

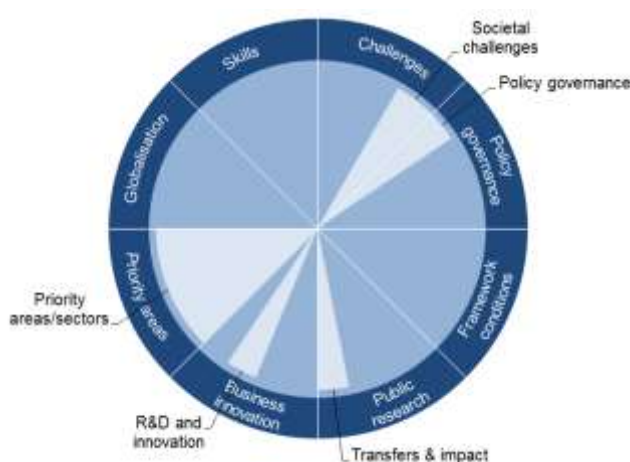
CHILE

While Chile has displayed resilient economic growth despite the reduction in commodity prices, the country will need to further diversify its economy to sustain this. Over 2011-14, Chile's productivity growth exceeded the average for the OECD area. Total factor productivity has grown particularly outside the capital-intensive mining sector. However, the country continues to struggle with a fragmented innovation system. Moreover, Chile displays persistent limited social mobility and high inequality, preventing lower-income individuals and communities in lagging regions from participating in innovation activities. The country has introduced STI policies to deal with these challenges. In particular, the new government's 2014-18 Growth, Innovation and Productive Agenda (GIPA) will help to strengthen innovation as a key driver for growth.

Table 1. Gross domestic expenditure on R&D (GERD)

	CHL	OECD
GERD		
USD million PPP, 2014	1 487	1 181 495
As a % of total OECD, 2014	0.1	100
GERD intensity and growth		
As a % of GDP, 2014	0.38	2.38
(annual growth rate, 2009-14)	(+6.0)	(+2.3)
GERD publicly financed		
As a % of GDP, 2014	0.20	0.61
(annual growth rate, 2009-14)	(+5.2)	(+2.5)

Figure 1. Major STI policy priorities, 2016



Hot issues

Supporting R&D and innovation in firms

While BERD as a share of GDP lags the OECD median (figure 5^d), it grew at an annual rate of 9% in 2009-14; 9% of BERD was publicly financed in 2014, down from 18.5% in 2009, and close to the OECD average (7.2%). Chile's business innovation performance is well below the OECD median (figure 5^{f,g}), particularly among SMEs (figure 5^j). In 2012, the government modified its R&D tax credit framework to encourage further private investment in R&D. The use of this incentive increased USD 13.4 million PPP (CLP 4 745 million) in 2012 to USD 52.5 million PPP (CLP 19 116 million) in 2013. In 2015, the government aimed to have an 87% increase in the number of firms benefitting from these subsidies as compared to 2013.



Improving the governance of innovation system and policy

In August 2014, the Chilean Ministry of Economy, Development and Tourism (MEDT) launched the Innovation Plan 2014-18, which currently guides the actions of STI institutions. The plan sets out several challenges to be addressed and recommends the strengthening of STI governance structures. In January 2015, shortly after the present Chilean administration took office, a Scientific Development Commission presented a proposal to strengthen STI in Chile. The implementation of the new government's 2014-18 Growth, Innovation and Productive Agenda (GIPA) will be co-ordinated by the MEDT with the participation of other ministries and state services. Like the Innovation Plan, the GIPA promotes the diversification of production, promoting sectors with high growth potential (see below), boosting firm productivity and competitiveness, and supporting export growth.

Targeting priority areas/sectors

Compared to the OECD and EU-28 countries, Chile has a strong position in bio- and nano-technologies and environment-related technologies. As part of the GIPA, the Chilean government introduced a Smart Specialisation Strategy with the aim of developing public-private collaboration in strategic economic areas to diversify the country's economic structure. These include: food and agriculture, manufacturing, construction, health, tourism and entertainment.

Addressing societal challenges (e.g. inclusiveness)

The government of Chile gives priority to the promotion of initiatives that generate social, labour and environmental inclusiveness through innovation. For this purpose, it introduced the Prototypes of Social Innovation programme in order to develop proofs of concept and prototypes of new solutions to the challenges facing Chile's regions by using open innovation. The programme identifies major challenges in a region and issues an open call for innovations to solve them, thereby encouraging individuals and domestic companies, universities and other organisations to innovate.

