

PART I
Chapter 1

The Emerging Role of Metropolitan Regions

1.1. Introduction

Globalisation and the acceleration of international trade flows have put cities back on the stage. Today, large cities, or metropolitan regions (metro-regions), are the key loci of transnational flows and function as essential spatial nodes of the global economy to such extent that one hears talk of “a common market of metropolitan economies”. Yet, the role of large cities in economic growth and their capacity to concentrate large parts of population and economic activity across national territories are not a new phenomenon. Memphis, Alexandria, Athens and Rome were the eyes of civilisation, education and power for thousands of years. The 19th century industrial revolution also asserted the role of large cities, especially trading ports. However, the acceleration of urbanisation along with globalisation and the international division of labour has reshaped the size of the metropolitan areas and their evolving nature:

- *From a spatial perspective*, urban areas tend to grow through outward expansion at progressively lower densities, meaning that the size of a metro-region in square kilometres is increasing faster than its population. This is happening, for example, in at least Chicago, London, Paris, Seoul and Tokyo among the OECD metro-regions. Moreover, suburbanisation and urban sprawl, along with the emergence of urban networks, has led to an increase of commuting flows, shaping the development of transport infrastructure and allowing for the pooling of a self-contained labour market.
- *From an economic perspective*, large cities have evolved from an urban form based on the production of manufacturing products to a larger area based on a myriad of activities. The former model meant horizontally integrated production systems that concentrated production and employment in a single centre; it also meant a process of suburbanisation aided by the development of transport infrastructure. The latter is rather characterised by a more diversified economic basis requiring highly specialised skills and an innovation capacity fuelled by a cross-fertilisation of ideas. Core-periphery commuting flows and distribution of goods has led to the emergence of a strong and dynamic service sector not only for consumers, but also for businesses.

The growing economic and demographic importance of metro-regions and their increasing relations to the world trade system raises important

policy issues. Is it the case that these areas confer economic advantages, such that firms that are not located within them will be at a disadvantage? If so, does this mean that policy makers should encourage the formation of such agglomerations? Or are they merely the consequences of successful growth rather than its cause? In cases where growth and innovation are concentrated in a small number of metro-regions, do other parts of the country gain from spill-over effects, or are they denuded of resources that they might have used themselves for autonomous development, and becoming dependent on fiscal support made possible through the wealth of the metro-regions? Do overall national economies gain or lose from the presence of metro-regions? These issues are made more difficult and pressing by the fact that large concentrations of population and economic activities are associated with certain negative externalities, such as congestion, pollution, social segregation or high crime rates. These impose economic and other costs that have to be set against any advantages. Whether they are encouraged or discouraged, or simply accepted as irreversible facts of life, metro-regions present major challenges of urban governance and financial management. Based on the work conducted by the OECD Directorate of Public Governance and Territorial Development, in particular from the series of *OECD Territorial Reviews*, this chapter attempts to define the phenomenon, draw out key trends and factors of growth and competitiveness, and identify some major dilemmas for policy-makers.

1.2. Defining metropolitan areas

Metropolitan regions are generally identified as large concentrations of population and economic activity that constitute functional economic areas, typically covering a number of local government authorities. An economic area in this sense denotes a geographical space within which a number of economic links are concentrated: most obviously labour markets, but also networks of firms, important parts of supply chains, and relations between firms and local authorities. Within this framework, it is possible to distinguish different types of metropolitan regions according to their population distribution and existing internal links and flows. The first model is the *mono-centric metropolitan region*, in its strict definition, with a single dominant core and its hinterland of towns and rural areas. However, many of those regions have grown to become *mono-centric metropolitan regions with smaller multiple nuclei*, which in addition to a dominant core, have a number of separate cities within reasonable proximity and well connected to each other. Among this category are such metropolitan areas as Stuttgart, London and Seoul. In contrast, a number of urban areas close to each other grew over the years to become an urban network, comprising built-up or urbanised territory, thereby called *polynuclear or polycentric metropolitan regions*. This last category includes

metropolitan regions such as the Randstad-Holland in the Netherlands comprising the four largest Dutch cities (Amsterdam, Rotterdam, The Hague and Utrecht), or the Rhine-Ruhr metro-region in Germany that encompasses important cities such as Bonn, Cologne, Dortmund, Düsseldorf and Essen (Box 1.1). In addition, within these different categories are *mega-cities* characterised by huge concentration of population, often found in cities that

Box 1.1. The concept of polycentric metropolitan areas

Polycentric urban regions are often defined as collections of historically distinct and both administratively and politically independent cities located in close proximity, well connected through infrastructure, commuting and business linkages and clustered together as a single economic functional area (Kloosterman and Lambregts, 2001). One of the important characteristics of these polycentric regions is that they usually have no dominant central city; instead there will be several city centres, the larger of which do not differ significantly in terms of size or overall economic and political importance. The notion of polycentricity derives its meaning from the patterns and dynamics of functional interrelations and cooperation (versus competition) between these centres. According to the EU/ESPON analysis, polycentricity has three interrelated dimensions. First, a *morphological dimension*: the geographical distribution of physical development and activity across a network; second, *socio-economic relations and flows*: the sharing and movement among the network including labour, services, knowledge and social capital; and third, *governance*: the presence of interconnected institutional arrangements, including organisations, procedures and instruments (ESPON, 2005).

Polycentricity then refers both to the morphology of urban areas, structured around several urban nodes, and to the existence of functional relationships (in terms of commuting flows, industrial and business relationships, forms of co-operation, or through divisions of labour) between the cities of such regions. However, as the literature on polycentric urban regions is still limited and therefore rather unconsolidated (Bailey and Turok, 2001), a diversity of concepts are applied, which are largely synonymous with the polycentric urban region concept. Recent examples include “multicore city-regions” (Westin and Osthol, 1994), “network cities” (Batten, 1995), “city networks” (Camagni and Salone, 1993) and “polynucleated metropolitan regions” (Dieleman and Faludi, 1998). Moreover, in terms of ideas on spatial structure and inter-urban relationships, the polycentric urban region concept builds on older concepts such as the “dispersed city” (Burton, 1963), “megalopolis” (Gottmann, 1961) or the idea of the “regional city” (Stein 1964 in Evert Meijers, 2005).

have recently experienced strong population growth such as Mexico City, Seoul or Istanbul that have attracted large-scale internal migration. In a mid-1980s study, the United Nations set the threshold size of a mega-city at a population of 8 million and later raised it to 10 million (United Nations, 1998).

Several methodologies have been developed to define functional metropolitan regions. While national definitions of a metro-region differ, they typically identify a core area with a significant concentration of employment or population and a surrounding area densely populated and closely linked to the core (Appendix 1). They therefore employ at least one of three criteria: large size (in terms of either employment or population); high population density; and higher commuting within the region than between it and other surrounding areas. The European Union through the Urban Audit has proposed a definition of Larger Urban Zones for all European countries based on commuting flows¹. Similar to national statistical offices, scholars have used different approaches for identifying metropolitan areas. Merriman, Ohkawara and Suzuki (1995) use commuting flows and time to define Tokyo's metropolitan regions, whereas Simmie, Sennett and Wood (2002) used administrative boundaries to define London's metro-region. Dümmler and Thierstein (2002) use the metro-region's functional roles such as innovation, nodal and regulation or institutional role to define a Zurich metropolitan region. These different approaches can be summarised in five groups based on: administrative or legal boundaries, housing markets, economic activity, services provision, and labour markets. Metro-regions can also be selected on the basis of a certain critical mass that make them important as economic, social and transport centres within a national state.

Whether metro-regions are mono-centric (in the strict sense or with multiple nuclei), polycentric or mega-cities, commuting flows and the labour market are important factors behind the definition that has been developed for the purpose of this publication (Box 1.2). On the one hand, commuting flows take place between the suburbs and the core in mono-centric metro-regions. On the other hand, some suburbs around the various cities that were formerly largely residential in character, mainly dependent upon the core of the metropolitan areas to which they were attached, have ceased to be "dormitories" and have developed their own productive activities. Commuting no longer solely takes the form of journeys in and out of a central city, but many people travel between smaller cities and suburbs. In any case, commuting is at the heart of a metropolitan region as it brings together firms and workers through transport and telecommunications infrastructure.

Bearing in mind these concepts and the large diversity of metropolitan areas within the OECD area, this report has selected 78 metro-regions with a threshold of 1.5 million inhabitants (Appendix 2). This Metropolitan database allows us to make some inferences about the position of one particular metro-region with

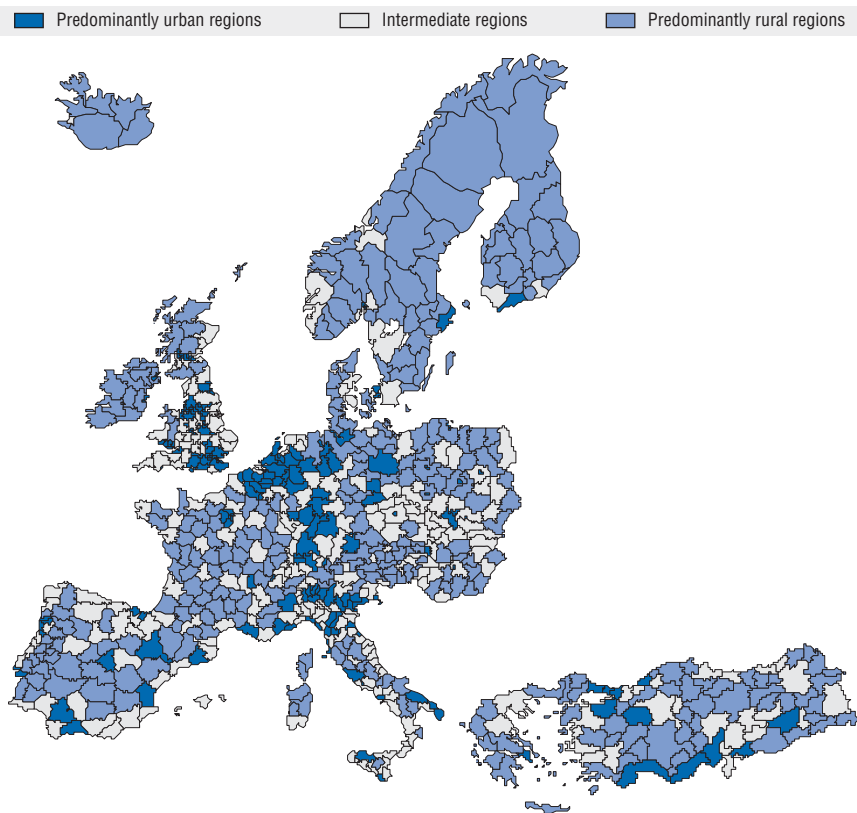
Box 1.2. OECD metropolitan regions: data and definition

For the purpose of this publication, the OECD has used a methodology to gather and analyse metropolitan data (Appendix 2). The Metropolitan database is based on four criteria. The first criterion is based on population size and a threshold of 1.5 million people is set to consider the region as metropolitan. Second, the density of population should exceed a critical value set at 150 people per km². These types of regions are considered as predominantly urban; therefore, it is not only important to be a region with a large population, but it is also necessary that they concentrate in a particular place thereby accounting for higher density rates. Third, it is also fundamental that these regions with large and dense populations constituting urban areas represent a contained labour market. In order to define labour markets, commuting flows are used to calculate net migration rates. Predominantly urban areas at Territorial Level 3 have been selected and a process of adding and eliminating neighbouring regions based on net commuting rates has been carried out as indicated in Appendix 2. Hence, metro-regions among predominantly urban areas (large and densely populated) are those for which the net commuting rate does not exceed 10% of the resident population. The fourth criterion has been set to include a small number of important cities in their national context. Therefore, the database also includes cities with less than 1.5 million people, but that account for more than 20% of their national population; in this event this means just one city, Auckland (Luxembourg and Reykjavik have been left out as they are extreme cases that represent outliers in many of our rankings).

There are a number of cities that have been included in the sample of 78 metro-regions that were over or under-estimated. For instance, London has been defined as a metro-region considerably smaller than the actual commuting zone around the city. Since data at the appropriate level (TL4) are not available for the surrounding regions of Greater London, the alternative would have been to largely over-estimate the metro-region using entire counties such as Essex, Kent or Oxfordshire among others to account for a part of these regions that may be argued to constitute part of London's labour market based on commuting patterns. In contrast, Busan has been slightly overestimated by taking into account the entire regions of Ulsan and Gyeongsangnam-do, large parts of which are effectively conurbated. Similarly, it could be argued that Milan and Zurich have also been overestimated. However, commuting flows and their net rates for Busan and Milan support our definition. Zurich along with the Turkish cities (Ankara, Istanbul and Izmir) were not defined using net commuting rates as flows are not available for them; instead the definition relies on previous studies as they are referenced in Appendix 2. Finally, Canadian, Mexican and US cities are already defined by their national authorities and data have been calculated using the corresponding statistical information accordingly. Although the database is supported by a solid methodology and makes extensive use of previous studies and definitions, there are caveats to bear in mind, particularly in the cases of Busan and London.

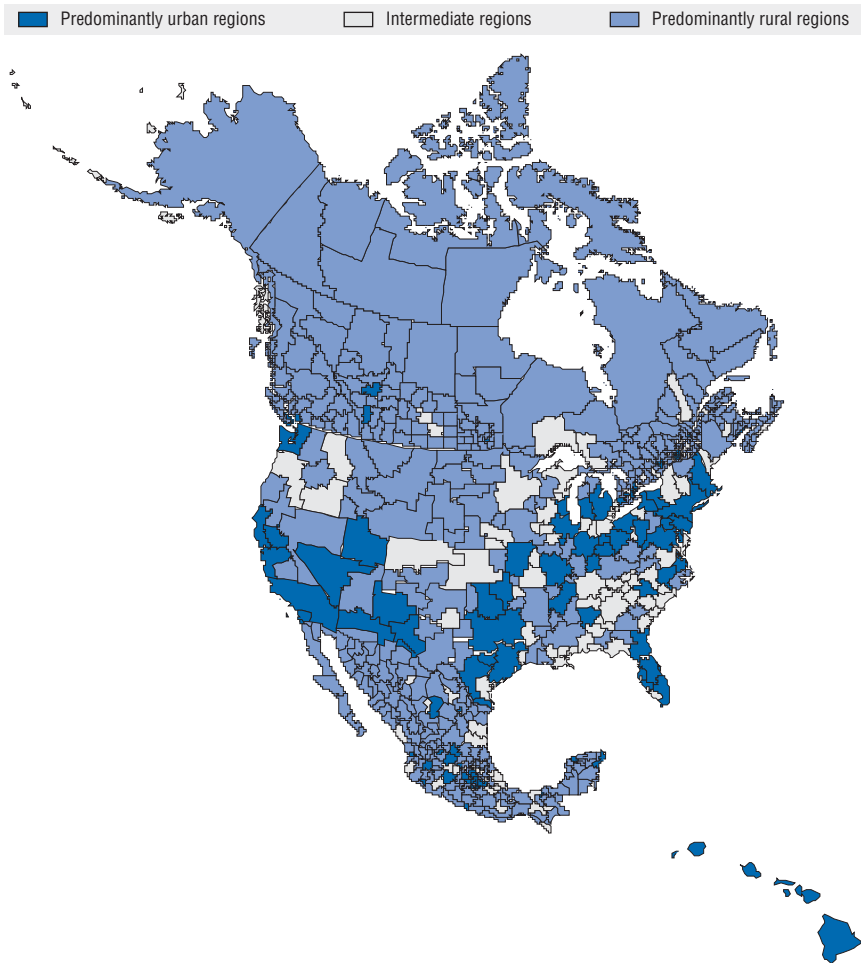
respect to the others or to the average, as well as to explore key issues concerning metro-regions such as the relationship between urban growth (in terms of population) and income (in terms of per capita GDP), ageing and dependency, the importance of capital cities, productivity and the contribution of metro-regions to their national economies. However, because of the limited data that are collected at this level, for some specific and key issues, we will also resort to the OECD Regional Database that provides data at the territorial level 3 (TL3 level)² and its regional typology (Appendix 2). According to the criteria of population density, the regional typology distinguishes among predominantly rural (PR), intermediate (IN) and predominantly urban (PU) areas (Figures 1.1, 1.2 and 1.3)³. Metro-regions are major examples of the last of these categories, except that some intermediate areas may be included within a metro-region, while many predominantly urban areas lie outside metro-regions.

Figure 1.1. **OECD regional typology (Europe)**



Source: OECD (2005g), *Regions at a Glance 2005*, OECD publications, Paris, France.

Figure 1.2. OECD regional typology (North America)

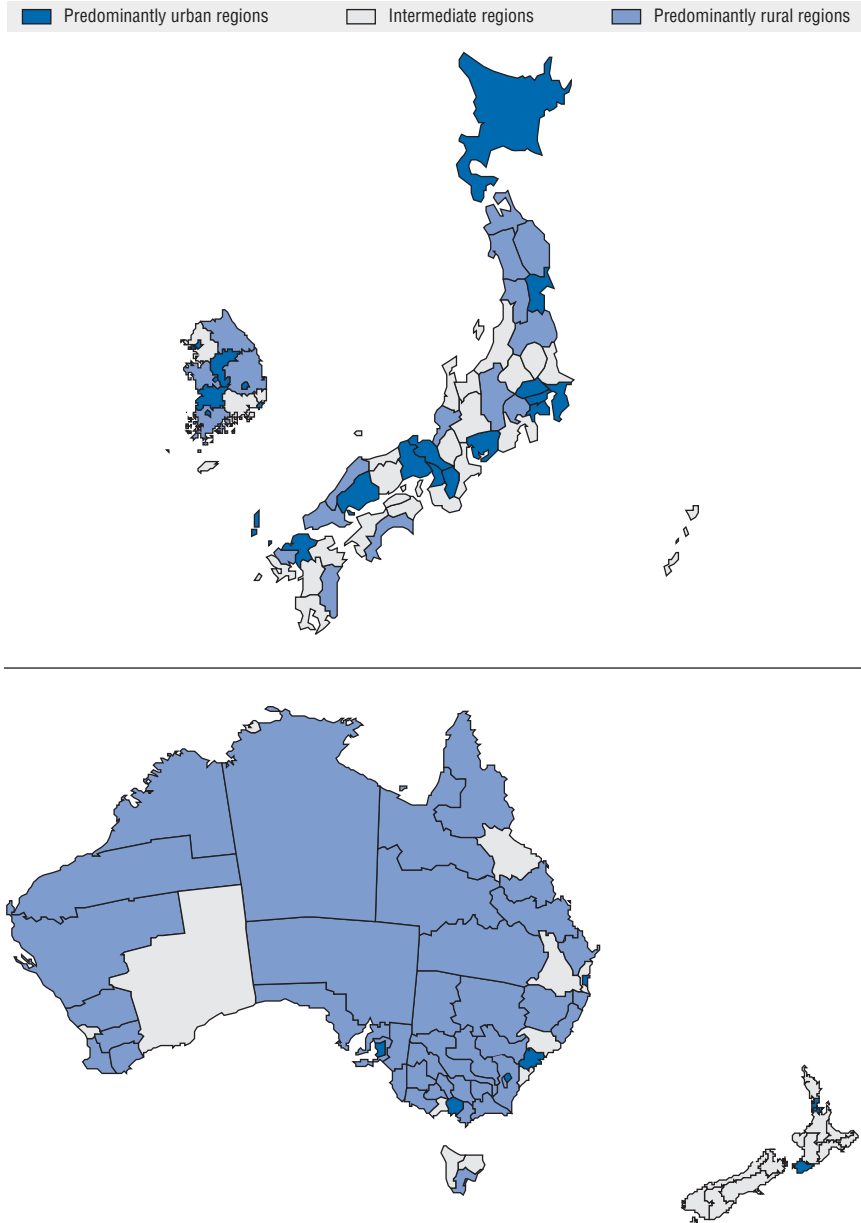


Source: OECD (2005g), *Regions at a Glance 2005*, OECD publications, Paris, France.

