LABOUR MOBILITY AND DEVELOPMENT DYNAMICS IN OECD REGIONS

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Introduction

1.   Demographic trends and migration represent key challenges for regional policy in the coming years, and marked regional differences exist for both phenomena. Important local labour shortages can emerge as a consequence of ageing and substantial outmigration. While regional unemployment might decrease in the short term through out-migration, employment growth and productivity can suffer if those leaving are the most talented, educated and entrepreneurial.

2.   In this paper we use annual inter-regional flows of population between TL3 regions within OECD countries to address the following questions: a) What is the geography of internal migration and of young adults in OECD countries? b) Is migration essentially explained by flows out of rural regions towards urban ones? c) Is there a regional productive structure that best characterizes patterns of mobility? d) Is persistent out-migration associated to economic distress and does it lead to a sustained downward economic spiral?

3.   Many regions experience sustained negative net-migration during the decade 1999-2008. While in general rural regions tend to experience out migration and depopulation and metropolitan regions positive inflows, this is not always the case and new areas – peri-urban and medium size urban centres – are emerging as attractive for internal mobility in Canada, France, Korea and the United States. The remoteness of a rural area is instead a key characteristic of regions losing shares of young population and metropolitan regions remain the attraction poles for young adults.

4.   Our empirical analysis suggests that the traditional labour mobility from rural to urban areas does not explain everything. Economic diversification and links with large urban centres determine the capacity of rural regions to retain population. We find that on average there are no significant population outflows from rural regions once one controls for the production structure of the area. This justifies further analysis

of local labour market characteristics (composition, mismatches, adaptability…) that are relevant for human capital retention and for resilience to shocks, within each type of region.

5.   We present a first typology of regions according to the degree of persistency of negative net-migration during the period of observation. While one or two years of negative net-migration might reflect just a phase of market adjustment and tell little of the economic performance of a region, persistent net outflows over a decade are likely to reflect a relative decline in attractiveness. The results show that regions with persistent out-migration are characterized by a certain number of economic distress indicators, such as higher unemployment rate, lower income per capita, higher share of employment in agriculture and lower productivity in the same sector. These regions have also a higher share of old population and lower population density than regions with prevalent in-migration. These results show that outmigration remains localized over time, suggesting that beyond the short term adjustment in the labour market, regions may struggle to improve local labour conditions when those migrating are more productive than those staying behind.

6.   The economics literature has long debated whether out-migration is the way regions adjust to economic shocks or instead deepens economic distress. Our contribution is to identify possible common trends across a large sample of OECD countries. The results of our regression models indicate that migration-induced decreases in labour supply do not reduce regional unemployment, suggesting the possibility of a sustained downward economic spiral linking outmigration and economic distress. The effects of out-migration on unemployment are found to be relatively higher in low-income regions, suggesting that more economically fragile regions might experience more selective out-migration, potentially reinforcing their relative weakness.

7.   The analysis carried out in this paper points to different implications for regional policy, namely targeting demographic changes, retaining labour and upgrading skills as well as innovating public goods and local service delivery to improve living conditions and well-being. In the last paragraph we discuss the scope for regional policies to implement specific place-based policies to gain from demographic changes and labour mobility. Some examples of regional policies targeting demographically fragile areas are reviewed.

Demographic changes and population redistribution among OECD regions

8.   Ageing processes can interact with migration patterns producing differentiated territorial effects – regions with out-migration and population loss, versus regions with ageing population and migration inflows of young people etc. As marked regional differences exist for both phenomena, regional policy will be called in the coming years to address them with policy responses targeted to specific places within countries and to multiple policy areas: improving regional labour markets, retaining workers and upgrading skills, providing and sustaining regional infrastructure and services, improving social cohesion and integration etc.

9.   In most OECD countries population is ageing. Due to higher life expectancy and low fertility rates, the elderly population (those aged 65 years and over) has increased almost three times faster than total population in the past twenty years, reaching 15% of OECD population in the most recent years. As the elderly population may be more concentrated in few areas within each country, regions face different socio-economic challenges and opportunities raised by an ageing population.

10.   The ratio of elderly to working age population, the elderly dependency rate, is steadily growing in OECD countries. The elderly dependency rate gives an indication of the balance between the economically active and retired population. In 2008 this ratio was over 20% in OECD countries, with substantial differences between countries (34% in Japan versus 9% in Mexico). Differences among regions

within the same countries were also large. The higher the regional elderly dependency rate, the higher the challenges faced by regions in generating wealth and sufficient resources to provide for the needs of the population. Concerns may arise on the financial self-sufficiency of these regions to generate taxes to pay for these services. In 2008, the elderly dependency rate across OECD regions was higher in intermediate and rural regions than in urban ones, with the only exceptions being Belgium, the Czech Republic, Hungary and Poland. This general pattern was more pronounced in certain countries, like Portugal, France, Japan, Spain and Korea (Figure 1). Besides the elderly dependency rate, the concentration of elderly people in a certain region may allow economies of scale in the provision of certain services, in particular health care and personal services. Only 27% of the OECD elderly population lived in rural regions in 2008; with more of the elderly residing in urban regions (46%). As such, rural regions are more likely to face the challenge of ageing due to higher elderly dependency rates and lower concentration of the elderly.

Figure 1. Elderly dependency rate (left) and distribution of elderly population (right) by type of regions; 2008

In 24 countries, the elderly dependency rate is higher in rural regions than in urban ones.

Only one-fourth of the elderly population live in rural regions
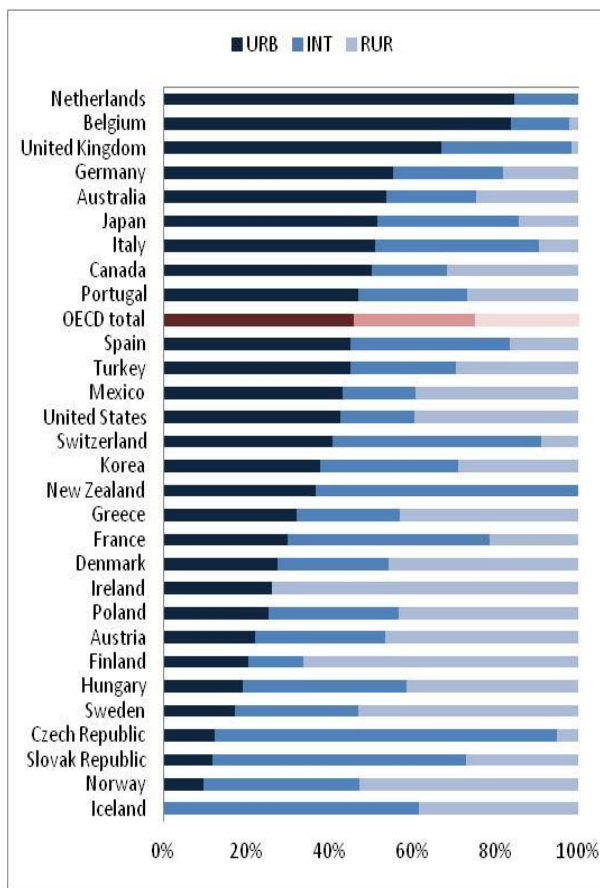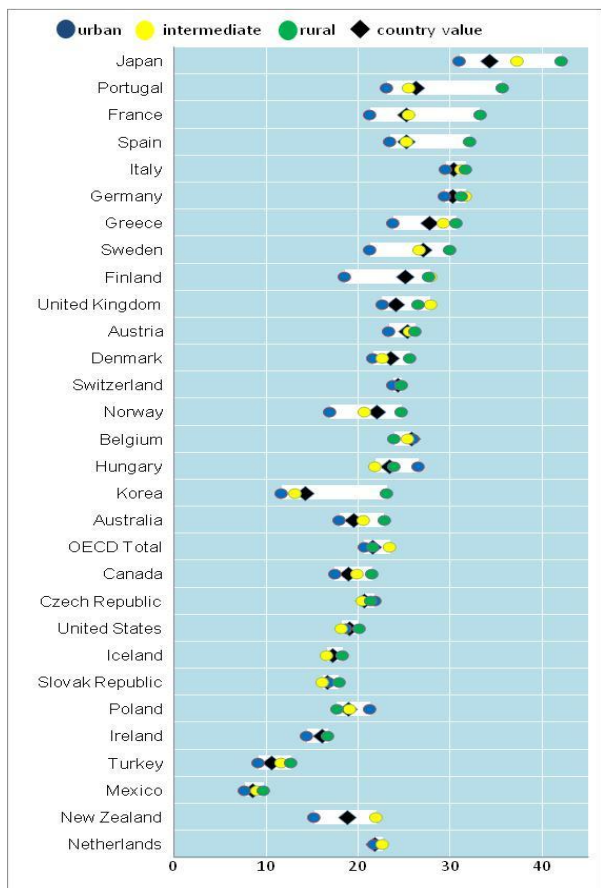
Source: OECD Regions at a Glance 2009

