

7. GEOGRAPHIC CONCENTRATION OF PATENTS

Patent statistics provide a measure of innovation, as they reflect the inventive performance of countries, regions and firms. The geographic distribution of patents therefore indicates the level of diffusion of technology and knowledge across regions.

Innovation is highly concentrated...

Figure 7.1 suggests that patents are concentrated in a small number of regions within countries. In 2003, 57% of all patents in OECD countries were recorded by 10% of regions.

The geographic concentration index reveals that Sweden and Korea (66), Japan and Greece (65), Turkey (63) and Hungary (60) had the highest concentration of patents in 2003 (Figure 8.2), followed closely by Spain (58), Mexico (56), Denmark and Finland (54), Norway and Portugal, (53), and Canada and Australia (52). The geographic concentration was lowest in Belgium (28), Austria and Poland (32), and the Czech Republic and Germany (35).

Over the period 1998-2003, the geographic concentration of patents increased most in the Slovak Republic (18) and Portugal (11), and it decreased most in Poland (-12) and Hungary (-8).

... particularly in urban areas

Predominantly urban regions appear to provide the most fertile ground for innovative activity. In 2003, the correlation between patents and population in urban regions was positive in all OECD countries (Figure 7.3). It was particularly pronounced in the Netherlands (0.92), Denmark (0.86), and Portugal (0.81).

Although somewhat less so, intermediate regions also make a noteworthy contribution to patent activity. In 10 out of 21 OECD countries the correlation between patents and population in intermediate regions was positive.

Finally the correlation between patent activity and population in rural regions was negative in all OECD countries except Korea (0.77), the Czech Republic (0.37) and Poland (0.01). The negative correlation was particularly pronounced in Canada (-0.90), the United Kingdom (-0.76) and Sweden (-0.74).

Innovation does not always mirror skill levels...

As patent activity is very skill-intensive, one might expect the regional distribution of patents to mirror that of skilled workers. In fact, a comparison of the geographic concentration indexes of patents and skilled workers (population with tertiary education) reveals that, in most countries, patents are more concentrated than the highly skilled population (Figure 7.4). Only in Australia is the skilled population more concentrated than patents.

... as it also requires physical capital

Thus, the geographic pattern of knowledge creation, as proxied by patent registrations, and of the skilled population, as proxied by the share of the workforce with a post-secondary degree or diploma, is not necessarily the same. The generation of patents requires inputs (e.g. physical capital) and infrastructure (e.g. laboratories) which tend to be geographically more concentrated than human capital.

Definition

A patent is defined as a right granted by a government to an inventor in exchange for the publication of the invention. It entitles the inventor to prevent any third party from using the invention in any way, for an agreed period.

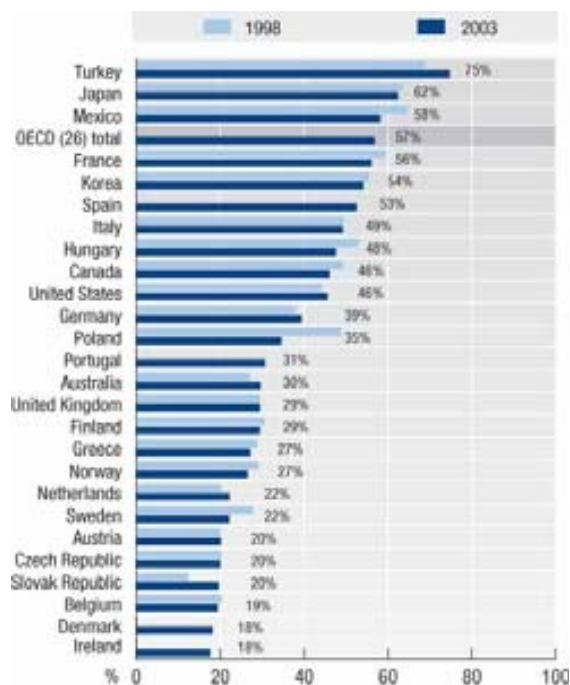
Patent data refer to priority data which corresponds to the first filing of the invention.

