theory of utility maximization (see e.g. Sen & Smith, 2012; Alvarez et al., 2021). In these formulations the decision to move is a two-step process: in the first step a person decides to leave the region, and in the second step a choice is made for the destination region. This argumentation at the micro level correlates with the opportunities and competition terms in the (macro) Alonso model. In the first stage the decision to leave is contingent on the characteristics of the origin region. In the second stage the choice of destination region, conditional on leaving the origin region, is a function of the utility (or attractiveness) of the regional alternatives,

that may include the moving costs between origin and destination. This may be expressed in the following equation:

$$p(j|i) = \Pr(U_j = \max_{k \in R} \{U_k\}), j \in R \quad (3)$$

Where $p(j|i)$ is the probability that destination j is chosen, given that the migrant leaves origin i . U_j is the utility, or attractiveness of destination j . The migrant can choose from a set of alternatives R and chooses the region with the highest attractiveness. In the random utility theory, the attractiveness of destination j is only known up to a structural component V_j , whereas the random component ϵ_j is unknown, hence the outcome of the model is a probability function $p(j|i)$, which depends on the distribution of the random components. The structural component V_j can be formulated in terms of Massey's theory, thus including the risk of deportation, unemployment, expected earnings and moving costs:

$$V_{j|i} = V(\int_0^T [P_{1,j}(t)P_{2,j}(t)Y_j(t) - P_{3,i}(t)Y_i(t)]e^{-rt} dt - C_{ij}) \quad (4)$$

Where $V_{j|i}$ is the relative attractiveness of destination j , given that the migrant leaves from origin i , and this is a function of the difference between the expected earnings in j and the expected earnings in i , discounted over time, and considering the moving costs between i and j , C_{ij} . According to the random utility theory, the destination with the highest expected attractiveness has the highest probability of being chosen by the migrant.

These micro level formulations have a strong economic underpinning, but at the same time the notion of attractiveness, and the trade-off between alternative destinations in terms of attractiveness leaves a lot of space to include richer formulations. Although economic drivers and motivations are very important for the migrant in his decision to move, other drivers and motivations play an important role as well, such as personal, family and network factors, the diaspora, which leads to much more complex migration patterns than predicted by push-pull or gravity type models (De Haas, 2021; King, 2012). In addition, personal and household characteristics, such as age, sex, education, income, housing situation, health, also influence the migration decision. We can thus arrive at a more flexible regional attractiveness function acknowledging migrant selectivity with the following elements:

$$V_{j|i}(z) = V(EMP_j, Y_j, X_j, EMP_i, Y_i, X_i, W_z, C_{ij}) \quad (5)$$

Where EMP_j are the employment opportunities in region j , Y_j the expected earnings in j , X_j a set of variables denoting non-economic (amenity) characteristics of region j , W_j a set of personal characteristics (demographic, health, education), and C_{ij} the moving costs between i and j .

Below we zoom in on applications of these theories at the international and internal level.

2.2 *National development drivers of international migration*

When applied to international migration, economic determinants are prominent in many empirical academic studies. Examples are Jennissen (2003), who looked at the relationship with unemployment and GDP for European countries, or Dinbabo & Nyasulu (2015), who focused not only on these economic determinants, but also on inflation, interest rates and health expenditures for the South-African case. But other determinants are also important, notably social and political variables. Models of international migration exist where next to GDP, the size of the diaspora is an important determinant of migration (Rikani & Schewe, 2021). This leads to positive feedback between stocks and flows of migrants in the destination region: higher migration leads to larger migrant stocks, which in turn attracts more migrants, and so on. The diaspora is an indicator of the migrant network in the country of destination. Country of birth is an important dimension in such models, to link diaspora origins and migration flows. The level of education of the regional population, as one of the key indicators of socio-economic development, plays a role in the model used by Kluge et al. (2024), which is an extension of the Rikani and Schewe model. The role of social security systems in international migration within Europe was studied by De Jong et al. (2020). They found that, contrary to expectations, the welfare system was not an important attractor for European migrants. The political climate is important to explain cross-country differences in attractiveness. Governments can restrict or stimulate migration flows according to specific migration policies or regulations, although international treaties may limit the degrees of freedom for individual countries to do so, such as the Refugee Convention, or European laws. But migrants are also attracted to or divested from countries according to the societal attitudes towards migration, and the extent to which migrants can become integrated into society. These political and cultural dimensions are also important as indicators of regional development levels.

