




# The nature, causes, and consequences of inter-regional inequality

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## Abstract

Social scientists and policymakers alike have become increasingly concerned with understanding the nature, causes, and consequences of inter-regional inequality in economic living conditions. Contemporary spatial inequality is multi-faceted—it varies depending on how we define inequality, the scale at which it is measured, and which groups in the labor force are considered. Increasing economic inequality has important implications for broader social and political issues. Notably, it is difficult to account for the rise of far-right populism in industrialized countries without considering the context of growing inter-regional inequality. Important explanations for the rise in inter-regional inequality include changing patterns of worker and firm sorting processes across space, major transitions like the reorientation of the economy from manufacturing to digital technologies, and increasing global economic integration, as well as policy. Different causal explanations in turn imply a different role for place-based policy. This article introduces the context of the special issue on the nature, causes, and consequences of inter-regional inequality, focusing specifically on inequality in North America and Western Europe, and aims to identify challenges for, and spark further research on, inter-regional inequality.

**Keywords:** global economic integration; inter-regional connectivity; inter-regional inequality; place-based policies; political polarization; sorting across space

**JEL classifications:** D63, D72, D83, F21, O18, R11

## 1. Rising inter-regional inequality

On 15 June 2023, the US Commerce Department's "Regional Economic Research Initiative" entitled its first posting of a new blog "Geographic Inequality is on the Rise in the US." It summarized its case as follows:

Geographic inequality has widened over the past four decades. The gap in incomes between richer places and poorer places has grown. Strikingly, geographic income inequality continued to climb in recent years even though many measures of overall income and wage inequality have narrowed somewhat as wage growth has been strongest for lower-wage workers. Rising geographic inequality suggests that economic opportunities are becoming less even across the country. Increasingly unequal economic

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opportunity risks reducing households' ability to move to desired locations, concentrating economic and social challenges in certain places, or contributing to political polarization.<sup>1</sup>

The fact that an official government website in the USA has such a direct statement about geographic inequality suggests growing awareness and concern about spatial distribution issues in policy circles. Indeed, similar concerns can be observed in recent years in Europe and, although not the focus here, in other parts of the world as well. Related dynamics of inequality have been a subject of considerable interest in social science research for a much longer period of time. This special issue of the *Journal of Economic Geography* brings together recent research on the nature, causes, and consequences of spatial, particularly inter-regional, economic inequalities in North America and Western Europe. Henceforth, we will use the terms “geographic inequality,” “spatial inequality,” and “spatial convergence/divergence” interchangeably. All can be used to describe the state of inequalities in incomes, wages, overall development, or human welfare between spatial scales, such as neighborhoods, metropolitan regions, or countries.

Whereas canonical economic models of such inequalities focus on investigating whether inter-regional or international convergence is increasing or decreasing, in recent years, the persistence of inequalities and their sharp increase at certain spatial scales has generated vigorous interest in the empirics and modeling of spatial economic inequalities. Research points to a substantial rise in inter-regional inequality in high-income countries in North America and Western Europe since about 1980, after a long period of decline during the mid-20th century (Ganong and Shoag 2017; Rosés and Wolf 2021; Bauluz et al. 2023). Accounts of this rise point at several possible causal mechanisms, and research has also identified manifold social and economic consequences of growing spatial inequality. This special issue aims to contribute to this ongoing social science project in these economies.

There are many reasons for social scientists to be interested in and concerned about inter-regional inequality. The papers in the special issue show that inequality between regions reveals much about the economic process itself, such as the tension between agglomeration and dispersion of economic activities, skills, and institutions, and whether inequalities are due to avoidable frictions or a result of fundamental forces in the economy. But another deep angle on inequalities relates to how place shapes peoples' trajectories over time. Research across Europe and North America has shown that it is not just personal endowments and chance that lead to differential personal prosperity, but also location (Chetty et al. 2014; De la Roca and Puga 2017; Granström and Engzell 2023). Inter-regional and intra-regional inequalities are also increasingly reflected in electoral politics, with polarizing majorities confronting each other in elections and policymaking. Attitudes about a wide range of social issues seem to be increasingly polarized as inequalities grow. The rise of misinformation, conspiracy theories, and populism throughout the world has made these rifts much stronger and deeper (Storper 2018). Opportunities for migration change with growing disparities between the labor and housing markets of places, and migration becomes increasingly directional, shaped by income and skill levels (Bartik 2018; Buchholz 2022). In recent years in the USA, a net inter-regional separation of the high-income and low-income groups has occurred in tandem with increasing income inequality (Diamond and Gaubert 2022). These are just some of the many issues that illustrate the urgency of studying patterns, causes, and consequences of inter-regional inequalities.

In Section 2, we begin by reviewing some basic descriptive findings on inter-regional inequality before discussing different dimensions and measurements. The empirical data we present focus on the case of the USA because the USA (1) has a large system of cities that permits greater statistical power in causal analyses; (2) consequently, much of the analytical work on inter-regional inequality focuses on this case; (3) additionally, the USA has high levels of inter-regional inequality among high-income countries (Bauluz et al. 2023). That being said, much of what we discuss is relevant to other European countries and Canada—and we explicate and use examples that demonstrate this. Section 3 then takes a closer look at some of the possible causes and correlates of inter-regional inequality. Here, we focus on the role of urban scale, agglomeration, and patterns of sorting, particularly of college-educated workers, the transition between mechanical and digital technological paradigms, increasing global economic integration, and political polarization. Section 4 discusses the role these different causal mechanisms suggest for place-based policies, and Section 5 offers reflections on important empirical,

<sup>1</sup> <https://www.commerce.gov/news/blog/2023/06/geographic-inequality-rise-us>

theoretical, and methodological challenges to the field. Finally, Section 6 highlights the contributions to this special issue.

Before beginning to develop our argument, however, it is important to note that there is no full consensus about the existence or importance of spatial economic inequality. In mainstream urban and regional economics, the dominant story-telling framework of spatial general equilibrium models is hesitant about this theme. In the canonical versions of the framework, real incomes are thought to equalize over time across space. By making the assumption that this does indeed occur, its proponents explicitly argue that population, not income, should be the focus of research (Glaeser and Gottlieb 2009). A newer generation of such economic models does the opposite, arguing that spatial efficiency should be privileged by enhancing agglomeration economies in the biggest and highest-income metropolitan areas, and that spatial income and consumption inequality is a natural feature of urban scaling processes (Hsieh and Moretti 2019; Duranton and Puga 2023).<sup>2</sup> Thus, many of the specific concerns that are explored in this special issue are not front and center to some of the core narratives of spatial economists.

## 2. Inequality in incomes, work, and non-work

As noted, there is broad consensus that inter-regional disparities and inequality have grown since the 1980s in North America and Western Europe (Ganong and Shoag 2017; Rosés and Wolf 2021; Bauluz et al. 2023). Research on the rising inequality between urban regions has focused mostly on GDP per capita or mean income levels (Erfurth 2024). Average (per capita) income provides important insights into the overall type of opportunity that regions provide and their productivity (Acemoglu and Angrist 2000) and is correlated with many other economic and social outcomes (Moretti 2012). Likewise, regions of similar income levels tend to have similar structural characteristics, making income a useful proxy for classifying regional economies (Iammarino, Rodríguez-Pose, and Storper 2018).

Spatial inequality, like overall income inequality, is greater in the USA than in most Western European countries. But it has grown significantly since the 1970s across Europe and remains at much higher levels than previously. For example, per capita income in the London and Paris metropolitan regions is about 40 per cent higher than the corresponding national averages. If these two regions were removed from their national economies, the remaining per capita income levels would be just about half of theirs. Indeed, as one provocative article remarked (Financial Times 2023), outside the capital regions, the rest of France and the UK have income levels that resemble those of Mississippi in the USA, its poorest state. There are similar stories for Italy (Milan's per capita income being 34 per cent higher than the Italian average) and Germany (with Munich's per capita income being about twice the German average). When wage inequality (one component of household income inequality) is examined, Europe shows steadily rising levels of inter-regional inequality in top-10 per cent wages, but more even patterns at the bottom of the wage distribution, differentiating it from the USA. This is related to more uniformly regulated minimum wages in Europe as compared to the varying federalist tapestry in the USA (Bauluz et al. 2023). The very high-income regions in Europe, those with more than 150 per cent of the corresponding national average, display higher population gains, higher employment creation, and lower unemployment than other regions, signaling their higher economic dynamism compared to other regions and contributing to continuing multi-dimensional spatial-economic inequalities in Europe (Iammarino, Rodríguez-Pose, and Storper 2018).