The regional distribution of patent applications is assigned according to the inventor's region of residence. If an application has more than one inventor, the application is divided equally among all inventors and subsequently among their regions of residence, thus avoiding double counting.

7. GEOGRAPHIC CONCENTRATION OF PATENTS

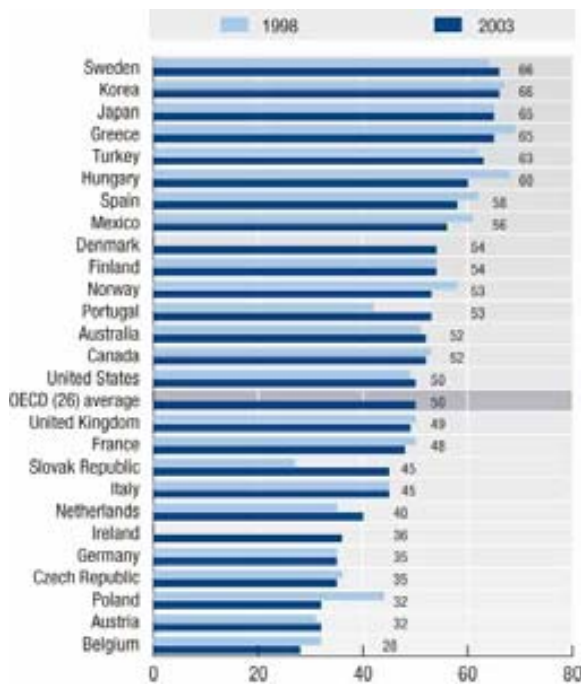
7.1. In 2003, 57% of total patents were concentrated in only 10% of regions

Per cent of national patent applications in the 10% of regions with the highest concentration of patents (TL2)



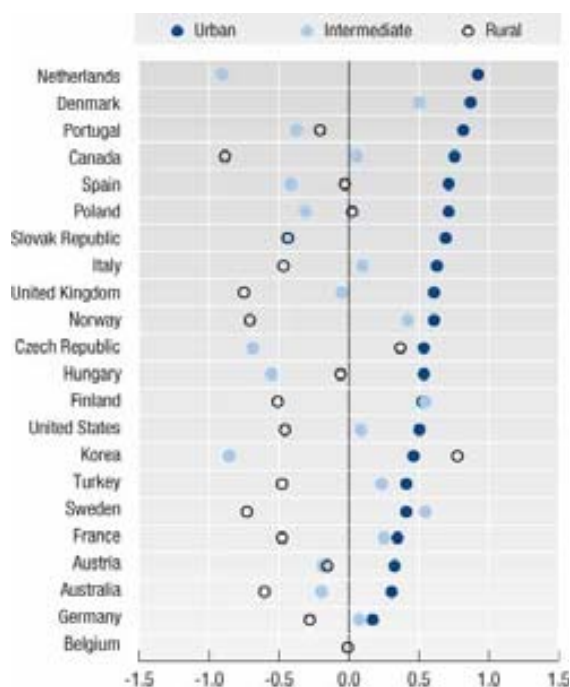
7.2. Sweden, Korea, Japan and Greece have the highest geographic concentration of patents

Index of geographic concentration of patents (TL2)



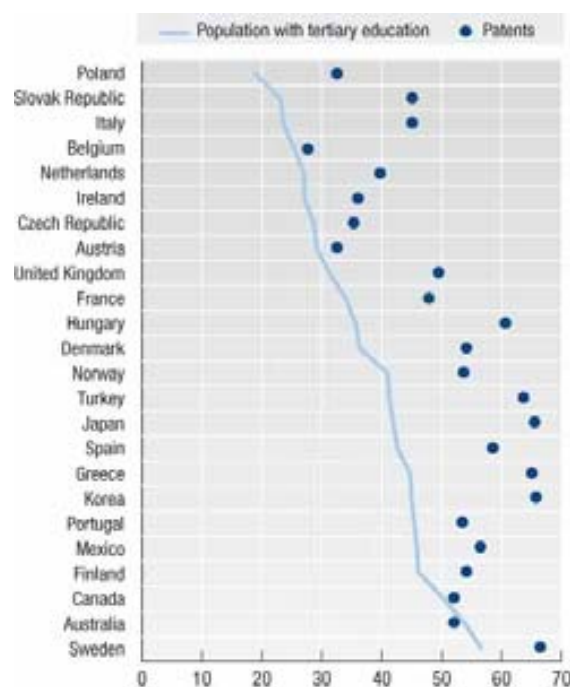
7.3. Predominantly urban regions provide the most fertile ground for innovative activity

