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Place-Based Policies and Spatial Disparities across European Cities

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Spatial disparities in income and worklessness across areas of the European Union are profound and persistent. Concerns about these disparities and the appropriate policy response are longstanding. Two trends have re-energized popular and academic debate. One is economic: on some dimensions, disparities have stopped narrowing and started to grow. The other is political: some argue that persistent disparities cause discontent and help explain the rise in populist movements (Rodríguez-Pose 2018).

We focus on disparities in income and worklessness across EU metropolitan regions, commonly called "metros," using new definitions from OECD and Eurostat. As these metros account for around two-thirds of the population and for larger and growing shares of employment and GDP, their economic performance is crucial for understanding EU disparities. Focusing on them also narrows down the area-based policies that are relevant. It means we have less to say about rural-urban disparities which involve different economic mechanisms and policies.

Our metro definition is based on the so-called NUTS3 regions, which divide up Europe into areas of 150,000 to 800,000 people. Our data combines these areas into metro regions: groups of NUTS3 sharing a common labor market and meeting a minimum size threshold. We focus mostly on the "EU-15," which was the group of 15 countries in the EU at the end of 2003, before the EU expanded to central and eastern Europe. We also offer some comparisons to the "EU-28," referring to the

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total number of EU countries before the departure of the United Kingdom, as well as some comparisons to the US economy.

We begin by providing evidence that differences in GDP per capita across EU-15 metros converged in the 1980s, stabilized in the 1990s and early 2000s, and have been diverging since the mid-2000s. We also show diverging patterns of worklessness.

We then turn to research in urban economics for theories and empirical evidence that help explain the factors driving these disparities. We will show that bigger cities pay higher wages (the "urban wage premium") because they make workers more productive. They also tend to attract more educated workers who are more productive and earn more. As a result, GDP per capita is higher in bigger cities. These two factors reinforce one another because the urban wage premium increases with education. Both factors play a role across EU metro areas in explaining the level and evolution of spatial disparities. We provide evidence that real estate costs increase with city size, with implications for real wage inequalities and whether area-level improvements in productivity capitalize into higher house prices. We also explore low mobility rates in Europe and differences in labor market regulations, which help explain why employment disparities are more pronounced than for income.

Do these profound spatial disparities justify place-based policies aimed at reducing them (Austin, Glaeser, and Summers 2018)? Neumark and Simpson (2015) provide a useful overview of the literature on place-based policies. We focus on several policies that target spatial differences directly. Our emphasis is on policies that work at broad spatial scales. We argue that it is important to differentiate between policies as they operate via different mechanisms and yield different trade-offs between spatial inequality and aggregate efficiency.

We start with EU cohesion policy. These convergence transfers appear to have fostered growth in supported areas and thus reduced income disparities, but the effects vary considerably across areas with the positive effects driven by areas with high human capital and high-quality local government. The evidence also finds decreasing returns from transfers. The changes in disparities over time suggest that the economic forces swamp the impact of EU policy. We then consider two major items of expenditure within total cohesion policy spending: transport and support for firms from capital subsidies. Finally, we consider enterprise zones and local employment multipliers for different kinds of private and public sector employment.

Europe has a long tradition of using place-based policies to support lagging regions and to address local downward spirals following structural change. While place-based policies did not prevent rising disparities in Europe, they may have modestly mitigated the increase.

The Evolution of Spatial Disparities across European Cities

A comprehensive literature discusses regional disparities in Europe. Much of this uses data on "NUTS2 regions" of 800,000 to 3 million inhabitants which also

determine eligibility for the main EU structural funds. In contrast, we use data on metro regions. As argued above, one reason for this is the economic importance of these metros, and their role in driving EU spatial disparities.

The other reasons for using metros are analytical, but important. The economic literature on spatial disparities emphasizes the need to think about the appropriate spatial unit. For example, functional urban areas tied together by flows of people and goods should be used to think about local labor markets. But, for many EU countries, NUTS2 regions do not approximate functional urban areas. For example, London is split into five NUTS2 regions and merging just these regions—so that the London metro is a single geographic unit—changes one commonly used measure of dispersion across the EU-15 by 29 percent. Moreover, NUTS2 cover disparate areas: comparing London, Paris, and Munich, with the agricultural areas of Ireland, the beaches of Andalusia, and the mountains of Tyrol. The economic theories that explain disparities across cities, countryside, beaches, and mountains would need to be quite broad. Such breadth also widens the relevant place-based policies.

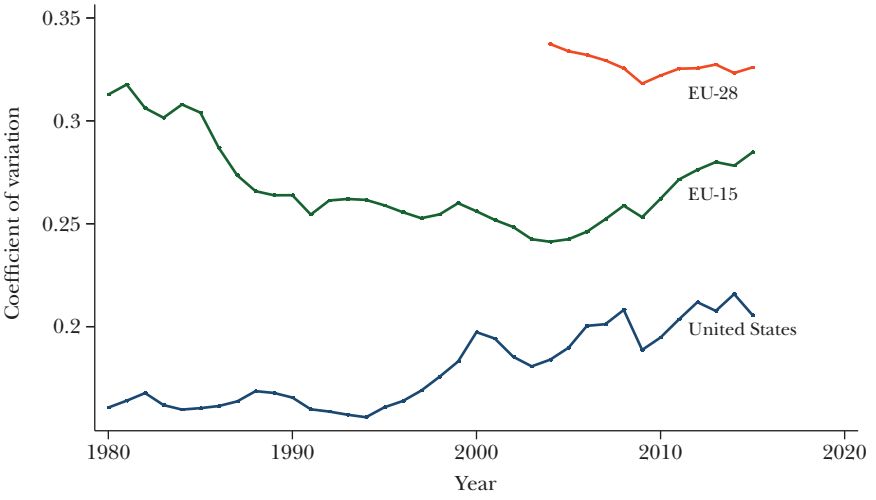
For these economic and analytical reasons, we focus on spatial disparities across metropolitan regions ("metros") using the recent EC/OECD specification (OECD 2019).[1] As described in the introduction, our data defines metros using NUTS3, or aggregates of NUTS3. For the EU-15 in 2015 (the latest date for which there is data), there are 226 metros with a minimum population of 250,000 and a maximum of 13.9 million. For the broader EU-28, we have 279 metros. In 2015, metros account for 64 percent of the population in the EU-15 (60 percent for the EU-28) and a higher share of employment and GDP.

