The gross domestic expenditure in research and development (R&D) is usually broken down among four sectors of performance: business enterprise, government, higher education and private non-profit. In general, R&D performed by the business sector accounts for the largest part of R&D activities. In 2007 R&D performed by the business sector was close to 70% of total R&D in OECD countries. At the same time governments can play an important role in fostering investment in R&D; and most basic research is performed in universities and public research organisations.

Differences in the share of R&D expenditure performed by the business and by the public (government and higher education) sectors can be very different both in countries with high R&D intensity (total R&D expenditure as a per cent of gross domestic product [GDP]) and in those that are less R&D-intensive (Figures 15.5 and 15.6).

The ratio between the business R&D expenditure (BERD) and the value added of industry was quite varied among OECD countries in 2007. Regional differences were the widest in the United States, Denmark, Finland and Sweden (Figure 15.1).

Evidence shows that for the OECD area as a whole, R&D tends to display larger variations than GDP over the business cycle (*OECD STI Scoreboard 2009*). This suggests that a drop in regional GDP due to the economic crisis could result in an even larger decrease in R&D expenditures of regions. This decrease is likely to affect countries differently, depending on the resilience of regions within countries. Responsiveness of business R&D expenditure to the business cycle seems the strongest in Portugal, Spain and Finland. On the other hand, in Belgium, the United Kingdom, the Netherlands and the United States the elasticity of business R&D expenditure to regional GDP is the lowest among the countries considered; this result suggests that these countries have been able to maintain their level of R&D expenditure over the business cycle (Figure 15.2).

Top performing regions in business R&D intensity can differ from the country average values as high as 2.5 percentage points; such is the case for Massachusetts (United States) and Eastern England (United Kingdom). But also in countries that are less R&D-intensive, the gap between the top performing region and other regions can be high, such as in Stredni Cechy in the Czech Republic and Trøndelag in Norway (Figure 15.3).

R&D expenditure performed by the public sector was around 0.6% of GDP in OECD countries. In most countries, the regions with largest R&D intensity performed by the public sector are usually capital regions, where public research centres are located. (Figure 15.4)

Definition

Gross domestic expenditure on R&D is the total intramural expenditure on R&D performed in the region or country during a given period (see the *Frascati Manual*, Section 6.7.1 and Section 6.6). Intramural expenditures are all expenditures for R&D performed within a statistical unit or sector of the economy during a specific period, whatever the source of funds (see the *Frascati Manual*, Section 6.2).

The gross domestic expenditure in R&D is disaggregated in four sectors: business enterprise, government, higher education and private non-profit.

R&D intensity is defined as the ratio between R&D expenditure and GDP.

Responsiveness of business R&D expenditure is measured as the estimated elasticity of BERD to GDP. The estimation is based on a country regression of the natural log of business R&D on one year lagged GDP with regional fixed effects.

In the maps, a regional R&D intensity is defined as strong (weak) if it is above (below) the OECD median; the share of business R&D expenditure is labelled as private (public) if it's above (below) the OECD median share.

Source

OECD Regional Database: *http://dotstat/wbos/*.

See Annex B for data, source and country-related metadata.

Reference years and territorial level

1995-2007; TL2.

Data for Chile, Iceland, Japan, Mexico, New Zealand, Switzerland and Turkey are not available at the regional level.

Australia regional data are available only for business R&D expenditure.

Further information

OECD (2011), *Regions and Innovation Policy*, OECD Publishing.

OECD (2010), *Measuring Innovation: A New Perspective*, OECD Publishing, DOI: *10.1787/9789264059474-en*.

OECD (2009), *OECD Science, Technology and Industry Scoreboard 2009*, OECD Publishing, DOI: *10.1787/sti_scoreboard-2009-en*.

Figure notes

15.1-15.4: Latest available year: France 2004, Greece 2005, Canada 2006.

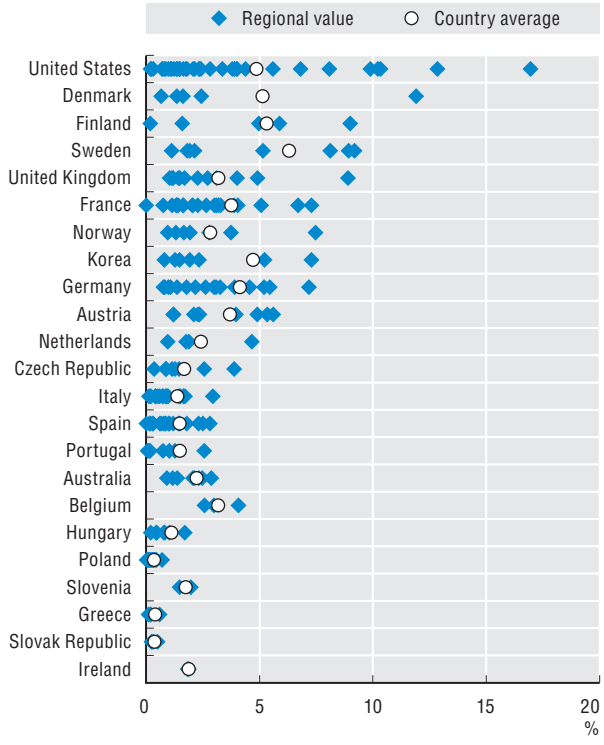
15.2: The coefficient measures the expected increment in BERD for 1 point increment in GDP.