Spearman correlation between patent applications and population share by regional type, 1998-2003 (TL2)



7.4. Patents are more concentrated than the highly skilled population

Concentration index, 2003 (TL2)

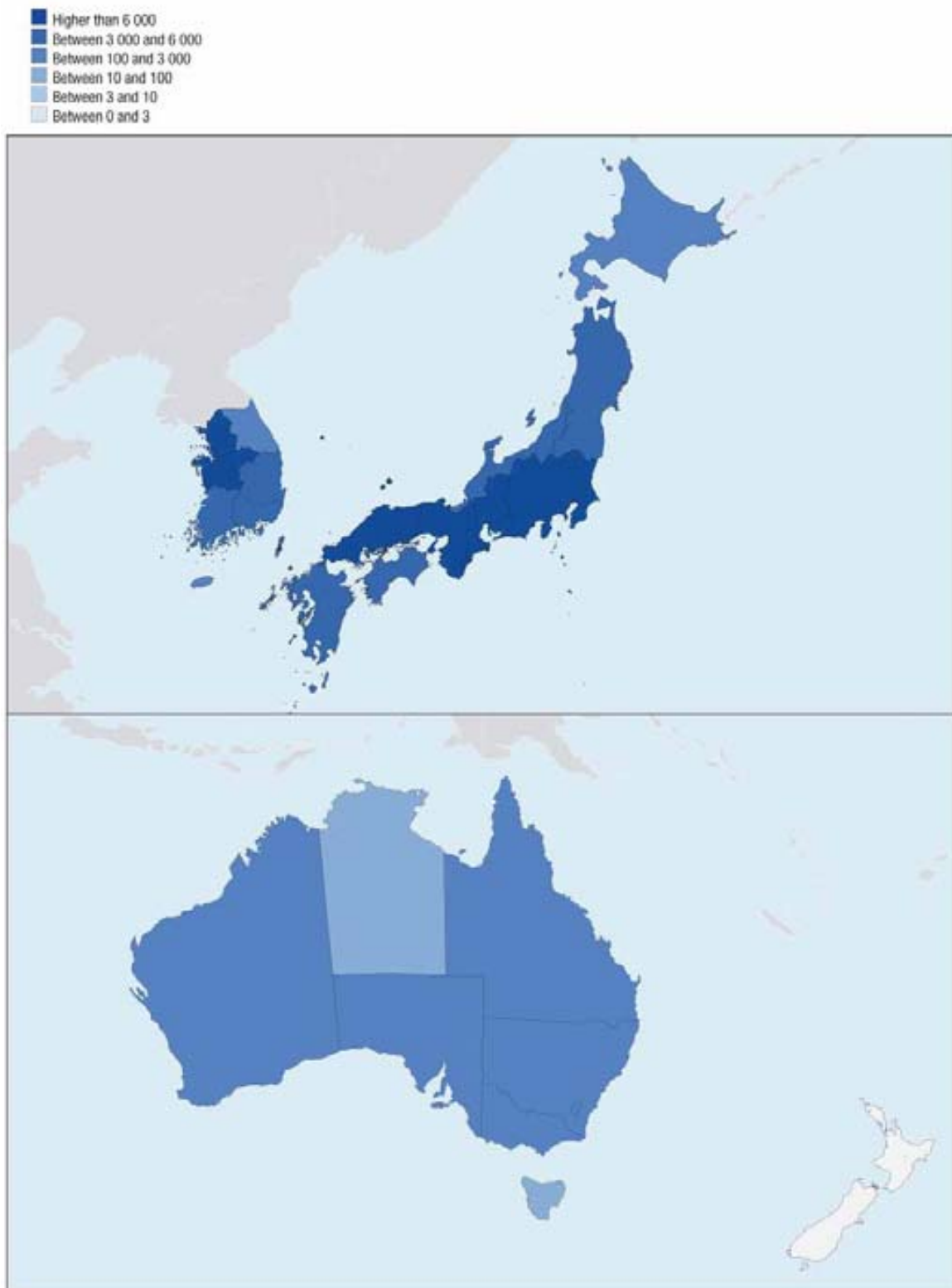


StatLink <http://dx.doi.org/10.1787/632442377332>

7. GEOGRAPHIC CONCENTRATION OF PATENTS

7.5. Patent applications by region: Asia and Oceania

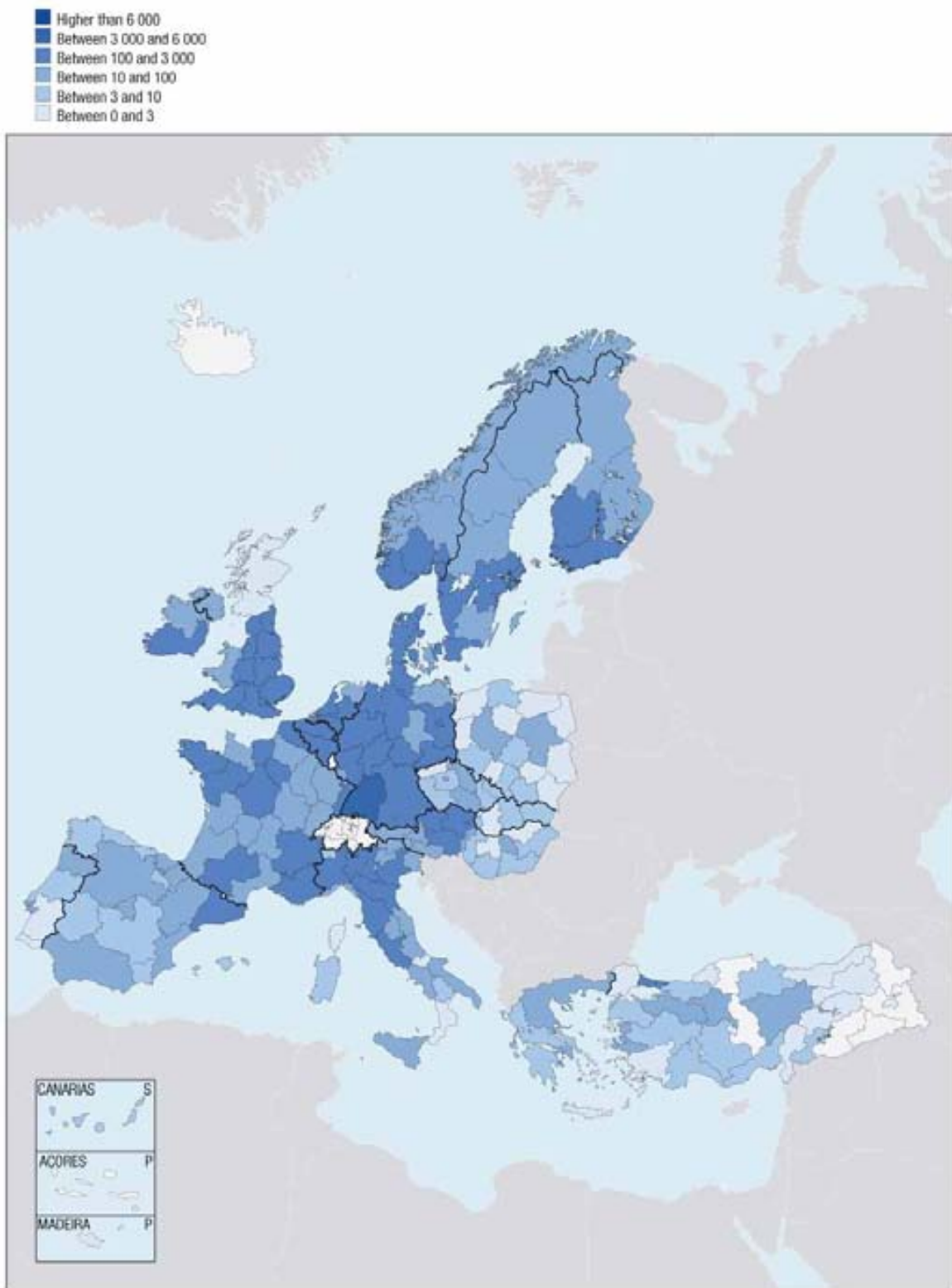