International migrants also choose a region within the country of destination, and therefore regional attractiveness and regional development are relevant triggers as well. The main motives of international migrants are economic, education, family reasons, and asylum (OECD, 2023). Of course, there is a close relationship between the motives of migrants and the characteristics of the regions they choose. Labor migrants choose the regions where they can find jobs. These are the major urban centers, but also rural regions in need of (often seasonal) agricultural workers. Student migrants focus on university cities. Retirement migrants seek the regions with a favorable climate and natural environment. Furthermore, other characteristics of migrants, such as educational attainment, cultural background, age and income level, not only affect migration motives, but also modulate the population structure and economic profile and development of the regions of destination – and origin.

2.3 *Regional development drivers of internal migration*

Quantitatively, internal migration is much more important than international migration. The appropriate measure of internal migration that is internationally comparable is the Aggregate Crude Migration Intensity (ACMI), defined as the total number of (permanent) changes of address within a country M , as a percentage of the population at risk P :

M/P%. In a global study on internal migration, Bell and colleagues collected internal migration data for a large group of countries (Bell et al., 2015; see also Bernard & Borsellino, this book).

People move a lot in North America and Australia and (15 percent per year), and very little in Asia (except for South Korea). Europe shows a north-south as well as a west-east high to low gradient. 15 to 19 percent of the population in the Nordic countries move annually, whereas the percentage in most Western European countries is between 8 and 10 percent, and Southern and Eastern European countries percentages do not exceed 5 percent. Interregional migration intensities are incomparable across countries, since they depend on the spatial scale of the regional classification. The larger the spatial scale, the lower the interregional migration intensity. For instance, in the Netherlands, whereas in 2023 almost 10 percent of the population changed address, less than half (4.6 percent) moved between municipalities, 2.9 percent moved between NUTS3 (labor market) regions, and 2 percent between provinces. International migration intensities (immigration or emigration rates) are much lower. The EU immigration rate in 2023 (not really a rate but a ratio of the number of immigrants as percentage of the EU population) is 1.54. The data reported by Eurostat (2024) show large variation, with lowest values for Slovakia (0.10 percent), Bulgaria and France (0.63 percent), Italy (0.70) and Poland (0.75), and highest values (disregarding the very small countries with often very high percentages) for Germany (2.33 percent) or Spain (2.60). The emigration rate is 0.60 with Bulgaria, France, Italy, Slovakia, Finland and Sweden showing values at or below 0.4, and Denmark, Ireland, Spain, and Romania having values above 1.5 percent. In any case, these values are far below the internal migration rates for these countries as reported by Bell and Muhidin (2009). For the Netherlands, the immigration rate (1.83 percent) is in the same order of magnitude as the interprovincial migration rate (of 2 percent). For European countries where internal migration statistics are available at the NUTS3 level (the Netherlands, Spain, Austria, Denmark, Sweden) the corresponding interregional migration intensities are (much) higher than the international migration intensities. Nevertheless, international migration is becoming more important in the last decades, at the national and regional level. Not only urban but also rural regions in various European countries benefit from net inflows of international migrants (Van Wissen & Arnold, forthcoming).

Internal migration drivers show many similarities as international migration, although the relative weights may differ. A main difference is that in most countries (with some notable exceptions, such as China) moving within the national borders is without constraints, so internal migrants are able ‘to vote with their feet’, meaning that they are free to move to the region that aligns best with their opportunities and preferences (Tiebout, 1956). Regions defined at the subnational level are smaller, and most likely more homogeneous in terms of character, landscape, culture, or regional economy, than world regions or countries. Regions at this level can be characterized as urban versus rural, or central versus peripheral, or by their economic structure, such as industrial, service or agricultural oriented. Interregional migration patterns can thus be described by terms of urbanization, suburbanization, counter-urbanization and re-urbanization (Champion, 2001). This topic is covered in detail in Bernard and Borsellino, this book and it is obvious that these processes are triggered by regional attractiveness

factors as well, with a strong age and educational gradient among migrants in the attractiveness of regions.

The economic dimension is also dominant as a driver of internal migration. In the neo-classical model people move to those regions where the jobs are. In regional economics internal migration is viewed as an equilibrating mechanism for the regional labor market. Harris & Todaro (1970) developed a model of migration flows from rural to urban regions in developing countries as a function of expected earnings in the urban region. It explains why there is persistent unemployment in cities despite large rural-urban flows. Job growth may be another trigger for attracting migrants to regions. Carlino & Mills (1987), developed a model to estimate to what extent people follow jobs or jobs follow people. This dual causality relates to the question of the reverse causality of migration and regional development and is discussed Section 3.

