# ISRAEL

### *Hot STI issues*

- Leveraging the scientific and technological labour force by supporting entrepreneurship and better linking scientific research and private industry.
- Improving the evaluation and monitoring of STI policy.
- Strengthening capacity in fields such as clean tech, computer science and biotechnology.

***General features of the STI system:*** Israel is a small economy with world leadership in dynamic high-technology sectors such as software. The global financial crisis only briefly slowed its growth. With BERD of 3.51% of GDP in 2010 Israel led OECD countries (Panel 1[(d)]). Its share in triadic patents per GDP is at the upper middle level (1[(f)]) and trademark registrations are above the OECD median (1[(g)]). Its share of top R&D investors corresponds to the OECD's median (1[(e)]). For entrepreneurship Israel leads the OECD in venture capital (1[(h)]). The national ICT infrastructure is in the medium range (1[(k m)]). With 45% of the adult population with tertiary education, Israel stands among leading OECD countries. However, the quality of its science education is in the lower middle range (1[(t)]); this suggests a need for quality-enhancing reforms. The share of S&T occupations is at the OECD median (1[(v)]). Links between research and industry correspond to the OECD median: public R&D expenditures financed by industry were only 0.06% of GDP (1[(o)]) in 2008. However, Israel leads OECD countries in terms of relative number of PCT patents filed by universities and public labs (1[(p)]). The share of international co-authorship (1[(q)]) is close to the OECD median, while participation in international co-inventions (14% of total PCT patent applications, 1[(r)]) is well below that benchmark.

***Recent changes in expenditures:*** Israel has very high R&D intensity in the OECD area, with GERD of 4.40% of GDP (excluding defence) in 2010. R&D investments grew on average by 4.1% annually over 2005-10. The private sector funded about 52% of GERD in 2008.

***Overall STI strategy:*** While there is no national plan or strategy for STI policy, several reports and policy documents provide orientations. Certain areas have been identified for policy attention: biotechnology, nanotechnology, clean technology sectors and improving the performance of low-technology industries. Attention is also paid to improving the quality of human capital.

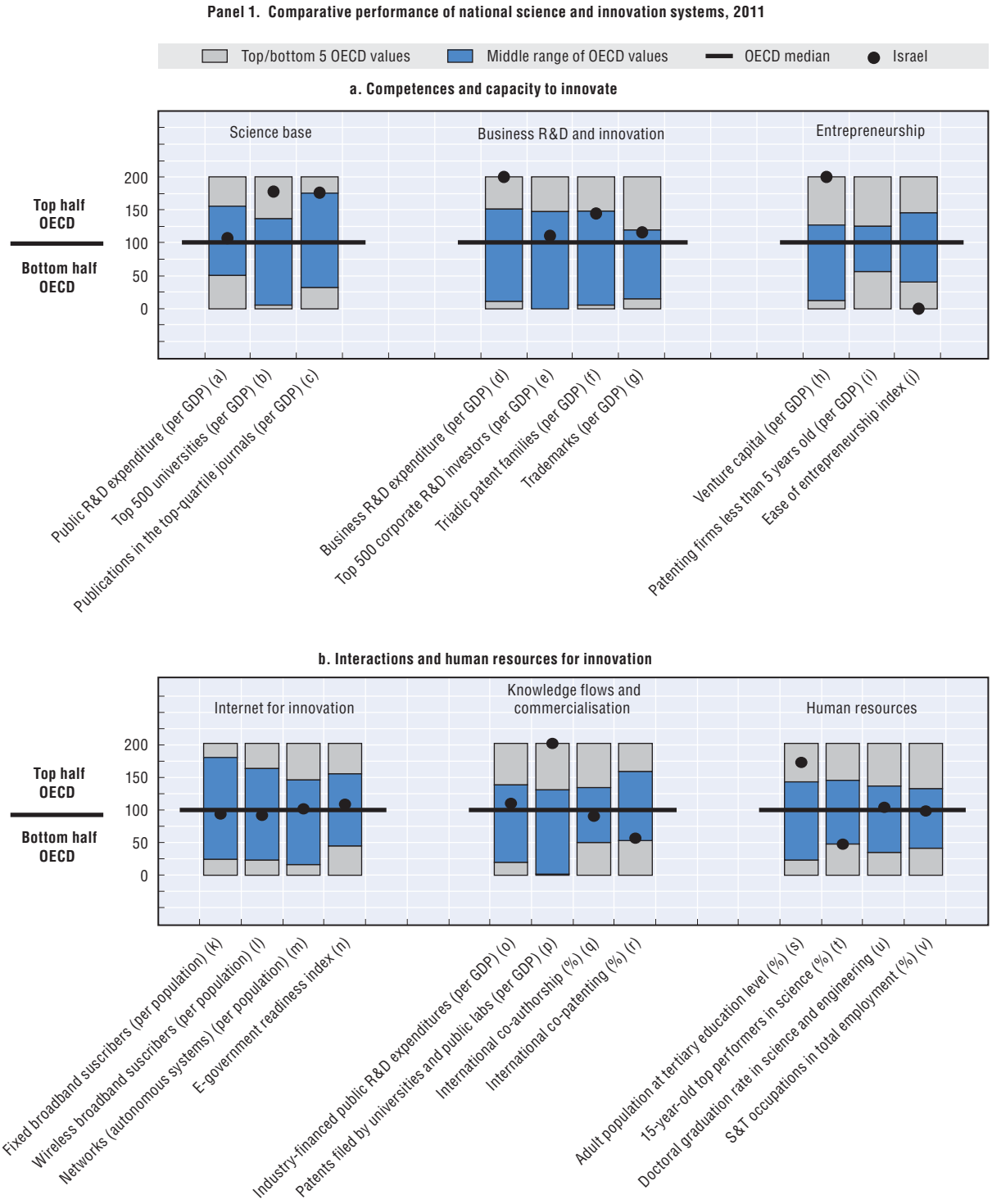
***STI policy governance:*** There have been no recent significant changes in STI governance. A main priority with respect to governance is to improve policy evaluation. This led to the creation of a policy and evaluation unit in the Office of the Chief Scientist which advises on policy aspects of governmental support for R&D and evaluates programmes.