Regional economic inequality is multi-dimensional in all countries. In recent work in the USA, researchers have identified large disparities in long-term joblessness across labor markets, which parallel those found in many areas of Southern Europe. In this vein, Amior and Manning (2018) argue that both employment rates and wages eventually respond to changes in opportunity within regions, but that the former can be a better indicator of local economic well-being as it does not also require consideration of local costs. As with income, there are strong disparities in employment rates across city-regions within many national economies (Amior and Manning 2018; Bilal 2023). In US left-behind regions, low employment, especially among White males, has grown significantly over the past few decades (Austin, Glaeser, and Summers 2018), with “deaths of despair” having risen dramatically in the White population, reducing the long-term trend toward greater longevity (Case and Deaton 2020),

<sup>2</sup> There is a recent generation of dissenters to this relative lack of concern with spatial inequality in theoretical spatial economics, but it is in early stages of development (e.g., Fajgelbaum and Gaubert 2020).

a phenomenon mirrored in the UK. Research suggests that strong non-pecuniary costs (e.g., attachments to place), as well as pecuniary barriers to mobility, make workers reluctant to adjust to these disparities by moving away to other places (Bartik 2018; Koşar, Ransom, and van der Klaauw 2022), allowing low employment rates to persist over long periods of time. In this context, geographic disparities in unemployment and non-labor force participation are increasingly viewed as a significant challenge for many national economies (Bartik 2020).

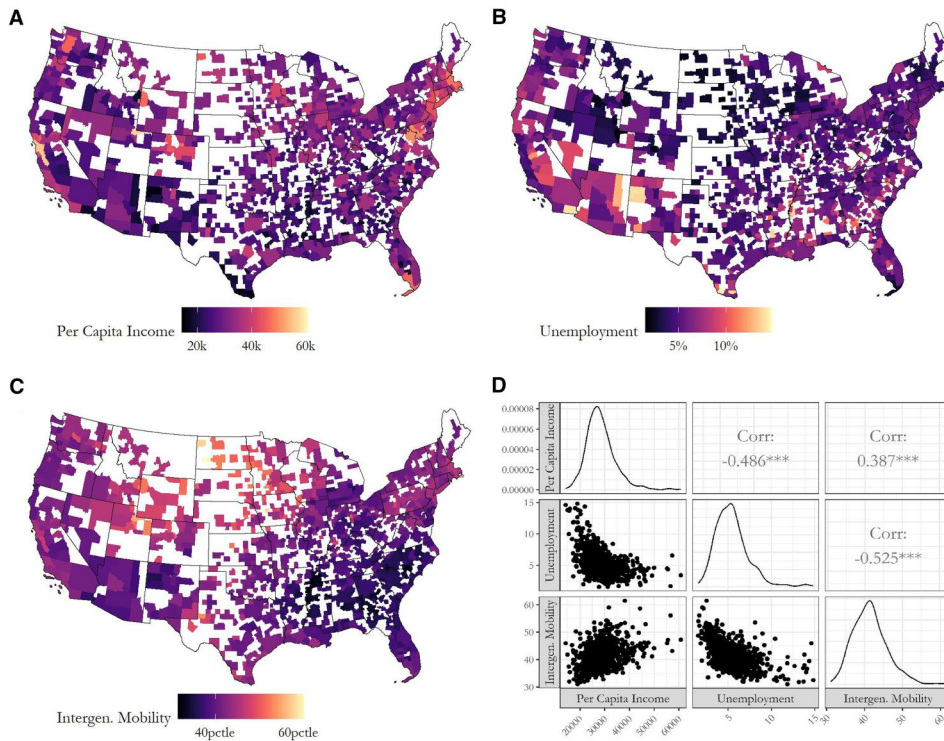
In the US context, these conditions have particularly dire consequences for many Black communities and other marginalized groups (Wilson 1996). In this light, employment rates are an ambiguous indicator. For one, they are shaped by local demography as some population groups (such as Black workers) are much more likely to be unemployed or out of the labor force altogether. Unemployment rates must also be interpreted with great caution. Iammarino, Rodríguez-Pose, and Storper (2018) highlight that in the European context, unemployment can be relatively high in dynamic technology regions with substantial job mobility, but this is usually related to high rates of labor turnover and immigration, whereas such rates can be relatively low in places with an abundance of low-quality routine jobs, but where stability masks lower wages and few opportunities for upward mobility compared to the former.

Short-term disparities may be linked to longer-term effects. In some countries, regions are characterized by substantial differences in workers' and their children's prospects for upward mobility. Scholars have become interested in geographies of inter-generational social mobility, where we see substantial variation across the USA and other national economies' urban regions (Chetty et al. 2014; Connor and Storper 2020; Granström and Engzell 2023). However, the relationship between mobility and overall levels of development is contested. On the one hand, Chetty et al. (2014) find that mean household income across US commuting zones is not significantly correlated with the inter-generational mobility of children born to lower-income parents (at the 25th percentile of the national income distribution). On the other hand, Connor and Storper (2020) show that this was not always the case. In the early 20th century, median household income was strongly correlated with inter-generational mobility across US regions, and changes in inter-generational mobility were strongly correlated with changes in income. In Europe, Granström and Engzell (2023) (who focus on how adulthood location rather than childhood location predicts inter-generational mobility) find that countries' capital regions and those with high skill/education levels tend to have the highest inter-generational mobility rates. Within individuals' lifetimes, research in the USA suggests that workers' wages grow faster in larger cities (Wheeler 2006), which tend to have higher incomes. In their study of Spanish cities, De la Roca and Puga (2017) find that the experience workers gain in bigger cities tends to be more valuable than in smaller cities. In sum, while different ways of measuring inequality are clearly interrelated, such research raises important questions about whether we should focus on disparities in levels of opportunity at a given time, the changes individuals and their children experience over time, or some combination of the two.

Figure 1 illustrates the geography and correlations of each of these variables for US Core-Based Statistical Areas (CBSAs). CBSAs are a useful unit to investigate city-regions as they are defined as functional regions with strong commuting linkages and wage spillovers. CBSAs captured 94.4 per cent of the US population in 2017 (US Census Bureau 2019). Per capita income and unemployment (for the population 16 years and older) are measured using 2019 5-year American Community Survey data (Manson et al. 2022). Inter-generational mobility data come from Opportunity Insights (2023) and measures the average income-percent rank in adulthood for children born to parents at the 25th percentile of the national income distribution between 1978 and 1983. All data were measured at the county level and aggregated to CBSAs<sup>3</sup> using boundaries following the 2010 census.

In Fig. 1, different dimensions of inter-regional inequality are strongly interrelated, but they are not perfectly correlated. Per capita income tends to be highest in the large coastal metropolitan areas and a handful of interior major urban agglomerations, while unemployment is lowest in central parts of the country (in the Midwest and Mountain West regions), though this in part may reflect non-labor-force participation in these regions. The strongest correlation ( $r = -0.525$ ) can be found for unemployment and inter-generational mobility. The latter tends to be higher in the Plains and Mountain regions,

<sup>3</sup> We used counties as they are nested within CBSAs, and because it is not possible to directly observe these variables over several decades at the CBSA level with decennial census data. Per capita income and inter-generational mobility estimates at the CBSA level are thus weighted by county population and the number of children used to produce the inter-generational mobility estimates in each county, respectively.



**Figure 1.** Spatial distributions and covariations of per capita income, unemployment and inter-generational mobility in US CBSAs, 2019 (sources: [Manson et al. 2022](#); [Opportunity Insights 2023](#)).

Notes: Hawaii and Alaska are not shown but their CBSAs are included in Panel D. Panel D plots bivariate relationships and densities.

possibly associated with out-migration from these regions into more favorable labor markets ([Connor and Storper 2020](#)). The weakest correlation, albeit still relatively high with  $r = 0.387$ , exists between per capita income and inter-generational mobility. All told, [Fig. 1](#) suggests that no single measure captures the diverse ways in which people experience inter-regional inequality. While we do not show corresponding data for European regions, we can expect similar relationships and patterns of inequality, albeit with potentially different magnitudes.