2003




StatLink  <http://dx.doi.org/10.1787/356300221452>

7.6. Patent applications by region: Europe

2003

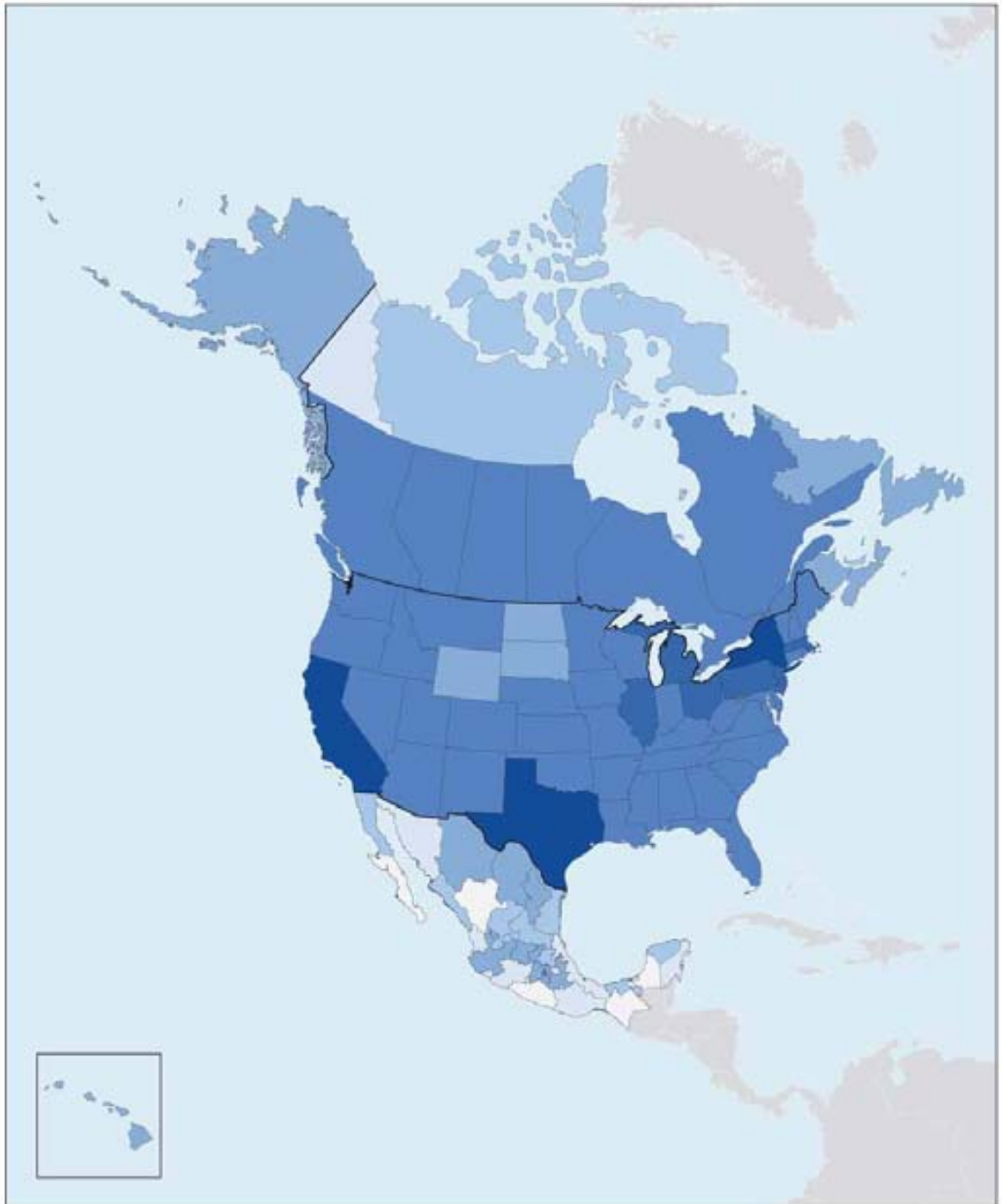
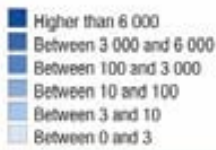