1.3. Urbanisation trends

Urbanisation is a worldwide phenomenon and a well advanced process within the OECD. By 2007, the world will have more urban residents than rural residents for the first time in history (United Nations, 2003) (Figure 1.4). This has already been the case in most OECD countries. Over the last 20 years agglomeration economies, migration and many other socio-economic factors have led people in OECD countries to increasingly choose to live in urban settings. On average, more than half of the total OECD population (53%) live in predominantly urban regions and the number rises to almost 80% if intermediate regions that include other less densely populated urban areas

Figure 1.3. OECD regional typology (Asia and Oceania)



Source: OECD (2005g), *Regions at a Glance 2005*, OECD publications, Paris, France.

Table 1.1. **Metropolitan database**
Ranking by GDP per capita

Rank	Metropolitan region	Country	Population (millions)	GDP pc in PPPs (thousand USD)	Share of nat. GDP %	Activity rate %	Employment rate %	Labour productivity (thousand USD)	% Difference in (compared to average)			Differences in GDP pc explained by (%)		
									Labour productivity	Employment rate	Activity rate	Productivity	Employment rate	Activity rate
1	San Francisco	USA	4.2	62.3	2.2	49.38	95.6	132.1	77.8	2.1	1.0	57.6	2.1	1.0
2	Washington	USA	5.1	61.6	2.7	57.32	96.9	110.9	49.3	3.5	17.2	40.1	3.4	15.9
3	Boston	USA	4.4	58.0	2.2	38.87	95.3	156.6	110.8	1.8	-20.5	74.6	1.8	-23.0
4	Seattle	USA	3.2	54.4	1.5	52.55	95.5	108.4	45.9	2.0	7.5	37.8	2.0	7.2
5	Minneapolis	USA	3.1	53.0	1.4	58.35	95.6	94.9	27.8	2.1	19.3	24.5	2.1	17.7
6	New York	USA	18.7	52.8	8.5	46.69	94.9	119.2	60.5	1.3	-4.5	47.3	1.3	-4.6
7	Denver	USA	2.3	50.8	1.0	52.90	94.7	101.4	36.5	1.1	8.2	31.1	1.1	7.9
8	Philadelphia	USA	5.8	50.5	2.5	49.69	95.3	106.6	43.5	1.8	1.6	36.1	1.8	1.6
9	Dallas	USA	5.7	50.1	2.4	49.83	95.0	105.8	42.4	1.4	1.9	35.4	1.4	1.9
10	Atlanta	USA	4.7	47.8	1.9	50.66	95.1	99.2	33.5	1.6	3.6	28.9	1.5	3.5
11	Houston	USA	5.2	47.4	2.1	46.82	94.4	107.3	44.4	0.8	-4.2	36.8	0.8	-4.3
12	San Diego	USA	2.9	46.8	1.2	44.78	96.0	108.8	46.4	2.5	-8.4	38.1	2.5	-8.8
13	London	UK	7.4	46.2	19.9	48.48	92.8	102.7	42.4	-0.9	-0.8	35.3	-0.9	-0.9
14	Chicago	USA	9.4	45.6	3.7	49.80	94.4	97.0	30.6	0.8	1.8	26.7	0.8	1.8
15	Los Angeles	USA	12.9	45.3	5.0	44.37	95.1	107.5	44.7	1.6	-9.3	36.9	1.5	-9.7
16	Detroit	USA	4.5	44.0	1.7	49.36	92.4	96.6	30.0	-1.3	0.9	26.2	-1.3	0.9
17	Baltimore	USA	2.6	43.3	1.0	50.04	95.7	90.5	21.8	2.2	2.3	19.7	2.2	2.3
18	Paris	France	11.2	42.7	27.9	46.13	90.7	102.0	37.3	-3.1	-5.7	31.7	-3.2	-5.8
19	Cleveland	USA	2.1	42.2	0.8	53.26	94.2	84.1	13.2	0.6	8.9	12.4	0.6	8.5
20	Portland	USA	2.1	41.8	0.7	48.83	94.7	90.5	21.8	1.1	-0.1	19.7	1.1	-0.1
21	St. Louis	USA	2.8	40.9	1.0	50.63	94.5	85.4	14.9	0.9	3.5	13.9	0.9	3.5
22	Phoenix	USA	3.7	39.9	1.3	47.45	95.5	88.1	18.7	2.0	-3.0	17.1	2.0	-3.0
23	Dublin	Ireland	1.6	38.9	47.6	50.87	95.9	79.7	7.3	2.4	4.0	7.0	2.4	3.9
24	Pittsburgh	USA	2.4	38.6	0.8	61.07	94.1	67.1	-9.6	0.4	24.9	-10.1	0.4	22.2
25	Tampa Bay	USA	2.6	37.8	0.8	49.35	96.8	79.2	6.6	3.4	0.9	6.4	3.3	0.9
26	Vienna	Austria	2.2	37.6	33.7	49.26	92.4	82.6	11.2	-1.3	0.7	10.6	-1.3	0.7
27	Miami	USA	5.4	37.2	1.7	44.32	96.7	86.9	17.0	3.3	-9.4	15.7	3.2	-9.8
28	Stockholm	Sweden	2.2	36.7	31.5	54.27	94.3	71.7	-3.5	0.7	11.0	-3.5	0.7	10.4
29	Stuttgart	Germany	2.7	36.4	4.3	53.21	94.1	72.6	-2.2	0.5	8.8	-2.3	0.5	8.4
30	Milan	Italy	7.4	35.6	17.2	47.96	95.8	77.5	4.3	2.2	-1.9	4.2	2.2	-1.9
31	Lyon	France	1.6	35.2	3.4	43.26	90.9	89.6	20.6	-3.0	-11.5	18.8	-3.0	-12.3
32	Munich	Germany	6.1	35.2	9.6	52.74	94.6	70.6	-5.0	1.0	7.9	-5.2	1.0	7.6

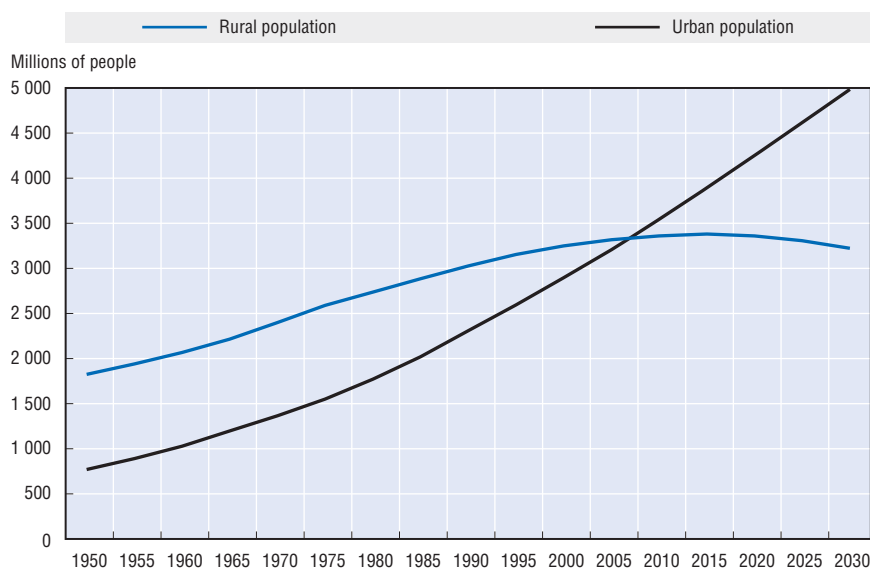
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									Labour productivity	Employment rate	Activity rate	Productivity	Employment rate	Activity rate
33	Oslo	Norway	1.7	35.0	36.5	53.44	95.7	68.5	-7.7	2.2	9.3	-8.1	2.1	8.9
34	Sydney	Australia	4.2	35.0	23.5	52.15	95.3	70.5	-5.1	1.7	6.6	-5.2	1.7	6.4
35	Brussels	Belgium	3.8	35.0	44.4	45.07	91.9	84.4	13.6	-1.8	-7.8	12.8	-1.8	-8.2
36	Toronto	Canada	4.7	34.9	17.7	63.44	93.0	59.1	-20.4	-0.7	29.7	-22.9	-0.7	26.0
37	Helsinki	Finland	1.8	34.0	42.1	53.54	93.2	68.1	-8.4	-0.4	9.5	-8.8	-0.4	9.1
38	Frankfurt	Germany	5.6	33.6	8.3	48.57	92.7	74.6	0.4	-1.0	-0.7	0.4	-1.0	-0.7
39	Copenhagen	Denmark	2.4	33.5	49.5	54.06	94.9	65.3	-12.1	1.4	10.6	-12.9	1.4	10.0
40	Zurich	Switzerland	2.5	33.4	33.1	50.19	97.7	68.1	-8.4	4.3	2.6	-8.7	4.2	2.6
41	Rome	Italy	3.7	33.1	8.1	44.77	92.5	79.9	7.6	-1.2	-8.5	7.3	-1.2	-8.8
42	Randstad-Holland	Netherlands	7.5	32.9	51.3	53.17	95.5	64.7	-12.8	2.0	8.7	-13.7	2.0	8.4
43	Melbourne	Australia	3.6	32.7	18.6	52.49	94.6	65.9	-11.3	1.0	7.4	-12.0	1.0	7.1
44	Vancouver	Canada	2.0	32.0	6.9	61.70	94.3	55.0	-26.0	0.7	26.2	-30.1	0.7	23.3
45	Turin	Italy	2.2	32.0	4.6	44.00	93.9	77.4	4.2	0.3	-10.0	4.1	0.3	-10.6
46	Auckland	New Zealand	1.2	31.2	36.1	55.16	96.2	58.8	-20.9	2.7	12.8	-23.4	2.7	12.0
47	Hamburg	Germany	4.6	30.9	6.4	44.74	90.7	76.1	2.5	-3.1	-8.5	2.5	-3.2	-8.9
48	Tokyo	Japan	34.2	29.3	30.4	51.92	95.2	59.3	-20.2	1.7	6.2	-22.5	1.7	6.0
49	Montreal	Canada	3.4	29.1	10.8	58.29	91.3	54.8	-26.3	-2.5	19.2	-30.5	-2.5	17.6
50	Madrid	Spain	5.6	29.0	16.7	51.42	93.3	60.5	-18.5	-0.4	5.2	-20.5	-0.4	5.0
51	Aichi	Japan	9.1	28.9	7.9	53.10	96.0	56.6	-23.8	2.5	8.6	-27.1	2.5	8.2
52	Birmingham	UK	2.6	27.8	4.2	45.30	93.2	65.7	-8.9	-0.4	-7.4	-9.3	-0.4	-7.6
53	Leeds	UK	2.1	27.5	3.4	48.25	95.5	59.6	-17.3	1.9	-1.3	-19.0	1.9	-1.3
54	Rhine-Ruhr	Germany	13.4	27.4	16.4	45.03	90.2	67.4	-9.2	-3.7	-7.9	-9.7	-3.7	-8.2
55	Lisbon	Portugal	2.7	27.1	37.9	50.96	92.4	57.6	-22.4	-1.3	4.2	-25.4	-1.3	4.1
56	Osaka	Japan	17.0	26.8	13.8	50.04	93.9	57.1	-23.1	0.2	2.3	-26.2	0.2	2.3
57	Manchester	UK	2.5	26.6	3.9	46.23	95.6	60.2	-16.6	2.0	-5.5	-18.1	2.0	-5.6
58	Barcelona	Spain	4.9	26.0	13.1	51.71	89.6	56.1	-24.5	-4.3	5.7	-28.1	-4.4	5.6
59	Prague	Czech Republic	2.3	25.6	34.7	52.33	95.4	51.4	-30.8	1.8	7.0	-36.9	1.8	6.8
60	Lille	France	2.6	23.7	3.6	46.10	87.3	59.0	-20.6	-6.8	-5.7	-23.0	-7.1	-5.9
61	Budapest	Hungary	2.8	23.5	45.6	45.43	95.5	54.3	-26.9	2.0	-7.1	-31.4	2.0	-7.4
62	Warsaw	Poland	3.0	23.1	16.2	43.01	88.5	60.7	-18.3	-5.5	-12.0	-20.2	-5.7	-12.8
63	Fukuoka	Japan	5.1	22.3	3.4	48.79	94.1	48.5	-34.7	0.5	-0.2	-42.6	0.5	-0.2

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									Labour productivity	Employment rate	Activity rate	Productivity	Employment rate	Activity rate
64	Valencia	Spain	2.3	22.2	5.2	50.12	89.3	49.6	-33.2	-4.7	2.5	-40.3	-4.8	2.5
65	Busan	Korea	7.9	21.9	18.9	46.59	96.5	48.7	-34.4	3.1	-4.7	-42.2	3.0	-4.8
66	Berlin	Germany	6.0	21.3	5.7	51.91	81.6	50.2	-32.4	-12.9	6.2	-39.2	-13.8	6.0
67	Athens	Greece	3.9	20.1	37.6	45.17	90.9	48.9	-34.1	-2.9	-7.6	-41.8	-3.0	-7.9
68	Seoul	Korea	23.5	19.1	48.6	48.35	95.8	41.1	-44.6	2.3	-1.1	-59.1	2.3	-1.1
69	Monterrey	Mexico	3.2	19.0	6.1	41.08	98.8	46.8	-37.0	5.5	-16.0	-46.1	5.4	-17.4
70	Naples	Italy	3.1	17.1	3.4	36.32	81.1	58.0	-21.9	-13.4	-25.7	-24.7	-14.3	-29.7
71	Mexico City	Mexico	18.4	14.3	26.7	39.21	98.3	37.0	-50.2	5.0	-19.8	-69.8	4.9	-22.1
72	Guadalajara	Mexico	3.5	13.4	4.8	42.73	98.9	31.8	-57.2	5.6	-12.6	-84.9	5.5	-13.5
73	Puebla	Mexico	2.1	13.1	2.8	39.54	98.5	33.7	-54.6	5.2	-19.1	-78.9	5.1	-21.3
74	Daegu	Korea	2.5	12.3	3.4	48.20	95.8	26.6	-64.2	2.3	-1.4	-102.7	2.2	-1.4
75	Krakow	Poland	2.1	11.2	5.6	46.42	83.7	28.8	-61.2	-10.7	-5.1	-94.7	-11.3	-5.2
76	Istanbul	Turkey	11.4	10.9	27.1	40.42	87.9	30.7	-58.6	-6.2	-17.3	-88.3	-6.3	-19.0
77	Izmir	Turkey	3.4	10.0	7.3	42.61	89.2	26.2	-64.7	-4.8	-12.9	-104.3	-4.9	-13.8
78	Ankara	Turkey	4.0	9.6	8.3	38.63	89.0	27.8	-62.6	-4.9	-21.0	-98.4	-5.0	-23.6

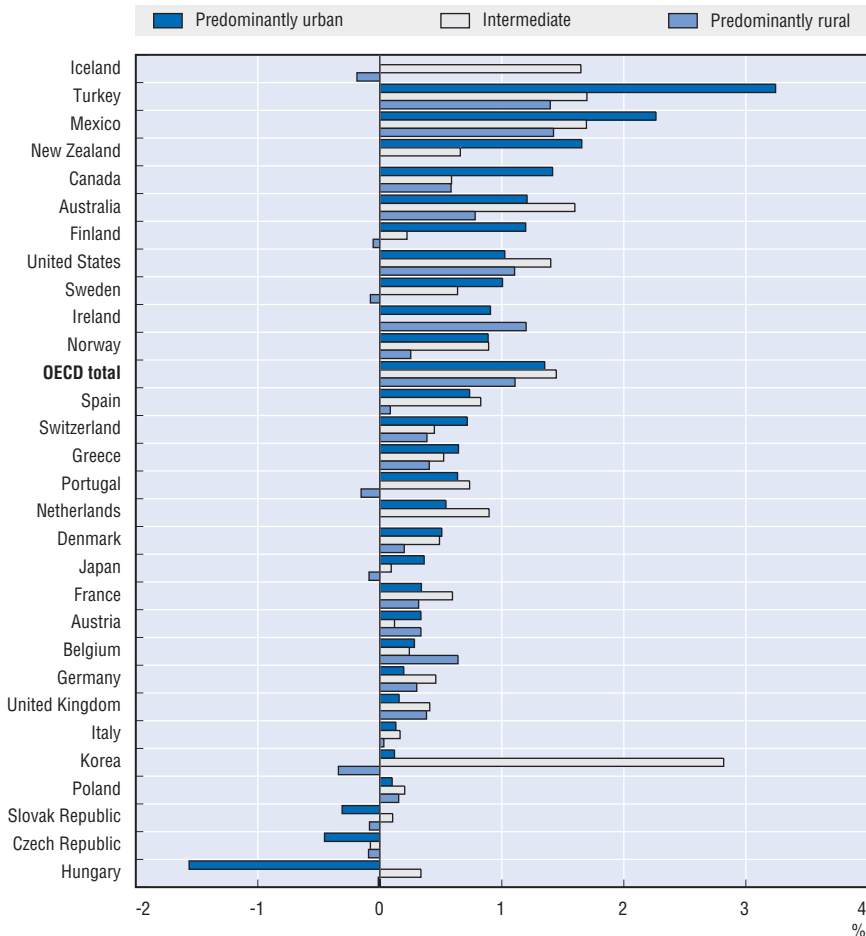
Note: This ranking by GDP per capita should be interpreted carefully. As mentioned in Box 1.2, due to data availability, there are a number of cities that have been included in the sample of 78 metro-regions that were over or under-estimated.

Figure 1.4. **Worldwide population projections (1950-2030)**

Source: United Nations (2004), "World Urbanization Prospects: The 2003 Revision", Department of Economic and Social Affairs, Population Division, www.un.org/esa/population/publications/wup2003/WUP2003.htm.

are taken into account. The level of urbanisation however varies among countries. In the Netherlands (85 %), Belgium (83%), the United Kingdom (69%), the United States (67%), Germany (62%), Japan (59%), Australia (55%), Korea (53%), Canada (53%), Italy (52%) and Portugal (51%), urban regions account for most of the national population. Less urbanised countries include Sweden, Norway, Turkey, Poland, Finland, Ireland, and Austria (OECD, 2005g).