### 3. Causes and dimensions of rising inter-regional inequality: illustrations using US data

Studies in the USA show that the increasing geographical gap in average wage and salary income is primarily driven by a select group of city-regions that have a large concentration of highly paid jobs, whereas other cities capture a much smaller share of those jobs ([Moretti 2012](#)). In a study of income disparities in the USA from 1940 to present, [Kemeny and Storper \(2023\)](#) show that most of the post-1980 spatial income divergence in the USA is related to the growing divergence between a group of “superstar” city-regions, which contain about 32 per cent of the population and 41 per cent of the output of the US economy, versus the rest of the country, which converged toward the national income mean. Similarly, there seems to be an increasing divergence between London and other cities in the UK and between the center Paris and other French cities, with similar divergence processes found across Europe ([Rosés and Wolf 2021](#)).

To visualize the causes and correlates of increasing inter-regional inequality in this section, we use US data. We consider important possible explanations for regional inequality that have been discussed in recent academic work, but emphasize that most of these causes have been shown to be operational in other areas of the world today, albeit with different magnitudes and context-specific deviations. In

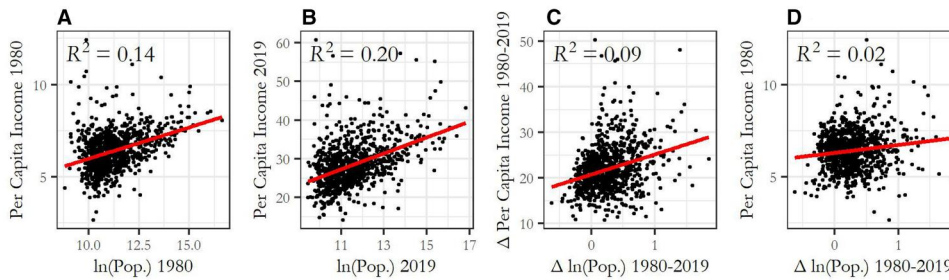
our discussion below, we use data for all US CBSAs<sup>4</sup> to identify regularities in the dynamics of inter-regional income differences and growing inequality within the urban system. Our argument develops through a series of scatterplots of per capita income over correlates of inter-regional inequality, including urban scale, education and skill levels, and global and domestic connectivity. A link is also drawn to tendencies toward political polarization and how this may be linked to inequality. We use data for income, urban scale, and education levels from the 1980 and 1990 Decennial Censuses as well as 5-year 2019 American Community Survey data (Manson et al. 2022). Indices of global and domestic connectivity are computed from the LexisNexis Corporate Affiliations database (LexisNexis 2018). Election data come from the MIT Election Data and Science Lab (2018). All figures show descriptive scatterplots that are presented in a similar fashion: first depicting the association for the year 1980 (for connectivity variables 1993); second illustrating the current situation in 2019 (or 2017 for the LexisNexis data); third showing how changes in the covariates over the entire observation period are associated with changes in income levels; and finally, considering whether high- or low-income cities in 1980 are associated with strong changes in the covariates during the observation period.

### 3.1 Urban scale

An important covariate of per capita income is urban scale or city size. Larger cities generally benefit from specialized agglomerations of production, labor, consumption, and innovation (Duranton and Puga 2023). The classic model of Krugman (1991) holds that firms locate in these cities where they benefit from economies of scale and lower transportation costs to their customers. This growth process creates inequality in economic opportunity between “core” urbanized areas and “peripheral” or smaller areas. Though returns to agglomeration-based productivity are at the core of explanations of inter-regional disparities in income levels (Duranton and Puga 2004), the recent rise in inequality requires that we ask why agglomeration-based specialization and size premiums may have grown in recent decades. For example, even though metropolitan areas have historically been linked to radical innovation and the rise of new industries, US data show that spatial and interpersonal income inequalities declined from 1940 to 1980, but have risen since then. Kemeny and Storper (2023) suggest that the shift from convergence to divergence may be related to the advent of the third industrial revolution (i.e., the shift from an economy primarily oriented around mechanical technologies and manufacturing to an economy primarily oriented around digital technologies).

Figure 2 shows for the USA that there is a strong positive association between city size as measured by  $\ln(\text{Population})$  and average income among CBSAs.  $R^2$  values in a linear regression increased from 14 per cent of explained variation of incomes in 1980 to 20 per cent in 2019, which suggests that the relationship between both variables has become stronger over time. High-income industries with sophisticated functionality and skilled workers are concentrated in these locations and drive higher incomes, but also higher costs and increasing congestion. These processes go along with higher intra-urban, inter-personal inequality in large cities, a process that is now well-documented (Autor 2020; Buchholz 2026). The scatterplots in Fig. 2 not only show a positive association between urban scale and income levels but also that cities with a large change in population between 1980 and 2019 on average had higher income increases. This of course raises questions regarding the direction of causality, of whether workers follow jobs or jobs follow workers (Storper and Scott 2009). Figure 2D suggests that low-income city-regions in 1980 tended to have a smaller increase in population over the period observed and vice versa for high-income locations, although the correlation is low. The latter suggests that changes in income levels and population since 1980 cannot fully be explained by workers moving to high-wage locations. To better understand the development of inter-regional income disparities, we need to better understand how the initial endowments of some cities may have positioned them to successfully transition their resources to the needs of the current economy, with specialized immigration being just one factor among many. In the EU, the most skilled places several decades ago remain so today and have in addition had high levels of employment growth compared to the EU overall (Iammarino, Rodríguez-Pose, and Storper 2018).

<sup>4</sup> 933 CBSAs were defined in the USA (excluding Puerto Rico) following the 2010 Decennial Census. We exclude eight CBSAs whose boundaries could not be consistently observed over time due to county boundary changes. Three additional CBSAs in Alaska that could not be cross-walked to the election data are also excluded in Fig. 6.



**Figure 2.** Scatterplots of per capita income (USD thousands) and  $\ln(\text{Population})$  in US CBSAs, 1980–2019 (source: [Manson et al. 2022](#)).

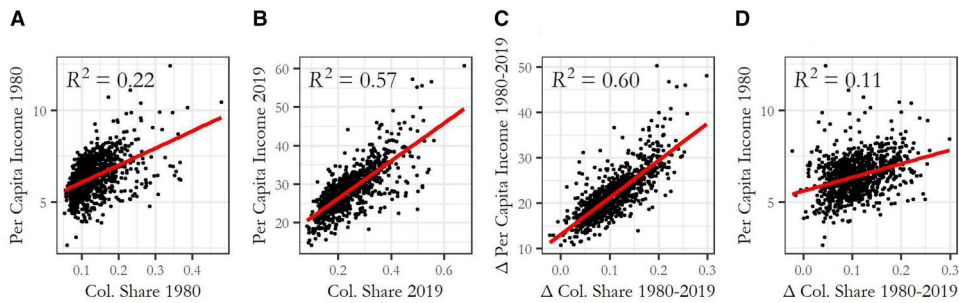
### 3.2 Skills, education, sorting, and technological change

Skills and education levels are widely considered key influences on growing income disparities, both in the USA and Europe ([Moretti 2004](#); [Autor, Katz, and Kearney 2006](#); [Martin et al., 2021](#)). Urban regions, and especially large ones with high skill and education levels, as measured by the share of employees with a college degree or higher, have had the greatest income growth in nominal and real terms. They are characterized by a large share of workers with white-collar jobs, a strong presence of highly skilled activities, and high concentrations of the most sophisticated business functions such as research and development.

Reinforcing inter-regional inequality in the US case, workers with college degrees have increasingly sorted into places that already had high shares of college-educated workers over the last several decades ([Kemeny and Storper 2020](#)). This education-selective sorting mechanism has increased total utility in such locations through endogenous increases in amenities relative to other regions ([Diamond 2016](#)). As such, these places have benefitted from a co-evolution in the development of skill levels, incomes, and all sorts of amenities that make places more attractive ([Storper and Scott 2009](#)). While the concentration of highly skilled workers in certain cities undoubtedly increases inter-regional inequality, there is no consensus as to why such workers began to sort this way so decisively in the 1980s. College-educated workers have increasingly high wage premiums in larger, denser, highly educated cities ([Baum-Snow, Freedman, and Pavan 2018](#); [Autor 2019](#))—though with substantial variation across race and gender ([Autor 2020](#); [Buchholz 2026](#))—suggesting that sorting reflects deeper underlying influences, while also being a cause of inequality. Research on European countries points to similar trends, suggesting that college-educated workers are increasingly sorting into large, dynamic regions, further elevating the wage premiums such workers enjoy in these locations ([Ehrlich and Overman 2020](#)).