11.   More than one third of OECD population lived in metropolitan regions (i.e. large urban regions with more than 1.5 million population)[1]. In the Netherlands, Korea, Japan, Belgium and Germany more than half of the total population lived in metro regions in 2008. Population growth has been faster in

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[1] We use the OECD metropolitan database on TL3 regions, which includes 78 urban regions with a population larger than 1.5 million. Both the metropolitan area of Auckland (New Zealand) and Oslo (Norway) are included even though their population falls slightly below the 1.5 million people threshold.

metropolitan regions than in the rest of the country, suggesting that migration, aside from demographic dynamics, has affected the size of urban regions. Compared to the national population growth rate, the population growth in metro regions in the past fifteen years has been particularly intense in Germany (for quite a few metro regions with the exception of Berlin), the Czech Republic (Prague region) and Japan (in particular Tokyo). On the contrary, both in the United States and in France the population growth of metro regions has been recently slower than the total population growth (Figure 2). In both countries this trend is the result of different movements at play: Paris as well as the metro areas of New York, Los Angeles, Chicago and San Francisco have recently experienced domestic outflows but have remained net recipient of international inflows (Brookings 2010, Baccaini and Levy 2009).

Figure 2. Percent of national population living in metro regions in 2008 (left) and percentage yearly change in total population living in metropolitan regions and in the whole country, 1995-2008 (right)

In the Netherlands and Korea, 70% of people lived in large urban regions.

In Turkey, the population in large urban regions grew 4% annually from 1995 to 2005.
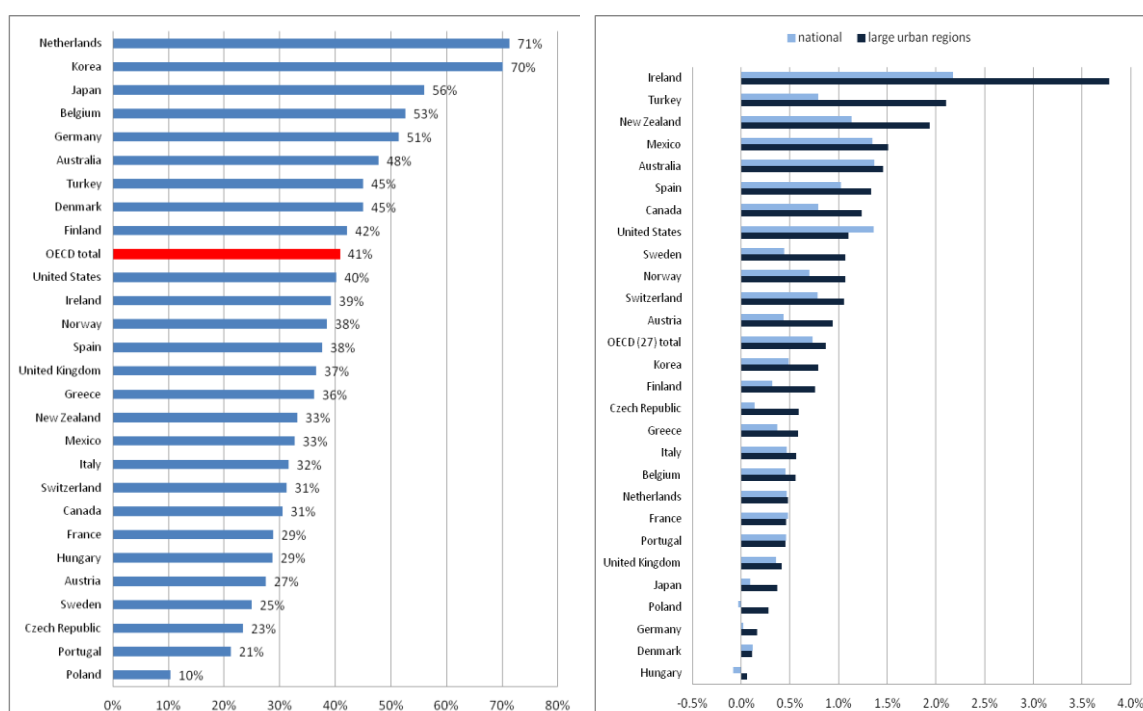
Source: OECD Regions at a Glance 2009 and calculations from OECD Metro database

The geography of internal migration in OECD countries

12.   The geography of inter-regional mobility within countries complements the picture given by the demographic structure, indicating whether the ageing of certain areas is reinforced by outflows of working age population or instead balanced off by inflows from other parts of the country. The data used in this paper refer to annual inter-regional flows between TL3 regions within 17 OECD countries. Flows include both national of the countries and registered foreigners. They were collected directly from the websites of National Statistical Offices, and the choice of the sample was thus primarily determined by the publicity of time-varying migration data at sub-national level. The time coverage can be different among countries but for most of them covers the period from 1997-1998 to 2007-2008[2]. For all the countries in the sample, data

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[2] In the case of Canada data are referred to economic areas (OECD NOG), Germany to NUTS3 regions, UK data are available only partially for Local authorities but do not cover the entire country. Finally, France inter-

are obtained from national population registers, with the exception of Canada, UK and the US[3]. Net-interregional flows (differences between inflows and outflows) have been mapped in figures 3, 4 and 5.

regional flows, registered in 2006, refer to the previous 5 years therefore France is not included in the econometric analysis.

[3] For Canada, the data are estimation undertaken by Statistics Canada, see http://www.statcan.gc.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SDDS=4101&lang=en&db=imdb&adm=8&dis=2 for a description of the methodology and checks of accuracy. For UK, the source of data is National Health Service (NHS) Patient Register data. For United States, we computed inflows and outflows at TL3 by aggregating county-to-county bilateral migration data from the IRS Individual Master File system for the years 2000 to 2008.

Figure 3. Net inter-regional flows (thousand people) in Europe; TL3 regions, 2008
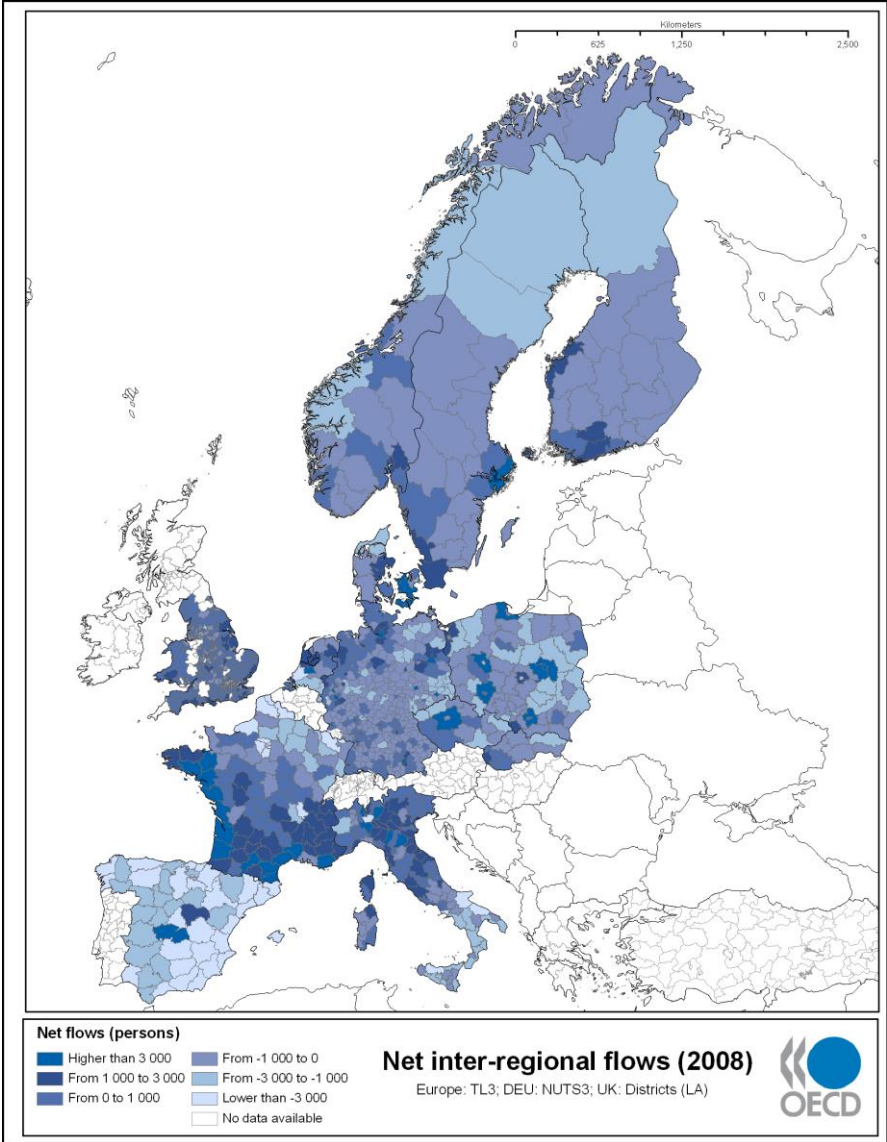
Figure 4. Net inter-regional flows (thousand people) in Canada and United States; TL3 regions, 2008