Urbanisation growth is still ongoing throughout the OECD but at different rates. According to the United Nations, the world's urban population estimated at 3 billion in 2003, is expected to rise to 5 billion by 2030. Although much of this projected growth will occur in less developing countries, the already high concentration of the population in OECD urban regions is likely to be reinforced (United Nations, 2004). The OECD total population living in predominantly urban regions grew by around 1.4% over the period 1990-2000, with a similar growth rate for intermediate regions (1.4%) and a lower one (1.1%) for predominantly rural regions (Figure 1.5). In some countries, the share of people living in urban areas has continued to increase, in some cases as result of population density in intermediate regions rising until they become fully urban (especially in Japan and Italy, but also in Belgium and Canada). Within OECD countries, average annual population growth among urban regions varies from 3.2% in Turkey to -1.6% in Hungary (Figure 1.6). Population growth in urban areas has been notable in Turkey and Mexico

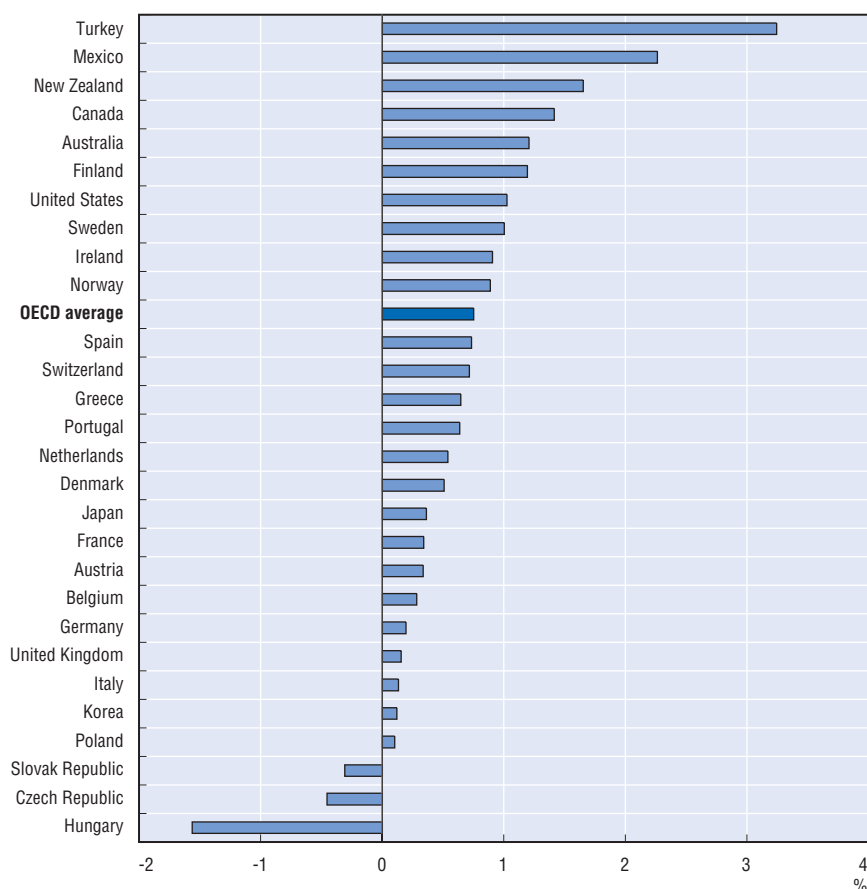
Figure 1.5. **Population growth according to the types of regions (1990-2000)**

Source: OECD (2005g), *Regions at a Glance 2005*, OECD publications, Paris, France.

where demographic transition and rural-urban migration are still ongoing. Growth of urban areas has also been important in New Zealand, Canada and Australia, a trend fuelled by international migration. In contrast, low-growth rates in urbanisation have been experienced in Austria, Belgium (already highly urbanised) and Denmark and even negative rates in some Eastern European countries such as the Czech Republic, the Slovak Republic and Hungary, probably due to international out-migration. Although the average distribution of the total population among the three types of regions within the OECD area has been quite stable over the period 1990-2000 (Figure 1.7), in some regions the rate of urbanisation has been much higher, suggesting that population in member countries is likely to become even more concentrated

Figure 1.6. Urbanisation growth in OECD countries

Average annual growth in population in predominantly urban areas (1980-2004)

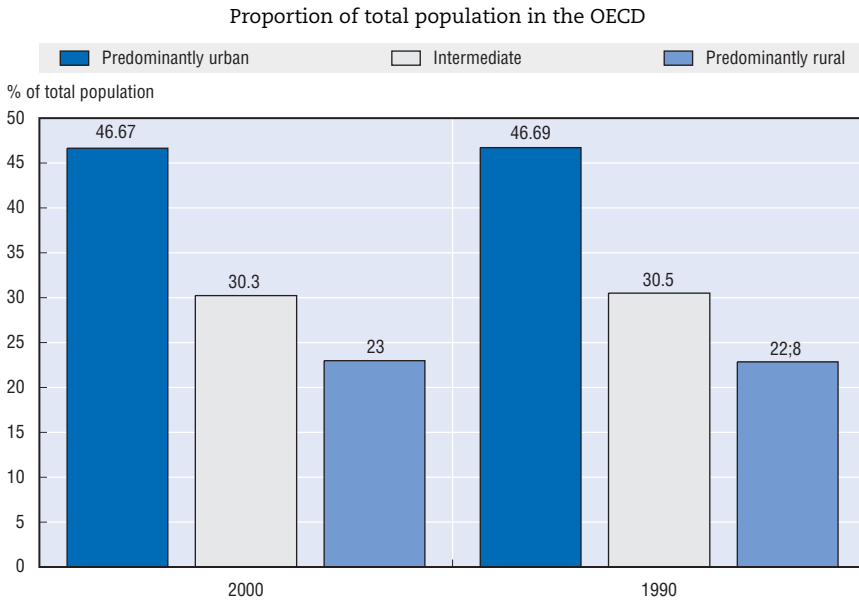


Source: OECD (2005g), *Regions at a Glance 2005*, OECD publications, Paris, France.

over the coming years. These patterns raise important issues about the long-term sustainability of increasing concentration in urban regions – where congestion due to high population density is already considerable – and depopulation of rural areas, where the small size of communities makes the provision of basic services increasingly costly (OECD, 2005g).

The acceleration of urbanisation along with increasing trade flows among cities have led to the emergence of metro-regions. The OECD has taken into account 78 metro-regions with 1.5 million and more inhabitants. The size of the metro-regions varies widely among countries from small, growing, mono-centric metro-regions in Europe (Dublin and Helsinki with less than 2 million inhabitants) to mega-cities in Asia such as Tokyo (34) and Seoul (23.5),

Figure 1.7. **Distribution of the total population among types of regions (1990 and 2000)**



Source: OECD (2005g), *Regions at a Glance 2005*, OECD publications, Paris, France.

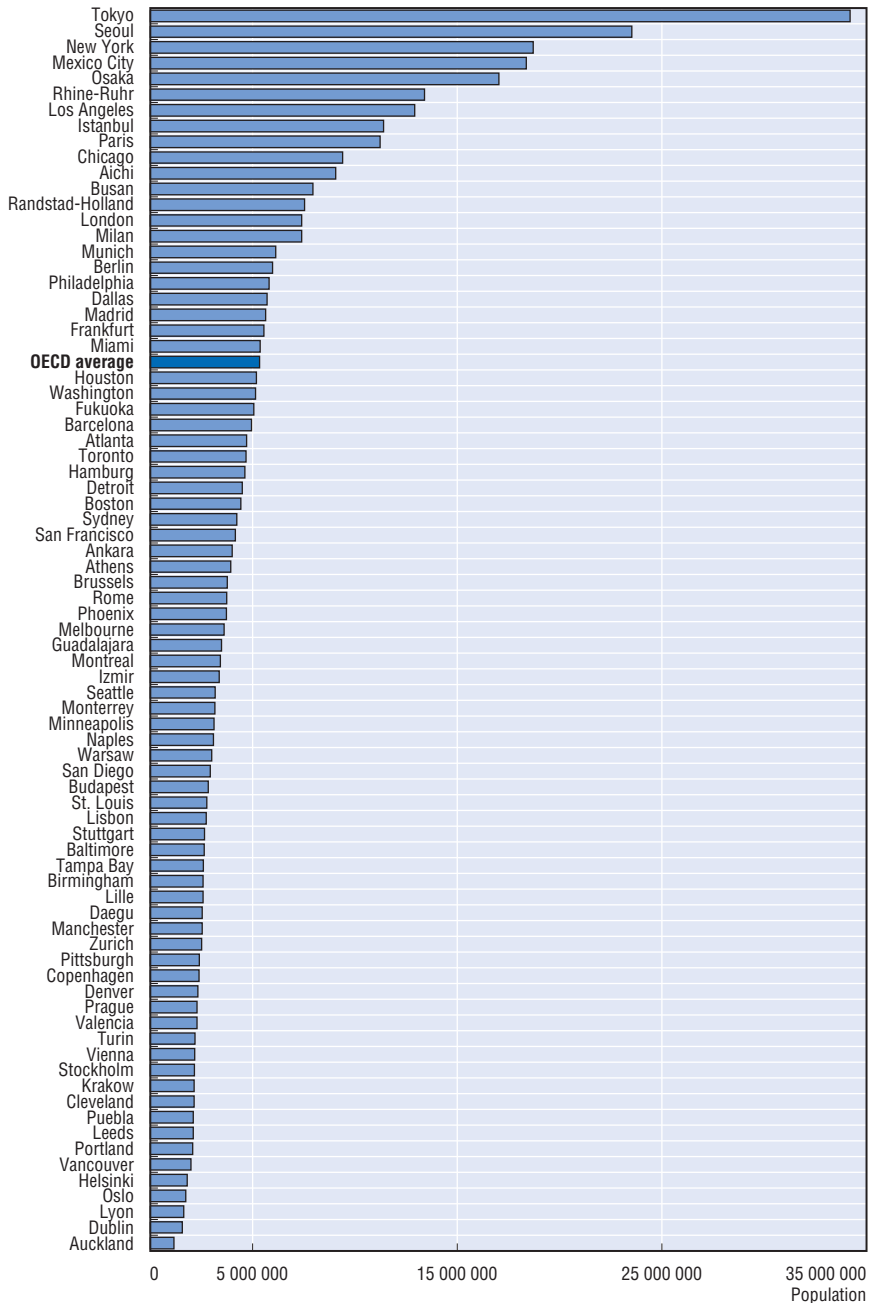
and in North America like New York (18.7) and Mexico City (18.4). Some other European metro-regions also largely outstrip the OECD average (around 5 million people) such as Rhine-Ruhr (13.4), Istanbul (11.4), Paris (11.2), Randstad-Holland (7.5), London (7.4) and Milan (7.4) (Figure 1.8). Based on simple graphic observation of their size, it is possible to identify three groups of cities:

- Small metro-regions with 1.5 to 3 million people with Dublin and Helsinki as examples.
- Medium to large metro-regions with 3 to 7 million people such as Atlanta, Melbourne and Montreal.
- Mega-cities of over 7 million people mentioned above as dominating the ranking.⁴

Metropolisation is the result of several processes among which are urbanisation, suburbanisation, migration, centripetal forces and linkages amid polycentric regions. The process of urbanisation and suburbanisation particularly in the US cities – but also a feature in others – has continued, spurred by agglomeration economies. The massive agglomerations in Japan are nothing new; however, it is important to highlight the fact they have grown in spite of congestion costs, perhaps since centripetal forces bringing firms and workers together are still stronger than any diseconomy of scale. In

Figure 1.8. **Ranking of metro-regions by population size**

OECD sample of 78 metro-regions



Note: OECD average refers to the average of OECD metro-regions.

Korean cities like Seoul and Busan, as well as in Mexico City, agglomerations were fuelled by rural-urban migration, but more recently their urban sprawl has outgrown administrative boundaries and they all include at least part of three other regions (provinces in the case of Busan and Seoul and states in the case of Mexico). In the Rhine-Ruhr in Germany and the Randstad-Holland in the Netherlands, metropolisation has been different from the rest of Europe – and the OECD as a whole for that matter – as it is the result of agglomeration and urban sprawl of smaller urban centres that have ultimately produced the integration of a networked urban-system into a single metro-region.⁵

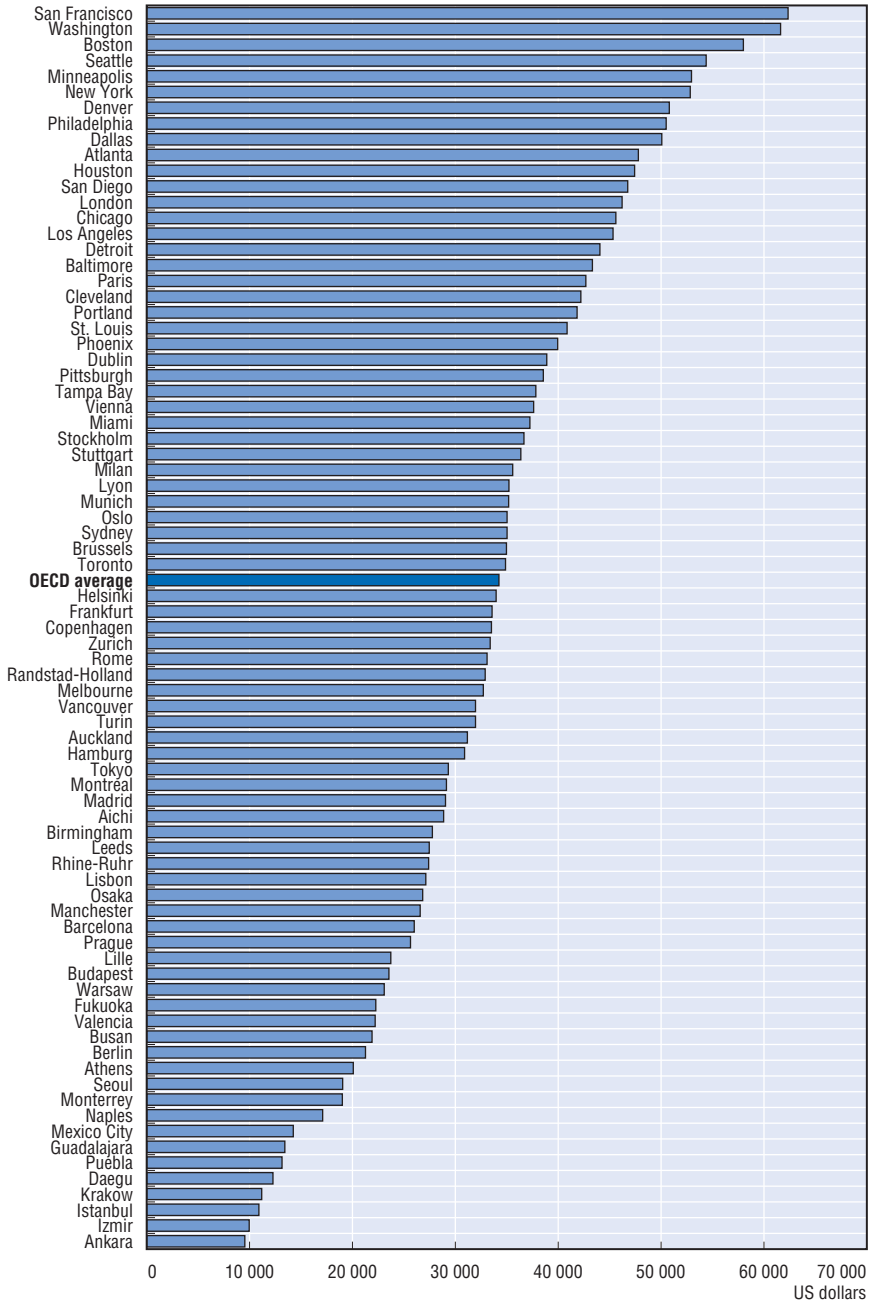
1.4. Performance of OECD metropolitan regions

Not surprisingly, metro-regions feature different levels of wealth. Per capita income in OECD metro-regions, measured in terms of purchasing power parity (PPP) GDP, ranges from USD 9 551 in Ankara to USD 62 350 in San Francisco (Figure 1.9). This largely reflects differences in national GDP and GDP per capita among OECD countries. However, a key dimension that needs to be considered is the path of economic growth over time in a given metropolitan area. The increasing opening of metropolitan economies to international markets might pose a threat to some dominant metro-regions, as richer metro-regions are not unchallenged leaders. For instance, during the period 1995-2002, in a sample of 44 metro-regions, relatively lower-income metropolitan regions in Korea (Busan), Turkey (Istanbul) and Eastern Europe (Prague, Warsaw) registered higher average annual growth rates than some richer metropolitan areas in Japan (Tokyo, Aichi), Germany (Frankfurt, Munich) and France (Paris) (Figure 1.10). Berlin and Budapest, among other metro-regions such as Randstad-Holland, Barcelona and Oslo, even yield negative average annual growth rates during the same period. However, the model and regressions results based on β -convergence suggest a strong pattern of divergence in which high-income metro-regions in the sample are outgrowing low-income ones⁶ (Appendix 3). If this trend is confirmed with further research and over a longer timeframe, the results would be in line with a hypothesis that globalisation and the benefits associated with it are increasingly more located in the richest metro-regions.

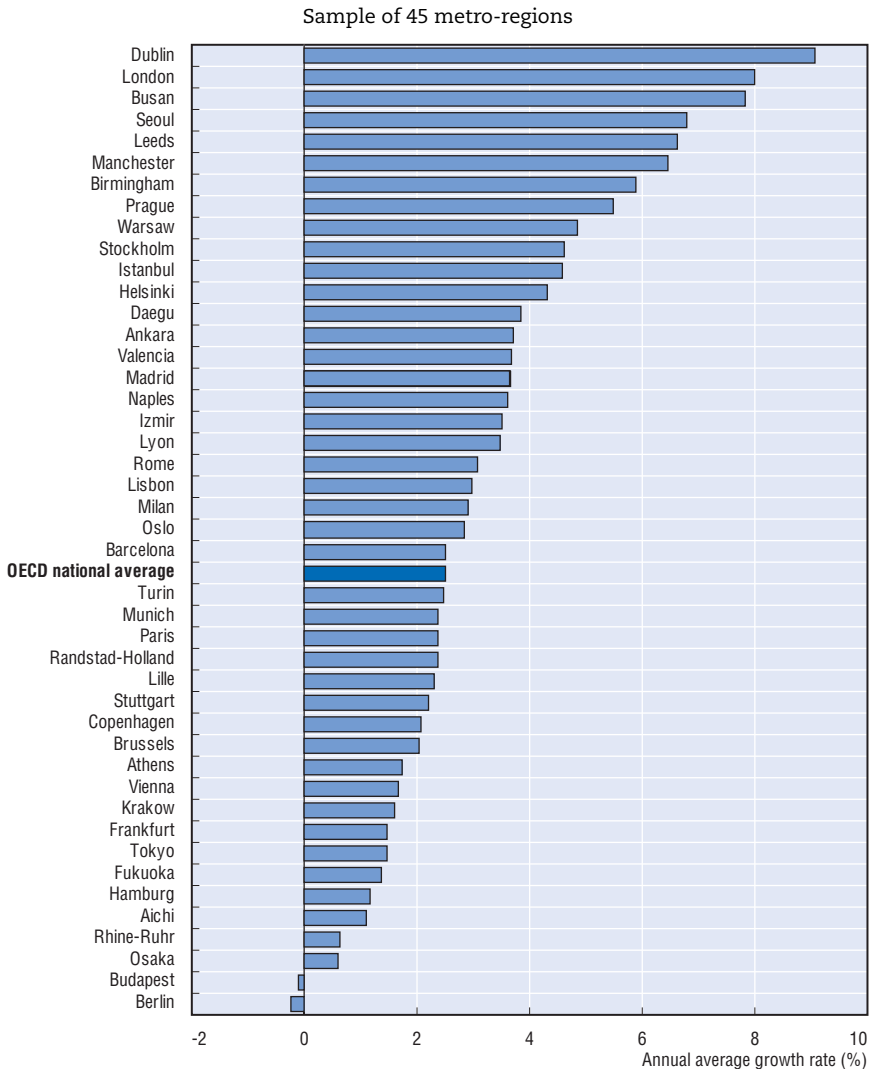
The ranking by productivity differences, with respect to the average for all metro-regions, shows also a quite similar trend to income (Figure 1.11). Again, the ranking is dominated by US and some European metro-regions. In addition to London, French (Paris-Lyon) and to a lesser extent Italian (Rome, Milan) metro-regions are better positioned in this ranking than in that of GDP per capita.⁷ Although some other European cities such as Brussels, Vienna and Dublin have productivity levels above the average, many other well-developed, above-average income cities with innovative capacities such as Helsinki, Stockholm, Sydney and Tokyo have productivity levels below the OECD average.