The crucial contribution of highly skilled workers to regional income levels is strongly supported by the scatterplots of US city-regions in [Fig. 3](#), which show per capita income over the college-educated population share (25 years and older) since 1980. Of all covariates discussed, this variable has by far the strongest association with income with an  $R^2$  value of 22 per cent in 1980 that increased to 57 per cent of explained variation of incomes in 2019. The figure also shows that those city-regions with the largest change in college-educated workers tended to have the largest income increases ([Fig. 3C](#)), suggesting that increases in skill levels have had a positive effect on regional prosperity. But increases in education and skill levels are not equally distributed across the US urban system; it is large city-regions that have most benefitted from this, along with the concentration of the most sophisticated and innovative industries ([Kemeny and Storper 2020](#)). This is clearly supported in [Fig. 3D](#), which shows that those city-regions with high incomes in 1980 had higher increases in college-educated workers over the next 40 years, thus triggering inter-regional inequality, associated with a growing gap between low-skill, low-income versus high-skill, high-income cities ([Kemeny and Storper 2023](#)). A pressing question for future research is to investigate why such geographical skill-wage premiums have increased so much, comparing causes such as productivity differences due to agglomeration and skill-biased technological change ([Baum-Snow, Freedman, and Pavan 2018](#)) or monopoly rents partially passed on to the most skilled workers.

While relationships between income, education levels, and agglomeration appear strong for the USA, [Figs. 2](#) and [3](#) also raise important questions. They show that places with greater increases in overall and skilled populations have fared much better, and that college-educated workers have moved to



**Figure 3.** Scatterplots of per capita income (USD thousands) over the share of college-educated workers in US CBSAs, 1980–2019 (source: [Manson et al. 2022](#)).

Note: College share is measured for the population 25 years and older.

places that had already higher incomes in 1980. Yet, they do not tell us (1) why workers (especially college-educated workers) increasingly migrated to large, high-income cities, and (2) why this migration pattern suddenly became more selective along education levels around 1980. Supply-side arguments, particularly in the spatial equilibrium literature, have emphasized shifts in workers' preferences and housing costs. In the original spatial equilibrium account on the rise of the Sunbelt, the invention of air conditioning, the great increase in the use of automobiles and rising housing costs in many former population centers are said to have prompted households to move out of cold, dense cities in the Midwest and Northeast and into warm, cheap, sprawling cities of the South and West, while the decline in crime revitalized many major urban regions ([Glaeser, Gyourko, and Saks 2005](#); [Glaeser and Gottlieb 2009](#); [Ganong and Shoag 2017](#)). There are several problems associated with this perspective, most notably that the timing of these changes does not align well with the shift from convergence to divergence in 1980. An alternative explanation relates to changes in labor demand across space, catalyzed by the third industrial revolution ([Kemeny and Storper 2020](#)). This reorientation of the economy from mechanical to digital technologies favored skilled workers as it increased the complementarity between capital and skills, elevating returns to the agglomeration of highly skilled workers, and contributed to rising wage premiums for the college-educated, particularly when they were located in big, dense, and high-skill cities ([Baum-Snow, Freedman, and Pavan 2018](#)).

Turning to the sorting of less-educated workers and their separation from highly skilled workers, non-college-educated individuals have increasingly become net domestic outmigrants from high-income regions. According to recent versions of spatial equilibrium models and some housing economics literature, this is due principally to high housing prices in high-income regions, which are said to drive these people out of the most productive regions, as well as prevent in-migration to productive regions from elsewhere, leaving only the most highly skilled and waged households in the “superstar” city-regions ([Hsieh and Moretti 2019](#); [Duranton and Puga 2023](#)). A different view holds that housing is an outcome more than a cause and that the cause is that the jobs for such people have moved away from the high-income regions ([Rodríguez-Pose and Storper 2020](#); [Buchholz 2022](#)). Whether the high-housing costs of prosperous regions are principally related to supply inelasticity due to regulation of construction, or instead elastic demand from agglomeration of high-income earners combined with structurally rising land costs, is open to further debate. Moreover, it seems that restrictive regulation may be an endogenous response of residents to natural geographic features that limit potentially developable land and an incentive to capitalize on strong demand into home values ([Saiz 2010](#)). In many European cities, the problems faced by policymakers are of a different nature as these cities are characterized by extensive rental markets—although workers' changes in housing choices are similarly divided by income and skill levels.

Running throughout these debates about jobs, incomes, and sorting are various views of agglomeration economies. In the manufacturing era from 1880 to 1960, many agglomerations of successful cities were based on a particular industry and its vertical supply chain. Today, high-income cities are less characterized by vertical supply chains but instead by more inter-industry co-agglomeration ([Delgado, Porter, and Stern 2016](#)). This appears true for many developed economies. Even in the past, however, there were exceptions such as the cross-cutting diversity celebrated in Jane Jacobs' classic text on



New York (Jacobs 1961). In any event, if agglomeration economies of the highest-income metropolitan areas are now mostly of this type, an important implication is that it raises the urban-size premium, centering income growth on a smaller number of bigger and more diverse cities at the top of the geographical-economic hierarchy (Kemeny and Storper 2023).

Connor, Kemeny, and Storper (2024) lend further support to this explanation for the USA. They show that the rise of new general-purpose technologies creates new categories of jobs that were initially highly concentrated in space and created wage premiums for people in the places where they were located; later on, such technologies diffused throughout the urban system, evening out wages. Such processes are not limited to North America and have similarly been expressed in ideas about historical concentration and dispersion processes in the context of industrialization in Europe and long-term economic growth processes. Gerschenkron (1962) explained in his historical description of the industrialization process of European economies how countries that initially lagged in economic growth experienced growth spurts when their underdevelopment became severe enough to put pressure on governments and firms to introduce institutional changes that supported catch-up processes. Similarly, Rostow (1977) described in his stage model of economic growth that countries that fell back in one wave of technological development made up for this through above-average growth during one of the next waves. All this suggests that underlying the sorting dynamics we observe in Figs. 2 and 3 may be a new wave of technological change that has particularly benefitted large, skilled, high-income cities, and thus contributed to rising inter-regional inequality. This has likely occurred in both incomes and overall quality of life (Diamond 2016), and is further associated with increases in intra-regional inequality within successful places (Baum-Snow, Freedman, and Pavan 2018; Autor 2019; Buchholz 2026).

In the USA, these structural dynamics have been compounded by policy choices, such as large cuts to the public sector after the financial crisis in the late 2000s, which has had disproportionately negative consequences for rural areas as public spending did not fully recover later on (Rodden 2024). In some European countries, by contrast, policies based on redistribution to lower-income regions may have softened inequality levels; worryingly, however, they have not eliminated the effect of inequality-generating structural dynamics (Iammarino, Rodríguez-Pose, and Storper 2018; Diemer et al., 2022).

### 3.3 Globalization and inter-regional connectivity

In concert with the transition from mechanical to digital technologies, that is, its strong agglomeration, urban size, and skill bias, and policies that may include retrenchment of the public sector or weakened worker protections, increasing global economic integration has also shaken up the distribution of incomes within national urban systems. On the one hand, much has been said about the downsides of increasing globalization processes, particularly as they relate to tradable activities (Rodrik 1997). US regions that have been more exposed to import competition have experienced rising unemployment, lower labor force participation, reduced wages, and increased use of disability and other public benefits (Autor, Dorn, and Hanson 2013a). Regions that experienced these negative impacts were disproportionately specialized in labor-intensive manufacturing and located in the “Rustbelt” and South (Autor, Dorn, and Hanson 2013b).<sup>5</sup> Similar processes have taken place in other developed economies, where increasing global economic integration negatively impacted employment and wages in many regions (Rodríguez-Pose 2012).

At the same time, research on global and world cities (Sassen 2001; Taylor and Derudder 2004) and the international business and economic geography literature (Johanson and Vahlne 2009; Iammarino and McCann 2013; Cantwell and Zaman 2018; Li and Bathelt 2018) have shown that international corporate networks of subsidiaries across different countries can have important advantages for those firms that connect these locations, and in aggregated form for those regions that are being connected. Such subsidiary linkages create a long-term infrastructure for firms (and their regions) to access and transfer knowledge needed to trigger innovation processes and enter new markets (Bathelt and Buchholz 2024). To investigate the impact of such linkages on income development in US CBSAs, we use measures of global connectivity<sup>6</sup> (and of domestic connectivity<sup>7</sup> in the next step) and their changes over a 25-year period from 1993 to 2017. These measures do not describe how easily or how fast

<sup>5</sup> It is interesting to note that much of this research does not consider investment motives, which may at least partially account for the different outcomes observed (Bathelt et al., 2023).