But apart from regional opportunities regarding wages or jobs, specific regional amenities or quality of life play important roles as well (Deller et al., 2005). Whereas suburbanization may be viewed as a push out of the central cities due to limited housing supply and unaffordable housing prices in the urban centers, counter-urbanization may be viewed as triggered by quality-of-life considerations and rural amenities, especially for older couples nearing retirement (Chen & Rosenthal, 2008). This migration selectivity is also apparent in Florida's expectation that regional human capital acts as a specific attractor of the 'creative class': artists, academicians, journalists, etc., which in turn would foster further regional economic growth (Florida, 2014). According to this approach, local and regional governments would do well to create the social and physical conditions to attract these people.

This sketch of the regional development drivers of migration shows that many similarities exist both at the international and the interregional level. The underlying force is that migrants are attracted to those regions that fulfil their preferences and needs. For many migrants, economic drivers of migration are dominant, but the 'soft' dimensions of regional development levels also play an important role. However, the relationship is more complex as migration is not only triggered by regional attractiveness but is an important factor in generating regional development as well. This reverse process is the focus of the next section.

3. The 'chicken-and-egg' problem of migration and regional development

So far, we looked at the regional factors that attract migration. Reality is a lot more complicated, however. Regional attractiveness 'pulls' specific types of migrants to the region, but migration in turn, both in number and type, may have an influence on the regional attractiveness. If there is a positive effect, then a self-propelling effect of increasing numbers of migrants may emerge, since migration may foster regional development, and regional development leads in turn to more migration, and so on. If, on the other hand the relation is negative, the system may evolve to an equilibrium situation of lower levels of regional development and less migration. In this section we look at the bi-directional relationship between both. Following the outline of the former

section, we first briefly focus on the international level, and next on the subnational level.

3.1 Regional feedback effects of international migration

The discussion on migration and regional development at the global or international focuses particularly on two issues: the role of remittances in economic development in the country of origin and the effects of migration selectivity on the country of origin. Remittances are a major source of income for many developing countries, which exceeds the size of global development aid by a factor of three (Ratha et al., 2016). A key question is whether these remittances are invested to foster regional development or used for other needs, such as food, housing, etc. In addition, for those left behind, remittances are an indicator of the benefits of migration, and this may trigger others in the same family or community to make the move as well. A related issue is whether emigrants from the Global South constitute just a brain drain, since they are often the most talented and higher educated, or an effective brain circulation when these migrants, endowed with additional human capital from their experience in the host countries return to their home countries. This of course is related to migrant heterogeneity – not only the number of migrants, but also the type of migrant matter for regional development. The net effect of remittances and brain drain or circulation on regional development of the sending countries is inconclusive (De Haas, 2023). Finally, more development in sending countries does not reduce emigration from these countries. On the contrary, development of countries in the Global South may lead to more migrants in the short to middle term (De Haas, 2023).

Regarding the destination countries, international migration has become a significant population growth component for countries of the Global North, as Billari empirically showed for both Italy and Germany (2022). Due to aging and structural low fertility levels in many developed countries there is a structural demand for labor. Countries are to some extent able to regulate labor migration, through migration policies, but for instance within the EU migration is free. Similarly, international student migration is important to attract the most talented young people. Nevertheless, whether international migrants can contribute to regional development depends not only on their ability and human capital, but also on their successful integration into society. The public attitude towards international migrants has become more negative in many receiving countries in recent years, which may be both a cause and a consequence of the lack of integration of migrant populations.