Figure 1.9. **Ranking of OECD metro-regions by income**

GDP per capita in PPPs for a sample of 78 metro-regions in the OECD

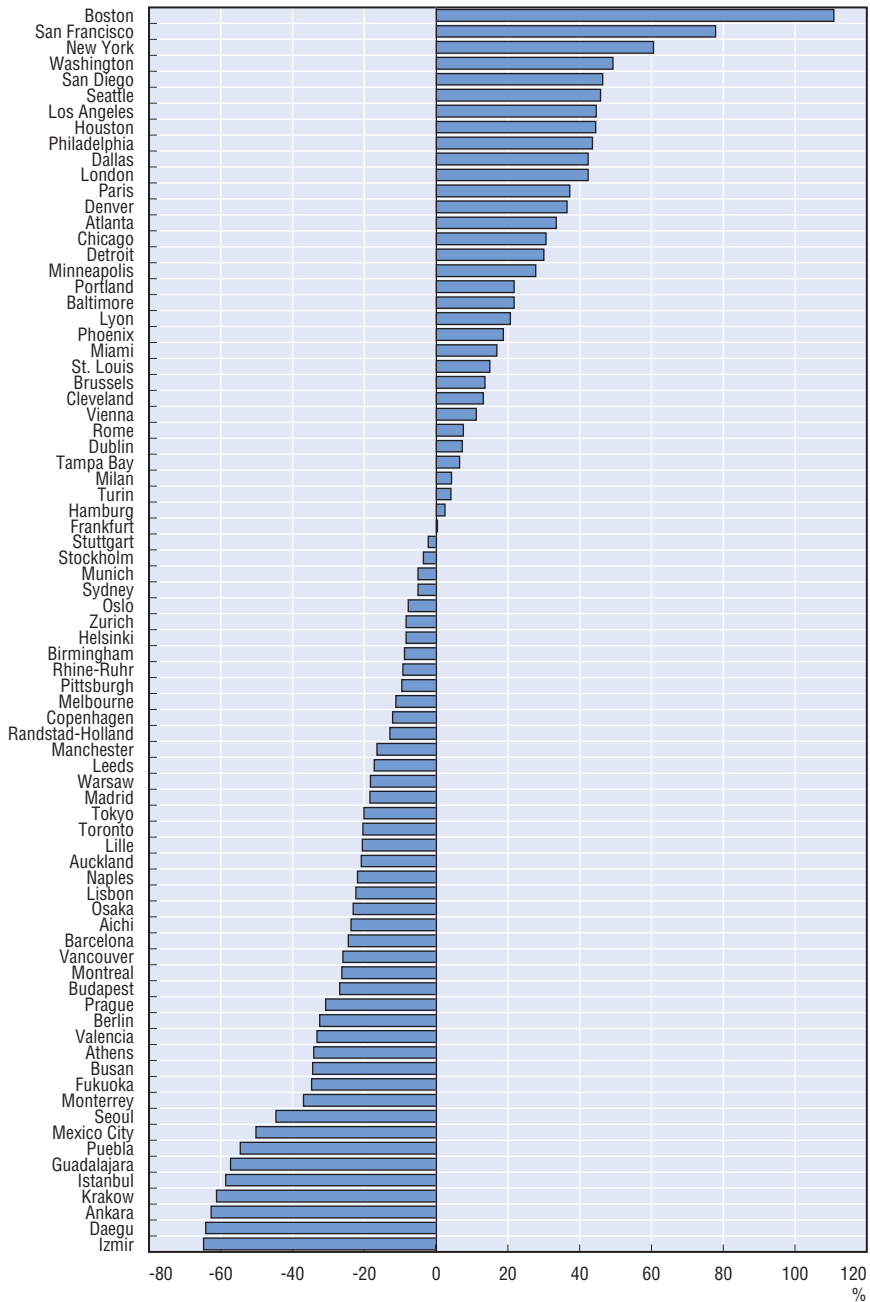


Note: OECD average refers to the average of OECD metro-regions.

Figure 1.10. **Average annual growth rate among OECD metropolitan areas (1995-2002)**

The results may be influenced by commuting flows and the fact that productivity is measured only for the labour factor and does not take into account other multi-factor productivity measures. In addition, some metro-regions in countries which have opted for low levels of working hours, such as Stockholm and Randstad-Holland may appear to be losing ground to competitors. This is because a misleading impression of labour productivity is created when labour productivity is measured at the local level by GDP per worker and not by GDP per man-hour worked.

Figure 1.11. **Productivity differentials across OECD metro-regions (2002)**
Sample of 78 metro-regions in the OECD



1.5. City size and income

At first sight, the relationship between population size and income is not a straightforward one. One of the most important features claimed for urban economies, including metro-regions, is their capacity to concentrate population that nurtures the development of a pooled labour market, as well as human and physical capital, income and infrastructure besides cultural and recreational amenities. However, an initial look at the data for OECD metro-regions does not support this argument; if anything, there is a slight negative association between the size of a metro-region and the income of its inhabitants (Figure 1.12). A different picture emerges if size is taken into account with the largest metro-regions as outliers. Even if we disregard Auckland, whose population size is below the 1.5 million threshold, there is still considerable diversity in the size of metro-regions, ranging from 1.5 million (Dublin) to 34 million (Tokyo) population. Using natural logarithms for population and GDP per capita in PPP enables us to obtain linearized figures that compress the effect of size, giving the association between concentration of population and income (Figure 1.13). Pearson's correlation coefficient confirms the graphic suggestion that there is a positive and statistically significant correlation between the size of the population and income (Appendix 3). Hence, population size is positively associated with the level of income, but exceptionally large cities ("mega-cities") may become "dysfunctional".

Figure 1.12. **Correlation between population size and income in OECD metro-regions**

Sample of 78 OECD metro-regions (2002)

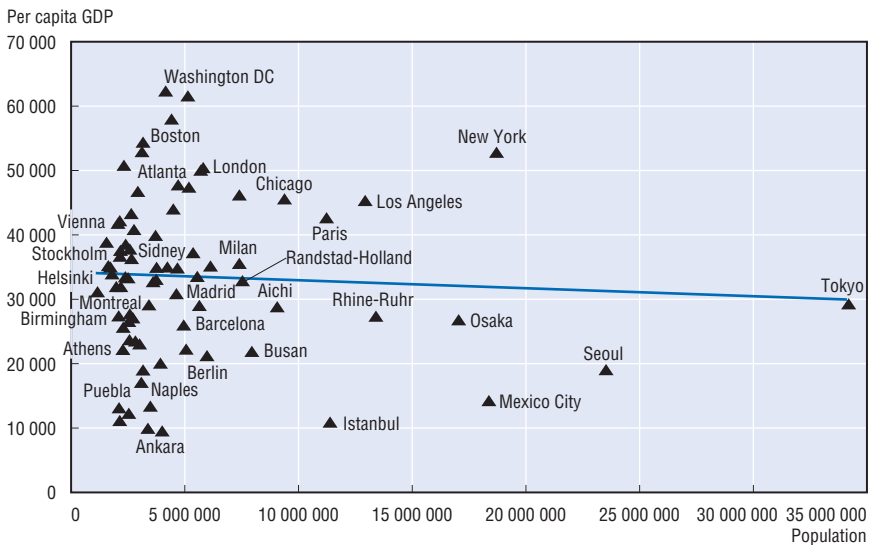
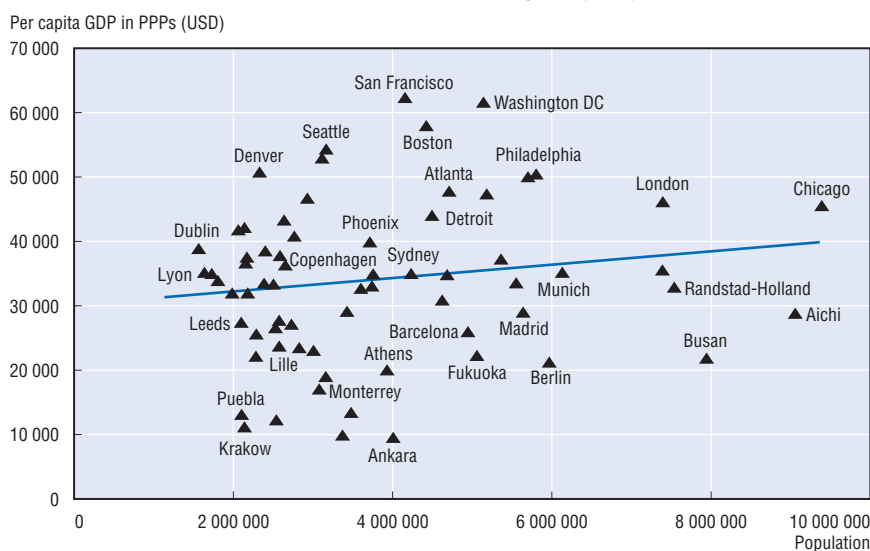


Figure 1.13. **Correlation between population size and income in metro-regions with fewer than 10 million inhabitants**

Sample of 69 OECD metro-regions (2002)



In fact, bigger may mean richer until congestion reaches a certain level. It can be argued that in mega-cities, income is affected by population size, probably as diseconomies of scale and congestion costs appear. Congestion costs seem to outweigh centripetal forces after a certain critical value that can be regarded as a threshold.⁸ Figure 1.14 shows a somewhat weak, but negative, association between population and income for OECD mega-cities. Although the Pearson's correlation coefficient yields a statistically non-significant result, using the model in Annex 3 we can conclude that for metro-regions of over 6 million people, the relationship between income and population size is negative. One explanation for possible disadvantages of large size may lie in the congestion and related costs of very large urban agglomerations, i.e. higher commuting times, higher costs of logistics and transport, as well as land rent values and environmental costs. These results are important if we bear in mind that there is an ongoing discussion in the literature on whether there is an optimal city size that balances increasing and decreasing returns to scale in activities.⁹ Therefore, it can be argued that many of the mega cities in the OECD are experiencing some type of diseconomies of scale such as congestion costs that impinge on the standard of living.

Metro-regions that concentrate within them over 20% of national GDP are likely to have higher incomes compared to both their national average and other metro-regions (Figure 1.15).¹⁰ In some countries, one or a small number of metro-regions concentrate the majority of the population and produce the

Figure 1.14. **Relations between population and income in metro-regions of over 6 million people**

Linearized values for population and per capita GDP in PPPs (2002)

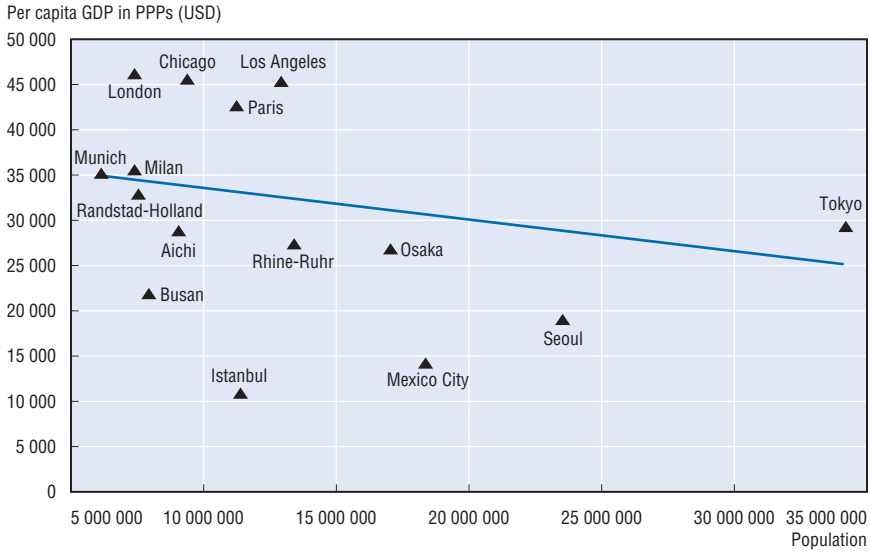
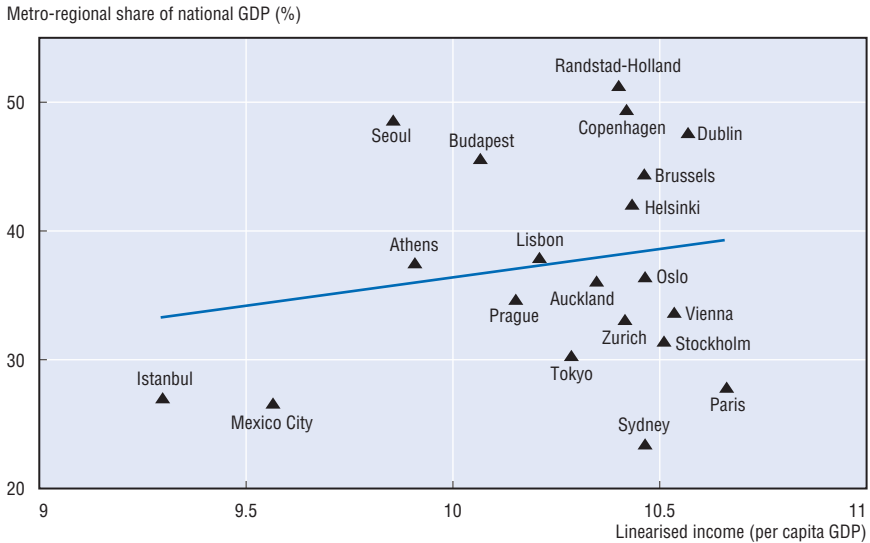


Figure 1.15. **Capital cities and income**

Sample selected using metro-regions representing more than 20% of their national output (2002)



bulk of the national output and employment. For instance, one Hungarian out of five lives in the city of Budapest which produces 34.5% of national GDP. The metro-region represents 42.2% of national GDP and 65% of total FDI. The capital region of Seoul concentrates more than 45% of the South Korean population, nearly half of the national GDP, 45% of total employment and 56% of FDI. In Canada, half or more of the GDP of the provinces of Ontario, Quebec and British Columbia is generated by one metro-region, respectively Toronto, Montreal and Vancouver. Similarly, the cross-border region of Vienna-Bratislava accounts for almost one-half of both countries' GDP (Austria and the Slovak Republic). Almost one-half of the Danish and Irish GDP and more than 40% of the Finnish and Belgian GDP are produced in Copenhagen, Dublin, Helsinki and Brussels respectively. One-third or more of Norwegian, New Zealand and Czech GDP are based in their national capitals (Oslo, Auckland and Prague). Around 30% of national GDP in the UK, Sweden, Japan and France is accounted for by London (31.6%) Stockholm (31.5%), Tokyo (30.4%) and Paris (27.9%) respectively.

Of the 20 metro-regions that concentrate more than 20% of national GDP, 15 are capitals and one more (the Dutch Randstad-Holland) includes the national capital within a multi-polar metro-region, leaving only Auckland, Istanbul, Sydney and Zurich as non-capitals. More generally, in only six countries (Australia, Germany, Italy, the USA, as well as Switzerland and Turkey already mentioned) the capital city was not the largest single metro-region. In eight it was the largest of a group of national metro-regions (Canada, France, Japan, Korea, Mexico, Poland, Spain, United Kingdom), and in ten relatively small countries it was the sole metro-region (the Czech Republic, Denmark, Finland, Hungary, Ireland, the Netherlands, Norway, Portugal and Sweden). The implication of this is that capital cities may be favoured by being the centre of political – and in many cases also economic – decisions in their countries, not only by attracting the most qualified workers in the country, but also through policies and resource allocation (Box 1.3). It can be argued that not only are public infrastructure, resources and human capital particularly allocated to and developed in those capital cities, but also institutional factors forming social capital that strengthen even more the centripetal forces in place.

Among non-member countries, China offers another example of the effect of concentration of wealth in a small number of metro areas, including the capital city. Shanghai and Beijing, the two mega-cities, have become two growth engines of China's economy.¹¹ The city of Shanghai has expanded and grown into a national economic centre during the last three decades. In 2003, Shanghai's GDP reached about RMB 625 billion with an annual CAGR (Cumulative Aggregate Growth Rate) of 17%, much higher than the national average. The city contributes one twelfth of China's total industry output

Box 1.3. Main advantages of capital cities

Capital cities tend to be linked, with political, diplomatic and international corporate headquarters activities being concentrated, and interacting, within them; this helps explain why capital cities feature so strongly among metro-regions. In many cases capitals function as both political capitals and as internationally linked commercial cities, Germany, Italy, Switzerland and the USA being special cases of where the political and financial capitals do not coincide. Capital cities are essentially political products, governments having worked to make them the communications centres and main showplaces of the country, in many cases for several centuries. Rail and road networks and major airports tend to be concentrated in them, even if they are situated far from a country's geographical centre. Major cultural and sporting facilities tend to be built within them. Employment in public administration is by definition centred there, with corporate national headquarters tending to locate there as a consequence. They therefore have disproportionate shares of educated workforces, good transport links and a high level of public infrastructure. Some of them, as our data show, succeed in using these advantages to develop other activities and become innovative metro-regions. Others simply continue with the size and prominence afforded by capital-city status. Vienna is an interesting example of a capital city of an extensive central European empire, which subsequently became the capital of a much reduced nation, but retaining the cultural and communications advantages of its previous situation (OECD 2003d). It also became a major industrial city, a role which, in common with most capitals in advanced countries, it is now losing. Its growing links with Bratislava as a joint metro-region suggest a potential new role as a major centre linking parts of central and Western Europe, though the sectoral composition of such a role remains at present undeveloped.

value, one-sixth of the country's port cargo handling volume, and one fourth of the country's total exports. In addition, the city also leads the nation in industrial upgrading and science and technology innovation. The metro-region has expanded its economic development beyond its city boundaries to the two neighbouring provinces – Jiangsu Province and Zhejiang Province. Similar arguments apply to Beijing. As an indicator of Beijing urban expansion, the Greater Beijing Plan includes Beijing, the northern part of Hebei Province and Tianji covering an area of nearly 70 000 square kilometres, as well as many large and medium cities in north China.

1.6. Factors of competitiveness

City competitiveness is a broad concept and can be assessed in different ways (Box 1.4). There is a wide range of indicators developed by international

Box 1.4. What is city competitiveness?

There is an extensive literature on factors of competitiveness. Factors such as infrastructure and accessibility, industry and economic scale and structure, human capital and labour force may act as major determinants of city competitiveness. Major drivers that function as intermediaries between the indicators and final regional performance or competitiveness may include entrepreneurship, innovation, investment and competition (Parkinson in ODPM, 2004). These factors are especially important in facilitating new business growth and product development and playing an even more important role in fostering the growth of a new economy that centres on knowledge creation and innovation. Facilitating these drivers entails creating competitive dynamics or efficient interrelationships among the major competitiveness indicators and other aspects of local business environments (government and business associations, etc.).

A widely cited case for measuring competitiveness is the measurement by the International Institute for Management Development (IMD), which measures competitiveness in four major categories: economic performance, government efficiency, business efficiency and infrastructure. These four major categories can be further sub-divided into more specific measures covering a comprehensive set of perspectives in national growth. Although employed at the national level, these measures apply to regional economies as well. A recent study in the United Kingdom identified factors in urban competitiveness, including economic diversity, quality of life, skilled labour force, internal and external connectivity, innovation in firms and organisations, and strategic decision taking capacity, etc. (Parkinson in ODPM, 2004).

Cities compete to attract and retain mobile factors of production, namely labour and capital. Cities compete directly with each other by providing the greatest quantity or optimal combination of location factors (such as green spaces, affordable housing, business support, quality of pre-university education for families, presence of headquarter functions, etc.) to lure skilled labour and investment. However, some economists may argue that competition is indirect as it derives from competition among businesses based chiefly on productivity. Whatever the view on city competition, policies to enhance the capacity of cities to attract businesses and workers have shaped regional and local policy in many OECD countries. There is also a concern across OECD countries to seize economic opportunities taking into account a sustainable growth approach.

organisations, academics and consulting groups to assess competitiveness of cities, most often utilised to elaborate an international ranking. Although not taking into account such determinants as quality of life, level of social cohesion and environmental quality, a commonly used definition is the aggregate indicator – GDP per capita. To conduct a more in-depth analysis of regional economic performance, the OECD has developed a cross-country comparison model, examining which factors explain a given region's gap in GDP per capita with other OECD metropolitan regions (Appendix 4). These are productivity per worker, efficiency of the local labour market expressed in terms of employment/unemployment, and the relative size of the labour force with respect to the population, i.e., the activity rate. Greater productivity per worker translates into a higher level of GDP per worker,¹² an efficient labour market results in better labour utilisation (more employment, less unemployment), while a larger labour force relative to population implies that more of the region's human resources are being used in production. This methodology has been applied within the framework of the *OECD Territorial Reviews* to assess competitiveness of some metro-regions.