<sup>6</sup> The global connectivity of a CBSA is measured as the weighted degree centrality of the number of foreign locations that CBSA is connected to, normalized by the home-region population.

<sup>7</sup> Domestic connectivity of US CBSAs is measured in a similar way as global connectivity but only takes into consideration subsidiary linkages with other domestic city-regions.

city-regions can reach other places to distribute their products; rather, economic connectivity describes how closely city-regions are embedded in networks with other places, through which they receive and exchange knowledge, get access to finance and other resources, access specialized skills and markets, and so on. While there are different ways on how such linkages, which play a substantial role in economic development, can be measured, we focus on subsidiary linkages of firms (majority ownership links only) between their places of origin and destination. These subsidiary networks between different city-regions change over time through direct investment activity and show how corporate strategies evolve and, along with them, orientations to other regions.

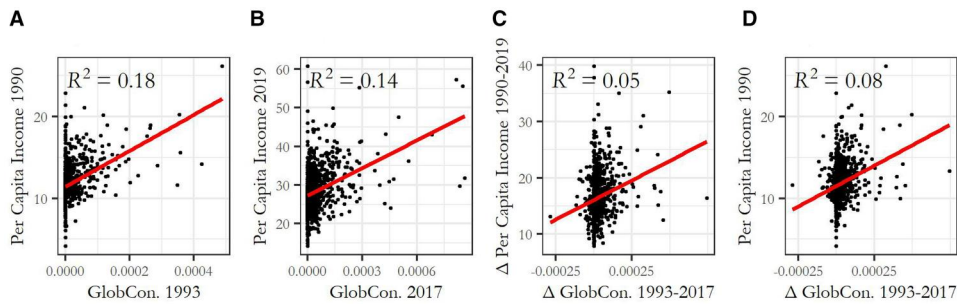
Whereas it is now widely accepted that inward investments create a positive impact in the target (host) regions (Iammarino and McCann 2013), outward investments are often viewed as being associated with offshoring activities (Rodrik 1997) and assumed to have negative impacts on the home regions. However, there is much evidence to suggest that outward investments are a crucial mechanism through which firms establish growth peripheries in new distant markets, with positive effects on income development (see, for the USA, Bathelt and Buchholz 2024) and even employment growth at home—although empirical studies suggest that differences may exist depending on the regional/national context, for instance between the UK and USA (Gagliardi, Iammarino, and Rodríguez-Pose 2021; Crescenzi, Ganau, and Storper 2022). Many incoming and outgoing investments in a city-region may thus have a positive impact on regional performance measures. Relatedly, the social network literature suggests that regions in different countries have positive development outcomes when their international (or, more generally, inter-regional) connectivity level is high (Neal 2014; Derudder 2021; Glückler and Panitz 2021).

Our analysis of income disparities in the USA strongly supports these claims. Figure 4 suggests that there is a positive and robust relationship between city-regions' global connectivity (their overall incoming and outgoing investment linkages with major metropolitan regions abroad) and their income levels. The strength of this association has remained relatively stable over time, with  $R^2$  values of 18 per cent in 1993 and 14 per cent in 2017. Figure 4C shows that city-regions with increases in global connectivity tended to have above-average income changes (though with relatively low  $R^2$  value). Similarly, regions with a high-income level in 1990 were characterized by above-average increases in global connections during the observation period. This positive relationship between global economic connectivity and income has been systematically established and tested in recent empirical studies (Bathelt and Buchholz 2024).

While these relationships may not hold across all developed economies (e.g., Gagliardi, Iammarino, and Rodríguez-Pose 2021), Zaman and Cantwell's (2024) analysis supports such claims of positive development impulses on an international level, with respect to linkages that connect major city-regions with international epistemic communities. These communities shape sense-making processes and joint knowledge bases in patenting processes. They argue that city-regions characterized by strong engagement with corresponding epistemic community channels have been characterized by better development outcomes in terms of innovation, and that there is a growing gap between those city-regions which do and those which do not connect with these knowledge bases, thus indicating increasing inter-regional disparities.

In comparing the scatterplots in Fig. 4, it should be emphasized that most US city-regions had few direct global connections and correspondingly also few changes in connectivity over the observation period—some city-regions even experienced decreases in global connectivity. Overall, the positive association between global connectivity and city-region income was primarily driven by a limited number of high-income city-regions that had a strong increase in global connections (Bathelt, Buchholz, and Cantwell 2023). This suggests that these city-regions were part of virtuous development processes where high investment activity led to income increases and additional subsequent investment activities. Many low- and medium-income cities were not able to benefit from such investment impulses and were caught in a spiral of low capabilities to engage internationally, low investment activities, and relatively small income increases.

Aside from an increasing gap between regions that do and those that do not have strong global connections (Buchholz and Bathelt 2024), international investments can be a driver of higher intra-regional inequality as the benefits of increased global connectivity are not equally spread among the populations and workers in these cities. Research across a broad range of countries suggests that the income and employment triggers from increased outward investments are highest for skilled workers



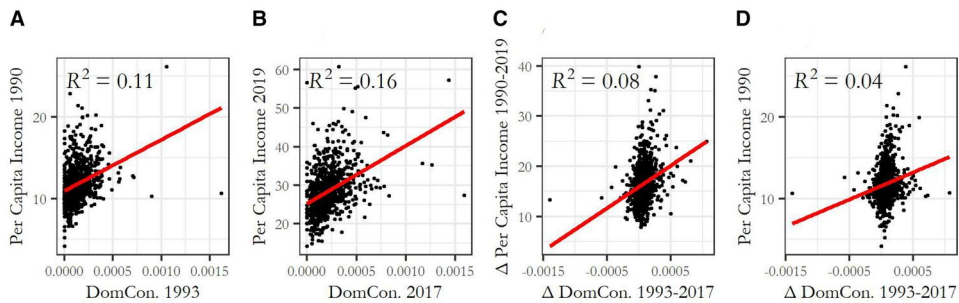
**Figure 4.** Scatterplots of per capita income (USD thousands) over global connectivity in US CBSAs, 1993–2017 (source: [LexisNexis 2018](#); [Manson et al. 2022](#)).

and those with college degrees, while they are much lower for workers in lower-skill occupations and for those who do not have college degrees ([Lin, Kim, and Wu 2013](#); [Crescenzi, Ganau, and Storper 2022](#)). Indeed, it has been shown that some of the most globally connected cities in the USA are also among those with the highest levels of inequality ([Boschken 2023](#)).

Compared to analyses of international linkages, few studies have investigated the effects of inter-regional domestic connectivity on income levels, although these linkages should in principle have similar impacts ([Li and Bathelt 2018](#)). With the emergence of new technologies and industries, firms that initially cluster in certain metropolitan areas de-agglomerate and establish spatially extended supply chains located in secondary cities with specific advantages and/or lower costs ([Norton and Rees 1979](#); [Duranton and Puga 2004](#)). Cities in a country thus develop different capabilities and specializations over time which are reinforced through linkages with other cities in the country. This is especially important in a large country such as the USA where firms' industrial focus and absorptive capacity vary substantially between different regions ([Mahroum et al., 2008](#)).<sup>8</sup> However, inter-regional institutional differences are smaller within than between countries, the latter of which have their own distinct national innovation and production systems and stark historical differences in economic interaction and consumption. Therefore, on average there may be fewer risks and hurdles in making domestic investments compared to international investments, but benefits in terms of access to new demand, knowledge, and income triggers may also be lower. Currently, there is little empirical work that investigates the effects of domestic connectivity on regions and the relationship between global and domestic connectivity, although some work suggests that the latter may have import impacts on regional income levels ([Bathelt and Buchholz 2024](#)).

[Figure 5](#) shows per capita income and domestic connectivity and is similar to [Fig. 4](#) for global connectivity. It confirms a consistent positive association between income and domestic connectivity since the 1990s, supporting the above claims, albeit with moderate  $R^2$  values. Regions with positive changes in connectivity have on average had positive changes in income. However, [Fig. 5C](#) and [D](#) show that there is a great level of heterogeneity, especially for the many city-regions that have few domestic linkages and small or no changes in these linkages over the observation period. It should also be emphasized that many city-regions in the USA experienced a decline in domestic linkages since the 1990s and, as such, it seems that the positive association in [Fig. 5](#) is partially driven by city-regions losing domestic connections and having below-average income growth. In a recent study, [Buchholz and Bathelt \(2024\)](#) show that many small and medium-sized city-regions that were once connected through subsidiary networks with leading global centers in the USA, especially through manufacturing networks, have become disconnected from these global centers over time, which initially provided important triggers for innovation and trade ([Lorenzen, Mudambi, and Schotter 2020](#)). These city-regions were neither able to make up for this loss of connectivity by creating links to other domestic city-regions, nor to engage in international networks themselves, and tended to have lower income levels. These places were “left behind” by major firms with wide-ranging economic, social, and political consequences

<sup>8</sup> While such inter-regional differences may be more pronounced in Europe, firms in Silicon Valley and Boston, for instance, organize innovation processes quite differently and are embedded in rather different knowledge ecologies ([Saxenian 1994](#)).