Net flows (persons)

Higher than 10 000
From 5 000 to 10 000
From 0 to 5 000
From -5 000 to 0
From -10 000 to -5 000
Lower than -10 000
No data available

Net inter-regional flows (2008)
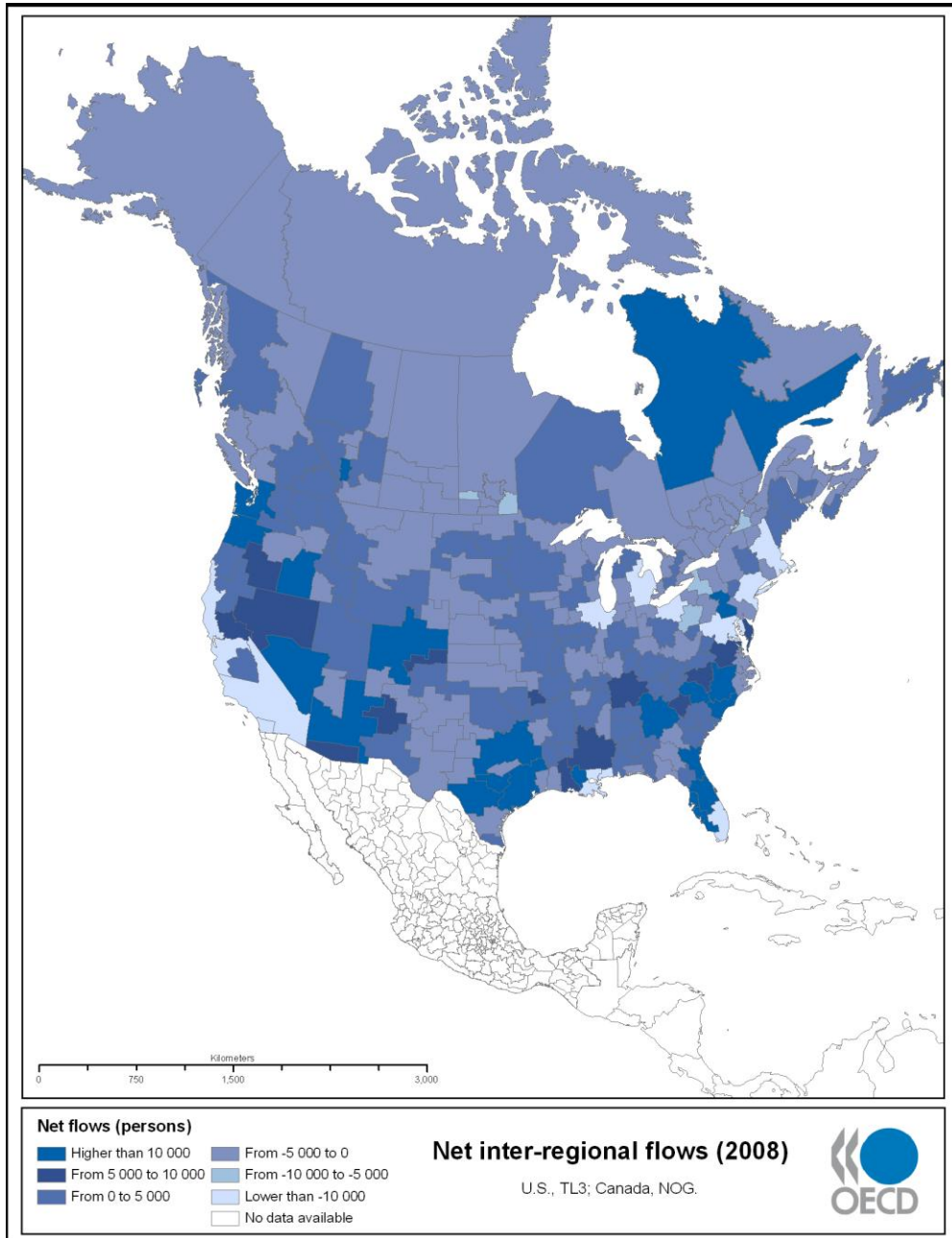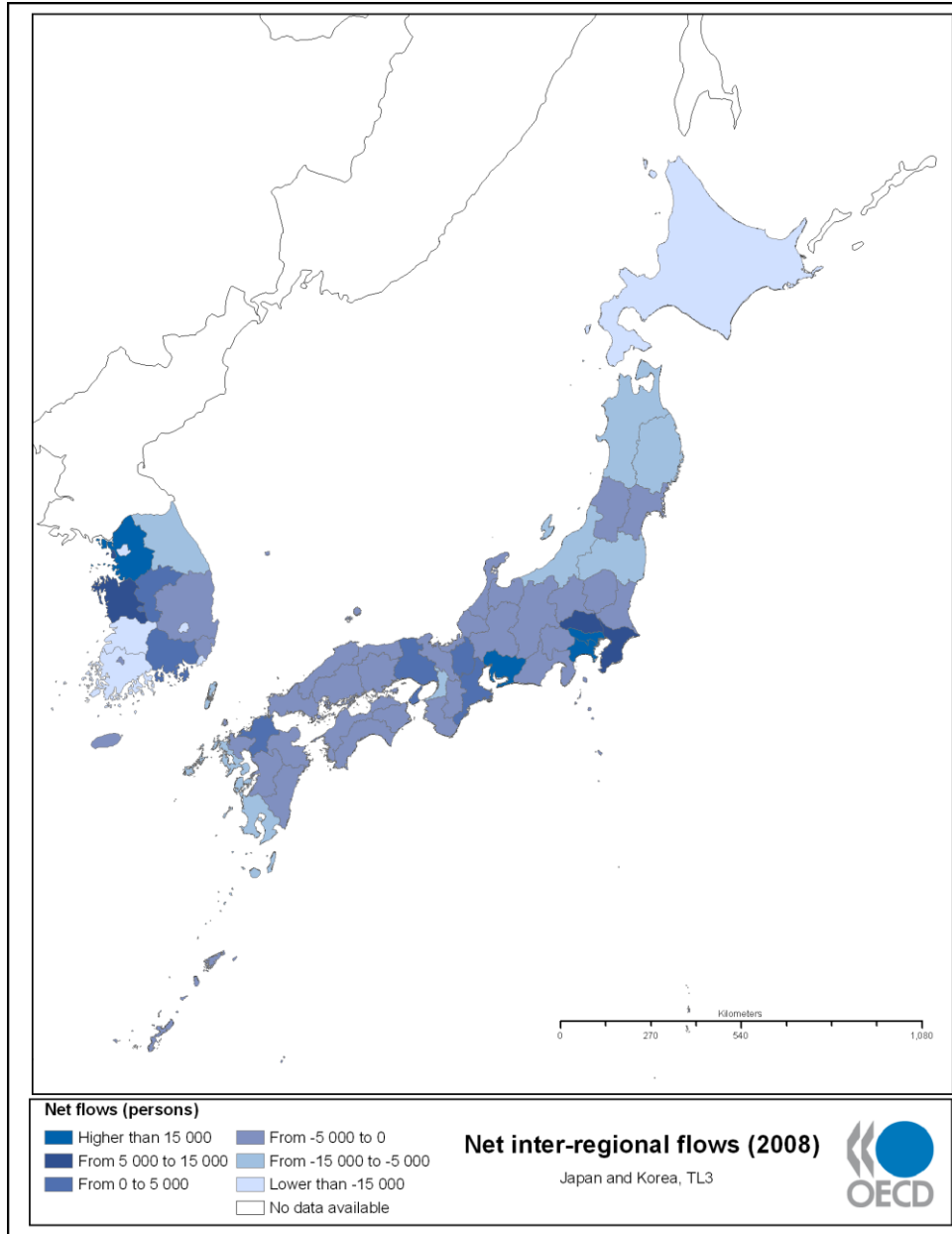
U.S., TL3; Canada, NOG.