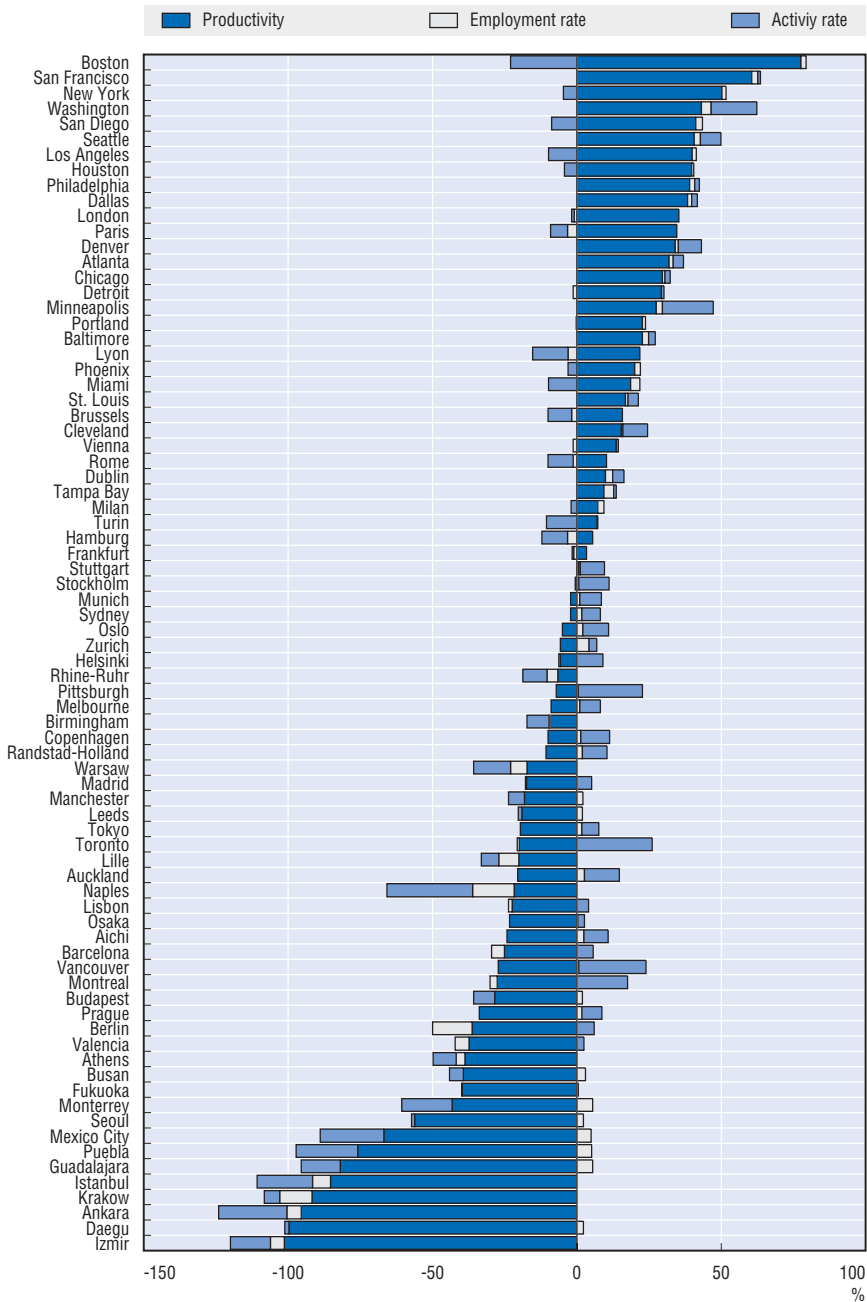
1.6.1. Productivity is key...

Productivity emerges as a key factor in metro-regional performance among the three explanatory factors. Figure 1.16 shows that labour productivity (measured as the quotient between GDP in PPPs and employment) explains most variation in GDP per capita among metro-regions themselves. That is, productivity differences from the OECD average determine whether the per capita income in a particular metro-region stands below or above the average. Since employment rates differ only slightly among metro-regions (from 81.1 to 98.9%), the activity rate then becomes the second explanatory factor, but its capacity to determine income is much weaker than productivity (activity rates range between 36.3 and 63.4%). This result is of utmost importance if we bear in mind that productivity, albeit not entirely, explains a great deal of the level of competitiveness of a country, a region or a metropolitan area. Thus, countries should place particular importance on understanding agglomeration economies that entail higher levels of productivity in their urban areas, particularly in their metro-regions, in order to foster their competitiveness.

... fuelled by a high value-added industrial mix

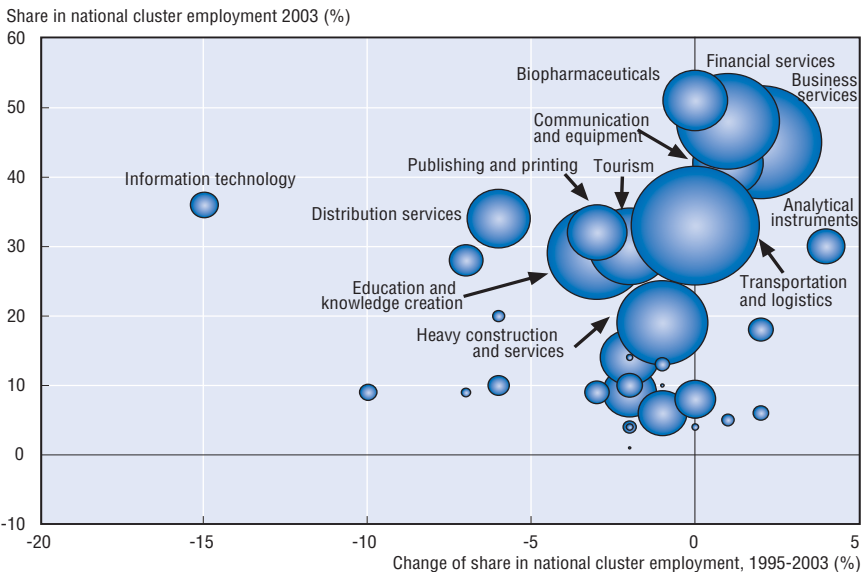
Performance in the productivity level of many (though not all) metro-regions is strongly linked to their association with certain kinds of economic activity, in particular high-tech and advanced services. Unfortunately, it is not possible to obtain data on the economic specialisations of metro-regions; but this information would be valuable for discovering what is important about these urban forms, and discriminating among them. However, *OECD Territorial*

Figure 1.16. **Main explanations of GDP differentials between OECD metro-regions (2002)**



Reviews provide some empirical evidence. For instance, well-performing metro-regions such as Stockholm and Helsinki have developed strong value-added clusters in telecommunications and ITC, as well as biopharmaceuticals, and to a lesser extent and especially in Stockholm, financial and other business services, transport and logistics, and analytical instruments (Figure 1.17). In both cases, strong concentration of productivity and a high skill level have been established, supported by a network of universities and advanced research centres around industrial activities, making use of the diversity of innovation sources that a metro-region can provide¹³ (OECD, 2006d and OECD, 2003a). In Milan, the percentage of firms and people working in high knowledge activities is respectively 9.4% and 45.9% against a national average of 6.15% and 32.1% (OECD, 2006b). In the United States, high-tech industry concentrates more in metropolitan regions – the top 114 metro areas account for 67% of all jobs but 81% of high-tech employment. Conversely, in Busan, the second largest metro-region in Korea and one of the top five container ports in the world, the industrial mix has been advanced as the main cause of lower labour productivity. Actually, Busan exhibits the profile of a typical post-industrial city with many traditional industries undergoing restructuring and few knowledge-based and high technology-led industries able to fuel innovative development in the region (OECD, 2004b).

Figure 1.17. **Cluster composition in the Stockholm Region (NUTS 2)**



Notes: 1) Bubble size is proportional to employment levels; 2) Stockholm share of national cluster employment in 2003 is 22.9%; and 3) Change in Stockholm's overall share of national cluster employment over 1995-2003 is -0.5%.

Source: "Institute for Strategy and Competitiveness, HBS" with data from Statistics Sweden (2005).

In fact, such a pattern of specialisation towards higher value-added economic activities tends to favour metropolitan areas which also have a larger and more diversified economic basis. Even less well performing regions such as Mexico City, Seoul or Istanbul, have developed strong specialisations in high value-added activities as compared to their national average (50% of the country's total in the case of Istanbul). Henderson (1997) demonstrates that compared with medium-sized cities, large metro-regions are more specialised in modern services – finance, advertising, insurance, arts, consulting, etc. – or in consumer-oriented manufacturing such as publishing and high fashion apparel. They are also highly diversified in their remaining manufacturing bases, compared to medium-sized cities. Within basic manufacturing, very large metro-regions tend to have relatively low physical output per employee, instead producing administrative and R&D activities. Efficient R&D seems to need the diverse industrial base and labour force offered by large metro-regions. For example, major electronic firms in Japan, Korea and the United States tend to locate more R&D activities in metro-regions, but decentralise standardised production to medium-sized cities.

A more favourable industrial mix with high value-added activities is closely linked to the capacity of metro-regions to concentrate R&D activities and generate innovation. More than 81% of OECD patents, which are an important indicator of innovative activity, are filed by applicants located in urban regions (OECD, 2005g). Such regions are particularly prominent in the Netherlands (95%), Japan (90%), Belgium (88%), United States (78%), Portugal (77%), Germany (73%), Spain (72%), Australia (69%), Italy (65%), the United Kingdom (65%) and Korea (59%). In Ireland, Greece, Finland, the Netherlands, Japan, Korea and Canada, a single region is responsible for almost half of the national patenting activity. In France and the United Kingdom, Paris and London account for more than 40% of the country's total applications. In particular, the regions hosting the capital city (Paris, London, Dublin, Athens, Helsinki, Tokyo and Seoul) are the leading national centres of innovation.

The innovative capacity of metro-regions should however, be balanced. First, innovation and patents production requires physical capital and infrastructure (e.g., laboratories) that tend to be more concentrated than even human capital. Fujita and Ishii (1998) find that the R&D activities of nine major Japanese electronic firms are located solely in the major metropolitan areas of Tokyo, Kyoto and in Boston in the United States.¹⁴ Seoul concentrates around one-quarter of the country's universities, patents and students, more than one-third of research centres and more than 60% of the national R&D workforce (OECD, 2005f). Almost one-half of Sweden's university-based research is located in Stockholm and 42% of all research – private and public – spending (OECD, 2006d). More importantly, it should be borne in mind that in many cases, patents are registered in the headquarters, typically found in large cities, while they can be generated in other regions.

These tendencies suggest a distinctive logic of post-industrial urban forms that may favour large agglomerations in a way that was not so true of industrial activities. The latter sometimes have specific physical geographical needs and have large space requirements. In general, the added-value and productivity of service activities are less dependent on physical space, and these sectors are less constrained in their choice of a location. They are primarily driven by the availability of quantities of human capital, in the case of high value-added sectors such as those mentioned above, educated and skilled human capital. They therefore are both attracted towards and create population concentrations of the metro-region form, in a reinforcing spiral. At the same time, the strong pressure they exercise on land costs deters space-consuming industrial activities from locating within the metro-region, except for some high-tech industries where there is high value added per unit of space occupied. These forces together shape the metro-region as a space in which high value-added, largely post-industrial, activities take place.

The small group of so-called “world cities” is chiefly associated with strong specialisation in advanced activities, although a large number of other cities feature similar trends. One study shows that those cities regarded as world cities overlap heavily with some of the leading examples of metro-regions (London, Milan, Munich, Paris, Tokyo and New York).¹⁵ Similar findings come from the recent work by the *Globalisation and World Cities Group* (Taylor and Walker, 2001) that has focused on analysing flows and links between these cities, mainly flows among advanced firms within and across cities, rather than the characteristics of the cities themselves.¹⁶ However, these flows usually occur where certain high value-added sectors have both tendencies to geographical concentration and a need for extensive links with similar places across the globe, so they do tell us something about the kinds of activities concerned. It is relatively easy to identify the sectors that meet these criteria, primarily financial services and certain high-tech and scientific manufacturing activities, also some media, cultural and fashion activities. These are sectors where there are advantages in both clustering (to be discussed in the following chapter) and in global access to knowledge.

Some of the most successful cities and metro-regions have not necessarily conformed to the “world city” model. The renewed openness of the continental economies of both Europe and North America has provided cities with opportunities to assert new economic roles outside older notions of fixed national economies (implying urban hierarchies). In Europe, relatively successful metro-regions such as Randstad-Holland and Frankfurt, both of them well-performing financial centres, do not demonstrate all the characteristics of world cities compared to London and Paris. Other successful cases such as Helsinki and Hamburg display different patterns. With these latter two, technological prowess is a major source of strength. In

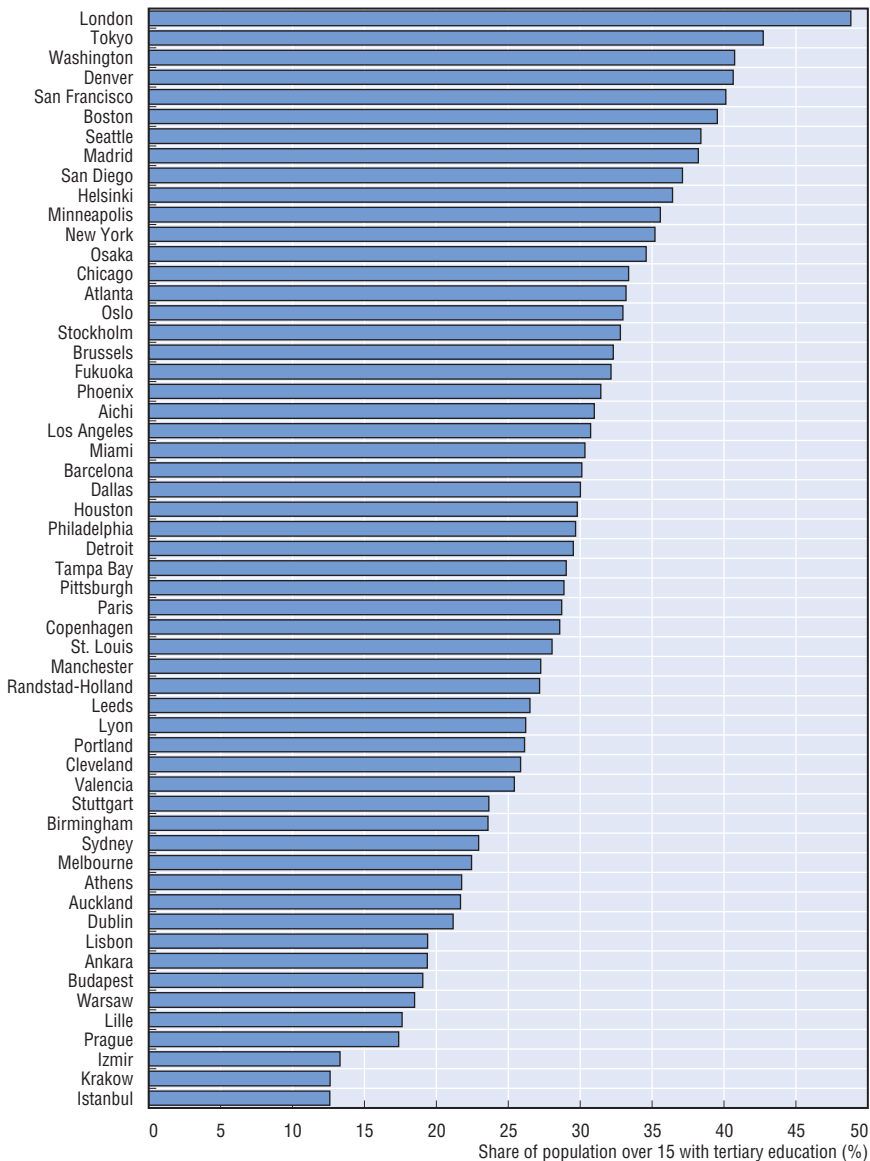
North America, cities such as New York and Chicago exhibit the main features of the “world city” model, but others such as Boston (technology and education), Los Angeles (film and manufacturing) and San Francisco (technology and finance) all succeed without having these characteristics.

Yet, it would be wrong to stereotype all metro-regions as specialising in these particular sectors alone. Even those that do so specialise have large populations engaged in lower-productivity services activities typically associated with large concentrations of population, such as various cleaning and maintenance services, as well as all forms of retail trade, security, transport and traffic related occupations. London, New York and Tokyo, three main examples of metro-regions with large and geographically concentrated financial services sectors, depend heavily on local and national markets and customers as well as other sectors in order to sustain employment and output. It is likely that the balances between these different kinds of activities help explain the different levels of productivity in different metro-regions, and that data on these would enable us to construct a more extended typology of metro-regions. At the same time, metro-regions will rarely be polarised between these two kinds of socio-economic groups, as typically there is a large intermediate population engaged in the large diversity of economic activities that constitute a metro-region.

... and human and physical capital endowment

Skills in metro-regions strongly influence their productivity level.¹⁷ In Montreal, for instance, which belongs to the category of metro-regions that have specialised in high value-added sectors, relatively lower productivity was caused by lower educational attainment and insufficient investment in equipment, as well as research and development (R&D), especially within small and medium-sized enterprises that constitute an important share of the regional fabric (OECD, 2004c). In less advanced metropolitan areas, such as Mexico City and Istanbul, productivity level is highly inhibited by the relatively lower skills of the working population and the extent of the informal sector where adult education and skills training are difficult to provide (OECD, 2005e and OECD, forthcoming a). In general, lower productivity seems to be related to lower skills, not only in Turkish and Eastern European metro-regions, but also in metro-regions from more advanced countries such as Athens, Lille, Lisbon and Valencia. There are however, some fast growing metro-regions such as Dublin, Warsaw and Lyon which surprisingly do not rank very high in terms of the skills of their labour force (Figure 1.18). One hypothesis is that the level of skills of these metro-regions was initially low. In contrast, high skill levels but low growth is experienced in all Japanese metro-regions reflecting an overall stagnating growth trend in Japan (OECD, 2005b). In most cities however, productivity and skills seem to be related, notably so with the

Figure 1.18. **Share of population of 15 years and more with tertiary education**
 Sample of 56 metro-regions (2004)



Note: OECD average refers to the average of OECD metro-regions.

positive trend in London, Madrid, Oslo and Stockholm and the lagging one in Lille, Krakow and Stuttgart. In addition, countries such as Finland, Australia, the United States, France, Sweden and the United Kingdom, whose metro-

regions also belong to the fast productivity-growth group, attain high productivity levels which are largely explained by skills (OECD, 2005g).

Regions with the highest concentration of economic activity tend to have greater endowments of infrastructure and physical capital, thus a higher stock of capital per worker that can positively impact productivity. There are no data available at the local level to establish the link between the stock of capital and the level of productivity. However, a positive correlation between regional productivity and the stock of infrastructure has been detected in eight out of 15 OECD countries, (i.e., the Czech Republic, Denmark, Germany, Hungary, Japan, Sweden, United Kingdom and United States) (OECD, 2005g). From a theoretical perspective such a link could be easily supported. For instance R&D infrastructure (e.g., laboratories) and allocation of adequate spaces in metro-regions allow for the exchange of ideas and cross-fertilisation of innovative activities. In other words, capital provision in urban areas will not only increase the ratio of capital per worker, but can also allow R&D activities within firms and innovation arising at the production site to take place.