***Science base:*** Israel has a strong science base and its share in the top 500 universities is among the OECD leaders (1[(b)]). Israel's publications are also at the upper end of the middle range (1[(c)]). Public R&D expenditures as a share of GDP are at the median (1[(a)]).The Higher Education Plan 2011-15 seeks to improve the quality of higher education and research. Several measures have been implemented. Funding provided by the Israel Science Foundation for competitive research is to increase from USD 75 million to USD 139 million. Moreover, to stimulate

***Key figures***

| | | | |
|---|---|---|---|
| **Labour productivity, GDP per hour worked in USD, 2010** | **35.2** | **GERD, as % of GDP, 2010** | **4.40** |
| (annual growth rate, 2005-10 ) | (+0.9) | (annual growth rate, 2005-10) | (+4.1) |
| **Environmental productivity, GDP per unit of $CO_2$ emitted in USD, 2009** | **3.16** | **GERD publicly financed, as % of GDP, 2008** | **0.82** |
| (annual growth rate, 2005-09) | (+2.1) | (annual growth rate, 2005-08) | (+4.9) |

Figure 10.23. **Science and innovation in Israel**




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

quality research, a new funding formula based on more substantial performance evaluation has been adopted. Additional resources have also been made available to allow hiring new staff at universities and to improve universities' infrastructure. The centres of excellence I-CORE project aims to boost research infrastructure in chosen fields (see below). The project was endorsed by the government and adopted by Israel's Council of Higher Education in March 2010. It has a total budget of about USD 362 million.

***Business R&D and innovation:*** Several measures support business R&D; about 80% of the R&D budget goes to SMEs. The R&D Fund was specifically created to reduce risks for industrial innovators. It approves projects of all types of firms – start-ups and SMEs but also large firms – based on industry experts' advice and systematic project evaluations. It has been instrumental in the successful development of the ICT sector and now mainly focuses on new priority fields such as biotechnology.

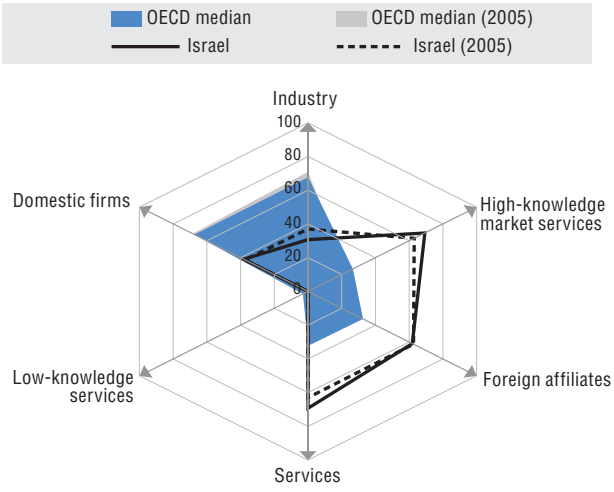
***Entrepreneurship:*** Support for start-ups is an important dimension of Israel's STI policy. The Technological Incubators programme supports early-stage technological entrepreneurship by providing support for turning innovative ideas into potentially successful commercial products. The programme's budget is about USD 40 million. The TNUFA programme also supports innovative technological entrepreneurship at the pre-seed stage by helping to prepare patent applications and evaluating the initiatives' technological and financial feasibility.