OECD

Figure 5. Net inter-regional flows (thousand people) in Japan and Korea; TL3 regions, 2008

Net flows (persons)

- Higher than 15 000
- From 5 000 to 15 000
- From 0 to 5 000
- From -5 000 to 0
- From -15 000 to -5 000
- Lower than -15 000
- No data available

Net inter-regional flows (2008)

Japan and Korea, TL3

OECD

13.   On aggregate, among the countries considered 60% of rural regions display net negative inflows versus 40% of urban regions. In the Czech Republic, Japan and Denmark almost all the rural regions lost population due to internal mobility. Rural regions in Japan will bear the largest share of the future reduction in population: the already high incidence of elderly population in rural reinforced by out-migration of young farmers is posing serious threat on the sustainability of rural regions. Differently, in the United States, France and Korea fewer rural regions experienced negative flows than urban regions (Figure 6 left).

Figure 6. **Percentage of regions with net negative inflows by type of regions (left) and percentage of rural regions with net negative inflows by remoteness of region (right); 2008**

All rural regions in the Czech Republic display a negative balance of internal mobility

In almost all countries, remote rural regions displayed negative flows
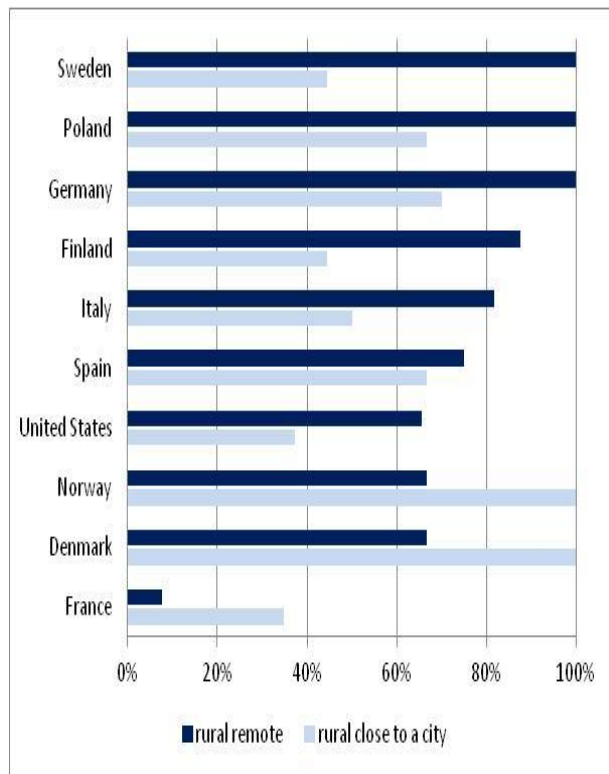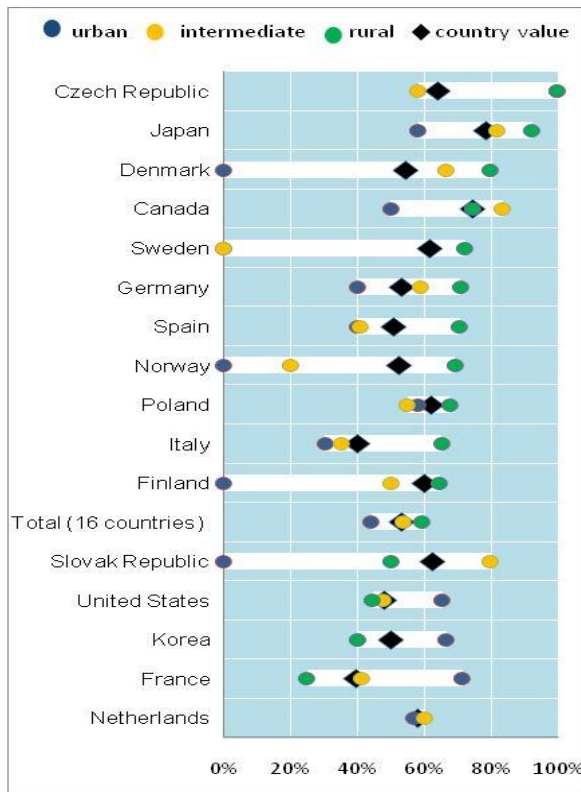
14.   While in general metropolitan regions are net recipient of international migration, this is not necessarily true in the case of mobility across regions in the same country. The metropolitan regions of New York, Los Angeles, San Francisco, Cleveland and Miami (United States), Paris (France), Bari and Naples (Italy), Madrid and Zaragoza (Spain), and the core region of the metropolitan area of Seoul have lost population in favour of other domestic regions in the last decade. As a result the net inter-regional flows for metropolitan regions included in the OECD metro database is negative in 2008 (figure 7).

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Figure 7. Net inter-regional flows in metropolitan regions as a percentage of population; 2008
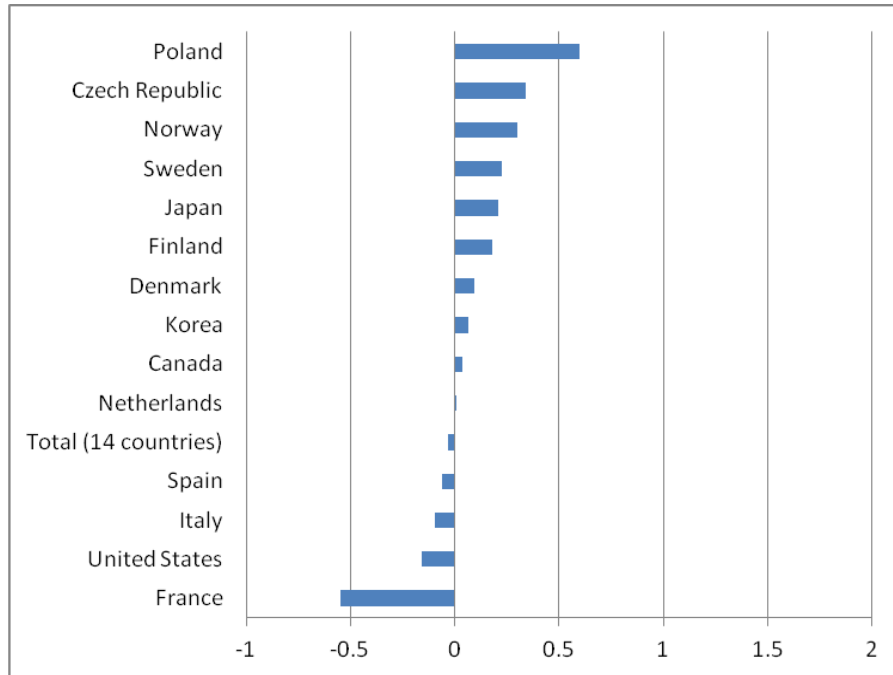
Source: own calculations from OECD Metropolitan database and OECD Regional database. Germany and the United Kingdom are not included due to the unavailability of data on internal mobility for TL3 regions. The Slovak Republic does not contain a metropolitan region.

15.   We now present results from a multivariate model to better describe what determines regional attractiveness with respect to population flows. The model we estimate pooling the data for the all the years of the sample is the following:

$$NETMIG_i = \alpha_i + \beta' X_i + \gamma' EmpStr_i + \delta Unempl_i + \phi Old_i + t + \varepsilon_i \qquad (1)$$

16.   The dependent variable is the net immigration to the region i (number of inflows minus number of outflows). The vector X includes the population size of the region, the OECD regional typology or the refined regional typology, the population density of the region. Importantly, we control for proxies of the production structure of the region, using data on share of employed in agriculture, in manufacturing and in construction sectors ($EmpStr$). We further explore the correlation between net inflows and the unemployment rate in the region, and we use the proportion of those aged 65+ over those aged 15-64 (Old) as a proxy for the level of ageing in the region ($Unempl_i$). t are year fixed effects and ε is the error term. The results from the model are displayed in table 1.