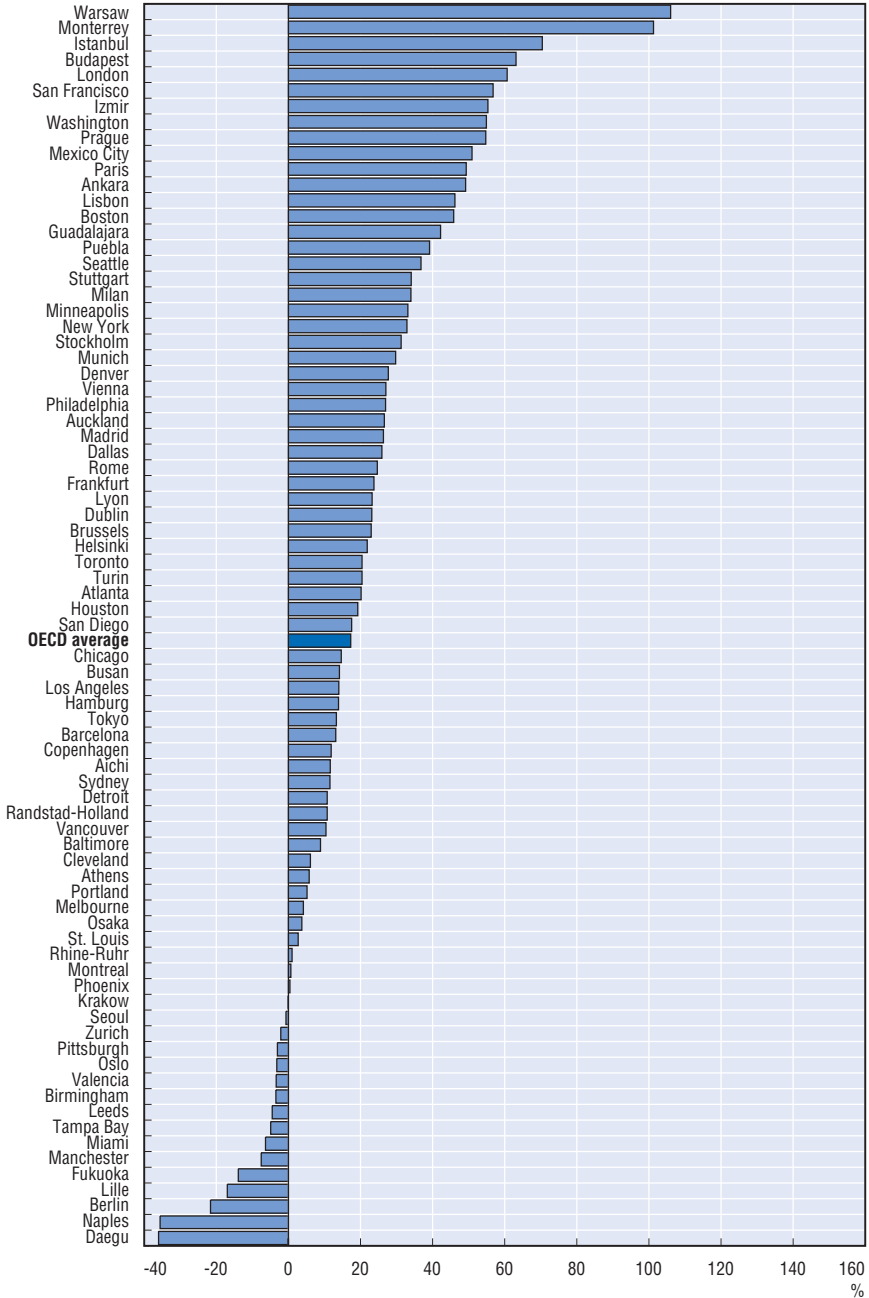
1.6.2. Labour market also does contribute

Although it has less impact on GDP per capita differential among metro-regions, labour market dysfunctionality can be a drag on a metropolitan region's competitiveness. Overall, activity rates and employment explain a smaller portion of GDP per capita differentials across metro-regions than productivity. However, higher activity rates of metro-regions in the United States (Pittsburgh, Washington and Minneapolis), in Canada (Montreal, Vancouver, Toronto) and to a lesser extent in some European capital cities (Copenhagen, Stockholm, Randstad-Holland, Prague) and New Zealand (Auckland) do contribute positively to differences in GDP per capita (from 26% of the differential in Toronto to 8.4% in Randstad-Holland). By the same argument, lower activity rates typically found in Mexican and Turkish metro-regions, but also in other European cities such as Berlin, Rhine-Ruhr, Hamburg (Germany), Naples, Rome and Turin (Italy) and Lyon (France) might also impact the differential in GDP per capita (up to 29.7% differential in Naples, 23.6% in Ankara and 12.3% in Lyon). Employment rates have a limited impact on GDP per capita differentials except for some regions with significantly lower employment rates such as Lille, Krakow, Berlin and Naples where such factors negatively affect their GDP per capita differentials.

1.7. Cities as engines of national economic growth?

Overall, metropolitan regions appear to be the dynamic engines of national growth. In most cases, metro-regions exhibit higher GDP per capita than their national average (Figure 1.19). Similar conclusions derived from the OECD Regional Database shows that GDP per capita tends to be higher in regions with a high concentration of population (86% of total OECD area GDP

Figure 1.19. Differences in per capita GDP of metro-regions and their national level (2002)



Note: OECD average refers to the average of OECD metro-regions.

is produced in predominantly urban regions and intermediate regions [OECD, 2005g]).¹⁸ Moreover, there is a positive correlation between growth rates achieved by metro-regions and those experienced at the national level¹⁹ (Figure 1.20). Again, the Regional Database shows that over the period 1996-2001, the fastest growing areas in OECD countries were predominantly urban areas (3.8%) followed by intermediate regions (3.5%) and predominantly rural regions (2.8%) (OECD, 2005g).

Yet, growth differentials between metropolitan regions and their national averages differ widely from one country to the next, and the causal link is not obvious (Figure 1.21). One can distinguish between three groups of metro-regions: those that grow considerably faster than their countries (*e.g.*, Stockholm, Prague, Rome, Milan, London), those that grow considerably slower than their countries (*e.g.*, Budapest, Daegu, Krakow, Athens, Barcelona or Berlin), and those whose growth is similar to their countries' and hence yield national small differentials. In other words, for most countries in the sample, metro-regions determine their growth dynamism, hence the small differences in growth rates between the country and the metro-region. There are however a small number of metro-regions which are outstripping national growth as well as a small number of lagging metro-regions such as Berlin, Lille or Krakow which are typically those experiencing industrial restructuring. However, further research is needed to establish the causal relationship of growth between the two levels and most importantly, the determinants of such growth.

Figure 1.20. **Relation between national and metropolitan growth rates**
Average annual GDP growth rates 1995-2002 for a sample of 44 metro-regions

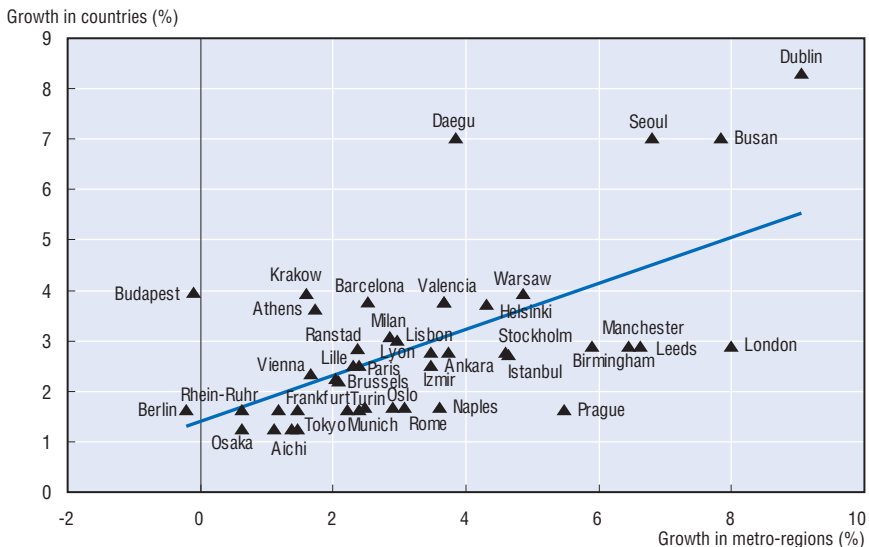
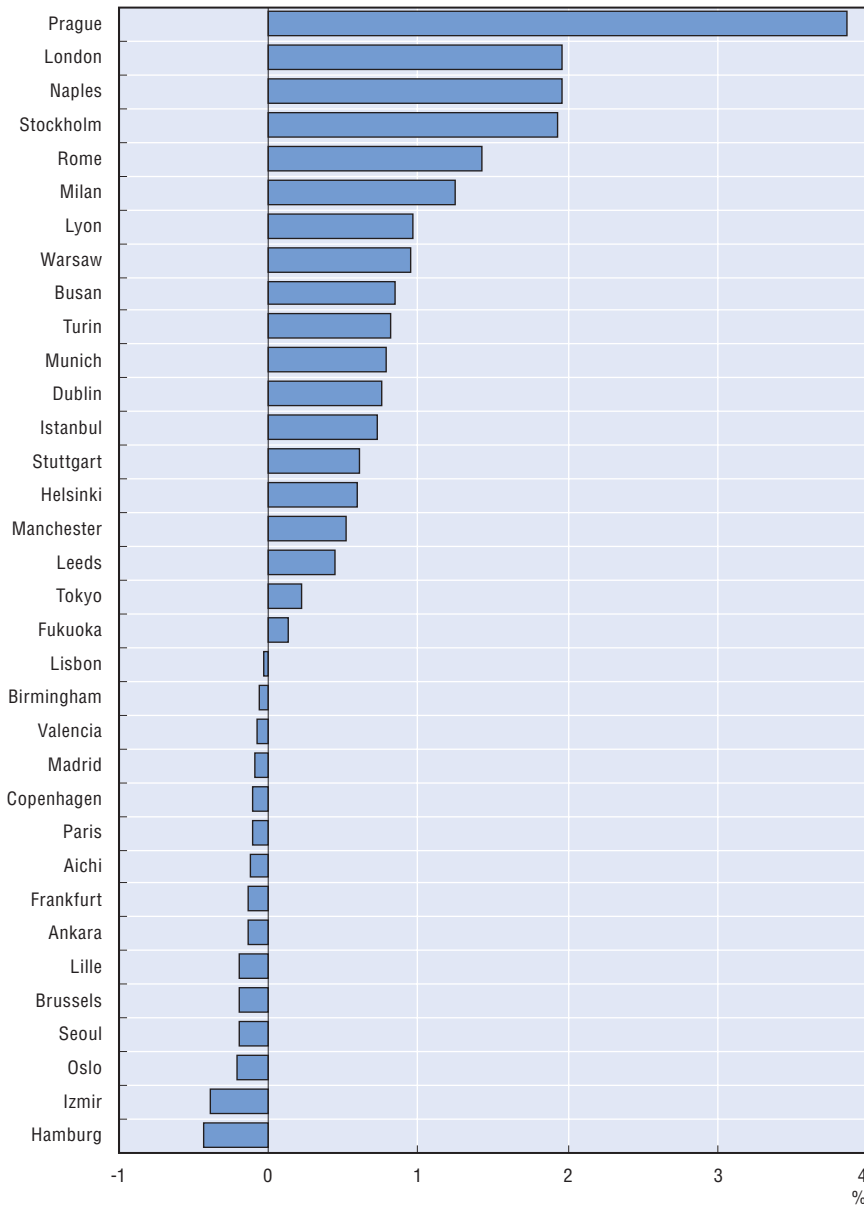


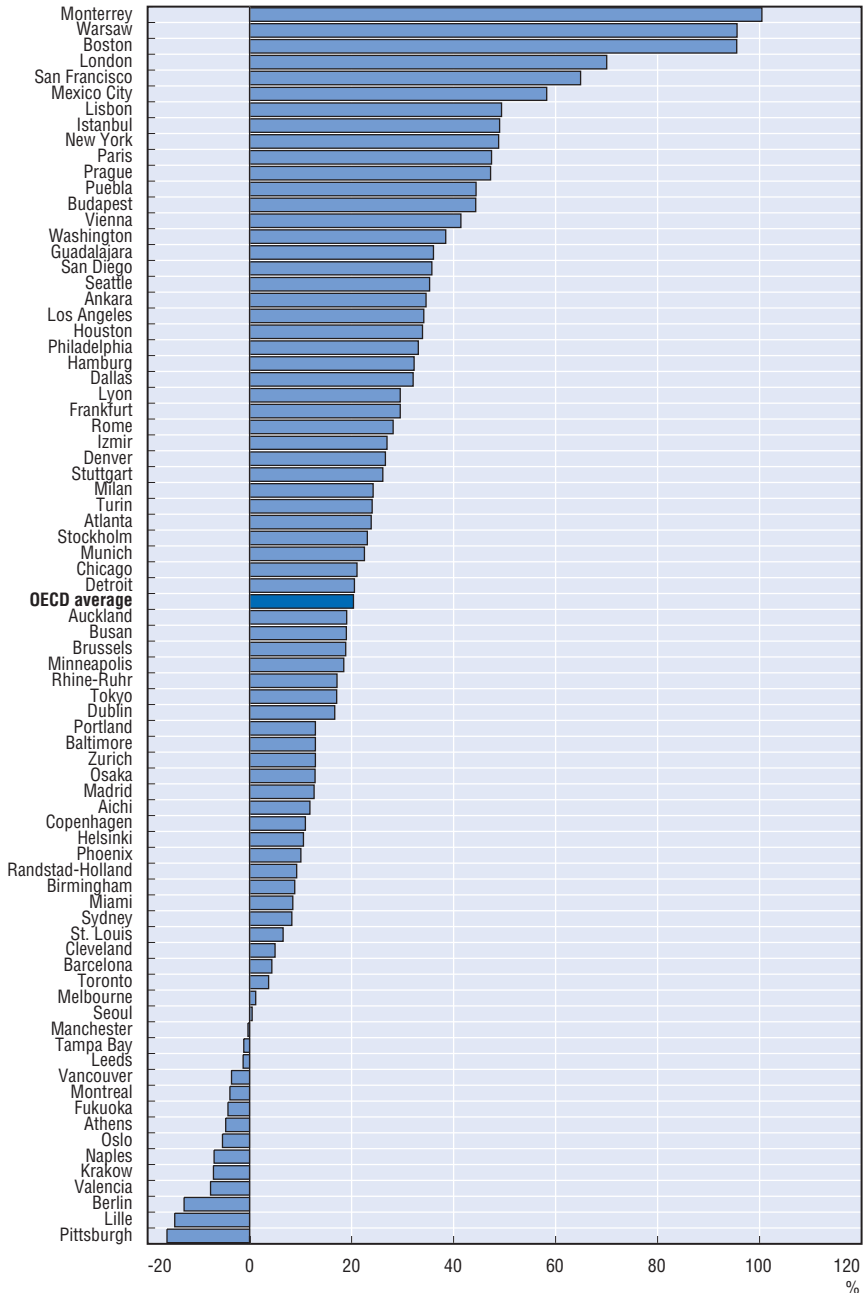
Figure 1.21. **Economic growth at the national and metro-regions levels**
Differences between average annual growth rates for the metro-region and its country
(1995-2002) – sample of 44 metro-regions



Similarly to GDP, productivity is typically higher in metro-regions than in the national economies – in many cases well beyond, but productivity growth is frequently lower for a number of metro-regions (Figures 1.22 and 1.23). The

Figure 1.22. **Productivity differences between the metro-regions and their national level (2002)**

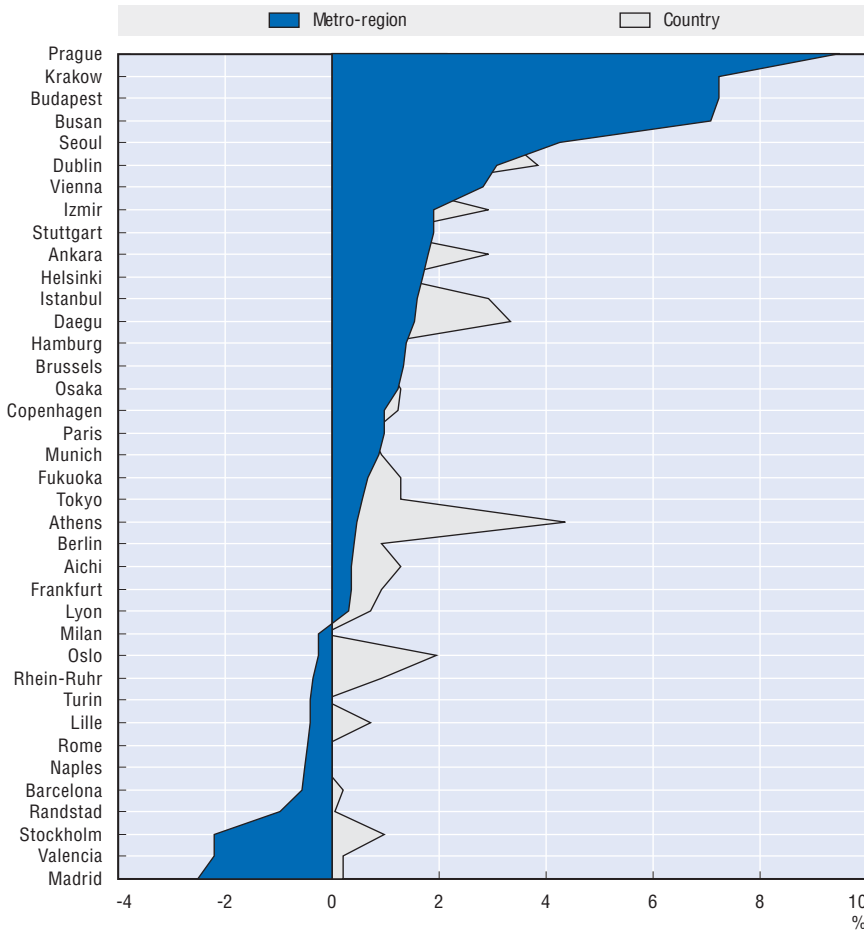
Sample of 78 metro-regions in the OECD



Note: OECD average refers to the average of OECD metro-regions.

Figure 1.23. **Productivity growth differentials between metro-regions and their national level**

Sample of 38 OECD metro-regions (1999-2002) using average annual growth rates



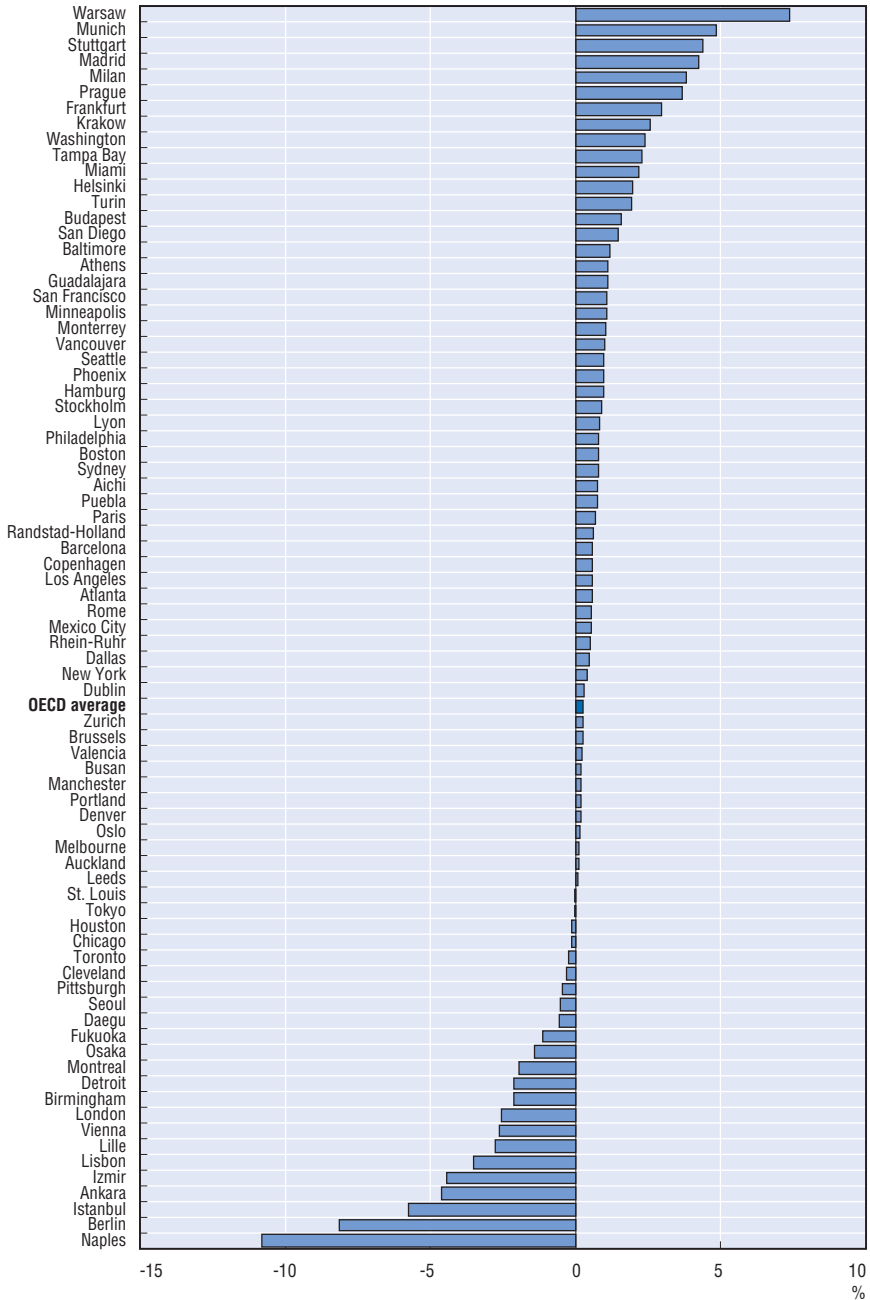
former datum suggests that the scale of production, the linkages among firms, the skills of workers and the agglomeration economies generated at the level of a metro-region are generally higher than in the rest of the country. Some authors call this “superproductivity”.²⁰ A number of issues have to be considered to better understand the apparently weaker productivity growth. First, the available data do not include some of the metro-regions with the highest productivity levels (such as those in the United States and the United Kingdom). Second, new measures of productivity such as labour productivity using man-hours worked and multi-factor productivity should be used to further explore the issue. Economic growth theory establishes that

countries – or regions for that matter – will grow faster the farther away they are from their “steady-state”. That is, poorer countries or regions grow faster than rich ones simply because they are growing from a lower level of production so increases in those levels typically represent a greater proportion (rate). Indeed, it is somewhat normal that growth rates are slower in more developed areas. Although the evidence presented in Figure 1.21 is rather ambiguous as we found that economic growth in metro-regions is not always higher than in their respective countries, the same is less true for productivity growth (most often higher in metro-regions), which brings us to an additional argument. We may be in the presence of external economies; that is, cities provide agglomeration economies external to the firm that are at the core of economic growth.²¹ Thus, although productivity levels (internal to the firm) are in many cases larger in metro-regions than in their national context, they tend to grow at a slower pace and contribute less to economic growth than agglomeration economies (external to the firm). However, this argument needs to be further developed and researched.