***Knowledge flows and commercialisation:*** Several programmes support interaction between the public research sector and private industry. One is the MAGNET programme, which was established in 1994 and had a budget of USD 57 million in 2011. It supports pre-competitive generic research conducted by consortia of industrial firms and academic institutions. The programme supports proposals from academia and industry and MAGNET staff also propose ideas to academia and industry as a way to generate the creation of consortia. An additional objective of the programme is to support development of technological clusters. The NOFAR programme actively supports commercialisation by financing applied academic research in biotechnology and nanotechnology to adjust innovations for use by industry and promote their take-up. Budgets allocated for these 12-15-month projects tend to be around USD 100 000.

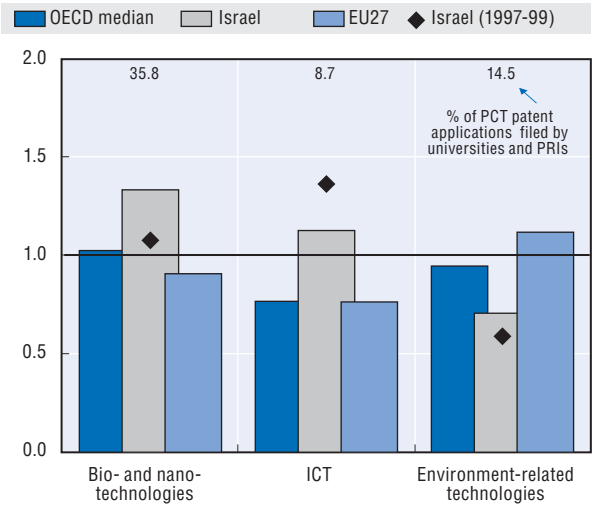
***Emerging technologies:*** The four research fields selected by I-CORE as key policy priorities also include investments in relevant tertiary education in the coming years. They are: the molecular basis of human diseases, cognitive science, computer sciences, and renewable and sustainable sources of energy. The objective is to develop new industries able to provide Israel with a competitive edge in international competition. Other priority sectors include brain research, nanotechnology and biotechnology, this last with support from the Israeli Biotechnology Fund.

***Green innovation:*** Green innovation is an important priority, with a specific focus on renewable and sustainable sources of energy. A technology centre has been established to support the transfer of knowledge from academia to industry up to the "proof of concept" stage and to provide opportunities for testing such technologies. Another technology centre relevant for green innovation focuses on water technologies, an area in which Israel has contributed frontier innovations.

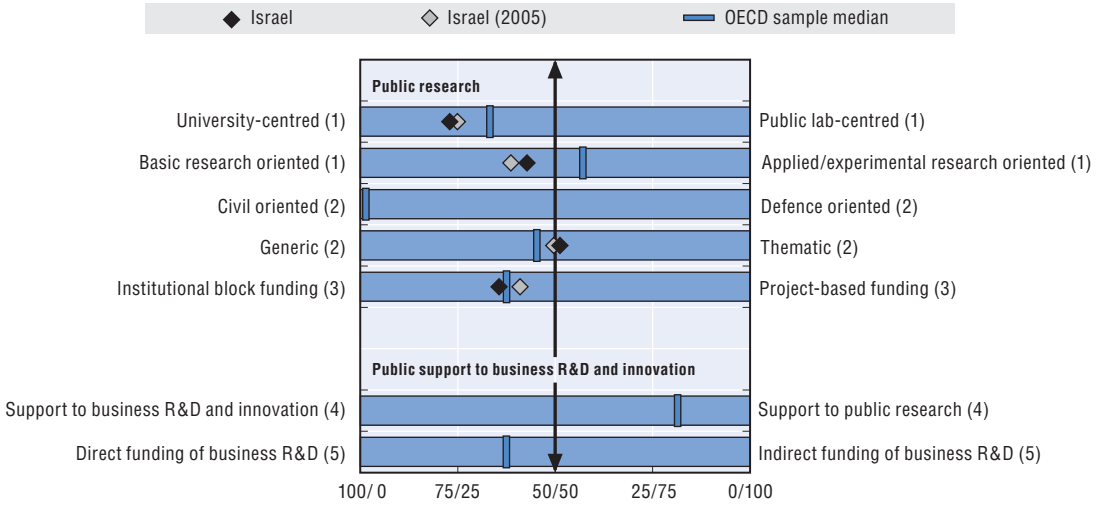
**Panel 2. Structural composition of BERD, 2009**
As a % of total BERD




**Panel 3. Revealed technology advantage in selected fields, 2007-09**
Index based on PCT patent applications




**Panel 4. 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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