One important headline indicator of disparities—because it determines eligibility for the main EU cohesion policy funds (discussed in detail later)—is whether a NUTS2 region has GDP per capita less than 75 percent of the EU average. Applying this indicator to EU-15 metros, 32 of 226 metros—home to 12.5 percent of the metro population—are below 75 percent of the average GDP per capita. For the EU-28, the corresponding figures are 51 out of 279 metros and 14 percent. In the United States, a similar proportion of metro areas (70 out of 384 as defined by the US Bureau of Economic Analysis) have per capita GDP that is 75 percent or less of the national average but account for only 7 percent of the metro population. In the EU, people are much more likely to live in poorer metros than in the United States. This hints at the role mobility plays in understanding EU disparities.

The coefficient of variation—the standard deviation divided by the mean—is a common measure of dispersion. Figure 1 plots the (unweighted) coefficients of variation of GDP per capita across EU-15, EU-28, and US metros over the last four decades. In 2015, the coefficient of variation was 0.28 for the EU-15 and 0.33 for the EU-28. EU disparities appear to be higher than their US equivalents, although the coefficients of variation are not directly comparable: for the United States, we

[1] The online Appendix available with this article at the *Journal of Economic Perspectives* website provides information on data sources, descriptive statistics and additional figures. It also provides a more detailed discussion of disparities across NUTS2 regions.

Figure 1
Coefficient of Variation of GDP Per Capita: EU-15, EU-28, and US Metros



Source: Based on authors' calculations.
Note: Calculations based on Eurostat and BEA data and metro definitions as described in the text. EU-15 and EU-28 calculations use GDP per capita; US uses income per capita.

used income (not GDP) per capita and Bureau of Economic Analysis (BEA) metros, rather than the OECD definition.[2] These differences are bigger if we include non-metro areas because the least productive rural areas in the EU are less productive (relative to the EU mean) than the least productive rural areas in the United States (relative to the US mean).

Variation across EU-15 and EU-28 countries explains around half the coefficient of variation for metro areas—44 percent and 50 percent, respectively (based on decomposing the squared coefficient of variation). EU-15 disparities fell in the 1980s, stabilized in the 1990s, fell again in the early 2000s, then increased from the mid-2000s and markedly after Europe's double-dip recession. For the EU-28, the coefficient of variation fell somewhat when new members joined and then remained at similar levels until 2015.

Disparities in income per capita across US metros started widening around 1995, roughly a decade before the EU-15. But since about 2004, the trends are relatively similar. From their lowest value in 2004, EU-15 disparities have increased by 18 percent, compared with 12 percent in the United States over the same period).

[2]We experimented with using data from the US Bureau of Economic Analysis, weighted by area shares, to approximate the OECD metro definition. However, the approximation is imprecise, so we focus on comparing trends rather than levels. The online Appendix provides a figure using comparable OECD metro area definitions applied to the United States (for a shorter time period), which confirms that the coefficient of variation for the EU-15 metros is 15 percent larger than for the United States (see Figure A1).

Figure 2
Coefficient of Variation of Worklessness: EU Metros

Source: Based on authors' calculations.
Note: Metro definitions as defined in the text.

For the EU-28, we observe a much higher level of disparity, but the short time series makes it hard to assess the longer run trend, which is why our focus is on the EU-15.

This rise in inequality across metros is especially striking because it follows a longer period of convergence across European regions in per capita income. Rosés and Wolf (2019) provide estimates of regional GDP per capita for a mixture of NUTS1 and NUTS2 regions (excluding Greece) and show a 31 percent decrease in the coefficient of variation between 1950 and 1980.

Another measure of convergence focuses on whether on average poor metros grow faster than rich metros by regressing growth rates of GDP per capita on initial levels, where the regression coefficient measures the extent to which regions are moving toward the mean level of per capita income (often referred to as beta-convergence). Running such regressions for 1980–2015 or for 1990–2015, we find evidence of significant mean-reversion, but for 2005–2015, we find divergence instead (see Figure A2 available in the online Appendix). Such findings reinforce the message that a longer-term pattern of mean-reversion of per capita income across the EU-15 has stalled and even reversed itself. This is similar to results for the United States (Ganong and Shoag 2017), although mean-reversion ended there around 15 years before it did in the European Union.

Other measures of economic performance show similar patterns. The rates of employment and worklessness (that is, of not working in the working-age population) also vary substantially. As shown in Figure 2, the coefficient of variation of worklessness for EU-15 metros increased from 0.31 in 2000 to 0.41 in 2015. The

level and trend are similar for the EU-28.[3] This variation in worklessness has been of long-standing interest in Europe and is receiving increased attention in the United States. For example, Austin, Glaeser, and Summers (2018) show that US disparities in worklessness rates are pronounced and have increased in the last decade.