Metro-regions also typically have better employment performance. Most metro-regions in the Metropolitan Database have higher employment levels than their national contexts and 29 out of 38 feature higher employment growth than their national average (Figures 1.24 and 1.25). Similar conclusions derived from the OECD Regional Database shows that over the period 1996-2001, the bulk of employment within the OECD area was generated in a handful of regions. In fact, only 10% of regions were responsible for almost 60% of employment creation (OECD, 2005g). Except for Belgium and the United Kingdom, employment in predominantly urban areas grew, and grew faster than in predominantly rural areas (Figure 1.26). An extreme case is Greece where 92% of total employment growth took place in Athens. Similarly, three-quarters of employment generated in Poland was in Warsaw and 70% of Korean employment growth was located in the Seoul metropolitan area. At least 40% of employment expansion in Finland and Sweden stemmed from Helsinki and Stockholm respectively (OECD, 2005g).

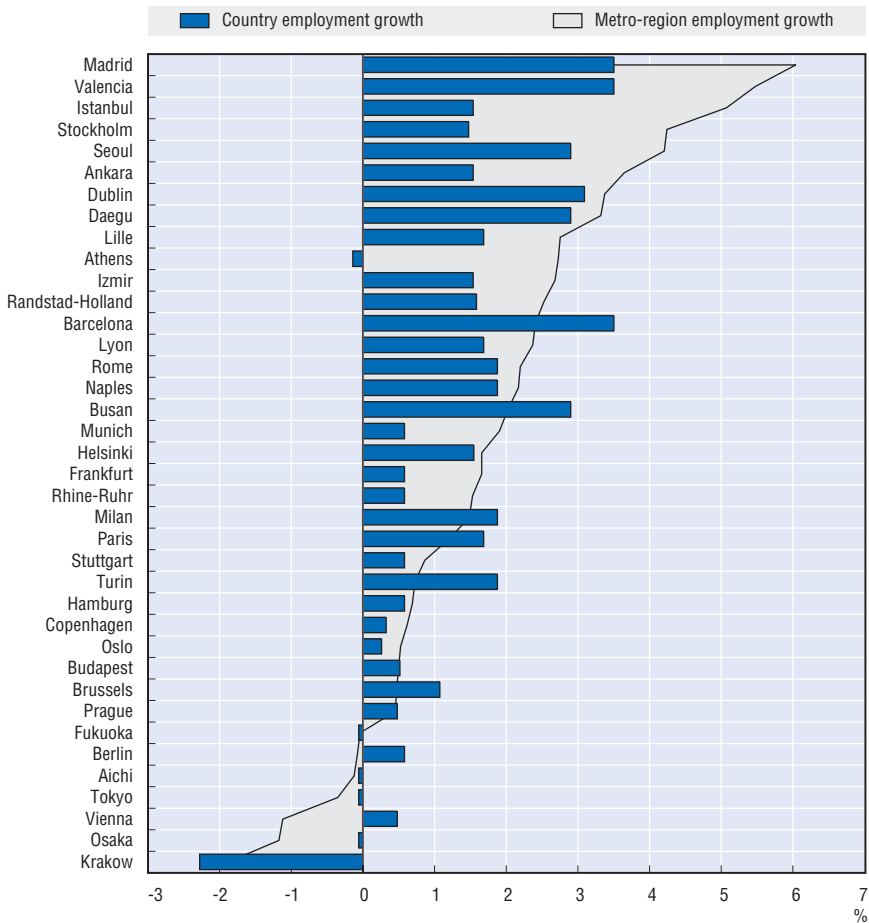
A number of metro-regions are facing severe job creation problems. In some cases, employment at the national level grew faster in metro-regions that have been performing below the OECD average on many other indicators stemming from the Metropolitan Database, such as Barcelona, Milan and Turin. Other metro-regions that experienced moderate economic growth such as Paris also found themselves creating less employment than their national averages. Busan experienced less job creation than Korea when in fact it has been yielding solid economic growth rates; one explanation may be that Busan is experiencing higher value-added job creation that allows faster growth rates without growing employment. Some metro-regions seem to be actually creating employment while the country loses jobs (Athens and Fukuoka),

Figure 1.24. **Employment differences between the metro-regions and their national level (2002)**



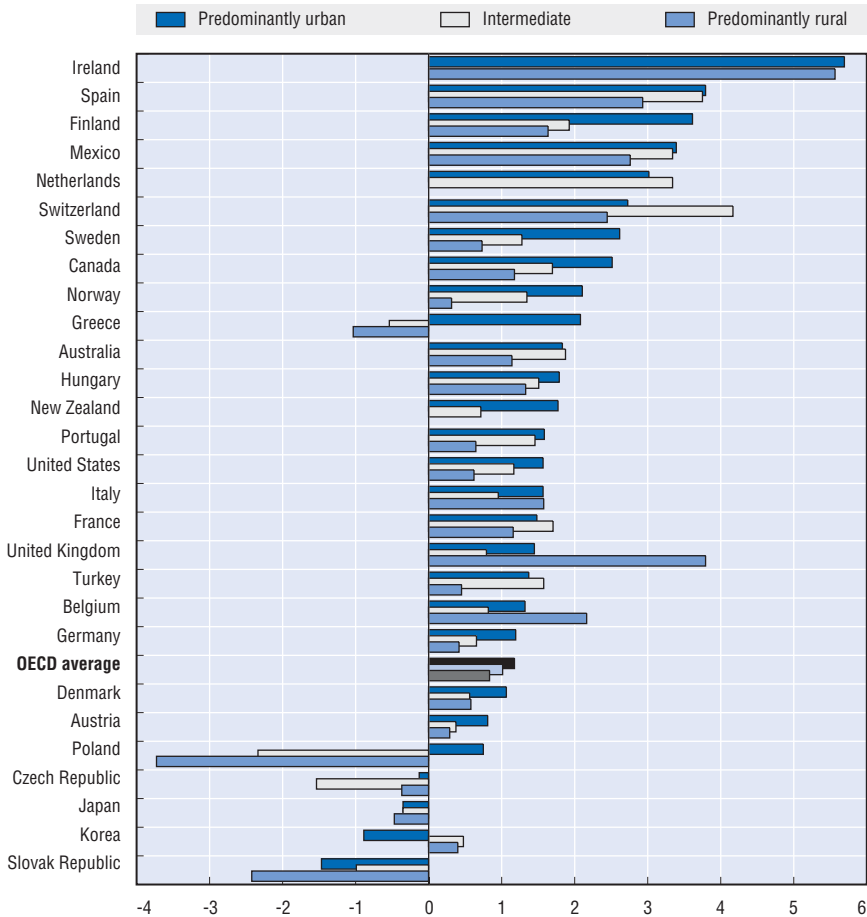
Note: OECD average refers to the average of OECD metro-regions.

Figure 1.25. **Employment growth rates in metro-regions and their countries**
Average annual growth rates (1999-2002) – Sample of 38 metro-regions



while others drive national decline in employment such as in the case of Krakow. However, the evidence is mixed as there is a lack of data on the types of jobs created and their relationship to specialisation of higher value-added activities, a subject that should be further analysed.

Metro-regions exhibit more positive trends in their demographic profiles than their national average. The first positive factor is the *ageing and dependency profile*. The proportion of the population over 65 years old in OECD countries has been growing over the past 25 years as has the old-age dependency ratio (OECD, 2005b). Both indicators are expected to increase with implications for the size of the working-age population.²² However, this trend is not always

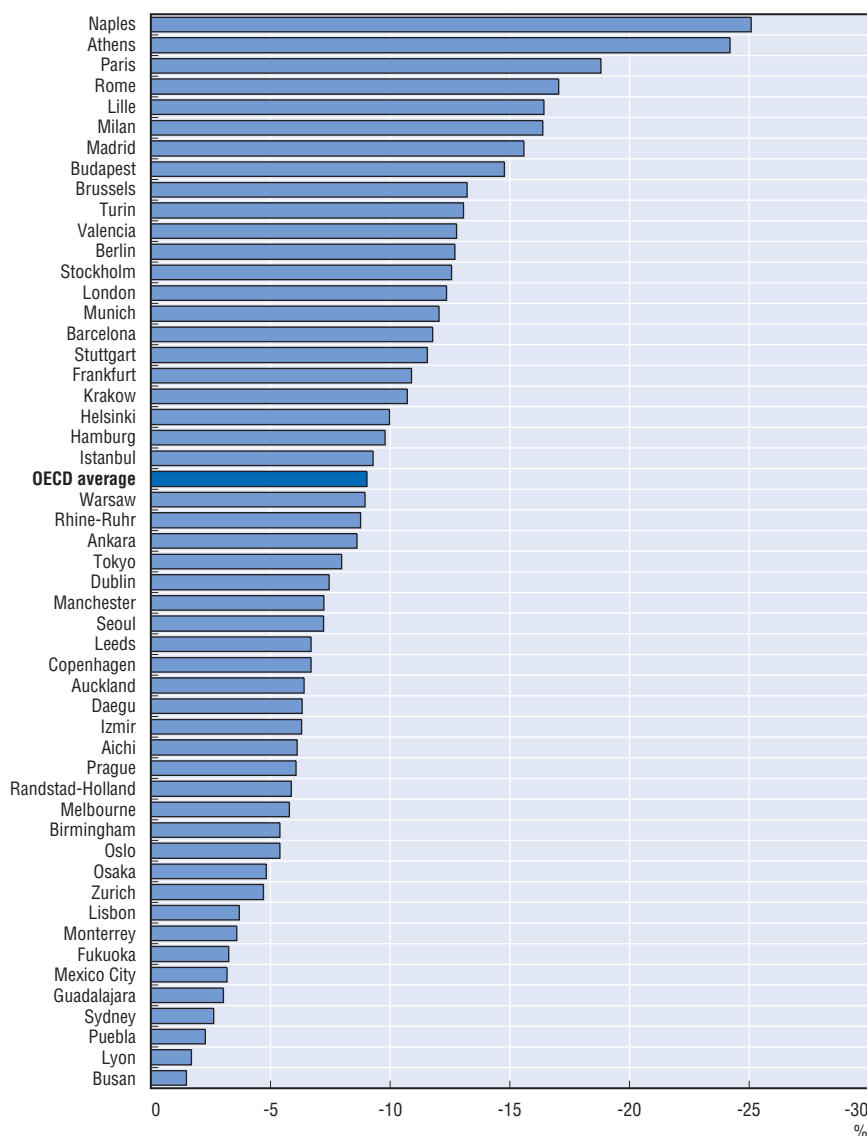
Figure 1.26. **Employment growth by type of regions (1996-2001)**

Source: OECD (2005g), *Regions at a Glance 2005*, OECD publications, Paris, France.

found in metro-regions to which people and resources are attracted by wages, amenities, networks and firm linkages among many other things. All OECD metro-regions have lower old-age dependency ratios than their national economies (Figure 1.27). The difference between the national context and the metro-region level can be as large as in Naples (25%), Athens (24.2%), Paris (18.8%) or Rome (17%) or as small as in Busan (1.5%), Lyon (1.7%) or Puebla (2.3%) with the OECD average differential standing at 9%. In fact, ageing tends to concentrate in rural and peripheral areas. Although having better dependency ratios than those of their national countries, the situation has worsened over the period 1999-2004 for many metro-regions, including Lyon, Busan, Osaka, Tokyo, Aichi and Turin (Figure 1.28). An explanation for this phenomenon may

Figure 1.27. Old-age dependency in metro-regions with respect to the national dependency level (2004)

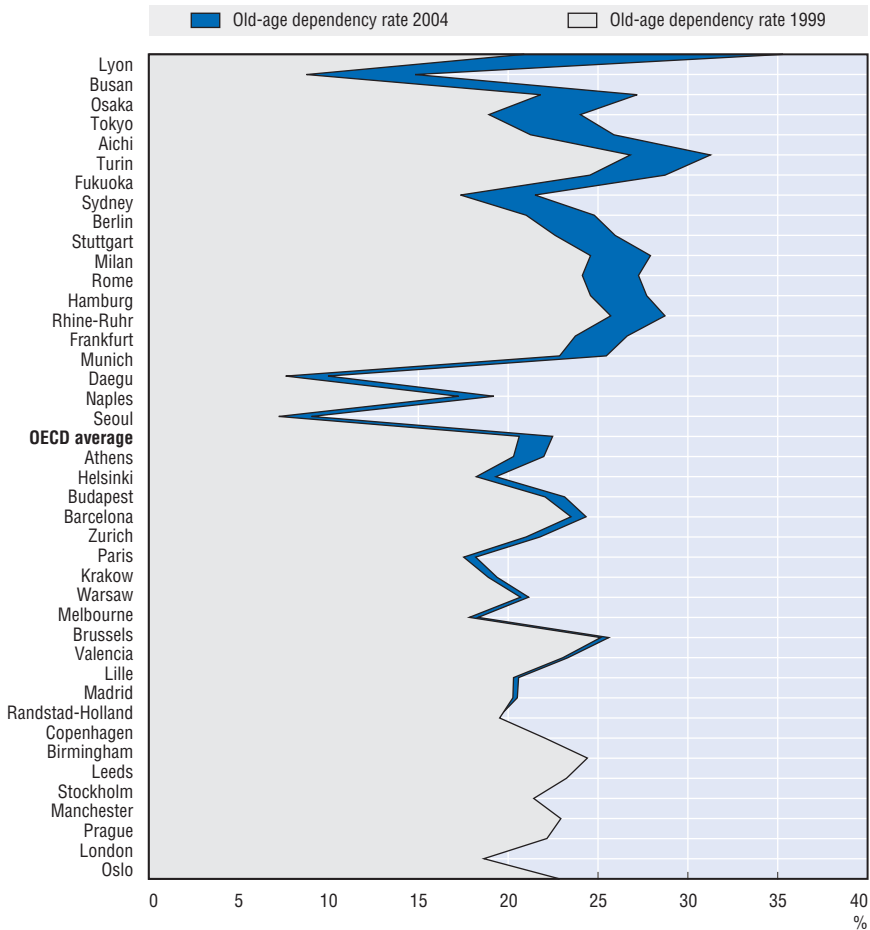
Sample of 50 metro-regions using the differential in ratios between the metro-region and its national dependency ratio



Note: OECD average refers to the average of OECD metro-regions.

be related to industrial restructuring or even retirement migration that might be taking place in metro-regions such as Sydney. The trend has however been more positive in Oslo, London, Prague, Manchester and Stockholm. This has a

Figure 1.28. **Changes in old-age dependency 1998-2004**
Sample of 42 metro-regions

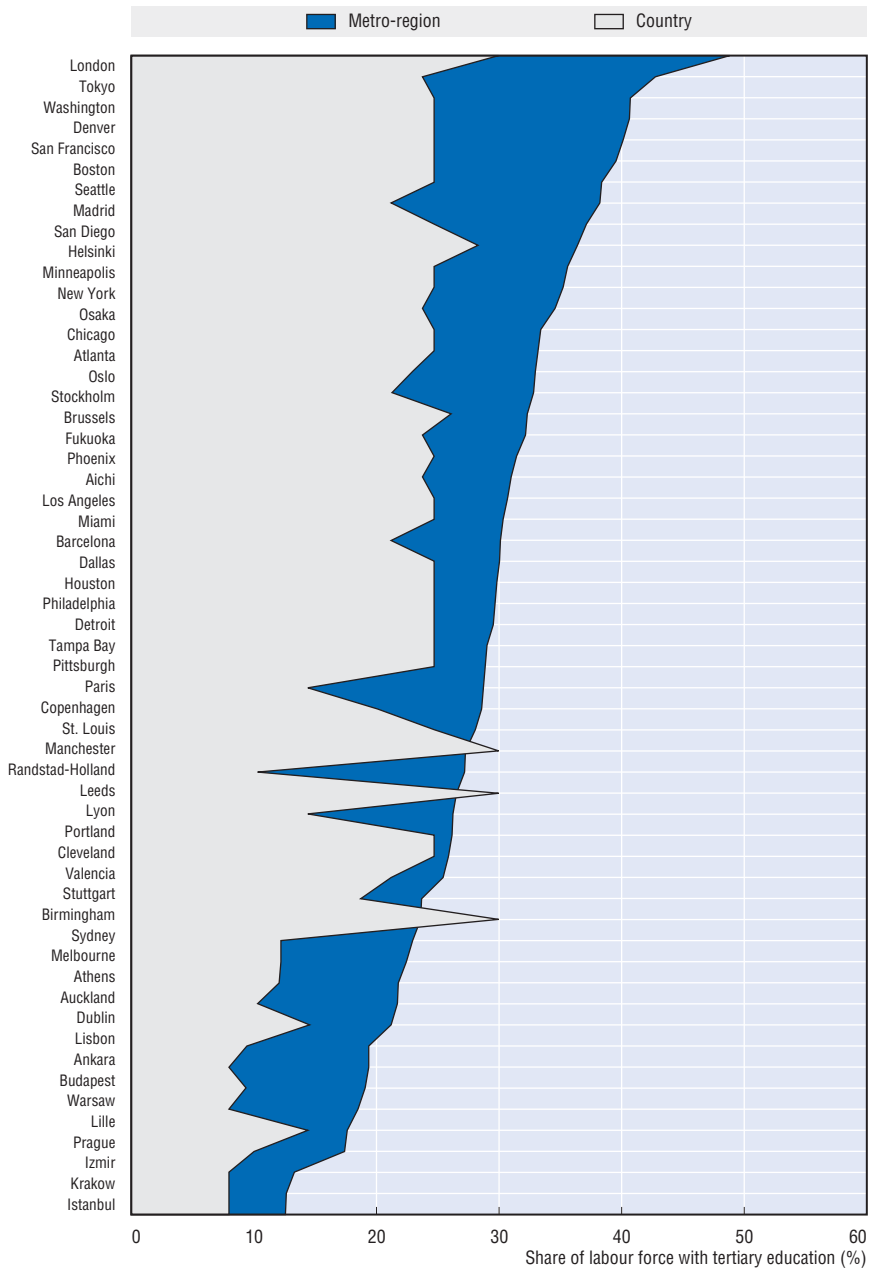


clear impact on competitiveness for firms as dependency may imply a tighter labour market due to less availability of labour force.