Table 1. Determinants of net inter-regional migration

VARIABLES	Model 1 Net inter-regional migration	Model 2 Net inter-regional migration	Model 3 Net inter-regional migration
Rural region	-1.348*** (-0.497)		
Urban region	0.139 (-0.999)		
Prop. Agriculture		-18.42*** (-3.967)	-26.98*** (-4.225)
Prop. Manufacture		-3.654 (-2.662)	-14.41*** (-2.375)
Prop Construction		40.79*** (-6.528)	47.11*** (-7.533)
Rural close region			-0.328 (-0.623)
Rural remote region			-2.783*** (-0.56)
Population	-1.22e-06** (-5.94E-07)	-2.54e-06*** (-5.57E-07)	-3.56e-06*** (-5.10E-07)
Population density	-0.00104 (-0.00087)	3.56E-06 (-0.00065)	-0.00159*** (-0.00055)
Unemployment rate	-0.183*** (-0.03)	-0.188*** (-0.0297)	-0.183*** (-0.0263)
Share of old population	-0.134*** (-0.0358)	-0.0973** (-0.0397)	-0.146*** (-0.0431)
Year Fixed effects	Yes	Yes	Yes
Constant	7.135*** (-2.075)	5.503*** (-1.405)	9.589*** (-1.793)
n. of observations	5,425	4,338	3,258
R-squared	0.037	0.147	0.279
Note: robust standard errors in parenthesis. *** p<0.01 ** p<0.05 * p<0.1			

17.   In column 1, we can see that excluding from the model the proxies for the regional productive structure, rural regions as defined by the OECD typology tend to experience population losses as a result of internal migration relatively to intermediate regions. The unemployment rate in the region is, as expected, significantly negatively correlated with net inflows, suggesting that population redistribution are highly sensitive to differential in employment opportunities[4]. The elderly dependency rate is significantly negatively correlated with positive net flows, confirming the intuition of a possible self-reinforcing process linking internal population redistribution and ageing.

18.   In column 2, we replace the OECD typology with data on employment shares in different sectors. The proportion of employed in agriculture is a strong predictor of internal population losses, confirming that the ongoing structural adjustments out of agriculture bring substantial mobility out of rural areas. Interestingly, when inserting together the dummies for the rural-urban typology and the share of

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[4] In a conditional logit model linking the probability of negative net inflows each year to (lagged) changes in the number of unemployed, we find an elasticity of migration to employment shocks that is much higher in North American than in European regions. This confirms the general observation of relatively higher labor mobility in US and Canada with respect to the relatively sticky European labor markets. For Asian regions, the elasticity of migration with respect to employment is at an intermediate level.

agricultural employment, it is the latter that is significant (result not shown). This probably means that the traditional rural-urban dichotomy used to explain population flows oversimplifies the geography of labor mobility among OECD regions. In effect, there is a wide heterogeneity among "rural areas", some of them having high degrees of attractiveness due to positive climate conditions and high levels of natural amenities (such as for example the Southeast counties of the United States). Besides the relatively share of agricultural activities, what determines the net losses of rural areas (the negative correlation in column 1) are problems of remoteness. This is clearly shown by the result in column 3, when we add dummies for the refined regional typology. The specification shows that, controlling for the importance of agricultural activities, rural regions which are close (in driving distance) from urban agglomerations are not relatively exposed to population losses. Remote rural regions, to the contrary, experience significant drains in their labor force.

19.   Distance to markets and services seems thus a stronger predictor of out-mobility than the mere population density. In seven out of the ten countries considered, more remote rural regions display negative net flows than rural regions close to a large urban centre[5]. The exceptions of Denmark, Norway and France are explained in the first two cases by the attracting role of capital regions on population from surrounding rural regions, while in France the relative better position of remote rural regions is due to the recent positive inter-regional mobility in the western and southern *départments*.

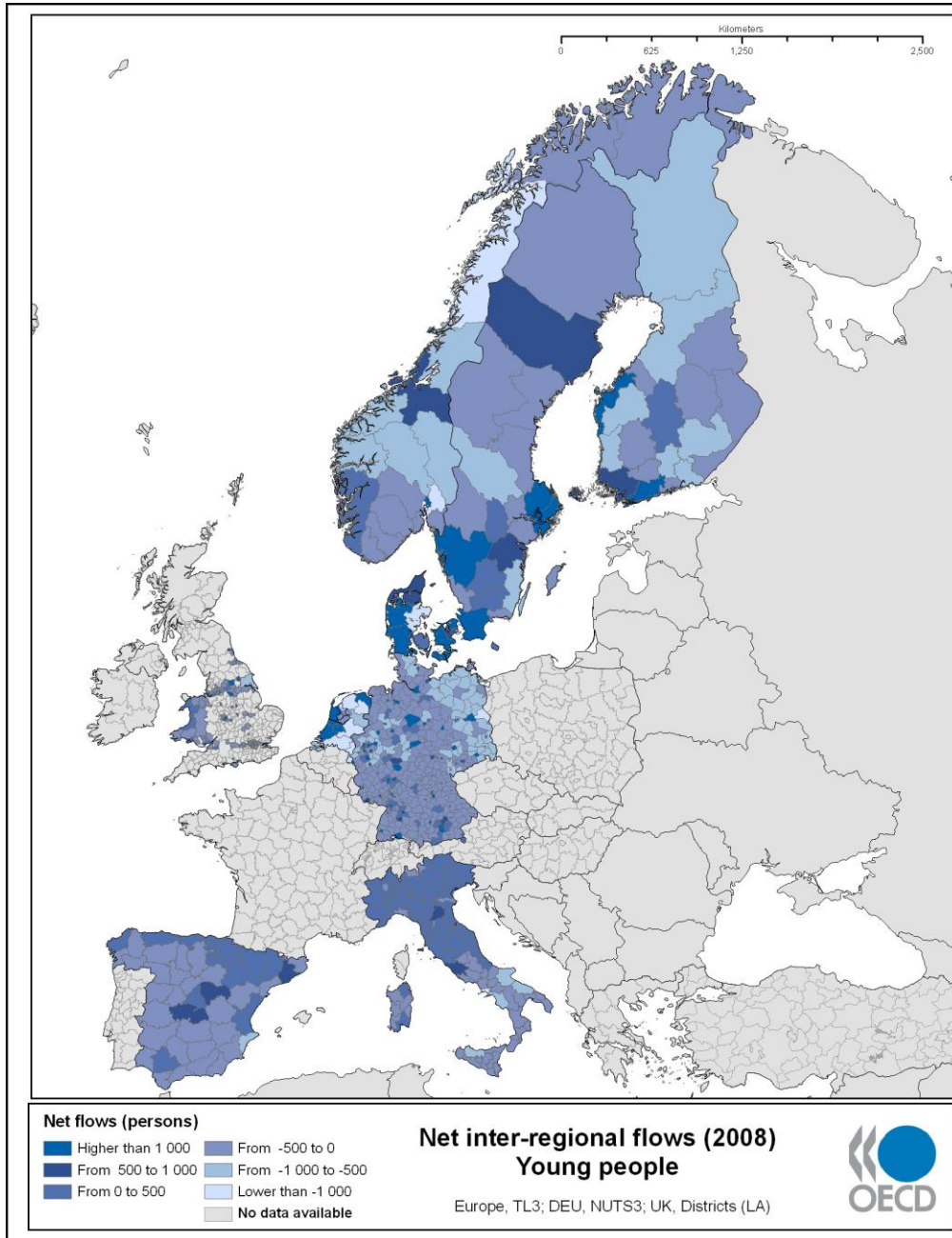**Main drivers of young adults mobility**

20.   The question of the selection of the migrants - who are those who leave - is crucial to design targeted policy both in the regions experiencing outmigration and in the receiving ones. Unfortunately, the annual inter-regional flows for small (TL3) regions do not allow for analysis on the employment status or educational level of migrants but only on the age structure and in a subset of 11 countries. Different findings underline the association between economic performance of regions and the difference between them in the matching of educational supply with local labour needs, and selective migration of young adults (Rodriguez-Pose and Vilalta-Bufi 2005). The mobility of young adults (those aged 16-24 years) is an important aspect of internal migration, not only because it represents around one-third of the total inter-regional flows, but also because large endowments of skilled, entrepreneurial, creative young is what regions need most to stay competitive.

21.   The geography of migration flows changes significantly when referred to young adults. The regions of Seoul (Korea), Madrid and Zaragoza (Spain), for example, attract young migration while display a negative net migration flow for the total population. The metropolitan and urban regions in the South of Italy, instead, lose young population as well as total population (Figures 8-10).

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[5] We use the *OECD refined typology* to define remote rural regions and rural regions close to a city (Dijkstra and Ruiz 2010). This typology has not been applied yet to Japan and Korea. The Czech and the Slovak Republic do not have remote rural regions and thus they are not displayed in figure 6.