Disparities in EU worklessness rates are more pronounced than those for GDP per capita: the coefficient of variation for per-capita GDP in 2015 is 0.28 and for worklessness is 0.41. As with GDP per capita, variation in per country worklessness explains around half the total variation (51 percent).

What Causes Geographical Disparities in Europe?

EU metros exhibit wide and persistent disparities in GDP per capita and in worklessness, and these disparities appear to be widening. To understand these disparities, the standard approach in urban economics is to think about firms and workers trading off productivity advantages of different cities for the costs of locating in those cities. (Urban amenities may play a role, too, but we sidestep that issue.)

Metro Disparities in Productivity and Land Prices

A substantial literature suggests urban size is an important source both of productivity advantages and of higher congestion and land costs. As an illustration, Figure 3 shows that city size is positively associated with GDP per worker and real estate prices. For 2015, regressing the log of GDP per worker on the log of city size gives an elasticity—the slope of the line in the figure—of 0.077. For the real estate index in 2011, the elasticity is 0.930.[4]

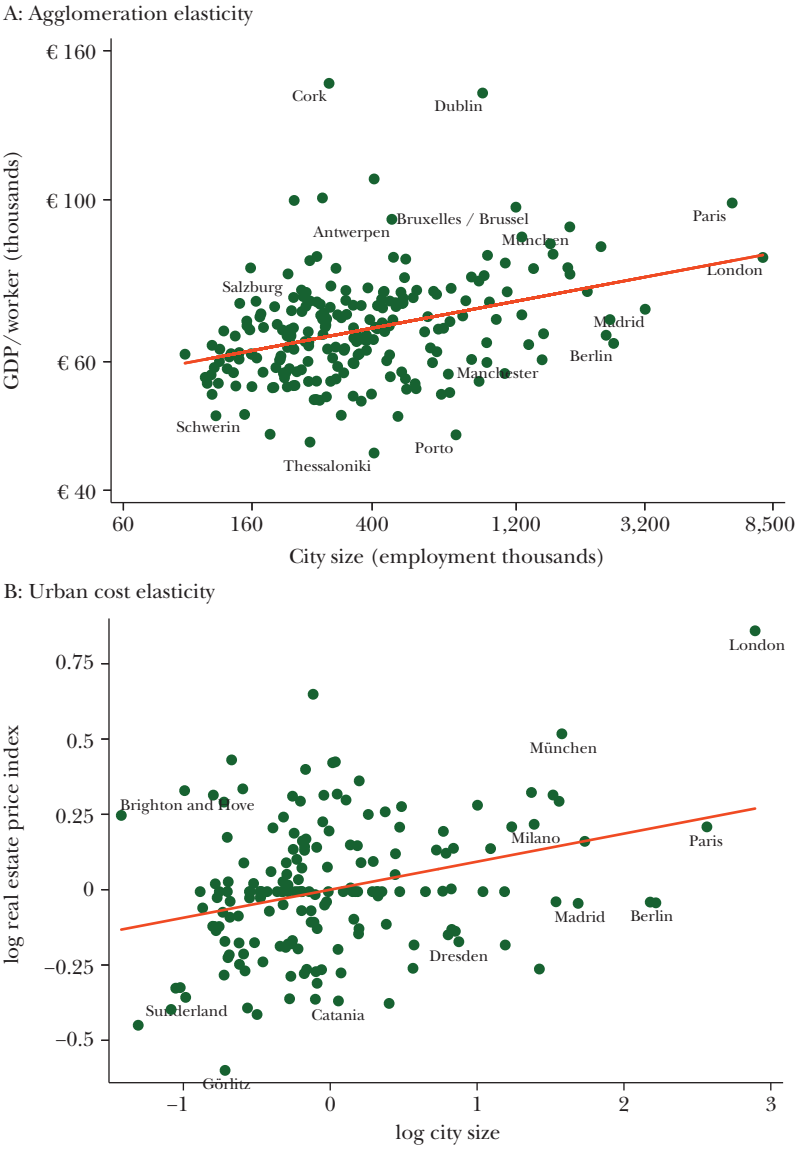
Because of the considerable wage premium earned by the "college educated," the relationship of GDP per capita with city size overstates productivity benefits if workers sort across cities in such a way that the higher-educated live in bigger more productive cities (as argued in Combes, Duranton, and Gobillon 2008). We see such sorting in our data: regressing metro GDP per worker on the share of population with tertiary education and absorbing country fixed effects gives a coefficient of 0.015 (that is, a 1 percentage point increase in the educated share increases GDP per worker by 1.5 percent).[5] Individual country-level studies control for such sorting on both observed characteristics (like the share of college educated) and

[3]For the EU-28, there is a longer time series of data on worklessness than there was for GDP per capita so we can look at the evolution over the same time-period as for the EU-15. Regressing the rate of worklessness in 2015 on the rate in 2005 gives a slope of 1.19 for EU-15 metros, suggesting that, as for GDP per capita, the recent past has seen divergence of worklessness. The same regression gives a coefficient of 1.07 for the EU-28.

[4]This second elasticity looks low compared to country-level estimates reported in Ahlfeldt and Pietrostefani (2019). This is not surprising, given that we pool together quite different data.

[5]Tertiary education data is only available from 2000 onwards for NUTS2. We compute the shares for metros by assigning each NUTS3 the corresponding NUTS2 education shares. For 14 metros, which only have data from 2005 on, we impute shares using a model with metro fixed effects and a linear time trend.