Improving transfers of science and its returns and impact

Chile's public research system has a small budget; few of its universities are among the world's leading institutions, and there are few international publications relative to GDP by OECD standards (figure 5^{a,b,c}). However, the 39% of Chilean GERD performed by HEIs in 2014 was well above the OECD average (27%), owing to the importance of HEIs in the innovation system. The government continues to devote efforts to capitalise on the returns from a rather limited science base. In 2014, it introduced a scheme of Innovation Vouchers to deepen linkages between enterprises and knowledge providers and to support the commercialisation of public research. The country's Production Development Corporation (CORFO) has also continued to support the creation of new Technology transfer offices (TTOs) in HEIs and PRIs (see below).



Some key STI performance indicators

Figure 2. Economic performance

Labour productivity, GDP per hour worked,
index 2005=100

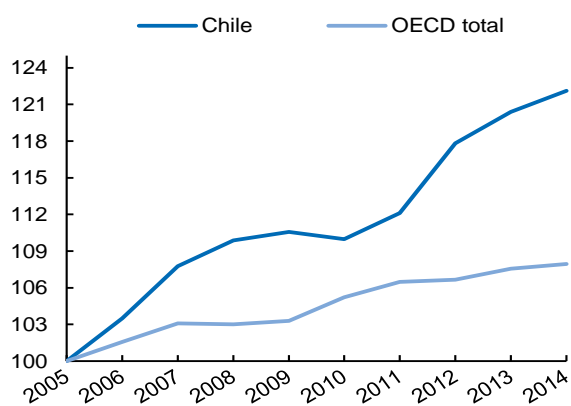


Figure 3. Environmental performance

Green productivity, GDP per unit of CO2
emitted, index 2005=100

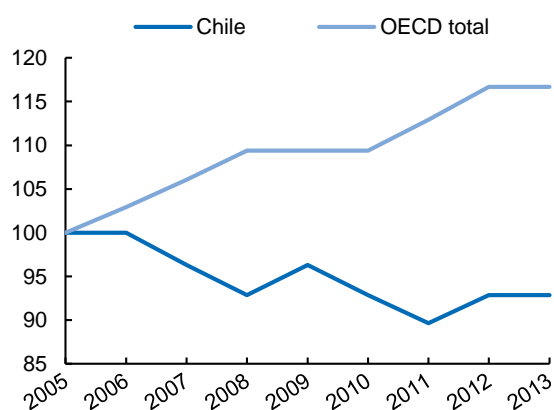
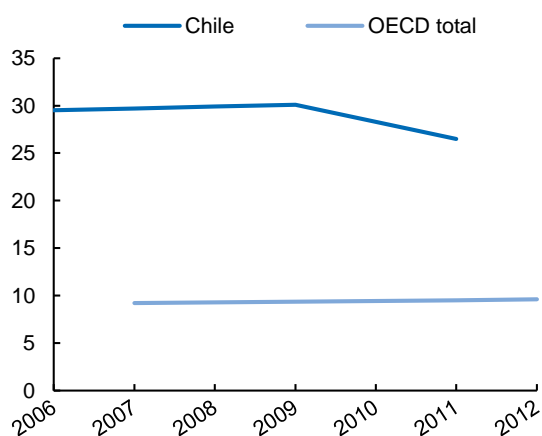