A second element that impacts positively on the demographic profile and the labour force is the capacity of large cities to exert a *pull effect on the population*, especially young population. On average, labour force grows faster in urban regions than rural ones (OECD, 2005g). Cities have long been net importers of people. They used to depend on surplus rural labour for growth; nowadays migration is more likely to be from smaller to large cities. Among those that choose to migrate to large cities are highly skilled young people attracted by urban amenities and higher wages. Some cities see rising percentages of older people either because they are stagnating (such as those in Hungary, Japan or

Figure 1.29. **Skills in metro-regions and their national average (2001)**

Percentage differences of population with tertiary education
(sample of 56 metro-regions)



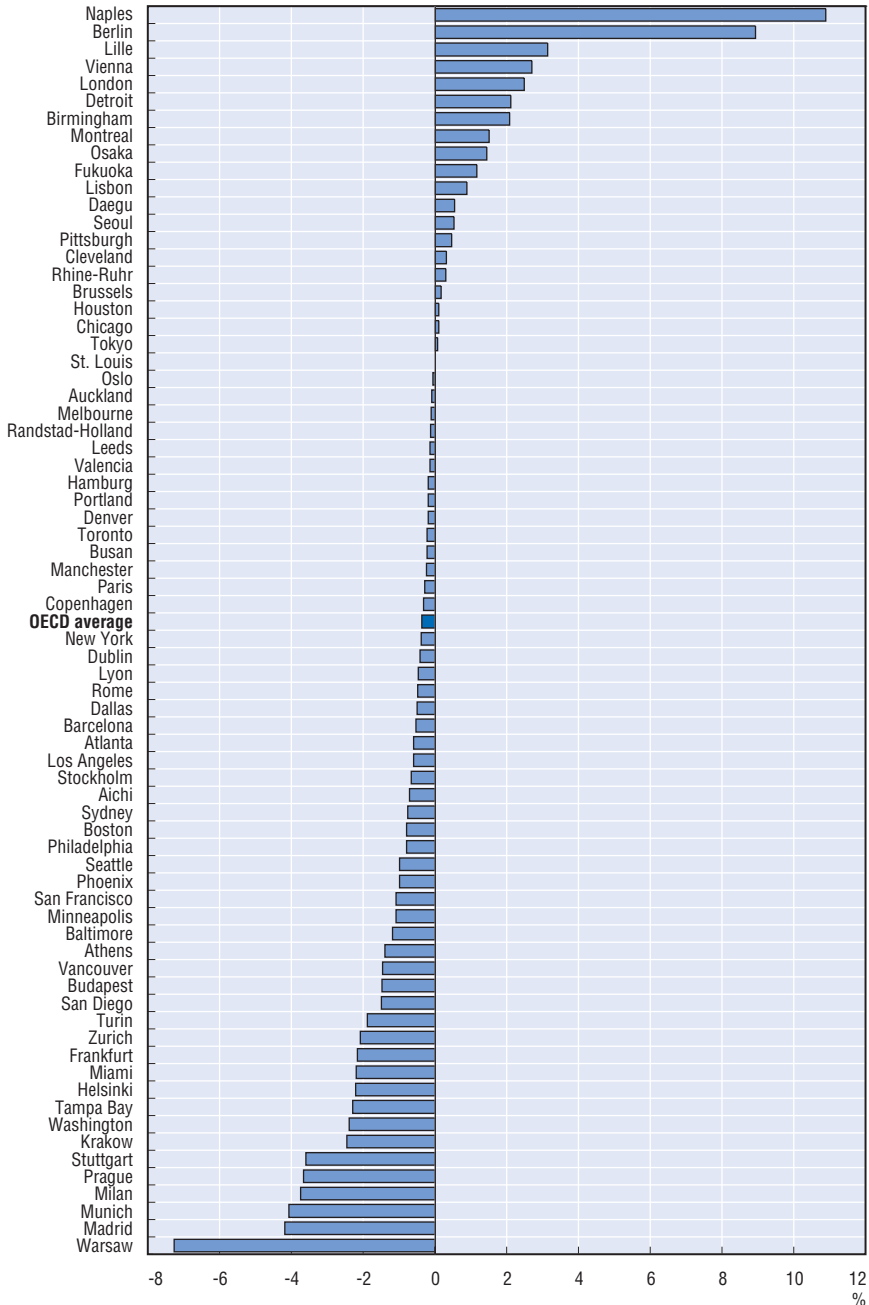
Italy) or because older people are attracted to live there (such as in the cases of Australia, Canada or Spain). However, many metro-regions – even in countries such as Germany and Japan with rapidly rising percentages of older people – actually have above-average percentages of younger people with respect to their national context. Metro-regions not only attract young people, but also the most educated. Metro-regions constantly outstrip the national average in concentrating a larger share of their working-age population with tertiary education (Figure 1.29). In fact, only UK cities (except London) have a lower share of population with higher skills than their national averages.

1.8. The urban paradox

Although most metro-regions appear to be characterised by high concentrations of wealth and employment associated with leading sectors and the focal points of their national economies, they also tend to concentrate a high number of unemployed residents. In other words, wealth is not adequately translated into job creation. According to the OECD Regional Database, about 47% of unemployment in OECD is concentrated in urban regions, but this figure reached 60% in the United Kingdom, Japan, Korea, the Netherlands and the United States. The Regional Database also finds activity rates lower in predominantly urban regions. Overall, unemployment rates are lower in metro-regions than in their national context but for almost one third of metro-regions unemployment rates are higher than their national average (Figure 1.30). The Urban Audit of the European Commission reaches similar conclusions (European Commission, 2004). Although its data refer to a wider size range of cities and not to metro-regions, the areas that fall within many metro-regions are included within this generalisation. While employment and employment growth are typically higher in cities, they also contain disproportionate numbers of people who are either unemployed or inactive (or who work in the informal economy). Among the main explanations advanced by the Urban Audit are the lack of affordable child care facilities, larger proportions of immigrants who generally have lower skills and who may be discriminated against, and in some cases, the presence of a sizeable informal economy, typically large in large cities. The Urban Audit further points out that within European cities there are both a higher share of residents with tertiary education and a higher share of residents without secondary education. It should also be noted that greater absolute numbers of unemployed in metro-regions are a likely result of concentration.

In fact, certain characteristics of dynamic post-industrial cities produce increasing socio-economic inequalities that increase segregation and its consequent discontent. Exclusion is not just a phenomenon within metro-regions in developing countries, produced by migration into poor cities from an even poorer rural hinterland, but also an increasing trend within all OECD metropolitan areas. Exclusion does not, of course, take the same form or intensity

Figure 1.30. **Differences in unemployment rates between metro-regions and their countries (2004)**



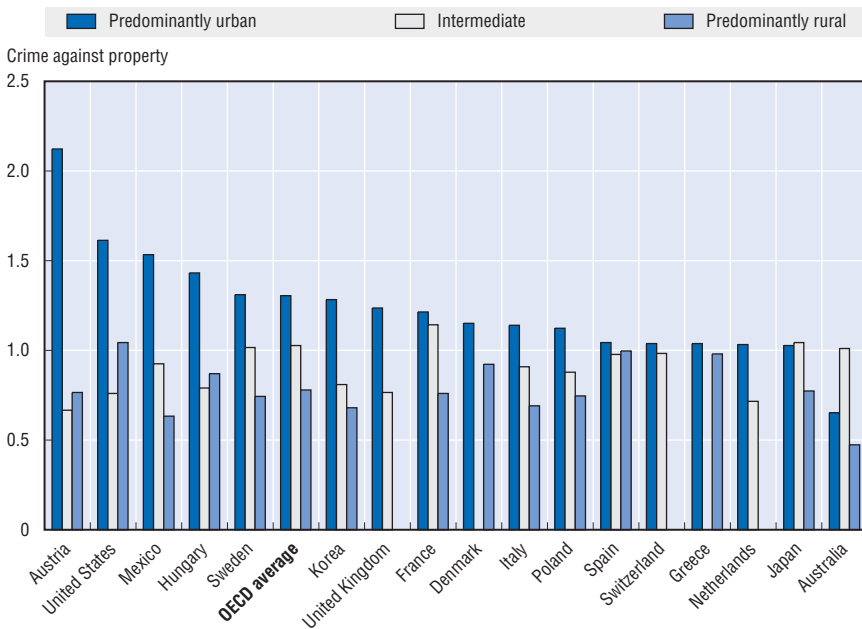
Note: OECD average refers to the average of OECD metro-regions.

in every city. The precise patterns vary from country to country and from city to city, partly depending upon national economic trajectory, labour market policies, welfare state policies and citizenship rights. Most large cities, including the wealthiest ones, have large pockets of populations with low standards of living and accumulations of social problems. They may be particularly vulnerable to extreme social segregation between high-income people working in the high added value services, and those engaged in servicing them. This creates a need for integration strategies in relation to urban services, job opportunities, housing, and the like. Among the main consequences of urban poverty is a higher level of criminality. For instance, urban regions record the highest rates for crimes against property and crimes against the person, which are on average 30% higher than the national level (Figures 1.31 and 1.32) (OECD, 2005g).

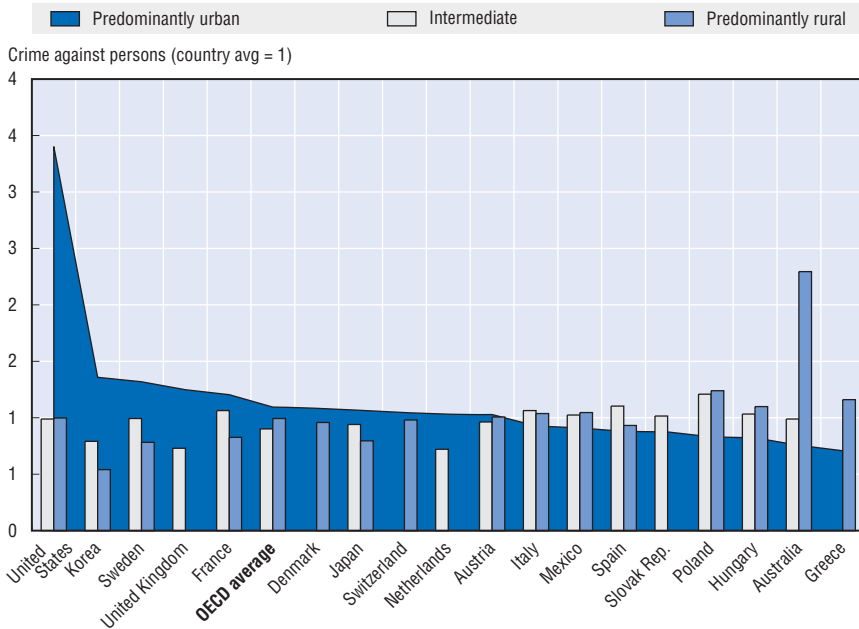
Social exclusion in urban areas is generally associated with strong residential segregation between the prosperous and deprived populations that concentrate in deprived neighbourhoods. Far from being solved, the situation has worsened since the 1980s, both in countries with strong employment growth and in those where unemployment remains high. Even Nordic countries, which generally have comprehensive benefit systems, have not been able to prevent the emergence of inequalities in some urban areas. An OECD report on ten countries

Figure 1.31. **Crime against property by type of region (2001)**

Country average = 1.0 (2001)



Source: OECD (2005g), *Regions at a Glance 2005*, OECD publications, Paris, France.

Figure 1.32. **Crime against persons by type of region (2001)**

Source: OECD (2005g), *Regions at a Glance 2005*, OECD publications, Paris, France.

surveyed – containing around half of the total population of the OECD – shows that the proportion of the population of major urban areas in relative distress ranges from 7 to 25%, representing up to 10% of the national population. In those countries surveyed, approximately 20 million people live in deprived areas, out of a total metropolitan population numbering 185 million (OECD, 1998). In many urban regions today, problems have now become chronic with patterns of social exclusion – unemployment, dependency, crime and violence – perpetuated from one generation to the next in the affected areas. Problems are also becoming more pervasive, affecting the wider urban region, including to the spread of decline to hitherto reasonably well-functioning areas (such as the inner ring of suburbs in US cities), or the crossing of jurisdictional boundaries through higher levels of city-wide crime and violence, more widespread pollution, traffic congestion, and derelict sites in the suburbs and/or the inner city.

1.9. The dilemmas for metropolitan regions

The present chapter demonstrates the importance of gaining more knowledge. It strongly indicates the need for further work, particularly of two kinds:

- The collection of statistical data at the level of the metro-regions in order to acquire knowledge of their internal economic and social structure. These

regions, which are defined functionally and technically, only coincidentally correspond to existing administrative or census boundaries. It is therefore difficult to acquire knowledge of their distinctive occupational and economic structure. For cities of the industrial era it is possible to gather data on their typical industrial and other specialisations; we need to be able to do the same for metro-regions, which may be the typical urban forms of the post-industrial economy.

- Detailed ethnographic studies of whether, and if so how, metro-regions function as integrated economic wholes. It cannot be assumed *a priori* that all metro-regions possess an overall integration; and it is certainly the case that any functional integration found will involve only a part of the overall economy. There are however studies that suggest that innovative large cities in particular are characterised by certain kinds of networks, even cultural forms (Florida, 2002). But these studies are only fragmentary, covering only a small number of cases, and normally comprise statistical correlations rather than profiles of actual networks.

Based on existing data availability, the above discussion has shown the economic advantages but also some difficulties posed by the rise of metro-regions and mega-cities, presenting a number of strategic choices that confront policy-makers. These choices can be presented as a set of contrasted or opposed options or dilemmas. It would however be wrong to see them as dilemmas in the strict sense of requiring the pursuit of one against another of a particular pair of options. Often, compromises can be struck, the options being more the ends of a continuum than actual choices. At other times choices will be resolved by policy-makers moving, under the pressure of difficult choices, to new and original positions. However, it helps clear thinking if the choices are initially set out as dilemmas. The following account will therefore be organised in terms of these choices. After a particular choice has been set out and explained, the discussion will move to consider the scope for creative compromises around them, and also initiatives which have sought to transcend the need for choice. Cases are quoted, not because they serve as models to follow, but because they illustrate themes and provide examples. The actual paths chosen in specific contexts will depend on political criteria, the particular balance of issues at stake, and the creativity of individual groups of policy-makers.

The key dilemmas are the following:

Competitiveness, liveability and strategic visions

1. Metro-regions have become major centres of growth in contemporary economies; but are they the causes of such growth or its consequence? If the former, they need to be encouraged; if the latter, does their tendency to

attract resources away from other regions do more overall harm than good? Assessment of the net balance of the value of metro-regions must also take account of a further negative characteristic that leads to the second dilemma.

2. To view the economic activities of a metro-region as a whole in this way, to seek to encourage the location of particular activities within the region, to provide an environment in which both they and the population in general will thrive implies that there is a strategic vision at the level of the metro-region. Public authorities are central to the generation of such visions; but can they do this without attempting direct substantive economic planning of a kind which cannot work in a dynamic, changing economy?
3. Concentrations of population that account for part of the dynamism of some metro-regions also contribute to typical urban problems of congestion, poor environment, housing shortages and the formation of ghettos. Is there a choice between economic dynamism and having a liveable city?

The governance of metro-regions

1. The *de facto* existence of metro-regions, and even more their need for strategic visions and overall infrastructural planning, suggests some need for a relatively autonomous public authority at the appropriate geographical level; but this level will be remote from many citizens' local concerns, and there is evidence that local levels are also necessary to engage citizen commitment. There are also major potential conflicts with existing city authorities within the metro-region if they lose power to a new, higher level of government. Particularly significant may be the fact that metro-regions are often favoured by central governments, which associates them with concentrating power upwards from existing local authorities rather than devolution downwards from itself.
2. There may however also be potential conflicts between any autonomous public authority at the metro-regional level and the role of central government, as the former may seek devolved powers or seek to pursue policies at variance with national government priorities. In countries with wider regional or federated levels of government, there will also be complex relationships between metro-regions and these levels. Where is the balance between these to be found?
3. A further issue of governance is raised by the fact that for the development of policies for economic development, public authorities need to involve the private sector in constructing regional partnerships, but does this encourage improper lobbying and a squeezing out of small and medium-sized enterprises by large corporations?

4. The high cost of urban and inter-urban infrastructure and of other public and social services required by metro-regions presents major fiscal issues. If these costs are borne within the region alone, investment may be deterred; but investment specifically directed to meet the high costs of metro-regions by central government may create distortions between the favoured areas and the rest of the country. Meanwhile, there will be a loss of autonomy over their own infrastructural priorities for local governments within the regions concerned, exacerbating existing problems of levels of government and governance.

Notes

1. See Appendix 1.
2. The OECD classifies regions within each member country based on two territorial units: the higher level (Territorial Level 2) consists of about 300 macro-regions while the lower (Territorial Level 3) is composed of more than 2300 micro-regions. TL3 levels are provinces in Belgium, Italy, Korea, the Netherlands, Spain and Turkey; statistical divisions in Australia; departments in France; development regions in Greece, regional authority regions in Ireland, regional councils in New Zealand and subregions in Poland; groups of municipalities in Mexico, cantons in Switzerland or prefectures in Japan; BEA Economic Areas in the United States, census divisions in Canada and upper tier authorities – or some other form of groups of smaller tier authorities – in the United Kingdom. Other particular names are given for TL3 regions in Austria (Gruppen von Politischen Bezirken), the Czech Republic (Kraje), Denmark (Amter), Germany (Regierungsbezirke), Finland (Maakunnat), Hungary (Megyek), Norway (Fylker), Portugal (Grupos de Concelhos) Sweden (Län). For more information about the OECD regional typology, see OECD (2005g).
3. The OECD Regional Typology classifies regions into three categories: predominantly rural (more than 50% of the population living in rural communities), intermediate (between 15-50%) or predominantly urban (less than 15%). A rural community is a community with a population density below 150 inhabitants/km².
4. The UN has defined mega-cities as those with populations over 10 million people. Simple graphical observation of metro-regions shows that the largest cities are a group of metro-regions in itself. Moreover, as shown in Appendix 3, mega-cities over 7 million people may be experiencing similar challenges. Hence, the threshold for mega-cities was set at 7 million people.
5. In the case of the polycentric regions such as the Randstad-Holland, agglomerations have occurred around several urban centres (Amsterdam, Rotterdam, Utrecht and The Hague), and over time have resulted in the urbanisation of the entire region (except for the so-called “green heart”). However, the degree of functional economic integration in these regions is weaker than in monocentric metropolitan regions.
6. However, the period omits – due to unavailability of data – the years after Eastern Europe’s accession to the European Union. It is possible that metro-regions such as Budapest, Krakow, Prague and Warsaw may be growing faster, spurred by increased international trade.

7. The lack of data available at the sub-national level (at the level of the department, county, province or prefecture) does not allow the production of multi-factor productivity figures at the metro-region level. Therefore, these productivity figures and rankings at the metro-region level have to be taken with caution.
8. In Appendix 3, the threshold or critical population size at which the positive relationship between income and population becomes negative – suggesting congestion costs or diseconomies of scale – lies at 7.35 million people. There is in fact a stream of literature on the question of the optimum city size.
9. Starting with Flatters, Henderson and Mieszkowski's (1974) seminal paper, further developed by Stiglitz (1977), there is an ongoing debate over a possible optimum city.
10. This is shown in Table A.3.3 in Appendix 3 to be positive although statistically significant according to Pearson's correlation coefficient.
11. Shanghai Bureau of Statistics, *Yearbook of Shanghai Statistics*, 2004.
12. By definition, average productivity is a weighted average of sectoral productivity, where weights are given by the employment share of each sector. Therefore, differences in average productivity due to differences in employment shares can be regarded as the effect of specialisation and differences in average productivity due to sectoral productivity can be interpreted as the result of differences in capital and technology.
13. Yet, in both cases, there are some concerns about the concentration of this on one sector and, essentially, the one firm of Nokia in Helsinki or groups of large firms in Stockholm (Ericsson, ABB and Astra Zenica).
14. Quoted in Duranton and Puga (1999).
15. See Van Widen in Part II.
16. See also Sassen (1991).
17. In addition to industrial mix, productivity levels depend as well on complementary factors of production, i.e., skills, technology and physical capital. See Appendix 4.
18. In almost all countries, GDP is more concentrated than population. Only in Korea does the concentration of population exceed that of GDP.
19. In fact, such association is statistically significant as revealed by the correlation coefficient shown in Appendix 3.
20. www.amic.org.sg/websites/cities.pdf.
21. In fact, Appendix 3 shows that national economic growth in OECD metro-regions is positively (the regressions yield strong and statistically significant coefficients) influenced by metro-regional levels of income.
22. Another implication is that, as old-age populations depend on their national security system, and on the income received by the working-age group to a growing dependency ratio, implies greater pressures on national security systems and eventually, fiscal pressures to finance it.

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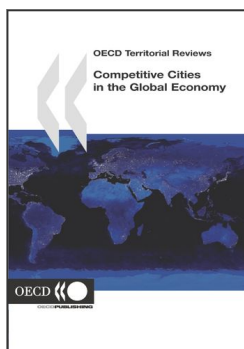
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