Figure 3
Agglomeration and Urban Costs: EU Metros



Source: Authors' calculations based on Boelmann and Schaffner (2019), Hilber and Mense (2020), Boeri et al. (2019) and other data sources detailed in the appendix.
Note: City size is number of workers in Panel A and population in Panel B. For Panel A, given variations in worklessness, we use GDP per worker and number of workers, rather than GDP per capita and population. Panel B uses data for France, Germany, Italy, Spain, and the UK and includes country fixed effects to account for differences in real estate price indices. Deviations in the log real estate index from the country mean are on the y-axis, deviations in log populations from the country mean are on the x-axis. Panel A uses data from 2015, Panel B from 2011 (Italy has no 2015 data). Results are robust to using 2015 and excluding Italy. For details, see the online Appendix.

Table 1
Agglomeration Elasticity: EU-15 Metros

Year	*Agglomeration elasticity*	*Agglomeration elasticity conditional tertiary education share*
1980	0.0429 (0.0260)	—
1990	0.0517 (0.0175)	—
2000	0.0778 (0.0136)	0.0764 (0.0135)
2010	0.0835 (0.0122)	0.0791 (0.0123)
2015	0.0774 (0.0132)	0.0686 (0.0134)

Source: Based on authors' calculations.
Note: Coefficients from regression of log GDP per worker on log number of workers controlling for share tertiary educated (column 2). Standard errors in parentheses.

unobserved characteristics (like the share with high ability) using individual panel data—that is, following specific workers over time. Unfortunately, no such panel data is available for the EU-15. However, if we re-estimate the relationship between GDP per capita and city size controlling for the share tertiary educated, the elasticity falls from 0.077 to 0.069.

Sorting and city size reinforce one another because more educated people live in more productive cities. Using US data, Moretti (2013) shows that the college wage premium is larger in big cities, a result we can replicate using less detailed individual level data from the EU. [6] The assortative matching of firms and workers may partially explain this effect (for discussion, see Card, Heining, and Kline 2013; Dauth et al. 2018).

Explaining the Changes in Disparities over Time?

If variations in city size and in the composition of educated workers help explain disparities across EU-15 metros, can a simple urban model also explain the changes over time?

Table 1 suggests a partial answer by looking at how the estimated elasticity of GDP per worker changes over time with respect to metro size. As convergence slowed and then reversed, the size elasticity increased markedly. In column 2, we control for sorting using the share of population with a tertiary education in periods when we have data. This has a relatively small effect on the agglomeration elasticities, although the effect does seem to be increasing over time. It is difficult to be precise because of the measurement error introduced by the way we must calculate tertiary education shares (see footnote 5).

[6] Using data from the EU Statistics on Income and Living Conditions (EU SILC), we run Mincer-style regressions including a city residence indicator interacted with a tertiary education indicator. The positive coefficient on the interaction suggests a higher tertiary education premium in cities, as shown in the online Appendix available at the *Journal of Economic Perspectives* website (see Table A3). Grujovic (2019) provides similar evidence with German data. Regressions using the EU SILC data show the high-skilled are 9.5 percent more likely to live in a city than the average and the effect has been increasing somewhat since the start of the data in 2005 (see Table A4).

We can look more directly at sorting by considering changes in the "college-educated" wage premium and in the spatial concentration of skilled workers. For some EU countries, the university graduate premium has increased (Machin and van Reenen 2007; Dustmann, Ludsteck, and Schönberg 2009) which directly increases disparities between smaller and bigger cities as the latter employ more highly educated workers.

Changes in the spatial concentration of highly educated workers reinforce the increase in the "college educated" wage premium. In EU-15 metros, the share of population with a tertiary education increased by about 10 percentage points between 2000 and 2015. This increase was not equally distributed across metros. Regressing the log growth of tertiary education shares on the log of initial population and including country fixed effects shows that a 10 percent increase in initial metro population is associated with a rise of 13.6 percent in the share tertiary educated over the period. That is, we see increased sorting of the more educated population consistent with US evidence (Moretti 2004; Berry and Glaeser, 2005). This increasing concentration of more educated workers is reflected in increased concentration of skill-intensive employment. For example, using patents as a proxy for skill-intensive employment, we see increased spatial concentration between the early 1990s and early 2010s.[7]

What explains the increasing concentration of more educated workers in big cities? One factor is the shift from manufacturing to knowledge-intensive services: the employment share of knowledge intensive services and high technology manufacturing increased in the EU from 2000 to 2015 by around 16 percent. This shift was caused by a mixture of increased globalisation (like the "China shock," as in Autor, Dorn, and Hanson 2013; Dauth and Südekum 2016) and technological change and increased automation (Acemoglu and Restrepo 2019; Dauth et al. 2019). As knowledge-intensive services employ more educated workers and benefit from higher agglomeration economies, this structural shift should see increased concentration of more educated workers in big cities.

An inelastic supply of housing in growing and more productive metros also plays a role. High house prices prevent the poor, who spend a higher income share on housing, from moving to more productive areas (Ganong and Shoag 2017). In some EU metros, land use constraints are highly restrictive and increase house prices (Hilber and Vermeulen 2016). For the EU countries in our data, real estate price increases are particularly pronounced in places with high initial GDP per worker.[8] For the United States, Hsieh and Moretti (2019) estimate the aggregate

[7] For details of the regression of the log growth of tertiary education shares on the log of initial population, see Figure A3 in the online Appendix available with this paper at the *Journal of Economic Perspectives* website. For details of evidence on increased spatial concentration, using patents as a proxy for skill-intensive employment, see Figure A4.