Figure 4. Income inequality

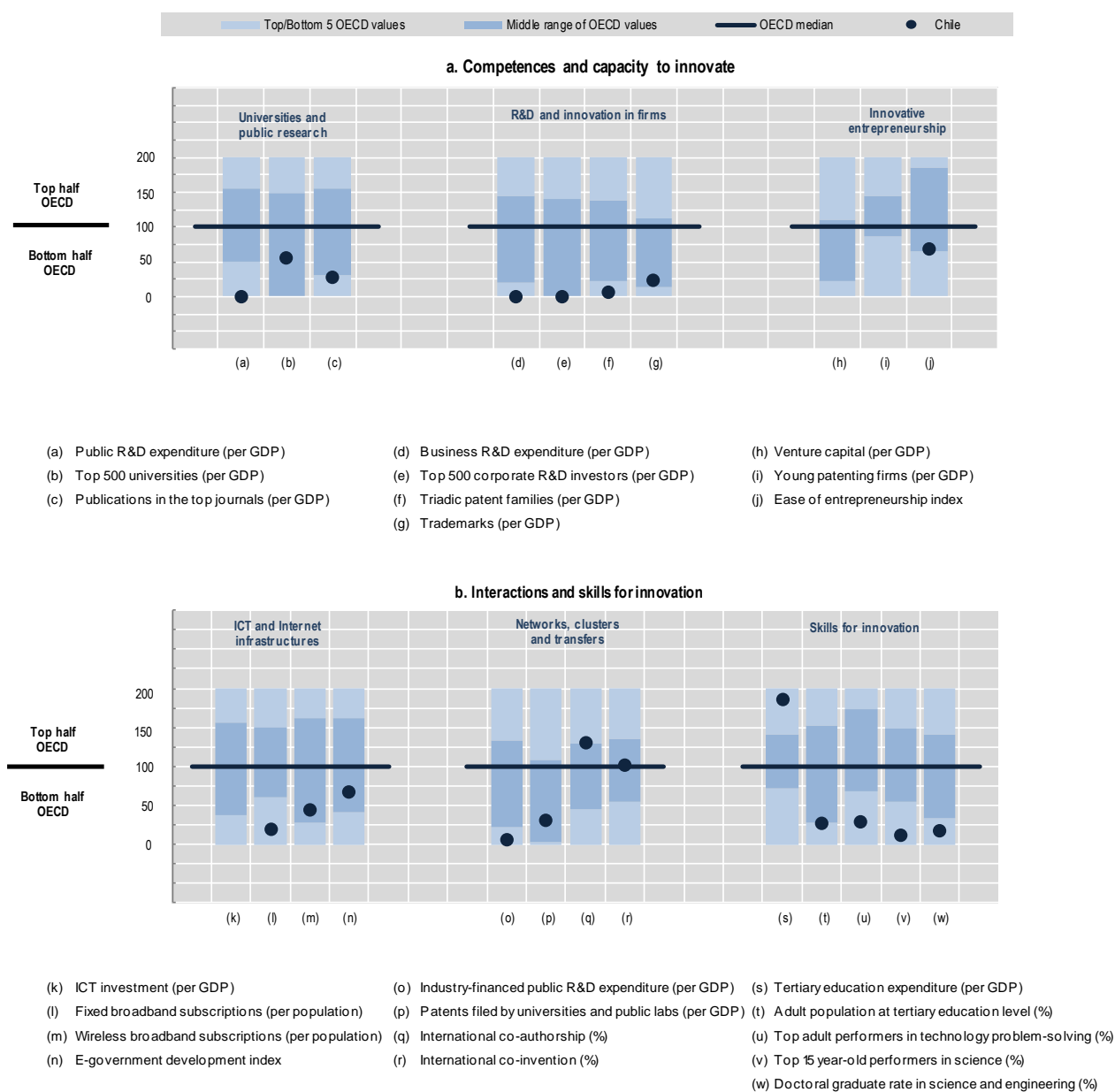
Ratio top decile/first decile of real
household net disposable income



Benchmarking national STI systems

Figure 5. Science and Innovation in Chile

Comparative performance of national science and innovation systems, 2016



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



Highlights of Chile's STI system

New challenges

Chile's environmental productivity has lagged that of the OECD since 2006 (Key STI Performance Indicators). To address this challenge, in 2014 the CORFO launched the Solar and Renewable Energy Programme - in the framework of the strategic national programs- with the aim of supporting the development of technologies for energy self-sufficiency based on renewable sources. In particular, the programme provides grants to companies developing new technologies and commercial applications in the field of solar energy. Among the other objectives set by the Chilean government for these grants is the reduction of costs related to electricity generation and storage.

Innovative entrepreneurship

Overall, Chile's ease of entrepreneurship index is below the OECD median (figure 5^l). The Chilean authorities have continued their efforts in this regard: a law introduced in May 2013 eases requirements for business registration and reduces the time required for registering a firm to one day. In addition to streamlining legislation, the government expects that allocations from its R&D tax credits for entrepreneurs and firms will increase by 87% during 2013-15.

ICT and Internet infrastructures

Connectivity and the use of the Internet continue to be a challenge for Chile. The country lags the OECD in fixed and wireless broadband subscribers per capita (figure 5^{l,m}). Its e-government development index has improved since 2012 but is still below the OECD median (figure 5ⁿ). The Smart Industries National Smart Specialisation Strategic Programme aims to encourage the development of the ICT sector by providing grants to companies, HEIs and PRIs.

