

CHILE

Hot STI issues

- Strengthening the science base to reach OECD benchmarks.
- Improving the quality of education at all levels and increasing enrolment in quality tertiary education.
- Fostering entrepreneurship through more favourable framework conditions, improvement of related skills and easier access to finance.

General features of the STI system: Chile is a small open economy. It is the world's leading producer of copper, on which its exports largely depend. Chile's economic performance over the last decades was driven by economic reforms and institution building. However, average GDP growth has slowed markedly in the 2000s, owing in part to the need to strengthen various aspects of the innovation system. The business sector plays a modest role in R&D; BERD accounted for only 0.16% of GDP in 2010 (Panel 1^(d)), the lowest among OECD countries. Business R&D performance suffers from a relative lack of the competitive pressures that stimulate innovation. Many firms innovate through adaptation of imported technologies, which is not tracked by R&D indicators. Chilean framework conditions continue to be a challenge: the ease of entrepreneurship index is below the OECD median (1^(j)). Scarcity of human capital is also a major concern: all indicators are below the OECD median (1^{(s)(t)(u)(v)}). Over 2008-10, 55% of total scientific articles had international co-authors (1^(q)) and 31% of total PCT patent applications were international co-inventions over 2007-09 (1^(t)), both above the OECD median, owing in part to the small size of the national scientific and research community.

Recent changes in STI expenditures: Following a substantial increase in public spending, Chile's GERD was 0.42% of GDP in 2010, among the lowest of OECD countries with Mexico and Greece. The government's objective is to increase spending on R&D from 0.4% to 0.8% of GDP. In 2012 the public budget for science, technology and innovation rose to USD 500 million to help reach this objective.

Overall STI strategy: The National Innovation Strategy for Competitiveness, presented in 2008 by the previous government, has three main pillars: i) the development of human capital; ii) the strengthening of the science base to address socio-economic needs; and iii) the improvement of business R&D and innovation activities. The current government's 2010-14 Innovation Plan has eight major axes; these include greater emphasis on entrepreneurship and on technology transfer, global connection and dissemination.

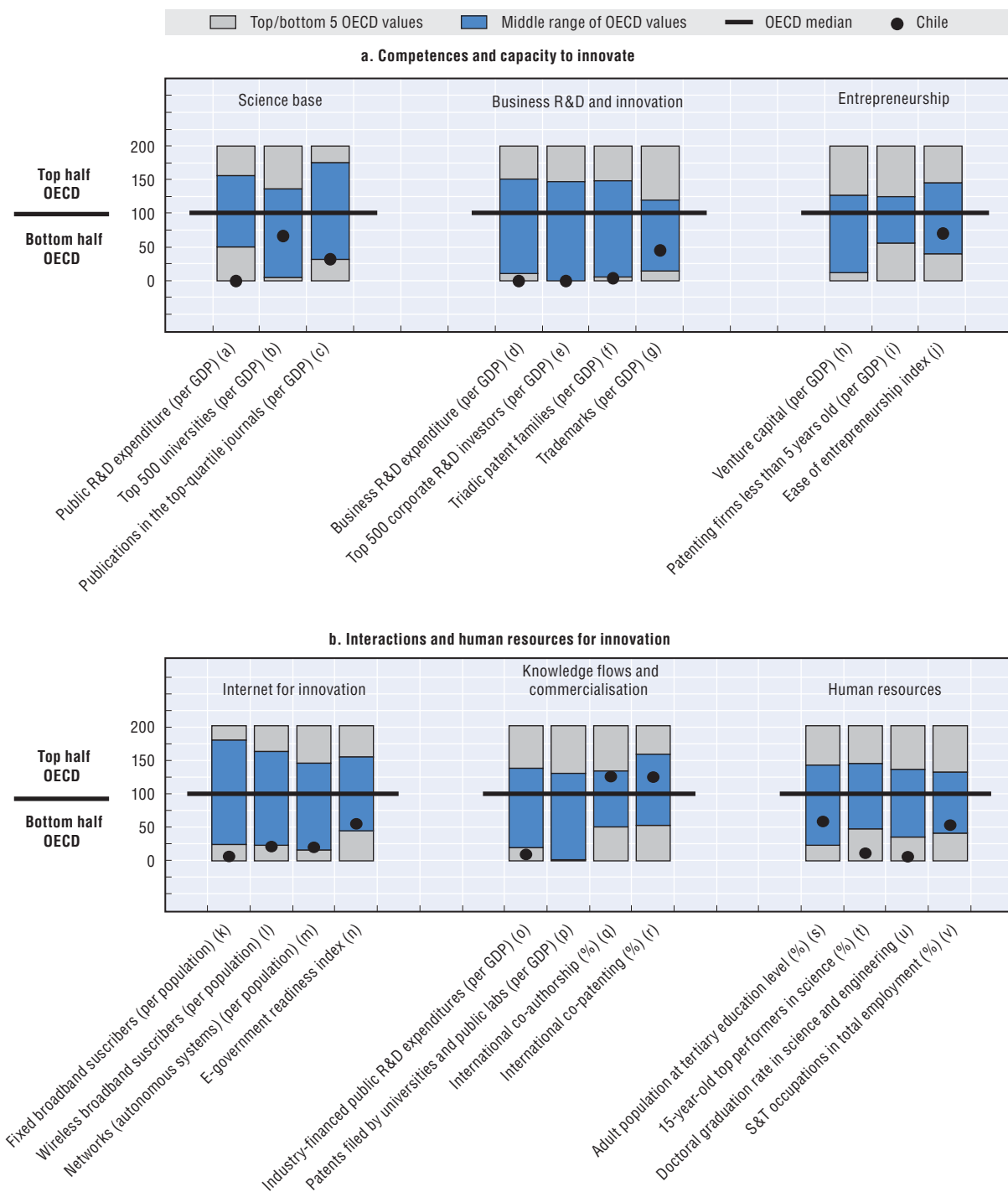
STI policy governance: Since the establishment of the National Innovation Council for Competitiveness (CNIC) in 2005 to advise the president on a national innovation strategy, there has been no major change in STI policy governance. An emerging debate in this respect concerns giving CNIC responsibility for monitoring the implementation of the strategy and evaluating its impacts.