**Figure 5.** Scatterplots of per capita income (USD thousands) over domestic connectivity in US CBSAs, 1993–2017 (source: LexisNexis 2018; Manson et al. 2022).

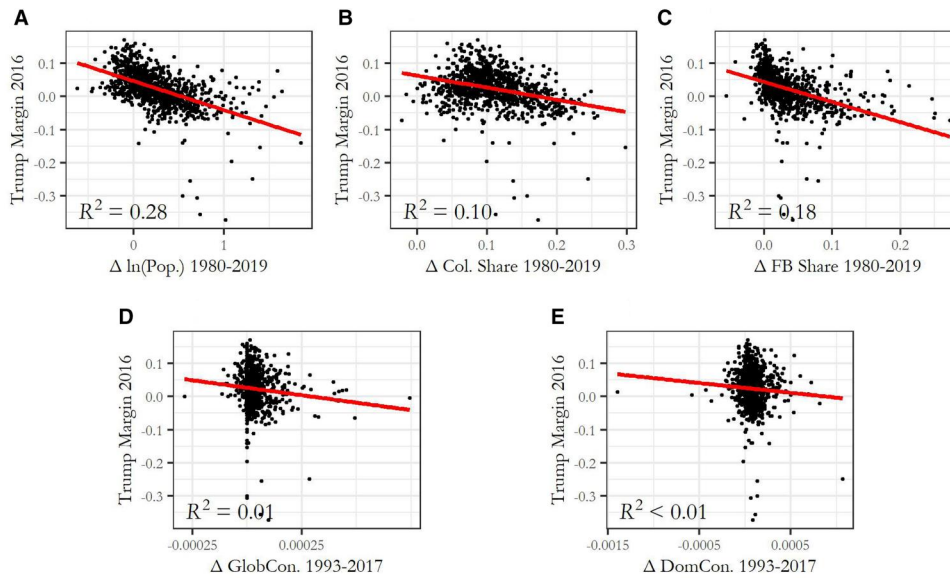
(Buchholz and Bathelt 2024). This again highlights how global economic integration may be contributing to inequality by helping already high-income places while harming or doing little for lower-income places. Recent work on left-behind places in Europe, especially in the UK, seems to support such claims (Martin et al., 2021; Rickardsson, Mellander, and Bjerke 2021; Tomaney et al., 2024).

Overall, a growing body of research suggests that places that are well-connected through economic linkages to global and domestic locations have been able to secure positive development impulses. By contrast, places that do not develop such connections participate less in corresponding knowledge flows and do not develop the full range of capabilities to establish and benefit from such connections. There seems to be a growing gap in income between those regions that do thrive in such networks and those that do not, as well as a strong tendency for city-regions that are well-connected globally to have weakening connections to less-well-connected places. If this accompanies stagnating incomes, low growth, and a loss of economic opportunities, it may generate resentment and drive political polarization.

### 3.4 Inter-regional political polarization

The previous sections discuss how agglomeration economies, skill levels, and extra-local economic connectivity are associated with high-income levels in certain city-regions, while at the same time also contributing to higher inequality between these and other places. This generates a contrast between high-wage, expensive, cosmopolitan cities that are deeply connected to other locations around the world, but highly unequal internally, and stagnating regions with little economic opportunity for their residents, and which have difficulty building competitive advantages, creating a sense of being left behind (Cramer 2016; Norris and Inglehart 2019). In the USA, this has been compounded by a substantial decline of the public sector in many of the latter regions (Rodden 2024). While there are undoubtedly many factors at play, it is difficult to view the rise in authoritarian populism in Europe and North America (and in many countries in the Global South as well) without placing it in the context of increasing inter-regional inequality, in addition to inter-personal inequality, xenophobia, and racism. This is explored in recent work by Rodríguez-Pose, Terrero-Dávila, and Lee (2023), who show that right-wing populism is bolstered by economic decline and rising inequality in European regions, while economic decline and rising inequality are mediated by the share of residents that are White in the USA.

These findings are supported by Fig. 6 for US CBSAs, which shows the Trump margin (the difference in the Republican vote between the 2016 and 2012 federal elections) over several covariates. It reveals a negative association between the vote for Trump and changes that occurred in each of these variables over the time period from 1980 to 2019 (or from 1993 to 2017, respectively). The figure reveals that the Trump margin is highest in those city-regions that, over this long period, had below-average increases (1) in overall population, (2) their college-educated population share, (3) their foreign-born population share, (4) global connectivity, and (5) domestic connectivity. The  $R^2$  value is highest at 0.28 for the relationship between the Trump margin and changes in city size, but changes in the share of college-educated residents and the share of foreign-born population are also significant with  $R^2$  values of 0.10 and 0.18, respectively. In contrast, the  $R^2$  values for change in global and domestic connectivity



**Figure 6.** Scatterplots of the Trump margin 2016 over changes in ln(Population), college-educated population share, foreign-born population share, global connectivity and domestic connectivity in US CBSAs, 1980/93–2019/17 (source: [LexisNexis 2018](#); [MIT Election Data and Science Lab 2018](#); [Manson et al. 2022](#)).

are insignificant. As pointed out by [Rodríguez-Pose, Terrero-Dávila, and Lee \(2023\)](#), the latter may indicate that economic connectivity does not have an isolated influence in itself but may become more important only in combination with other variables.

Untangling the relationships between regional inequality and right-wing populism requires consideration of a complex web of causal relations that may run in multiple directions. Anti-immigrant sentiment and resentment, racism, and feelings of grievance (principally but not exclusively among White, native-born majorities) may lead to increasing support for far-right populism. Paradoxically, research suggests that exclusion of certain ethnic groups, immigrants, or refugees from the labor market may be negatively correlated with regional economic development and contribute to further inter-regional inequality in the future, which can then feed into additional support for populism and further feelings of grievance, and so on. These processes are important in both North America and Western Europe although we may find that they play out differently across countries, as for instance in Germany with the extremist party AfD (“Alternative für Deutschland”), in France with Marine Le Pen and her “Rassemblement National” (formerly “Front National”), or in Italy with Giorgia Meloni’s far-right party “Fratelli d’Italia.” [Henn and Hannemann \(2024\)](#) observe in their study of a rural stronghold of the AfD in East Germany that right-wing propaganda increasingly enters firm policies and routines and leads to discriminatory hiring practices.

In conclusion, it bears emphasizing that understanding the causes of populist choices or political polarization more generally requires research at the intersection of personal positionality and the ecological effects of place (including individual intersectionality and institutionally structured combinations). Research has only just begun to consider spatial inequalities from the perspective of human experience, notably through the lens of politics, attitudes, and electoral behavior. Income, skills, occupations, race, religion, and culture all have distinctive geographical distributions and some relationship to political and cultural attitudes. However, related research is characterized by large residuals, meaning that there may be unobserved ecological effects at the area level that influence how people see the world, beyond their personal characteristics. For example, in her celebrated qualitative research, [Cramer \(2016\)](#) demonstrates that the institutional settings in American rural areas provide more right-wing channeling and political narration of views today than in the past, specifically in the retreat of worker-based institutions and their replacement by faith-based or individual affinity settings. Ongoing research suggests that this is also the case in Europe ([Henn and Hannemann 2024](#)), but

we remain far from being able to identify this in causal terms. In addition, it appears that in the USA at least, there may be an increased tendency for households to choose their place of living (and sort) according to their attitudes, possibly magnifying subjective polarization over time. This echoes [Sampson's \(2012\)](#) seminal point that, at the scale of neighborhoods, people select places, but places also select people.

In translating this into electoral geographies, moreover, the nature of the electoral system must be considered. It is now alarmingly apparent that the US electoral system favors peripheral areas (with potentially extreme attitudes) over centers, with likely substantial consequences for the future of the USA, but itself blocking reforms that could increase inter-party cooperation and moderation ([Spicer 2018](#); [Rodden 2019](#)).