StatLink  <http://dx.doi.org/10.1787/356300221452>

7. GEOGRAPHIC CONCENTRATION OF PATENTS

7.7. Patent applications by region: North America

2003



StatLink  <http://dx.doi.org/10.1787/356300221452>

Is higher labour productivity associated with more patents?

Innovation is expected to increase the productivity of firms. In fact the correlation between patent applications and labour productivity within regions during 1998-2003 is positive in 19 out of 22 OECD countries (Figure 7.8). Only in Belgium and Greece is the correlation negative and statistically significant.

The positive correlation was particularly pronounced in Japan (0.82), Norway (0.79) and Finland (0.64), followed by France (0.59), the United Kingdom (0.56), the Slovak Republic (0.54), the United States (0.49), Germany, Turkey and Poland (0.47), and Sweden (0.45). In all these countries it was statistically significant.

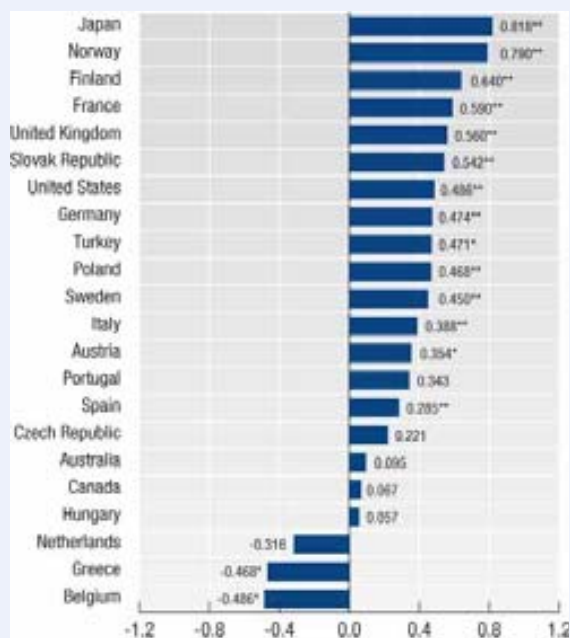
The ability to innovate may affect the competitiveness of different types of regions.

The correlation between patent applications and population was positive in rural regions in 14 OECD countries (Figure 7.9). In contrast, the correlation between patent applications and population was positive in urban and intermediate regions in seven and nine OECD countries, respectively.

This indicates that during 1998-2003 patent activity in rural regions was catching up relative to urban and intermediate regions. Nonetheless in Austria, Italy, Japan, the Netherlands, Portugal, the Slovak Republic and Turkey, predominantly urban regions provided the most fertile ground for innovative activity over the period.