Key figures

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|---|-----------------------|---|---------------------|
| Labour productivity, GDP per hour worked in USD, 2010 (annual growth rate, 2005-10) | 19.2 (+2.7) | GERD, as % of GDP, 2010 (annual growth rate, 2005-10) | 0.42 n.a. |
| Environmental productivity, GDP per unit of CO₂ emitted in USD, 2009 (annual growth rate, 2005-09) | 4.01 (+0.0) | GERD publicly financed, as % of GDP, 2010 (annual growth rate, 2005-10) | 0.20 n.a. |

Figure 10.7. **Science and innovation in Chile**

Panel 1. Comparative performance of national science and innovation systems, 2011



Note: Normalised index of performance relative to the median values in the OECD area (Index median = 100).

Science base: Chile's science base is weak. Public R&D expenditure was only 0.16% of GDP in 2010, the lowest among OECD countries (1^(a)). The scientific community is small (1^(v)) and quality research is concentrated in only a few universities. Public research does not do enough to meet the needs of the productive sector.

Entrepreneurship: Limited financial resources and administrative burdens have hampered start-up activities. In response, a law was passed in January 2011 to lower regulatory barriers for young companies and reduce the time to start up a business. Programmes such as Fondo Capital Abeja aim to ease access to credit for small enterprises and women, and the Support for Entrepreneurial Environment programme aims to foster entrepreneurship skills and competences.

ICT and scientific infrastructures: As part of the objective to strengthen the national science base, the government has increased funding for the modernisation and improvement of S&T infrastructures, notably through the recently established Fondecup, with a budget of over USD 10 million in 2012.

Knowledge flows and commercialisation: The Chilean Economic Development Agency (CORFO) promotes collaborative research by companies, researchers and PRIs in priority sectors (e.g. aquaculture, the food industry, mining). It offers a number of incentives to improve technology transfer (e.g. support for IPRs and programmes to strengthen universities' transfer and licensing offices). Go to Market, a programme launched in 2011, aims to facilitate the commercialisation and export of the results of applied R&D carried out by enterprises and researchers.

Globalisation: Start Up Chile, launched as a pilot programme in 2010, seeks to attract entrepreneurs from abroad by offering equity-free seed capital and a temporary one-year visa to develop innovative start-up activities. A programme to attract international centres of excellence for