Technology transfer and commercialisation

In order to strengthen the commercialisation of public research, InnovaChile's Transfer and Licensing Offices Programme seeks to build competences for managing technology transfer and commercialising R&D. It also funds training (in Chile and abroad) for professionals and technical staff in universities and research institutes. It furthermore seeks to strengthen Chile's IPR framework by improving procedures concerning IPR protection and enforcement. The National Commission for Scientific and Technological Research (CONICYT) is continuing its efforts to facilitate access to research data generated by public funds. In 2014, the CORFO launched the Technology Transfer Hubs programme with a view of supporting the clustering of businesses and knowledge providers around R&D in strategic sectors (agriculture, health, industrial production and energy technology). Moreover, the government created in 2015 the Technological Contracts initiative, which provides 24-month grants that fund projects between firms and research centres.

Clusters and regional policies

The National Selectivity Strategic Policy (2014-18) aims to diversify the production structure and boost sectors with high growth potential. It supports public-private collaboration in key economic areas and a Strategic Investment Fund addresses coordination issues and needs for critical public infrastructures. As part of this new policy, Chile has deployed a series of National Smart Specialisation Strategic Programmes in several sectors, including agriculture, food, construction, advanced manufacturing, ICT, health, tourism and creative industries. The Technological Strategic Programmes (2015-24) also finances collaborative R&D programmes involving SMEs and aiming to achieve high impact results.

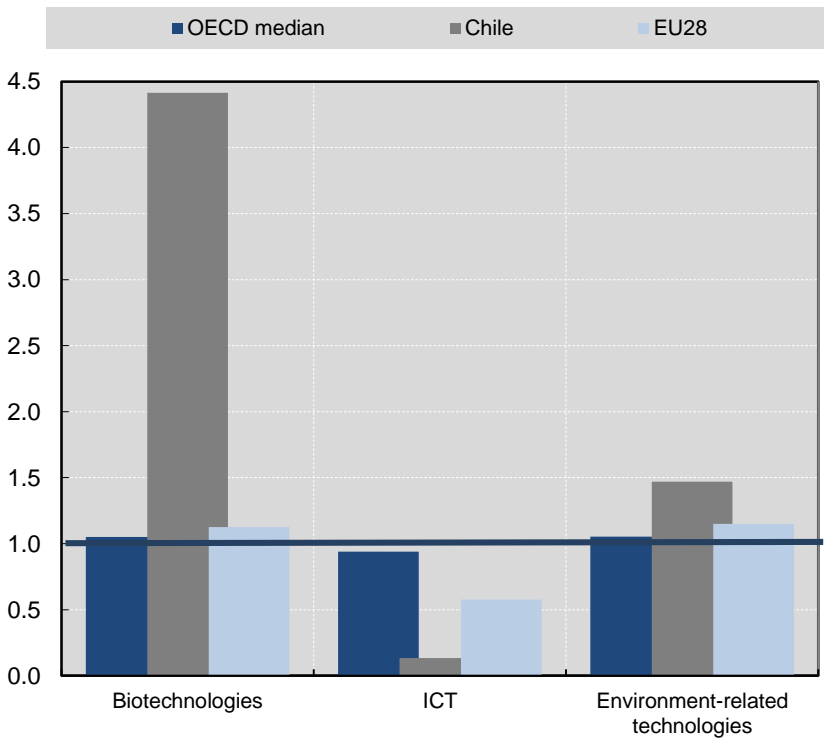


Globalisation

Over the past five years, Start-Up Chile, a seed capital programme, has supported between 200 and 250 start-ups per year founded by people from over 70 countries. The programme seeks to **improve Chile's** attractiveness for developing new firms by offering overseas entrepreneurs USD 40 000 in equity-free seed capital and a working visa to develop projects in the country.