3.2 Regional feedback effects of internal migration

People are an important resource for regional development. People have jobs, houses, spend money, but also create the social, entrepreneurial, creative, innovative and cultural fabric of the region. Migration therefore is a key factor in changes in the most important resource of regional development. People are therefore not only attracted to regions, but their migration decisions in turn also have effect on the attractiveness of the region. This may have a self-propelling effect, whereby migration increases attractiveness, and therefore leads to more migration, or a self-degenerating effect,

when migration leads to less attractiveness for the region, for instance due to overpopulation or congestion. There are several processes in the regional economy that may generate such a self-reinforcing effect: the theories of agglomeration economies and economies of urbanization, creating strong regional path-dependency. Since it is so common, we take it for granted that populations cluster in space, in villages, towns, cities, and agglomerations. In economic geography the mechanism behind this uneven spatial population distribution is summarized in economies of agglomeration. Agglomeration economies are specific benefits for firms located in large concentrations, mostly linked to cost savings due to the proximity to an output market, a large labor supply, a high-quality communication infrastructure and the proximity to tertiary services, such as banks financial consultancies, advertising or communication companies. Furthermore, in highly populated areas, firms and its employees will also enjoy other so called quaternary services, such as leisure opportunities varied cultural amenities and other beneficial externalities. Once a spatial cluster reaches a certain threshold density, costs of production start to decrease, scale economies set in, which will further increase the comparative locational advantages, which in turn leads to even greater attractiveness, etc. (Castree et al., 2013). This process attracts workers, and in turn the clustering of a large labor pool will further increase the agglomeration economies. More people (being workers and consumers) locate in the city, which attracts more firms, which in turn enlarges the variety of consumer goods produced in the city, which leads to higher real incomes, which again attracts more people, etc. (Van Oort, 2002). Agglomeration economies are therefore also the triggers for the spatial concentration of persons, in their capacities as workers and consumers.

The theory of economies of agglomeration has become mainstream in economics since the work of Krugman (1993). The social, environmental and political dimensions of regional development are absent, apart from figuring as spatial externalities that emerge due to the spatial clustering of people. In wealthy regions it is easier to create a good living environment than in poorer regions. But are people attracted to regions for economic reasons or for other reasons? This question was addressed by Carlino & Mills (1987) who estimated a model to determine, by using a simultaneous equation formulation, to what extent people follow jobs or jobs follow people. If people follow jobs, then internal migration is triggered by regional job growth. Their model is given by the following two equations:

$$\Delta P_{i,t} = \alpha_0 + \alpha_1 X_{i,t-1} + \alpha_2 P_{i,t-1} + \alpha_3 EMP_{i,t-1} + \alpha_4 \Delta EMP_{i,t} + u_{i,t} \quad (6a)$$

$$\Delta E_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 E_{i,t-1} + \beta_3 POP_{i,t-1} + \beta_4 \Delta POP_{i,t} + v_{i,t} \quad (6b)$$

Where, $P_{i,t}$ is the population size of region i at time t , $E_{i,t}$ is employment of region i at time t , $\Delta P_{i,t}$ ($\Delta E_{i,t}$) the change in population (employment) in region i between time t and $t+1$, $X_{i,t-1}$ ($Y_{i,t-1}$) a vector of population (employment) related characteristics at time $t-1$ of region i , and $EMP_{i,t-1}$ ($POP_{i,t-1}$) the size of the labor force (population) of the labor market area of i , which is usually larger than i . The crucial parameters are α_4 and β_4 . If people follow jobs α_4 is positive and significant. If β_4 is positive and significant, jobs follow people, whereas dual causality is the case if both parameters are significant and positive. A recent meta-analysis of 321 empirical studies with applications of the Carlino-Mills model found that

there is no clear answer to the direction of the causality (Hoogstra et al., 2017). However, roughly one-third of the studies found that there was no relationship at all, roughly one third that there was a dual causality, and of the remaining studies slightly more found that jobs followed people than people following jobs. Moreover, the results depend on the regional context, the exact specification of the data use and the methodologies.

If people do not follow jobs ($\alpha_4 = 0$) then other regional factors, captured in $X_{i,t-1}$ may be the driving factors of population change. As indicated above, the other dimensions of regional development, which are often called the ‘softer’ dimensions, are social, environmental and political (Pike et al., 2016). Environmental characteristics are often summarized as regional amenities or quality of life (see e.g. Deller et al., 2005; Waltert et al., 2011; Rodríguez-Pose & Ketterer, 2012). If this is the case, and jobs follow people ($\beta_4 > 0$) an attractive regional environment may trigger economic growth. The quality of the housing market, the regional human capital, are examples of social amenity factors. Environmental factors are for instance an attractive landscape, climate, or cultural and leisure amenities. The emphasis on the ‘creative class’ as the engine of urban growth, and the social and cultural amenities to attract them (Florida, 2014), fit into this picture. But other migrants, with different characteristics may be attracted to more rural settings. Waltert et al. (2015) found that forests, lakes, and are strong rural attractors, whereas agricultural land is not. Local political factors may also play a role, such as the quality of local governments, the fight against corruption, or government effectiveness (Ketterer & Rodríguez-Pose, 2015).