[8] For data showing correlations between real estate price increase and EU metro areas with high initial GDP per worker, see Figure A5 in the online Appendix available with this paper at the *Journal of Economic Perspectives* website.

GDP costs of the spatial misallocation resulting from such land use constraints, but no estimates are available for the EU.

Spatial Disparities in Worklessness

As is well known, differences in labor market institutions play an important role in explaining country variation in worklessness (in this journal, Siebert 1997). These institutions may also help explain why spatial disparities in worklessness are more pronounced. For example, nationally set minimum wages could increase worklessness in poorer areas: evidence for Germany suggests this happens in some low wage areas (Ahlfeldt, Roth, and Seidel 2019). Even without binding minimum wages, centralized wage bargaining may be a driver of spatial disparities in worklessness as such schemes prevent the adjustment of wages to regional productivity differences. Comparing Italy and Germany, Boeri et al. (2019) argue that centralized wage bargaining in Italy translates similar spatial variations in productivity into much smaller variation in nominal wages but much bigger variations in worklessness. Our results confirm the important role of labor market institutions: regressing metro worklessness rates against GDP per worker, we find a negative coefficient which is more than twice as large for countries with more centralized wage bargaining.[9]

Mobility and Spatial Disparities

According to Molloy, Smith, and Wozniak (in this journal, 2011), mobility in 2005 was significantly higher in the United States than in the European Union, which contributed to higher EU disparities. But in contrast to the United States where mobility rates have been falling, the EU trend is less clear, and mobility may have been increasing (EU Commission 2018). Fischer and Pfaffermayr (2018) suggests that labor mobility plays a small role in reducing EU disparities in per-capita GDP. Unfortunately, this increased mobility took place against a background of increasing concentration of economic activity and sorting of the high skilled toward big cities. There is also some evidence that regional transfers may slow down the adjustment that occurs via mobility (Egger, Eggert, and Larch 2014; Jofre-Monseny 2014).

Place-based Policies

So far, we have considered factors that explain disparities across EU metros and why these areas have stopped converging and have started to diverge. The rest of the paper considers place-based policies. We consider policies that *explicitly* target

[9] Conditional on country fixed effects, the effect of log GDP per worker on non-employment rates is –0.21 in the group of countries with more flexible regional wage bargaining (Austria, Germany, Denmark, Netherlands, Sweden) and –0.57 in the group with less flexible, more centralized wage bargaining (Belgium, Finland, France, Italy, Portugal, Slovenia). Both coefficients are significant at the 1 percent level.

the spatial allocation of economic activity. We will not discuss general national-level policies like schools funding, employment training, and others that directly target outcomes like education that matter for spatial disparities but aren't necessarily designed to target the issue of divergence. We focus on what we know about the impact of these policies on specific economic outcomes such as employment and how this depends on the economic forces driving spatial disparities that we discussed above.

These forces also affect the equity and efficiency of place-based policies. In distributional terms, the effect of policy will be partly determined by the mobility of individuals living in the area targeted and the housing supply elasticity (Kline and Moretti 2014). For example, with relatively elastic supply of labor across metros, but an inelastic housing supply, local benefits of spatial transfers are realized by landlords as they become capitalized into land prices. Firm and household mobility also increases the risk that if policy induces significant local employment effects in targeted areas, these may come at the cost of employment losses elsewhere. Displacement from richer to poorer metro areas will presumably narrow disparities.

The effect on overall output depends on whether agglomeration economies in targeted areas outweigh potential losses in non-targeted areas. Shifting investments and jobs from prosperous, productive areas to lagging, less productive regions is also likely to generate aggregate efficiency costs. The effect of displacement on aggregate welfare depends on equity considerations and also how it affects congestion externalities: for example, if displacement from richer to poorer cities reduces both congestion and agglomeration externalities, the net effect might decrease productivity, but increase welfare (for example, Fajgelbaum and Gaubert 2020; Henkel, Seidel, and Suedekum 2018). It is unlikely that policymakers have enough information to account for this potential mixture of externalities (Kline and Moretti 2014).

EU Cohesion Policy

Reducing spatial disparities in income and worklessness is a long-standing EU objective. Interventions directly funded by the European Union include investments in transport infrastructure and in local public goods and services—a mix of firm subsidies and human capital investments including employment training. There are three main funds: the European Social Fund, the European Regional Development Fund, and the Cohesion Fund. Other smaller funds also partly target less developed regions.

The cohesion policy budget for 2014–2020 is €645 billion (for a detailed description, see https://cohesiondata.ec.europa.eu/). Total expenditure is around one-third of the EU budget, which is small relative to total government expenditure. That said, the impact of EU policy is greater than the budget total suggests because EU state aid rules also restrict policy in member states. The lion's share of the budget (60 percent) goes towards "less developed" regions, with GDP per capita less than 75 percent of the EU average. Investments in transport infrastructure, research and development, and business support are the main expenditure categories accounting for 45–50 percent of the budget.

Various arguments are used to justify EU cohesion policies. One approach takes equity arguments used to justify policies to reduce disparities within nation-states and extends these to an EU-wide policy. For example, if all EU citizens should be entitled to similar public goods, EU policy may be justified as helping to equalize fiscal capacity.