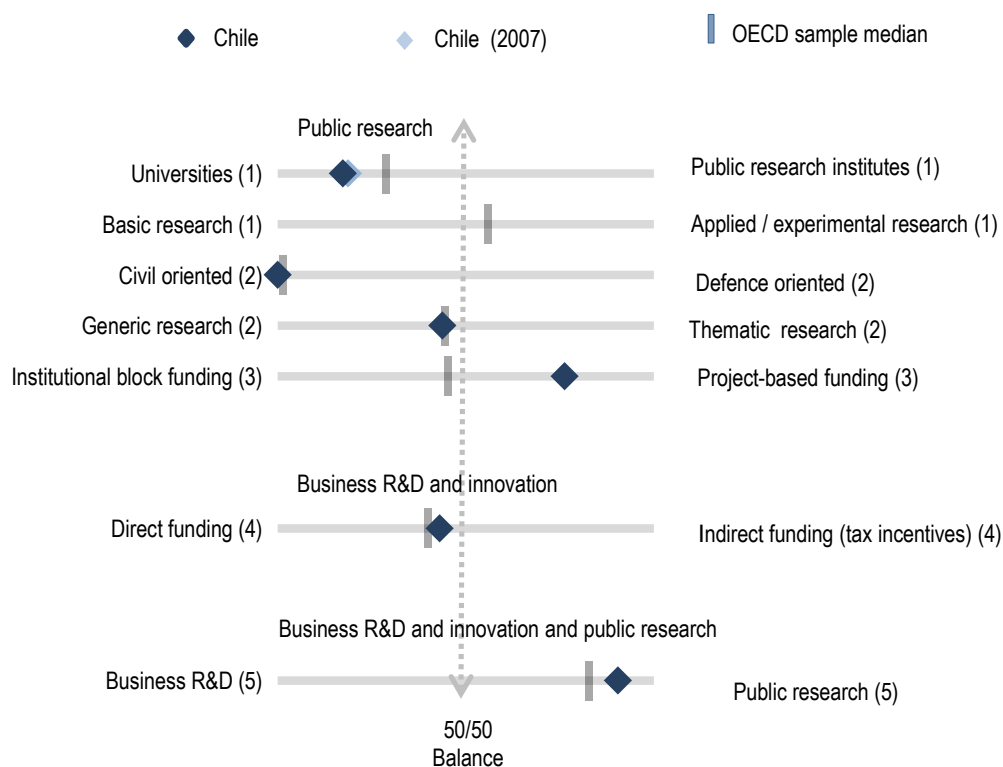
Structural aspects and specialisation

Figure 6. Revealed technology advantage in selected fields, 2011-13
Index based on IP5 patent families applications



National STI policy mix

Figure 7. Allocation of public funds to R&D, 2014 or latest year available
By sector, type of R&D and mode of funding



(1). Balance as a share of both higher education (HERD) and government (GOVERD) R&D expenditure.

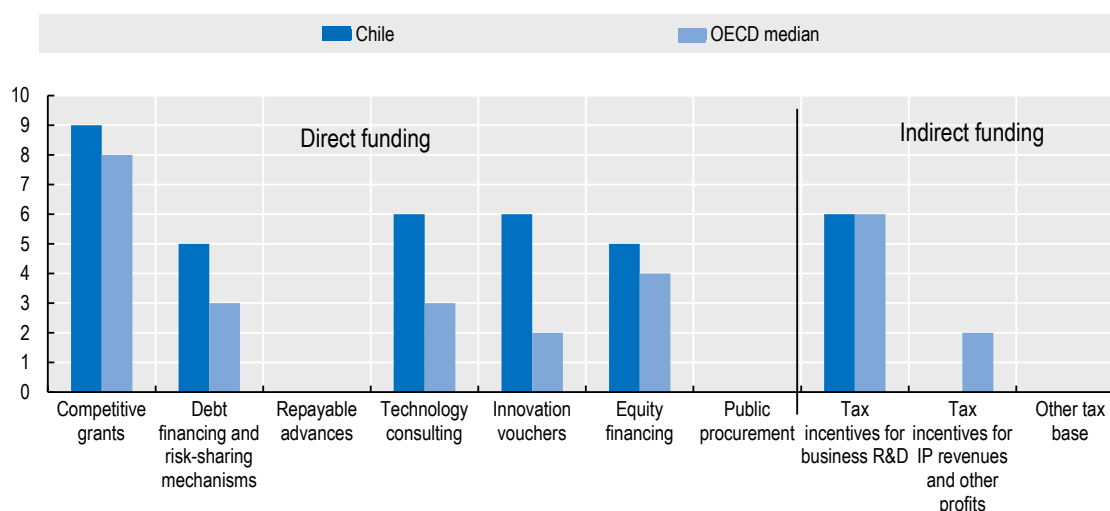
(2). Balance as a share of total government budget appropriations and outlays for R&D (GBAORD).

(3). Balance as a share of total funding to national performers.

(4). Balance as a share of both indirect funding (through R&D tax incentives) and direct funding (through grants, procurement, loans, etc.).

(5). Balance as a share of publicly-funded HERD and GOVERD and components of (4).

Figure 8. Most relevant policy instruments of funding for business R&D, 2016
Country self-assessment, index (9 = high and increasing relevance to 0 = not used)



Note: Policy information comes from country responses to the EC/OECD International Survey on STI Policies (STIP) 2016 and 2014. Chile's responses are available in the EC/OECD International Database on STI Policies, edition 2016 at http://qdd.oecd.org/DATA/STIPSurvey/CHL...STIO_2016.

Source: See the reader's guide and methodological annex.

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