15.3-15.4: R&D intensity is equal to R&D expenditure as a % of GDP. No regional data available for public R&D expenditure in the Netherlands.

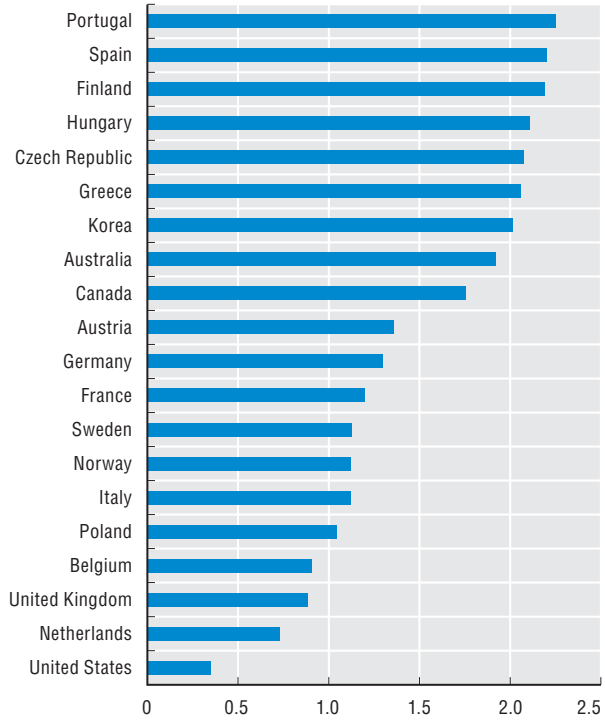
15.5-15.6: Regions are classified as strong (or weak) if their R&D intensity is above (below) the OECD median value; and private (public) if the share of BERD on total R&D expenditure is above (below) the OECD median value.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

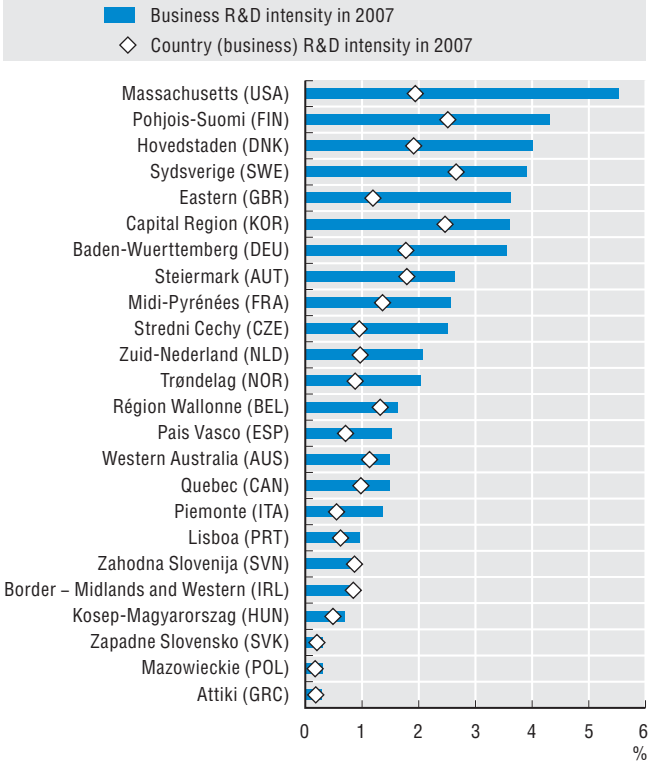
15.1. Range of TL2 regional business R&D expenditure as % of value added in industry, 2007