From an efficiency perspective, cohesion policy could lead to higher aggregate output if there are diminishing returns to public investment, so that investing in areas with lower levels of public investment will produce larger gains. Or the EU might play a federal role coordinating investments that exert cross-area externalities. Or EU transfers may mitigate externalities from fiscal competition among jurisdictions.

An alternative argument makes the case for cohesion policies as a tool for advancing European integration. For example, transfers may build acceptance of the EU in new member states. This may be important if integration generates economic growth at the center at the expense of peripheral regions (Puga 2002) or if wealthier areas can set higher taxes because firms' desire to locate there reduces tax competition (Brülhart, Jametti, and Schmidheiny 2012).

The effects of EU cohesion policies have been studied extensively. Clear eligibility criteria, strictly applied and largely unchanged since 1989, allow for a (quasi-) experimental situation in which NUTS2 regions with GDP per capita slightly below the 75 percent threshold receive substantial transfers and can be compared to regions slightly above the threshold that do not. Becker, Egger, Ehrlich (2010) use this threshold to identify the effect of transfers using a regression discontinuity design. On average, transfers appear to have been effective in fostering growth in recipients and thus reducing disparities (Becker, Egger, Ehrlich 2010; Mohl and Hagen 2010; Pellegrini et al. 2013; Giua 2017).

However, the effects vary considerably across areas depending on local conditions. The positive effects are driven by regions with high human capital, as measured by education of the workforce, and high-quality local government, as measured by survey data about public services (Becker, Egger, Ehrlich 2013). Transfers are ineffective elsewhere. One potential reason is that while member states agree on strategy and budgets, project selection is done by regional authorities. Lower-quality local governments may choose ineffective policy. Or worse, may be more susceptible to increased rent-seeking activities and white-collar crime (Accetturo, de Blasio, and Ricci 2014; de Angelis, de Blasio, and Rizzica 2018).

The empirical evidence also suggests decreasing returns from cohesion transfers. Becker, Egger, Ehrlich (2012) and Cerqua and Pellegrini (2018) estimate the effects of transfer intensity (defined as transfers relative to local GDP). Their results imply that the marginal treatment effect declines with higher intensity and becomes zero at some "maximum desirable treatment intensity." One explanation is that limits to institutional capacity mean that additional subsidies are used with increasing inefficiency. Alternatively, the returns to investment may decrease in a way consistent with a neoclassical aggregate production function so that even high-quality governments see decreasing returns. The literature does not discriminate between these two explanations.

Finally, a key question is whether transfers lead to temporary or permanent improvements. The evidence is inconclusive but raises doubts that effects are long-lived. For example, case studies of the Italian Abruzzi region and the UK's South Yorkshire region, which lost eligibility in 1996 and 2006 (respectively) suggest improvements were temporary (Barone, David, de Blasio 2016; Di Cataldo 2017). Becker, Egger, Ehrlich (2018) look at all areas which lost eligibility, finding on average a reversion to pre-transfer trajectories once funds are cut.

The findings raise several questions about ways to improve cohesion policy. For example, should the EU allow for a longer transition period when areas become ineligible for subsidies? Are transfers well-targeted at investments that improve long-run growth? Given the importance of human capital to the effectiveness of subsidies—both directly in labor markets and indirectly through improving local institutional quality—perhaps human capital should be a higher priority than, say, infrastructure? Similarly, given that effectiveness decreases as transfers increase, would it make sense to transfer some subsidies from regions with a higher ratio of subsidies to GDP to regions with a lower ratio?

All the existing empirical evidence is for regions rather than metros. Given the economic importance of metros, and the difference between urban and rural economies, more should be done to understand the differential impacts of cohesion policy. As metros are on average more highly educated, and human capital and GDP per capita matter for effectiveness, the efficiency of the funds may be increased by targeting metros that are relatively high skilled compared to surrounding regions. At the same time, the increased sorting of more educated workers means that declining areas, which are losing their more educated labor force, will also be less able to transform transfers into growth. This raises questions around place-based policies that target skilled labor, an issue to which we return below.

So far, we have focused on the overall effect of EU cohesion policy considering the effects of transfers consisting of a bundle of interventions. Blouri and Ehrlich (2020) find that there is significant variation across interventions in their effects. Thus, we next consider the impact of different policies, drawing on cross-EU studies and papers looking at national policies.

Transport Infrastructure

A substantial share of EU cohesion spending is on transport infrastructure: 18 percent in 2014–2020, down from 25 percent in 2007–2013. Nation-state infrastructure investment is many times larger. One way of thinking about infrastructure projects is as a public capital input that makes firms more productive (Aschauer 1989). This assumes decreasing returns to infrastructure investment, consistent with the findings for EU cohesion policy. More recent literature has emphasized the importance of thinking about the transport network. Changing the network affects firm access to goods, markets, and input factors, as well as worker access to jobs. As these determine the relative attractiveness of places, infrastructure may affect the location of firms and workers, shaping the spatial distribution of activity. For

an overview of theory and empirics on the impact of transport infrastructure, see Redding and Turner (2015).

Recent empirical evidence has looked at these effects using the impact of road investments. For example, looking at incremental changes in UK road infrastructure, Gibbons et al. (2019) find substantial positive effects on area employment and number of establishments. While employment gains are largely driven by firm entry, some firm-level analysis also finds productivity increases for incumbent firms. Holl (2016) provides such evidence for improved highway access in Spain, which also increased economic activity close to highways. These studies show sizable local effects but may not identify aggregate effects when improvements impact the entire network.