Figure 8. Net inter-regional flows (thousand people) of young adults, Europe; TL3 regions, 2008

Net flows (persons)

Higher than 1 000	From -500 to 0
From 500 to 1 000	From -1 000 to -500
From 0 to 500	Lower than -1 000
	No data available

**Net inter-regional flows (2008)
Young people**

Europe, TL3; DEU, NUTS3; UK, Districts (LA)

OECD

Figure 9. Net inter-regional flows (thousand people) of young adults, Canada NOG regions and Korea TL3 regions, 2008
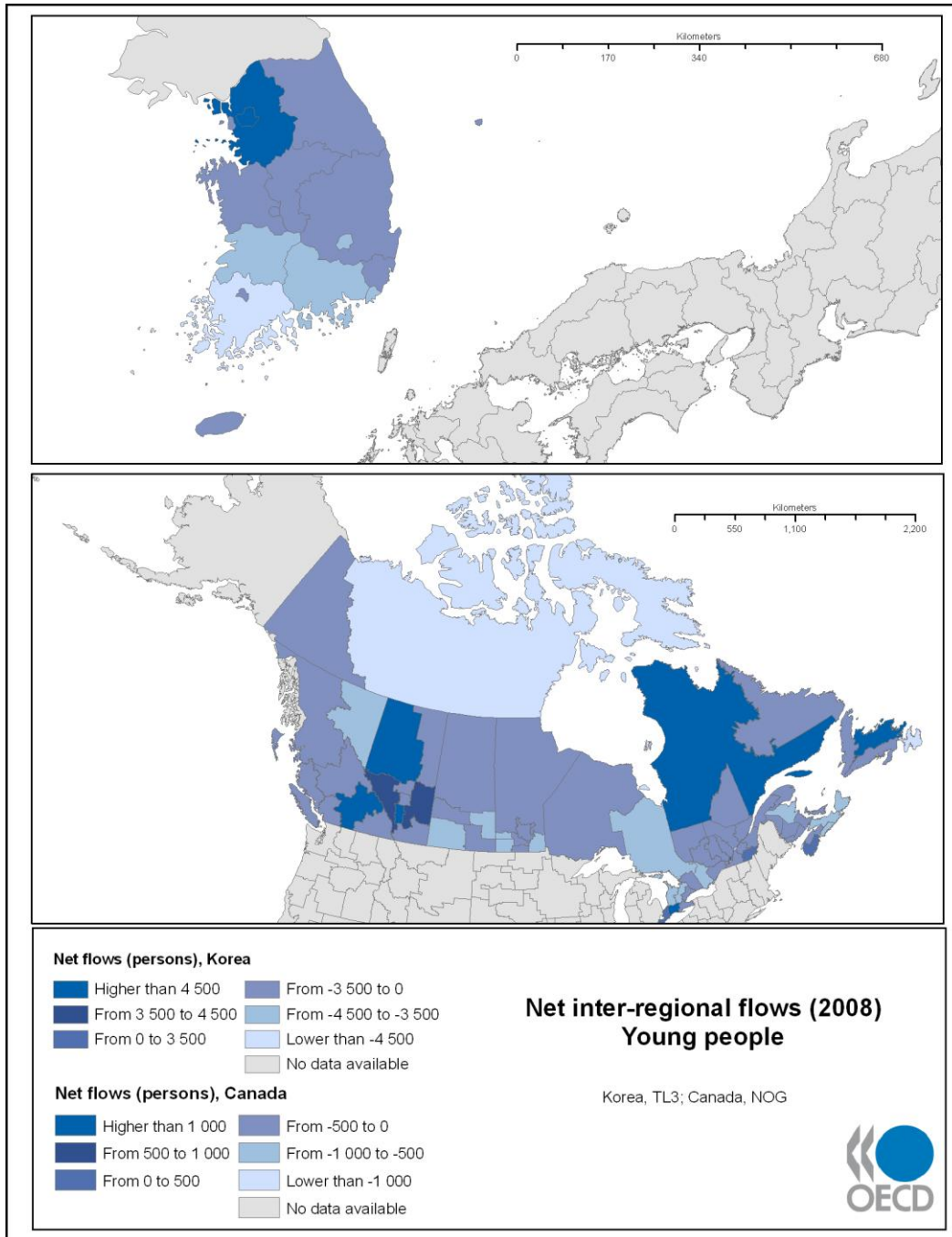
22.   The mobility of young adults is essentially a migration from rural to urban regions where higher education facilities and more diverse job opportunities can be found for first-time job seekers. Table 2 presents results from a regression of the proportion of emigrants aged (16-24) over the total number of emigrants from the regions over the same explanatory variables described in equation (1).

23.   The typology of regions and thus the population density seem to be the main driver for young mobility even when we introduce other characteristics related to the production structure of regions. The

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proportion of employment in agriculture enters with a negative sign in this model, probably indicating that young from communities where agricultural activities are prevalent tend to move less for pursuing higher education. The unemployment rate, as expected, tends to be a positive push factors behind migration of the young. The main results in this and the above regression are robust to the inclusion of country fixed effects (not shown). In this model for young migration, the country dummies show that there are significant disparities in the average age of migration within the OECD members. Countries where out-migration seems more delayed in the life-cycle are Italy and Spain. Cultural factors are the most likely explanation, even if, interestingly, these two countries have in common a very geographically diffuse system of higher education institutions, possibly reducing migration for education purposes.

Table 2. Selectivity of out-migration by age

VARIABLES	Model 1 Proportion of young among the emigrants	Model 2 Proportion of young among the emigrants	Model 3 Proportion of young among the emigrants
Rural	0.0789***	0.0795***	
	(-0.0039)	(-0.0044)	
Urban	-0.0182***	-0.0371***	
	(-0.00328)	(-0.0039)	
Prop. Agriculture		-0.276***	-0.597***
		(-0.037)	(-0.0501)
Prop. Manufact.		-0.127***	-0.207***
		(-0.023)	(-0.0267)
Prop Constr.		-0.956***	-1.275***
		(-0.0535)	(-0.0719)
Rural close			0.0878***
			(-0.00542)
Rural remote			0.156***
			(-0.00714)
Population	-1.54e-08***	-6.11e-09***	-2.32e-08***
	(-1.60E-09)	(-2.00E-09)	(-2.34E-09)
Population density	-1.07E-06	-7.82e-06***	-3.57e-05***
	(-1.31E-06)	(-2.09E-06)	(-3.06E-06)
Unemployment rate	0.000852***	0.000781**	0.000858*
	(-0.00026)	(-0.00035)	(-0.00048)
Elderly dep. rate	-0.00466***	-0.00342***	-0.00807***
	(-0.00022)	(-0.00024)	(-0.00037)
Year fixed effects	Yes	Yes	Yes
Constant	0.545***	0.375***	0.638***
	(-0.015)	(-0.0127)	(-0.0209)
Observations	2983	2208	1547
R-squared	0.348	0.433	0.653
Note: robust standard errors in parenthesis. *** p<0.01 ** p<0.05 * p<0.1			

Persistency of out-migration and economic drivers

24.   When we look at "fragile" regions in terms of out-migration and depopulation the typology rural/urban may not be sufficiently explanatory. While the attractiveness of the capital region in Norway explains much of the demographic and migration patterns, this is not the case for example in Canada where sector restructuring has been paralleled by a steady process of agglomeration around different urban

centres. The regional production characteristics can better profile the inter-regional mobility since mismatching of supply and demand linked to segmented markets has recently become important also within the same type of regions (Stambol 2005).

25.   The use of demographic criteria to target regional aid is increasingly common. Several of the US federal and state programs consider out-migration as an indicator of distress (Feser and Sweeney). In France, the main determinant for the attribution of package stimulus measures for rural areas is the ZRR (zone de révitalisation rurale) designation, mostly based on demographic criteria (falling active population and falling density). In Germany, regional support funding has been used to fund infrastructure in those regions experiencing demographic decline (EPRC, 2010).

26.   Data on net-migration flows can indeed help the identification of areas under serious distress and thus inform regional policy targeting. Figures on flows decomposed by age classes give in general a much more solid picture of what is the evolution of the most important asset of a region, working-age labor. Given the relatively high yearly variation in the figures on residential mobility, and the necessity to distinguish temporary and persistent distress, the net-migration figures become very valuable once one disposes of sufficiently long time series. In fact, while one or two years of negative net-migration might reflect just a phase of market adjustment and tell little about the economic performance of a region, persistent net outflows over a decade are very likely to reflect a relative decline in attractiveness, or serious distress when coupled with relative low levels of income per-capita and employment rates.

27.   The table below presents a first typology of regions according to the degree of persistency of negative net-migration during the period of observation. Regions which have experienced negative net flows in at least nine out of ten consecutive years are classified as regions with persistent out-migration (this group consists of around one-fourth of the regions in the sample). Similarly, regions with at least nine out of ten years of positive flows are referred as prevalent in-migration. We summarize a series of indicators of regional outcomes and characteristics according to this typology of persistency in migration flows in table 3.