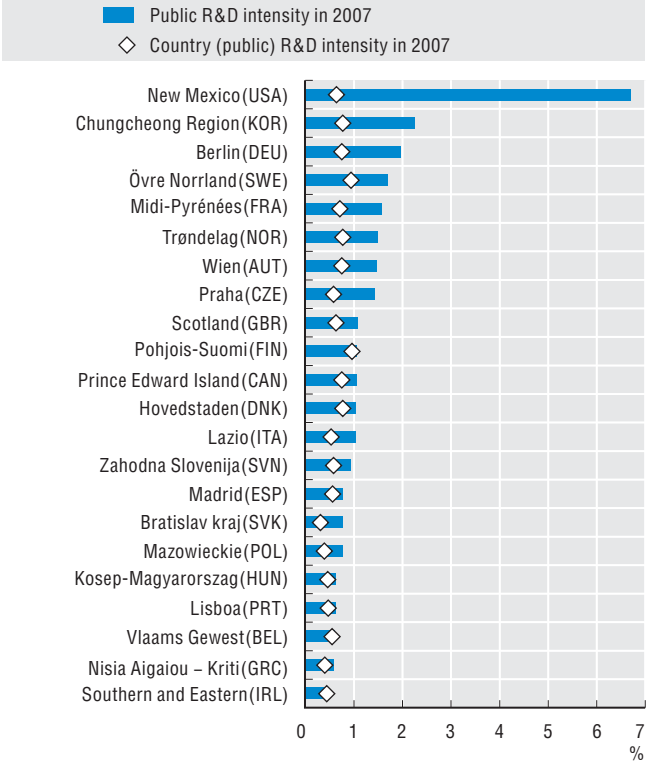
15.2. Percentage increase in business R&D expenditure for 1% increase in GDP, 1995-2007



15.3. Regions with the highest business R&D intensity, compared to the country average, 2007



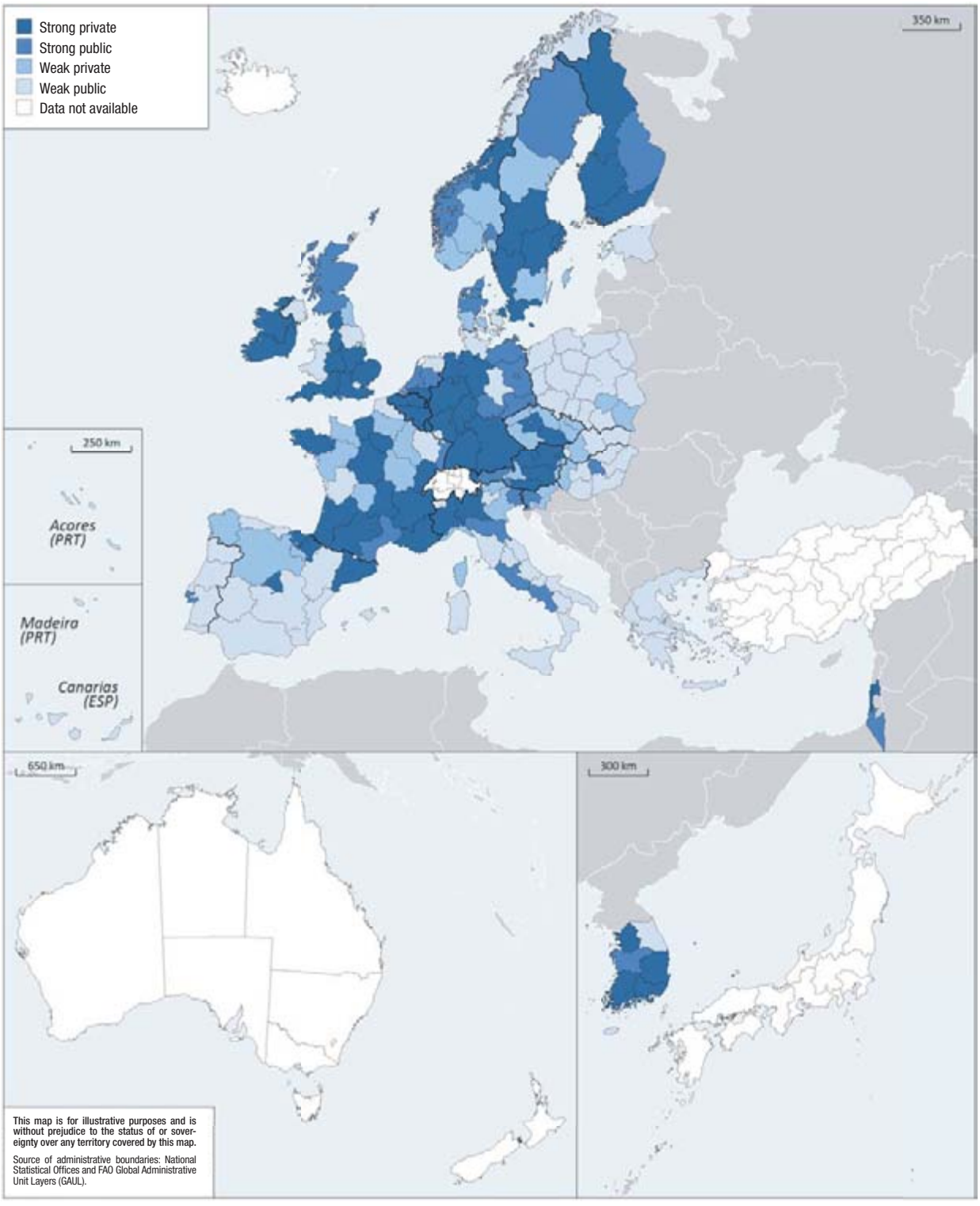
15.4. Regions with the highest public R&D intensity, compared to the country average, 2007