A central aim of the European Union is to increase integration by lowering transaction costs, thus potentially causing fundamental changes in economic geography. For example, the Trans-European Network is a key project that aims to improve integration. However, there are long-running debates about the spatial effects of infrastructure in the "New Economic Geography" research (Krugman 1991; Fujita, Krugman, and Venables 1999; Puga 2002; Baldwin et al. 2003) For example, the "two-way roads" problem points out that transport improves the access of firms in less-developed regions to core markets but also increases the access of core firms to less-developed regions. As a result, transport investments may increase or decrease industrial concentration. Overall, this literature suggests that the effect on spatial disparities depends on several factors: the reduction in trade costs, wage differences, congestion costs, and mobility.

Unfortunately, the two-region structure common in these earlier models proved hard to adapt to multi-region settings and complex transport networks. More recent spatial economic models eliminate the possibility of multiple-equilibrium but more easily incorporate realistic multi-region geography (Allen and Arkolakis 2014; Redding and Rossi-Hansberg 2017). Once fitted to real world data, such models can assess the relative contribution of location, market access and local (perhaps innate?) productivity differences in explaining spatial disparities. They can also quantify the effects of changes to transport networks on the spatial distribution of employment, income, and aggregate welfare while allowing for displacement.

Santamaria (2019) uses this approach to quantify the welfare effects of reshaping the West German highway network after World War II and finds that this generated large, persistent income gains. Allen and Arkolakis (2019) derive a framework to compute the welfare impact of local infrastructure improvements in the presence of agglomeration and congestion externalities. Even without relocation, the welfare effects spread over the network through changes in price indices. Blouri and Ehrlich (2020) use a similar model to consider the general equilibrium impact of EU infrastructure investments. Investments increase local productivity and this combined with reduced transport costs, generates significant aggregate welfare gains—but only a relatively small reduction in income disparities. The utility-maximizing distribution of investments suggests that funds should

be redistributed towards more central regions and some border regions. Unfortunately, this redistribution is predicted to increase spatial income inequality, once again highlighting the trade-off between aggregate efficiency and spatial disparities.[10]

Can transport infrastructure investments explain the recent divergence across metro areas? Initial investments in the Trans-European Networks may have mostly completed national networks, and the associated increase in public capital stock could have driven between-country convergence in the 1980s. However, if later investment did more to complete the cross-country network or were targeted more to core areas, the contribution to convergence would be reduced.

Again, much of the available evidence considers regions rather than metros. This leaves questions about place-based policy that have not been widely addressed. If reallocating transport expenditure towards more central regions maximizes aggregate efficiency, would this also hold true within regions? Transport investment may also interact with educational composition: for example, public transport in big cities may attract more educated workers, thus helping explain increased sorting. This has not been studied for Europe as a whole, but Fretz, Parchet, and Robert-Nicoud (2017) study the effects of the construction of the Swiss highway network, showing that improved access for municipalities led to a significant increase in their share of high-income households.

Capital Subsidies and Enterprise Zones

Governments offer subsidies to specific firms, particularly in disadvantaged areas. Such subsidies raise two major concerns: the "deadweight" problem that they finance activities that firms would have undertaken anyhow; and the "displacement" problem that if subsidies encourage new activity in targeted areas, this may come at the cost of activity elsewhere.

Research seeking to understanding the deadweight and displacement effects from EU policies struggles with a lack of detailed data and substantial identification challenges (for example, see Bachtrögler and Hammer 2018; Beņkovskis et al. 2019).

Country-level studies have made more progress because one (unintended) consequence of EU state aid rules is that they induce exogenous variation to identify the impact of place-based capital subsidies. Some studies suggest that subsidies, if well designed, can alter firm behavior (which is to say that not all the impacts are deadweight). For example, Criscuolo et al. (2019) look at the impact of the UK's Regional Selective Assistance scheme, which provided discretionary grants to manufacturing firms in disadvantaged areas. The rules governing area eligibility are determined by EU rules. Thus, changes in EU rules provide a source of exogenous variation for estimating the impact on employment, unemployment, and other firm

[10] Further welfare gains can be realized by supranational coordination of infrastructure—for example, if governments tend to ignore foreign consumers when deciding on investment in border regions (Felbermayr and Tarassov 2019).

outcomes. Subsidies have large and statistically significant effects: increasing area-level manufacturing employment and decreasing unemployment. These effects are driven by small firms. Similar strategies have been used for other place-based capital schemes including the GRW rules that set maximum levels for different incentives across regions of Germany (Brachert, Dettmann, and Titze 2019; Etzel, Siegloch, and Wehrhöfer 2020) and Law 488/1992 that governs incentives received by firms to invest in lagging areas in Italy (Bronzini and de Blasio 2006). The results are not always positive. Bronzini and de Blasio (2006) find evidence of substantial deadweight and displacement: subsidized firms bring forward investment projects and gains may come at the expense of non-subsidized firms.

Enterprise zones, in most incarnations, offer a broader set of subsidies (not just capital subsidies), some of which may offer indirect support to firms (like relaxation of planning regulations) but in a specific area often much smaller than a metro area. Most of the literature on enterprise zones comes from the United States(for a summary, see Neumark and Simpson 2015), but a small literature considers the effect of European schemes, particularly the French Franches Urbaines (for example, Briant, Lafourcade, and Schmutz 2013; Mayer, Mayneris, and Py 2017; Givord, Rathelot, and Sillard 2013; Gobillon, Magnac, and Selod 2012).

One difference that emerges is that US enterprise zones have larger impacts on area unemployment, which may reflect the fact that some US schemes impose "local hiring conditions," (usually that a certain percentage of workers must live locally) which are not used in Europe.