7.8. In 19 out of 22 OECD countries the correlation between labour productivity and patent applications is positive

Spearman rank correlation of regional labour productivity and regional patent applications, 1998-2003 (TL2)

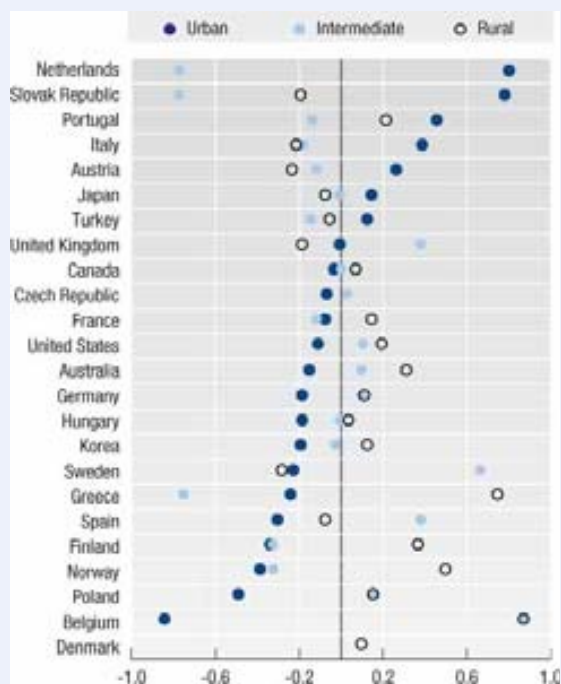


* Indicates significant at 95%.

** Indicates significant at 99%.

7.9. During 1998-2003 the share of patents filed in urban regions increased the most in the Netherlands and the Slovak Republic

Spearman correlation between patent growth and population share by regional type, 1998-2003 (TL2)



StatLink  <http://dx.doi.org/10.1787/632442377332>





II. MAKING THE BEST OF LOCAL ASSETS

8. REGIONAL DISPARITIES IN GDP PER CAPITA
9. REGIONAL DISPARITIES IN LABOUR PRODUCTIVITY
10. REGIONAL DISPARITIES IN SPECIALISATION
11. REGIONAL DISPARITIES IN TERTIARY EDUCATION ATTAINMENT
12. REGIONAL DISPARITIES IN UNEMPLOYMENT RATES
13. REGIONAL DISPARITIES IN PARTICIPATION RATES

THE KEY DRIVERS OF REGIONAL GROWTH

14. THE FACTORS BEHIND REGIONAL PERFORMANCE
15. REGIONAL GROWTH IN THE OECD
16. NATIONAL FACTORS AND REGIONAL PERFORMANCES
17. REGIONAL FACTORS: GDP PER CAPITA AND POPULATION
18. REGIONAL FACTORS: PRODUCTIVITY AND SPECIALISATION
19. REGIONAL FACTORS: EMPLOYMENT, PARTICIPATION AND AGEING

Symbols and Abbreviations

OECD (25) average	Unweighted average of 25 OECD countries.
OECD (25) total	Sum over all regions of 25 OECD countries.
OECD (25)	Range of variation over all regions of 25 OECD countries.
TL2	Territorial Level 2.
TL3	Territorial Level 3
NOG	Non Official Grid
*	Differences in the definition of data or regions. Please check the “Sources and Methodology” section.
PU	Predominantly Urban
IN	Intermediate
PR	Predominantly Rural
PPP	Purchasing Power Parity
USD	United States Dollar





I. REGIONS AS ACTORS OF NATIONAL GROWTH

1. GEOGRAPHIC CONCENTRATION OF POPULATION
2. GEOGRAPHIC CONCENTRATION OF THE ELDERLY POPULATION
3. GEOGRAPHIC CONCENTRATION OF GDP
4. REGIONAL CONTRIBUTIONS TO GROWTH IN NATIONAL GDP
5. GEOGRAPHIC CONCENTRATION OF INDUSTRIES
6. REGIONAL CONTRIBUTIONS TO CHANGES IN EMPLOYMENT
7. GEOGRAPHIC CONCENTRATION OF PATENTS