In addition to how all the above processes interact and whether they are causal, they remain mostly compositional, in the sense that increasingly fine sets of characteristics appear to mix at the individual level. All in all, research to date has few good data sources with which to disentangle the different types of causes that come into play: discrete individual characteristics, individual intersectionality, and place-based interactions and socialization. It is a huge challenge for research to consider the intersectionality of individuals and then to further aggregate such aspects to the ecological interactions of places. To accomplish such an agenda will involve joint efforts in business, economics, geography, sociology, political science, and social psychology, at the very least.

#### 4. Competing views on the need for place-based policies

The causal theories outlined in the previous section offer competing visions for whether place-based policy is a necessary or desirable endeavor. To many in the research community, spatial economic inequality is increasingly viewed as a problem in urgent need of policy attention. However, other researchers suggest that nominal wage inequality may not be problematic if there is not inequality in real wages or overall utility. Still other work argues that spatial inequality may be fine if it helps promote aggregate spatial efficiency.

The theoretical starting point for much of spatial economics is the assumption of an underlying tendency toward price and wage convergence in the presence of factor mobility ([Borts and Stein 1964](#)). In turn, adherents of the canonical versions of spatial equilibrium models that underlie much of the work on agglomeration and skills discussed earlier, claim that spatial inequality in real terms—that is, adjusted for real income or total utility across places—is fairly modest, although the magnitude is contested ([Glaeser and Gottlieb 2009](#)). However, rising nominal inequality has caused some to re-evaluate the need for policies as a tool to address inequality. The key, they argue, is to spread the benefits of skills and agglomeration by unlocking factor mobility. One view is that this should be done with a voucher policy that pays people to move out of disadvantaged regions ([Moretti 2012](#)), though other research suggests this may be prohibitively expensive ([Bartik 2018](#); [Koşar, Ransom, and van der Klaauw 2022](#)). More recently, it has been argued that the major impediment to increased factor mobility is, at least in the US context, high housing prices that restrict mobility into high wage places. Thus, internal mobility and spatial price and utility equalization may be maximized by both opening up high-income areas to more construction and maintaining the downward pressure on housing prices in other areas. It should be noted that this framework has little purchase outside the North American context. In contrast, a new generation of spatial equilibrium models accepts spatial income inequality in the name of aggregate spatial efficiency, maximizing agglomeration economies in the biggest city-regions, though again doing so through housing deregulation ([Duranton and Puga 2023](#)). Convergence does not exist in these models, and the policy positions rely heavily on the housing market and encouraging more spatial sorting of households.

A viewpoint, contrary to the neo-traditionalist position, can be found in the notion that the contemporary divergence is structural and durable. Such a perspective argues that the skill-biased agglomeration economies we witness today are the outcome of the third industrial revolution and that housing policy in cities, using this example again, has only a relatively small influence on un-trapping the people who live in left-behind regions ([Storper 2018](#); [Rodríguez-Pose and Storper 2020](#)). They lack the skills to become employed within high-skill agglomerations. For the USA, this perspective argues that a principal force behind the high housing costs in high-wage agglomerations is caused by the structural exhaustion of cheap developable land on the fringes of those metropolitan areas. In places such as New

York, Los Angeles, and San Francisco, population growth peaked some time ago and housing costs have remained above the national average since then, because available land in these metropolitan areas is exhausted. In more recent decades, a set of mostly Southern and Western metropolitan regions in the USA began their sharp upward growth. They started out with a lot of cheap developable land on the peripheries, but their growth exhausts supply, now driving housing prices up. There are few desirable urban frontiers to open up. Across the USA, housing prices are now both less elastic and more geographically differentiated between cities of different income levels. This perspective would conclude that policy should concentrate not only on increasing mobility as a presumptive solution to inequality, but on spreading and enhancing development to less fortunate regions so that their people would be able to enjoy prosperity in place (Austin, Glaeser, and Summers 2018). It also implies that solving the housing affordability crisis, a specific problem in the USA, will not come about through mobility or construction, but only through deliberate and targeted affordability policies in a context of a less land abundant country. As illustrated above for the case of the USA, these are all issues for place-based policy, not mobility-oriented people policy (that focus on education, skills, or training).

In many less prosperous (left-behind) regions in North America and Europe, there is low labor force participation (not just high frictional unemployment) and therefore under-utilized potential that neither generates its potential share for the national economy nor for its residents, and that is expensive to maintain through redistribution. The people who live there suffer from insufficient access and are not well-connected to knowledge, educational resources, and networks to be able to excel in today's economy. Therefore, even if such place-based policy is expensive and, in some ways, not optimal from a static efficiency standpoint, it may substantially enhance economic development in the long-run through social mobility and the reduction of paralyzing political conflict. Concretely, both the USA and Europe are beginning to experiment seriously, for the first time in a generation, with active industrial policy (Austin, Glaeser, and Summers 2018). Spreading development across space is only one of the reasons for the new interest in industrial policy, but it is a strong political motivation. And, as noted, a recent generation of theoretical spatial models explores the idea that urban agglomerations of skilled workers at present levels may not be optimal, suggesting that policies to reshape the urban system may be justified (Fajgelbaum and Gaubert 2020). At this point, a debate is just beginning about the appropriate goals, mechanisms, and relationship of costs and benefits of place-based policies in disadvantaged regions. It will be one of the most important economic policy debates of the current and next generation that will require further collective research efforts in social science to explore inherently complicated interfaces in rigorous ways.

## 5. Where to go from here: challenges to research on inter-regional inequality in North America and Western Europe

To summarize, there are different perspectives on the causes of rising inter-regional inequality in high-income countries in North America and Europe since the 1980s. Depending on where researchers are situated in this causal debate, they tend to have a different stance on whether place-based policies are necessary or desirable. One body of research emphasizes patterns of sorting, and how college-educated workers have increasingly located in a handful of large, high-income cities, further adding to their previous agglomeration advantages. Broadly, adherents to this perspective often agree that policy solutions must unlock factor mobility, such as through vouchers or facilitating more housing construction in expensive (but high-wage) places. An alternative causal story lies in major economic transitions, including the technological shift of the third industrial revolution from mechanical to digital technologies, as well as increasing global economic integration. This perspective implies a different policy prescription, one that necessarily includes place-based policies to remedy spatial inequality that is structural, durable, and cannot be fixed through factor mobility alone. Moving forward, it will be important to understand whether other transitions, such as a possible fourth industrial revolution around generalized AI and robotics, and crises, such as the climate emergency, wars, or economic crises, will exacerbate existing inequalities, lead to new geographies of successful and struggling places, and/or reignite convergence processes.

The previous discussion shows that spatial economic inequality can mean many things, and as this field of research matures, it is increasingly challenged by the multi-faceted nature of the phenomenon. In a preliminary conclusion, we wish to underscore the importance of four aspects of this multi-

faceted nature: areal definition, multiple scales, ecological dynamics and fallacies, and cross-sectional versus dynamic views of people and places.

The first challenge is that spatial economics and economic geography do not use standard-size spatial units. On the one hand, they inherit unevenly sized political jurisdictions. A prime example of this is that when convergence or divergence is assessed at the global scale, the results are entirely different from when nation-states are compared without population weights to when they are weighted. But each approach has its advantages and can be justified by theory. On the other hand, and especially at the inter-regional sub-national scale, the size of functional economic regions changes over time, irrespective of political jurisdictions, requiring great care in measuring inequality in a way that is consistent with the question at hand.

A second challenge is that spatial divergence, inequality, and convergence are all expressed across different scales, but do not necessarily align across these scales. A clear example of this is that the USA appears to be in a convergence process when states are the unit of analysis, in a divergence process when commuting zones or counties are considered, and a mix of both when metropolitan regions are investigated (Ganong and Shoag 2017). In other words, what is true at one scale is not necessarily the case at another. At the even finer scale of inter-neighborhood inequality, many different trends can be observed simultaneously, depending on whether we are considering income, race and ethnicity, access to amenities, environmental quality, violence, or other relevant indicators of inequality. The situation in other developed economies is not much different. This is why considerable caution must be used in evaluating how a given set of empirical results is related to substantive research questions about economic, social, and political developments over geographical space.