Another difference is that deadweight and displacement concerns are more pronounced for enterprise zones than for place-based capital subsidies operating at broader spatial scales. One explanation is that the latter are often selective. For example, to be eligible to receive UK Regional Selective Assistance, a firm must demonstrate that it does *not* predominantly serve local markets. Such a requirement may reduce displacement compared to enterprise zones that provide non-discretionary subsidies to all firms within the zone. Another explanation is that a firm relocating to an enterprise zone within the same metro can access the same local labor markets and do business with existing customers and suppliers. In the absence of a local hiring requirement, it can even employ the same workers. This creates large incentives to relocate within metros. In contrast, firms relocating to take advantage of other place-based capital subsidies may need to move to different local labor markets and face differential access to customers and suppliers.

We have little evidence on the efficient spatial allocation of these area-based initiatives. As one example, Gaubert (2018) studies the location choice of heterogeneous firms when offered firm subsidies to locate in different size cities. In the model (calibrated to the French ZFU programme for urban tax-free zones), firm subsidies in small, less productive cities led to displacement, which has negative effects on aggregate productivity. Transfers to large, productive cities increase aggregate productivity.

The effects of these policies on spatial disparities will be modest. If the findings for UK Regional Selective Assistance generalize, selective (capital) subsidies may

reduce disparities in worklessness, but not GDP per capita. For the scale at which enterprise zones operate, and given the findings on displacement, it is unlikely that these have much impact on metro disparities in the European Union.

Local Employment Multipliers

Firm-level subsidies aim to support employment at an individual firm or to attract new employers to an area. This should directly increase local employment, providing that subsidized employment does not displace existing jobs. This increased local employment may generate additional jobs by increasing productivity (as in Greenstone, Hornbeck, and Moretti 2010) or demand for locally produced goods and services. These positive "multipliers" may be offset by general equilibrium effects that increase local wages or prices.

The literature on local multipliers assesses the net effect on local employment. The evidence considers multipliers from three kinds of employment: tradable sectors (that sell mostly outside the local economy); tradable skilled and high-tech sectors; and the public sector. The multiplier for jobs in tradable sectors on jobs in non-tradable sectors is the most frequently estimated. Estimates for Italy, Spain, Sweden, and the United Kingdom differ, although they are broadly in line with US estimates. This suggests that an additional tradable job creates between 0.5 and 1.5 extra jobs in the non-tradable sector. A smaller number of studies provide estimates for high-tech or high-skilled tradables, generally finding larger multipliers (again, consistent with US evidence).

The fact that these multipliers are higher might provide an additional justification, over and above the direct effect on innovation for policies that support the clustering and collaboration of firms in sectors that are intensive in research and development. However, evidence on the effectiveness of these policies is mixed. For example, for Germany, Falck, Heblich, and Kipar (2010) document positive effects on innovation, whereas Martin, Mayer, and Mayneris (2011) and Falck, Koenen, and Lohse (2019) tend to find no effects on regional employment in France and Germany, respectively. Moreover, these studies ignore the negative aggregate effect of spreading out activities that may benefit from large agglomeration economies. It also ignores the possibility that price effects, like higher prices of housing, may outweigh any employment effects for the lower skilled (Lee and Clarke 2019).

Decisions about public sector employment allow governments to affect the spatial allocation of employment directly. For example, central government employment is usually concentrated in the capital city. Reallocation of public sector employment from richer to poorer areas provides a direct mechanism for reducing disparities.

Some studies estimate multiplier effects for these public sector jobs (Faggio and Overman 2014). The What Works Centre for Local Economic Growth (2019) identified six such studies. Results are mixed, with two finding negative effects on private sector employment (that is, crowding out), one finding no effect, and three finding positive multipliers. Two of these three report crowding out for manufacturing, offset by a positive multiplier on services. Increases in wages or house prices seem to underpin these crowding out effects. Overall, estimated public sector

multipliers are smaller than private sector ones. One explanation is that public sector employers may have weaker input-output linkages with local firms. Another is that salaries are relatively high in relocated public sector jobs, consistent with both larger price effects on wages and housing and higher levels of crowding out.

Conclusion

Spatial disparities across EU metro areas are profound, persistent, and may be widening. Thinking about the role of metros and the sorting of workers helps us to better understand these disparities and the effect of different policies and complements the extensive literature on regional disparities. The findings that EU support is more effective in higher educated regions, on the intensity of transfers and the impact of transport, raise questions about whether funds should be targeted more at metros. Regardless of the intervention, our understanding of many place-based policies is improved if we think about the effects from a metro perspective.

Our discussion has raised several questions without answering them, and here is one more. At least as far back as Akerlof et al. (1991), economists have raised the possibility of employment subsidies to help address EU disparities and reduce the risk of "downward spirals" arising from large localized negative shocks. But the emphasis of EU cohesion policy has remained on infrastructure investment and physical capital subsidies. Perhaps the set of cohesion policy instruments needs to be expanded?

Historically, arguments between proponents of place-based or place-blind policies have been conducted as an either-or debate. In a world where some people are mobile, and others are not, we do not find this distinction helpful. Instead we need to understand the impacts of a range of different policies regardless of whether they are targeted at people or at places. The cost-effectiveness, the consequences for spatial disparities, and the benefits for different kinds of people living in different places are likely to vary significantly across policies. It is unlikely that a priori classifications of policy as place-based or place-blind will be very informative about these differential impacts on redistribution and aggregate efficiency or the tradeoffs between them.

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