Table of Contents

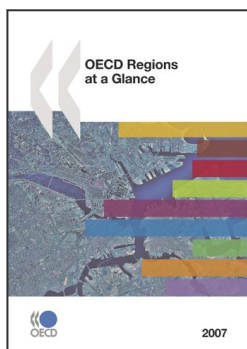
Executive Summary	7
Symbols and abbreviations	11
I. Regions as Actors of National Growth	
1. Geographic concentration of population	14
2. Geographic concentration of the elderly population	20
3. Geographic concentration of GDP	26
4. Regional contributions to growth in national GDP	32
5. Geographic concentration of industries	38
6. Regional contributions to changes in employment	44
7. Geographic concentration of patents	50
II. Making the Best of Local Assets	
8. Regional disparities in GDP per capita	58
9. Regional disparities in labour productivity	64
10. Regional disparities in specialisation	70
11. Regional disparities in tertiary education attainment	76
12. Regional disparities in unemployment rates	82
13. Regional disparities in participation rates	88
The Key Drivers of Regional Growth	
14. The factors behind regional performance	96
15. Regional growth in the OECD	98
16. National factors and regional performances	102
17. Regional factors: GDP per capita and population	106
18. Regional factors: productivity and specialisation	110
19. Regional factors: employment, participation and ageing	114
III. Competing on the Basis of Regional Well-being	
20. Accessibility: distance from the closest urban centre	120
21. Education: student enrolments in tertiary education	124
22. Voter turnout in national elections	128
23. Safety: reported crimes against property	132
24. Safety: reported murders	136
25. Home ownership	140
26. Environment: private vehicle ownership	144
27. Environment: municipal waste	148

IV. Regional Focus on Health

28. Health: age-adjusted mortality rate	154
29. Health status: premature mortality	160
30. Health status: incidence of cancer	166
31. Health resources: number of physicians	172
32. Health resources: density of practising nurses	178
33. Health resources: hospital beds	182
34. Health resources: medical technology	188
35. Non-medical determinants of health: prevalence of smoking	194
36. Non-medical determinants of health: prevalence of obesity	198

Source and Methodology

Territorial Grids and Regional Typology	205
Regional grids	205
Regional typology	205
Population – Chapters: 1, 8, 17, 21, 23, 24, 26, 27, 30, 31, 32, 33, 34, 35, 36	214
Population by age and sex – Chapters: 2, 11, 13, 19, 28	215
Gross domestic product – Chapters: 3, 4, 8, 9, 15, 16, 17, 18, 19	217
Employment by industry – Chapters: 5, 10, 18	219
Labour force, employment, unemployment and long-term unemployment – Chapters: 6, 9, 12, 13, 18, 19	220
Employment at place of work – Chapter 9	222
Patent applications – Chapter 7	223
Educational attainments – Chapter 11	224
Time distance from the closest urban centre – Chapter 20	226
Student enrolment in tertiary education – Chapter 21	228
Voter turnout in national elections – Chapter 22	229
Crimes against property – Chapter 23	230
Number of murders – Chapter 24	232
Number of dwellings inhabited by the owner; total number of occupied dwellings – Chapter 25	234
Number of private vehicles – Chapter 26	235
Volume of produced waste – Chapter 27	236
Death by age and sex: Chapters 28, 29	237
Number of new cases of cancer – Chapter 30	239
Number of physicians – Chapter 31	240
Number of nurses – Chapter 32	242
Number of hospital beds – Chapter 33	244
Number of CT scanners and MRI units – Chapter 34	246
Number of smokers aged 15 and over – Chapter 35	247
Number of people suffering from obesity – Chapter 36	248
Indexes and Formulas	249
The drivers of regional growth	251



From:
OECD Regions at a Glance 2007

Access the complete publication at:
https://doi.org/10.1787/reg_glance-2007-en

Please cite this chapter as:

OECD (2008), "Geographic concentration of patents", in *OECD Regions at a Glance 2007*, OECD Publishing, Paris.

DOI: https://doi.org/10.1787/reg_glance-2007-9-en

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document, as well as any data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area. Extracts from publications may be subject to additional disclaimers, which are set out in the complete version of the publication, available at the link provided.

The use of this work, whether digital or print, is governed by the Terms and Conditions to be found at <http://www.oecd.org/termsandconditions>.