A third challenge is to avoid ecological fallacies while better understanding ecological effects. Per capita income, as well as attitudes and average characteristics of people and economies assume a representative agent, and great care must be taken in all research comparing regions to assess representativeness. A starting point to understand this is an emerging literature that demonstrates that many of the highest-income urban regions exhibit some of the most unequal income distributions (Florida 2017; Ananat, Shihe, and Ross 2018; Autor 2020; Bauluz et al., 2023; Buchholz 2026). In the USA, this seems to be due to their polarized occupational structures, as they combine a higher-than-average proportion of high-skilled workers, a lower-than-average proportion of middle-skilled, and a high proportion of low-skilled workers (Autor 2019). Yet, an even more recent literature is excavating additional sources of such inequality. For example, it is widely understood that the most prosperous regions in Europe and North America not only concentrate higher-than-average proportions of skilled workers, but that they benefit from both skill-related wage premiums and increasing urban-, size-, and experience-related wage premiums (De la Roca and Puga 2017). Geographical gaps in wage premiums have been growing sharply within skill groups (Autor 2019). However, in the USA, urban wage premiums are lower for many marginalized socioeconomic groups, such as women, Black and Latinx workers, as well as those without college degrees. There is very little variation in their wage and salary incomes across space. Thus, many drivers of regional income, including agglomeration economies, human capital levels, and demographic composition, are more strongly associated with the wages of White, male, and college-educated workers than Black, Latinx, female, and non-college-educated workers (Cooke and Kemeny 2017; Buchholz 2026). All of this suggests that geographical economic disparities interact with and are differentiated by ingrained social disparities in opportunities of the more advantaged groups as compared to the less advantaged. This does not mean that place-based interactions—the ecological scale—are not relevant, but rather that their internal dynamics—institutions, discrimination, social, and economic hierarchies—may differ from region to region in structuring the ecological effect.

Finally, dynamics matter. As noted earlier, researchers are now inquiring into the geographies of dynamic experience effects (not just income or utility distributions over space), cross-sectional differences, or even panel differences in average income over time. Consider just two of these: first, a growing stream of research documents geographical differences in inter-generational social mobility, health, and access to opportunity, beyond individual characteristics such as education, suggesting that there is a geographical benefit or penalty (Chetty et al. 2014; Connor and Storper 2020; Case and Deaton 2020). This suggests that there are factors “in the air” of different regions that may influence behaviors, and that those behaviors have important systematic consequences. This regional literature echoes the long-standing concern of research on neighborhood effects and the “emergent properties”



of places that go beyond simple compositional effects (Sampson 2012). Second, another line of inquiry especially in political science, economics, and social psychology pursues the notion that growing spatial separation changes the exposure of people to networks, information, and other tools that are key to personal success, as well as attitudes and narratives of meaning (Enos and Celaya 2018; Brown et al., 2021; Diamond and Gaubert 2022). The map of the USA, and perhaps that of other countries, shows increasing inter-regional separation of the middle class from high-income households. The long-term consequences of this are just beginning to unfold. If, over a generation or two, we are broadly living in “separate worlds,” both objectively and subjectively, does this track us to different opportunities, mobilities, outlooks, and access to education and power? These are some of the cutting-edge areas of research that go beyond the usual concerns of models which do not properly pay attention to dynamic effects.

## 6. Contributions of the special issue

In the context of the complex research agenda to better understand the nature, causes, and consequences of inter-regional inequality, the papers put together in this special issue make numerous important contributions:

Researchers have long been interested in whether regions converge (or more recently, diverge) to some common level of development, usually measured by average income levels. In this tradition, but with a new twist, Erfurth (2024) asks whether regions are converging toward a similar level of intra-regional inequality (i.e., whether inequality levels within countries’ states are becoming more similar over time). A key contribution of the article is its use of harmonized data across thirty-five countries. With this, Erfurth (2024) shows that in a wide range of countries (e.g., the USA, Canada, Germany, and China), states are converging toward higher levels of inequality than their national means, a particularly alarming scenario, while others (many of which are in Latin America) are converging toward lower levels. In identifying how distributions of income are evolving across countries in a wide range of contexts, Erfurth (2024) thus makes an important contribution to our understanding of the nature of inter-regional inequality dynamics.

While inequality levels may be converging, average income is clearly diverging in many high-income countries (Rosés and Wolf 2021; Bauluz et al. 2023), but an open question regards causes: why has inter-regional inequality risen in many high-income countries since about 1980? Connor, Kemeny, and Storper (2024) help us get one step closer to an interesting answer. In their study of US urban regions, they show that industrial revolutions (specifically the second industrial revolution of the early 20th century centered on mechanical technologies and the third in the late 20th century centered on digital technologies) create new types of “frontier” jobs at the cutting edge of the development and application of these technologies. Initially, they show these jobs are highly concentrated in a limited set of cities, contributing to inequality between different types of work (e.g., between high-paid frontier jobs and lower-paid service jobs) and between those cities that are and those that are not able to capture these new types of work. Subsequently, these jobs spread out across space as the associated technologies mature, leading to inter-regional convergence in levels of economic development. In sum, Connor, Kemeny, and Storper (2024) provide evidence that waves of technological change create forces of agglomeration and dispersion that reshape disparities in economic development across space.

Zaman and Cantwell (2024) provide another angle on the issue of an increasing concentration of economic activity in particular places, arguing that global economic integration may be another contributing factor. They show that patenting activity around the world is becoming increasingly concentrated in a limited number of global cities. Moreover, those cities which draw knowledge from a more diverse array of locations around the world are more likely to further their lead in patenting. The analysis emphasizes the role of international epistemic communities, which are important in determining the direction of technological change, but in the case of patenting activity normally communicate through specific publication channels rather than face to face. Zaman and Cantwell (2024) illustrate that city-regions whose local inventor communities are more broadly linked to these international epistemic communities’ knowledge channels and where these links are more compatible with local knowledge are characterized by better development outcomes in terms of innovation. They indicate that there is a growing gap between those city-regions that do and those that do not connect effectively with these knowledge bases, thus contributing to growing inter-urban disparities at the global level.

Rodden (2024) adds a policy angle to the issue of income divergence by providing convincing evidence that since about 1980, rural US counties have become much more dependent on the public sector in terms of their overall employment and income levels. Consequently, when the 2008 financial crisis catalyzed massive cuts to public sector employment, rural areas were particularly hard hit. Much of this public sector employment is funded through economic growth in large successful cities, but since about 2000, state-level intergovernmental transfers to local governments have steadily declined, which has had particularly negative consequences in rural areas. Rodden's (2024) analysis thus provides an additional explanation for the spatial income divergence between urban and rural places but also hints at the interrelationship between divergence and politics. Indeed, several studies have now shown that feelings of resentment toward successful and capital regions, which have some power to distribute resources and economic opportunity across space, may spark the rise of authoritarian populism (Cramer 2016; Rickardsson, Mellander, and Bjerke 2021).

In this vein, Rodríguez-Pose, Terrero-Dávila, and Lee (2023) present a comparative analysis of recent voting behavior for right-wing populist parties in numerous European countries and for Donald Trump in the USA (using the Trump margin as an indicator). While the populist vote in European regions is correlated with the economic decline of these regions, neither intra-regional inequality levels nor economic decline can apparently explain the success of Trump in the US case. Instead, the study shows that the relationship between right-wing populism and economic inequality in the USA is mediated by an area's racial composition, as counties with a larger White population share that experienced rising inequality and economic decline were more likely to vote for Trump, while more racially diverse counties that faced economic hardship were not. This study contributes to our understanding of the interrelationships between cultural and political factors in driving support for right-wing populism.

Still, an important issue that has gone unresolved in much of the literature on the geography of populism is disentangling compositional from place-based effects. Henn and Hannemann (2024) show that for largely rural areas in Thuringia, East Germany (which are a stronghold for the far-right party AfD), many "opportunistic firms" engage in discriminatory behavior toward immigrants/refugees that trickles down from widespread local cultural practices. This is in contrast with many managers stating that they would prefer to be more inclusive in their decision-making processes when, for instance, not hiring immigrants despite strong labor demand in the region. An important contribution of this study is thus that it makes progress in disentangling how "place" might matter for shaping support for far-right populism from purely compositional and sorting effects.

All in all, these contributions vividly show that spatial economic inequality has become one of the most pressing and, at the same time, most difficult to study issues of our time, for the many reasons adumbrated above. Understanding it requires a multi-faceted social science approach, sensitivity to history, context and institutions, and experience, as well as recourse to the new types of data and computational techniques available. While exciting to the research community, it presents serious and immediate challenges to economic and social cohesion in our societies. We hope that this special issue contributes to this crucially important social science research agenda.

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