3.3 Migration selectivity

Migrants are not a homogeneous population. This is covered in detail in Bernard and Borsellino of this volume, but it also has consequences for the migration-regional development nexus. The age-selectivity of migration reinforces aging differentials between regions. This may align well with the regional attractiveness of regions, with more dynamic regions with a growing labor market attracting younger migrants, and more quiet regions with nature-oriented amenities attracting families and retirees (Chi and Marcouiller, 2013). But the downside of it may be those elderly left behind in regions without compensating amenities and services.

The demographic significance of the human capital dimension for developing countries was shown by Lutz et al. (2019). When linked to international migration, the concepts of brain drain and brain gain are important (see section 3.1). But at the regional level a strong case can be made for a similar role of human capital. The educational gradient in migration drains certain regions of their human capital, whereas other regions will gain from higher educated inflows. Generally, these migrants are young and move from rural to urban environments. Human capital is therefore a key factor for regional development, and regions with universities have a distinct advantage in this respect (see e.g. Benneworth & Fitjar, 2019).

4. Conclusions

The thus far strongly divided disciplines of spatial science and demography have resulted in a knowledge gap regarding how migration and regional development impact

on one another. How to fully understand this interrelationship? A first lesson is that both concepts should be clearly defined, as migration flows and its impact on the sending and receiving area hugely vary according to the size and spatial level of the 'region' addressed in both migration and development. Are we considering international migration, between countries, or are we dealing with regional entities, or even intra-regional migration? A second lesson is that regional development has many faces. Whereas traditional theories and models have used regional characteristics related to work, production, costs or income to understand and predict migration flows, current perspectives on regional attraction stress that 'softer' and social aspects, living arrangements, leisure amenities, political situations and culture matter as well. A third message is that not only size, but especially selectivity of migration flows may substantially impact regional economies and even societies in both the home and host region. Migration flows are varied and heterogeneous and the impact of migration flows for the regions of both origin and destination strongly depends on the migrant characteristics, capabilities and competences. And finally, our fourth message is that over time, flows of people leaving and entering change regions as well. Population size, but also population structure will change, and with that, both demand for and supply of workers, consumers, producers, (public) services and products. Migration, a thus far rather neglected component of demographic change is a strong and substantial force in national and regional population turnover (Billari, 2022). This leads us to shortly discuss below the migration-development nexus in the new demographic reality of many regions: population stagnation and even decline.

5. Discussion: the migration-regional development nexus in the context of population decline

Regional development is associated with growth, either economic growth, or in the wider sense, with increases in wellbeing or quality of life. Nevertheless, in many parts of the world the economy and population size of regions is stagnating or declining. Currently, about a quarter of all countries in the world are declining in population (UN DESA, 2024). In 2050, according to the medium variant of the UN, this will be more than 40 percent. Population decline in these countries will primarily occur in the rural regions. The EU population is stagnating and expected to decline from 2026 onwards (Eurostat, 2024). Almost half of the NUTS 3 regions in Europe face population decline, and without internal and international migration this percentage would have been more than 80 percent (Eurostat, 2024). China, the most populated country, started to decline since 2020. Here as well, it is predominantly the rural regions that are hit the hardest: the rural population of China has declined from 850 million in 1995 to 600 million in 2014 (Liu et al., 2017). Similar trends are visible in many other world regions. Cumulative causation may also have negative consequences for regions, where negative migration and negative regional growth reinforce each other. Less people will lead to less consumer demand, less labor supply, less housing demand and lower housing prices, a smaller tax base for the necessary investments in infrastructure and services, a corroding social network, which will lead to even more net outflow of migrants, thus creating a vicious circle of decline (Pike et al., 2016). Declining regions are often aging regions, with a relatively large share of vulnerable people, who require adequate health care, which is increasingly difficult to maintain in these regions. Regional development

in these regions should not be focused on restoring economic growth, which is practically impossible to realize, but maintaining a quality of life for its inhabitants. This implies a regional development based on the 'softer' social and environmental dimensions of the region. Regions following this path can exploit their comparative advantages, which should be found in the social fabric and rural amenities, such as landscape, space and quietness, and that may attract migrants who favor such a corresponding lifestyle.

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