StatLink http://dx.doi.org/10.1787/888932439672

15.5. Regional R&D intensity and share of business R&D: Asia, Europe and Oceania, 2007

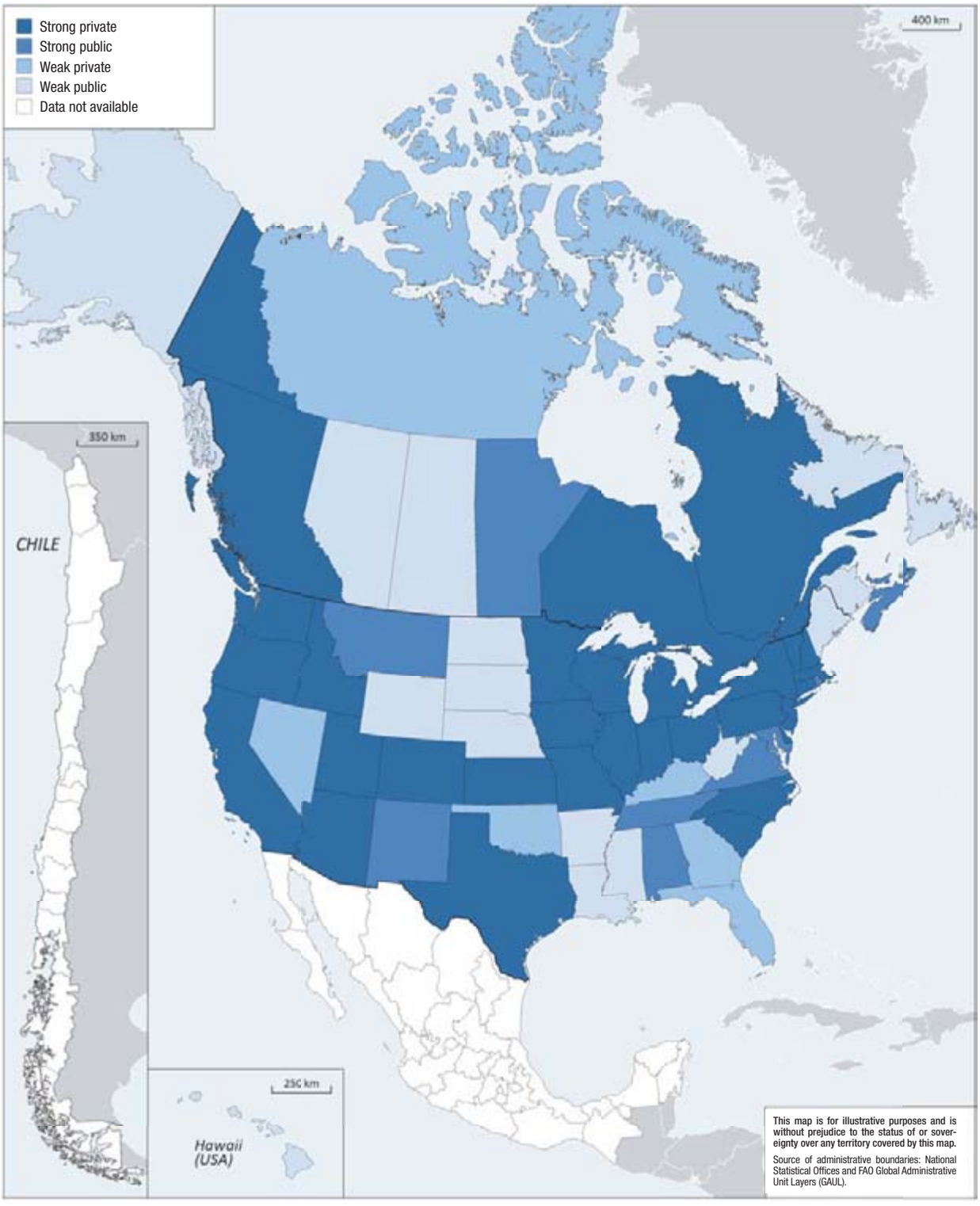
TL2 regions



StatLink http://dx.doi.org/10.1787/888932440128

15.6. Regional R&D intensity and share of business R&D: Americas, 2007

TL2 regions



StatLink http://dx.doi.org/10.1787/888932440128