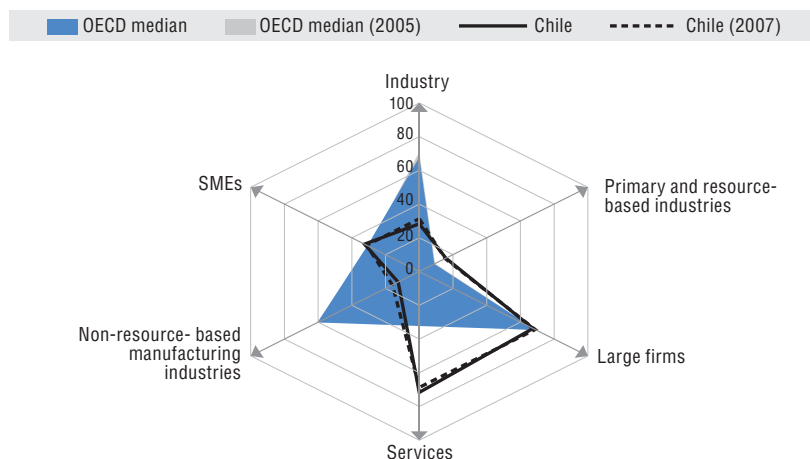
competitiveness aims to facilitate the installation in Chile of international centres of excellence in R&D. Collaboration has already been established with the Fraunhofer-Gesellschaft (Germany) in biotechnology, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) (Australia) in mining and mineral processing, Inria (France) in ICT, and Wageningen UR (Netherlands) in the food industry. It focuses specifically on generating capacity in priority sectors such as aquaculture and mining. The Global Connection programme supports the internationalisation of Chilean entrepreneurs.

Human resources: The improvement of the quality of the national education system at all levels is a priority. The Teacher Vocation Scholarship, launched in 2010, encourages good students to become teachers, and a quality assurance system was introduced in 2011. Chile VA! (2011) is a programme to promote S&T vocations by organising science camps. These programmes are complemented by an increase in scholarships and a reduction in the interest rate on guaranteed student loans. A programme for placing researchers in enterprises has been implemented to enhance researchers' involvement in activities that support private innovation.

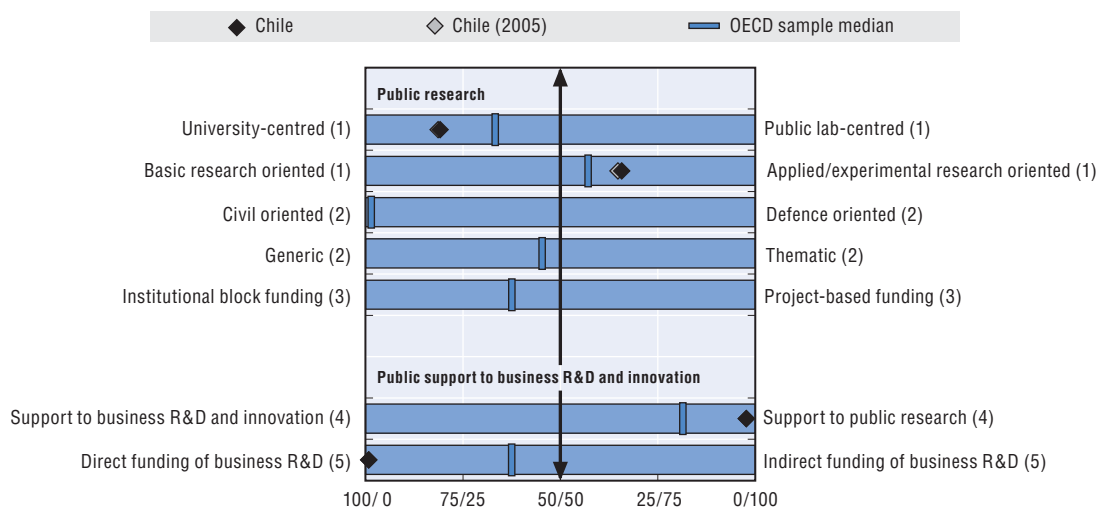
Emerging technologies: Through CORFO, Chile has developed a programme to strengthen strategic productive sectors in five fields: food, mining, global services, aquaculture and special interest tourism. With a budget of USD 1.1 million for 2012, the programme focuses on co-ordination of work between public and private institutions, companies, researchers and academics to promote the competitiveness of these sectors.

Green innovation: The Ministry of Environment, established in 2010, is in charge of implementing the National Plan on Climate Change 2008-12. In 2009 the Renewable Energy Centre was created to help build national capabilities to address related challenges.

Panel 2. Structural composition of BERD, 2009
As a % of total BERD



Panel 3. Overview of national innovation policy mix, 2010



1. Balance as a percentage of the sum of HERD and GOVERD.
2. Balance as a percentage of total GBAORD.
3. Balance as a percentage of total funding to national performers.
4. Balance as a percentage of the sum of HERD and GOVERD funded by government and higher education and components of (5).
5. Balance as a percentage of the sum of indirect funding of business R&D and innovation through R&D tax incentives and direct funding of BERD through grants, contracts and loans.

Source: See reader's guide and methodological annex.

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