Table 3.   Regional characteristics by degree of persistence in out-migration

Characteristics	Total regions	Never out-migration	prevalent in-migration	prevalent out-migration	persistent out-migration
% of old pop	23.77	24.72	22.93	22.84	23.57
	(6.47)	(7.59)	(6.41)	(7.18)	(6.52)
GDP per capita (US $)	22,130.40	25,714.53	24,883.46	21,591.66	18,502.42
	(8553.57)	(7471.53)	(10553.94)	(7454.39)	(7833.85)
Share of employment in agriculture	0.05	0.05	0.04	0.05	0.09
	(0.06)	(0.05)	(0.04)	(0.05)	(0.10)
Share of employment in construction	0.08	0.07	0.07	0.08	0.08
	(0.03)	(0.02)	(0.03)	(0.04)	(0.03)
Share of employment in manufacture	0.19	0.19	0.22	0.19	0.18
	(0.08)	(0.08)	(0.10)	(0.09)	(0.08)
	7.55	6.01	7.03	7.98	9.35
Unemployment rate	(4.53)	(3.10)	(3.59)	(4.86)	(6.02)
Pop density	317.05	197.79	541.66	310.98	310.17
	(1048.01)	(278.17)	(856.11)	(661.69)	(1304.73)
	0.39	0.28	0.27	0.45	0.53
Share of rural regions	(0.49)	(0.45)	(0.45)	(0.50)	(0.50)
Share of urban regions	0.28	0.28	0.45	0.24	0.18

	(0.45)	(0.45)	(0.50)	(0.42)	(0.39)
Labour productivity in agriculture	0.41 (2.30)	0.21 (1.15)	0.74 (2.30)	0.47 (2.06)	0.34 (3.60)

Standard deviations in parentheses

28.   The descriptive statistics in table 3 seem to validate the relevance of persistent negative migration as an indicator of relatively low economic performance. Regions with persistent out-migration are characterized by a certain number of characteristics commonly associated with economic distress, such as higher unemployment rate, lower GDP per capita, higher share of employment in agriculture and lower productivity in the same sector. These regions have also a higher share of old population and lower population density than regions with prevalent in-migration. Similar results hold on a longer time series for commuter zones in the United States based on IRS migration data[6]. These results show that outmigration remains localized over time and most regions experiencing net out-migration also display high rate of unemployment, suggesting that beyond the short term adjustment in the labour market, regions may struggle to improve local labour conditions and productivity if those leaving are the most talented, educated and entrepreneurial (Feser and Sweeney 2003). If out-migration leads to worsening economic conditions of certain areas, then regional policy interventions allocated on the basis of only other kinds of indicators may be poorly targeted.

29.   Future analysis on the characteristics of migrants (in terms of educational attainment, employment status, job history) would help understanding the reasons why regions with similar production conditions perform differently according to employment and mobility. Such an analysis would be extremely valuable to target regional funds and policies. A preliminary discussion on the impact of labour mobility on employment and economic conditions is presented in the next paragraph.

Distinguishing short and long run effects of labour mobility on regional outcomes

30.   If out-migration and population downsizing lead to economic distress has been a controversial topic for many years in the economics literature (Card 2009). Neoclassical growth models see migration as the way by which a region adjusts to economic shocks (Pissarides & Wadsworth 1990). According to this view, as labor flows from low income per capita regions towards high income per capita regions, migration is conducive to faster convergence across regions. On the other hand, new economic geography theories have pointed out that migration itself may impede recovery and agglomeration economies cannot occur if the younger, better educated and skilled workers move out in response to economic decline (OECD 2009c).

31.   There is increasing empirical evidence that workforce demographics are strongly correlated with productivity and output (Feyrer, 2007). The studies of the effects of labor mobility on convergence tend to either find no significant effects (Barro and Sala-i-Martin (1991)), or a negative association (migration leading to lower convergence across regions, Peeters).

32.   Besides the key argument that migration is a selective process, affecting not only the size but also the quality of the locally available labor force, other economic mechanisms might explain why in the medium-long term regions losing labor might be relatively worse-off. According to Rappaport (2005), out-migration from low income regions would lower the rate of return on capital in these regions, lower incentives to invest in capital and thus slow or even negatively affect convergence across regions. Epifani & Gancia (2005) develop a model showing that labor mobility raises unemployment rate of the host region in the short-run, but lowers it in the long-run. The immediate effect of in-migration is to increase the pool of job seekers, while out-migration lowers it. However, as soon as migrants are gradually absorbed by the

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[6] The analysis of these data is currently in progress and results will be presented in the next draft of the paper.

labor market of the host region, agglomeration forces kick in and lower local unemployment, the opposite happening in the other region.

33.	Our contribution to this debate is to explore the tightness of the link between migration and unemployment in our time-varying data for a large and diverse set of regions. As different regions have different economic capacity to adjust to similar variation in their labor force, persistent out-migration may well be a problem only for a limited set of economies, characterized by other (unobserved) structural weaknesses. We model unemployment rate in a region as a function of its value of net-migration computed with one lag (to reduce the very relevant simultaneity problems), and the other economic and demographic characteristics described above:

$$Unemp_{it} = \alpha_i + \beta Inflows_{t-1} + \gamma' X_{it} + \delta' EmpStr_{it} + \phi Old_{it} + t_t + \mu_i + \varepsilon_i \qquad (2)$$

Where μ are regional fixed effects, included in the specification of column 2, table 4.

**Table 4.	Unemployment and net-migration**

VARIABLES	Model 1 Unemployment rate	Model 2 Unemployment rate		Restricted sample Unemployment rate
Lag.net migration	-0.0273***	-0.00983**		-0.109***
	(-0.00449)	(-0.00436)		(-0.031)
Population	-3.25e-07***	-2.71E-08		-3.27e-07**
	(-3.17E-08)	(-2.09E-07)		(-1.35E-07)
% old	-0.0580***	-0.320***		-0.184***
	(-0.0125)	(-0.0397)		(-0.017)
Prop agric	23.06***	3.808		-0.271
	(-2.20E+00)	(-2.871)		(-2.782)
Prop. Manuf.	-2.388**	-14.98***		-17.49***
	(-1.129)	(-2.744)		(-1.386)
Prop. Const.	31.93***	-36.92***		14.92***
	(-3.429)	(-4.073)		(-3.478)
Density	0.000661**	0.00281**		-0.000442***
	(-0.000258)	(-0.00135)		(-1.42E-04)
Rural	-1.542***			-1.028***
	(-0.197)			(-0.248)
Urban	0.0545			0.639***
	(-0.245)			(-0.246)
GDP per capita (PPP)				-0.000425***
				(-2.86E-05)
GDP per capita* Lag.net migration				4.06e-09***
				(-1.19E-09)
Region fixed effects	No	Yes		No
Constant	8.085***	19.75***		28.14***
	(-0.563)	-1.196		-1.128
Observations	3879	3879		1633
Number of region f.e.				
R-squared	0.181	0.269		0.556
Note: robust standard errors in parenthesis. *** p<0.01 ** p<0.05 * p<0.1				

34.   We are particularly interested in exploring whether we can observe variations across our sample in the robust negative correlation between net migration inflows and unemployment rates (shown in column 1). The panel data results in column 3 controls for time-invariant structural differences across the regions. Notably, this specification allows controlling for several key variables that have little time variance and are remarkably difficult to collect for small regions, indicators of average education attainments *in primis*. The panel data model confirms the robustness of the negative link between net-population losses and employment performance.).

35.   In the third column of Table 4, we estimate the model for unemployment for a more restricted sample of regions, for which we dispose of data on GDP per capita[7]. GDP per capita is negatively correlated with unemployment, as agglomeration economies lead to both higher revenues and better functioning labor markets (Epifani & Gancia, 2005).. Importantly, the interaction term between net-migration and GDP per capita is positive and statistically significant. This simply means that negative net-migration has a reinforcing effect on the unemployment rate that is higher in low income region.

Implications for regional policies

36.   Polèse and Shearmur (2006) have argued that **"**regional decline will become an increasingly common occurrence in nations at the end of the demographic transition whose economic geographies display centre-periphery relationships. Such broad structural trends cannot be easily altered by public policy". According to this perspective of inevitable spirals of decline, regional and local development policies targeting marginal regions with population decline are not only ineffective, but are also counterproductive. In fact, geography, structural changes in the profitability of the economic base of these regions, and other exogenous forces can overwhelm even the best-conceived regional economic development strategies. The conclusion of the argument is that regional policy makers and local stakeholders in declining regions should rethink their goals, devising positive "decline strategies" adapted to a shrinking human capital base.

37.   In the current phase of redefinition of the goals of regional policy, it is very important to take a stand on how we define 'unfavorable' demographic changes, how we identify regions suffering from it and whether it is feasible and suitable countering it. The question is particularly challenging for geographically large OECD countries, with several scarcely inhabited spaces located far from sizable urban centers. Before concluding that marginal and severely depopulating regions have no other options than downgrading their development ambition (going towards 'decline strategies'), it is worthy to explore more in depth what are the strongest determinants of depopulation and what cost-efficient solutions can be advanced.

38.   There is in fact still a great uncertainty regarding instruments to counter self-reinforcing spirals of selective out-migration, human capital losses, ageing-driven decreases in labor market participation and their combined effects on productivity. In very general terms, 1) peripherality, 2) industrial specialization in traditional and declining sectors, 3) lack of climatic/location amenities, 4) poor availability and lower quality of public services are four attributes that are found in most depopulating areas. All these attributes are within the target of regional policy. Whether and to what extent depopulating remote areas deserve targeted interventions (higher unitary costs of public investments) is mostly a national political decision. However, *too fast* depopulation (and conversely, too rapid increases in the population of certain cities) of certain areas is a global objective as it poses evident social challenges. Similarly, opportunities and challenges of asymmetric ageing due to different pattern of mobility of young and old people should be

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[7] It should be noted that the results of the model in the third column are not broadly comparable with those in columns 1 and 2. The restricted sample excludes in fact United States, Canada and UK because of data unavailability.

better understood. Policy exchanges on how to best shape regional policies to account for these demographic changes need to be increased.

Box 1. Examples of regional policies targeting demographically fragile areas

Addressing peripherality and distance from large markets. The Paras project in Finland aimed at creating larger municipalities through administrative merges, both to consolidate the financial capacities of small towns and to improve access to service and diversified work opportunities. In Sweden, there is ongoing discussion concerning the creation of larger labor markets by merging administrative districts in the low densely populated North.

Revitalizing labor markets under industrial restructuring. The Western region of Ireland suffered steep population loss for a number of years. The regional governance body (WDC) concluded that difficulties in access to capital were the major constraint limiting rural entrepreneurships and innovation. It thus established the Western investment Fund to fill this equity gap by providing seed and venture capital. The Fund invested over EUR 27 million in 75 SMEs. The projects created or sustained over 1500 jobs, mainly at the graduate level and outside urban centres.

Increasing value of location amenities. The border trail Napfbergland was begun in 1997 with government support with the objective of revitalize through tourism the economy of Napf border area of Switzerland. The area's individual attractions are not considered as spectacular as those in the more mointanous regions. By creating a critical mass of attractions through the trail project leaders hope to attract visitors and market labeled products.

Ameliorating equity in access to high quality services. In northern Sweden, the e-health project uses IT solutions to improve the cost-efficiency of regional health service and ameliorate access. In France, there has been a long term policy of improving the provision of higher education in medium sized towns (ville moyennes) in order to retain more young people. The *villes moyennes* have become a destination for white collars and executives and they are now gaining more of this category of employees than they lose.

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39.   The analysis carried out in this paper points to different implications for regional policy, namely targeting demographic changes, retaining labour and upgrading skills as well as innovating public goods and local service delivery to improve living conditions and well-being. The scope for regional policy to explicitly address and monitor demographic changes has been assessed for the European Cohesion Policy (Barca, 2009). Regional policy could implement place-based actions and coordinate policy responses between different levels of government to exploit the benefits of labour mobility. In the remaining paragraph we advance for discussion some of these possible actions.

40.   Our empirical analysis pointed to *peripherality* as a key characteristic of regions losing sizable shares of young population. Peripherality implies the inability of certain areas to develop agglomeration economies due to excessive distance to large cities. The most straightforward policy solution is to reduce the "real" distance of marginal, depopulating areas, by investing in roads and other network infrastructure. However, in the short term, reducing mobility costs can increase out-migration from less attractive areas. Another policy solution often advocated is to strengthen linkages among small and medium-sized cities. Larger functional areas can be generated by the networking of more cities. Complementarities among cities in the networks would grant to people in the rural hinterlands access to urban functions and diverse employment opportunities that would usually only be offered by high-ranking cities. The development as functional areas of such networks of small cities might also change the nature of the current pattern of mobility, as people in rural areas might substitute permanent migration with commuting and migrants move to work to destinations closer to their origin dwellings.

41.   The empirical analysis developed in the previous sections has also pointed to the key role of the regional production structure is a key factor in explaining patterns of mobility. *Sector restructuring* and population adjustments go clearly hand-in-hand. The structural declines in the demand for labor in the agricultural and mining sectors are only part of the picture and several regions are expected to undergo dramatic adjustments in the future[8]. Economic diversification facilitates adjustment to shocks and reduces pressures for outmigration of the young (Alasia, 2010). More detailed disaggregation by industry could further improve our understanding of the links between industrial restructuring and migration of young and job-seekers. Efforts to diversify the local economy have been the cornerstone of many local economic development programs, and are at the core of the new OECD paradigm for regional development and of the agenda for the European Cohesion Policy.

42.   Our finding that on average there are no significant population outflows from rural areas once one controls for the production structure of the area seems to indicate that the higher availability of natural amenities might balance the lower availability of diverse employment opportunities. A clear policy issue is whether regions under distress are under-exploiting their amenity potentials, because of the clear difficulties in marketing public goods. Instruments to ensure optimal provision of amenities can take several different forms: for example, creating direct amenity markets (paying for access, user fees); creating amenity-related commodity markets ("green" markets); the buying of resources by interest groups; incentives, taxes and subsidies to providers etc. There are two main types of policy that include market-oriented economic instruments: first, policies to stimulate co-ordination between supply and demand, and, second, instruments that provide regulatory or financial incentives or disincentives to act in a particular way. Policies designed to stimulate direct co–ordination between amenity providers and beneficiaries can work either through the market or through co-operation among agents acting collectively (OECD, 2009c).

43.   Mass media have steadily integrated rural residents into the urban lifestyle. Not only are rural residents now almost instantaneously aware of what is happening in urban areas, they also aspire to live in a similar way. A side-effect of this integration in expectations is higher migration of people willing to take full advantage of the services available in metropolitan areas. Countering these patterns involves substantial fiscal redistributions, as the unitary costs of service provisions are higher in less wealthy and more remote areas, and local revenues are lower. More analysis documenting that expenditures bringing services in under-served areas indeed raise access, health and education outcomes at reasonable costs would raise the political support for such transfers. Moreover, an extended use of monitoring and evaluation procedures in assessing effectiveness of spending could be linked to systems of incentives, rewarding localities able to meet target indicators and so raising political accountability (Brezzi and Utili 2007). In the very complex analysis of the links between equitable provision of services and population retentions, a key and underexplored policy issue is represented by the optimal distribution of higher education infrastructures.

44.   A final concern for regional policies addressing labour mobility is the management of excessive growth in urban suburbs and possible deterioration of living conditions and social and environmental context. Many OECD metropolitan areas are characterized either by a center and a number of smaller cores or cities well connected to each other (multi-core metropolitan region) or by an agglomeration of medium-large cities (polycentric structure). Studying rural-urban linkages within large metropolitan areas requires reflections on the way city grows, and about how adjacent areas adjust in their social, economic and geographic integration with the urban core. The spatial distribution of employment within the urban fringe has important policy implications. Urban sprawl is likely to be less of a problem in an urban area whose suburban jobs are concentrated in sub-centers. Public transportation can more easily be designed to serve

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[8] Other industrial sectors are experiencing even more dramatic shocks. For example, areas in the Nord-East of France are experiencing sustained population losses, especially of young people, due to the closure of a large number of military bases.

sub-centers. In turn, these transport networks alleviate the physical disconnection from jobs. There is increasing evidence that such a disconnection is exacerbating unemployment and earning gaps among workers living in the periphery. Ameliorating transportation links between cities, towns and rural areas and improving marketing connections are necessary, but non-sufficient elements of a new "network approach", geared toward growth with reduced "capability gaps" across localities. The growth objective can be pursued through the externalities generated by higher cooperation among poles and larger reach of knowledge flows. It requires more lateral connections between settlements and activities in a poly-centered organization of space.

Conclusions and way forward

45.　　This paper aims to stimulate a more lively policy debate on how regional policies can address and regional economies benefit from labour mobility and demographic changes.

46.　　Our first goal has been to collect an internationally comparable dataset on inter-regional population flows that help explaining the geography of migration across OECD regions. This dataset should be further improved firstly to cover all OECD countries and secondly to investigate how the results discussed in this paper can be adapted to emerging economies.

47.　　The empirical analysis points out to the importance of the productive structure of regions for mobility patterns and to links between out-migration and economic distress. A more refined analysis on possible local labour shortage and mismatch of skills would need more information on the characteristics of migrants such as education, age, employment status.

48.　　Finally, the preliminary discussion on the implications for regional policy could be enriched and completed by some case studies, in a country or in different regions across countries, of relevant issues such as quality of local services and migration, rural-urban demographic linkages, encouraging return and circulation, attracting young and skilled population.

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