HUNGARY

Hot STI issues

- Increasing innovative domestic firms.
- Reforming education to improve human capital and tertiary attainment.
- Building a competitive R&D environment that contributes to economic growth.

General features of the STI system: Hungary has a very open economy with quite a large manufacturing sector, much of which is foreign-owned. BERD has grown by a strong 9% a year in constant prices since 2000, almost doubling from 0.36% of GDP in 2000 to 0.69% of GDP in 2010. A high proportion of BERD is carried out in foreign affiliates engaged in high-technology manufacturing (Panel 2); much domestically owned industry performs little innovation. Industry-science linkages are sound, with the share of public research funded by industry (Panel $1^{(o)}$) above the OECD median. Integration with global networks is also good: 48% of scientific articles and 32% of PCT patent applications were produced with international collaboration ($1^{(q)(r)}$). However, the number of PCT patents filed by universities and public research labs per GDP is below the OECD median ($1^{(p)}$). Hungary has an RTA in environment-related technologies; ICT and bio- and nano-technologies are close to the OECD median. Human resource indicators are weak: only 20% of the adult population is tertiary-qualified ($1^{(s)}$), and PISA science scores of 15-year-olds rank Hungary 27th in the OECD ($1^{(t)}$). ICT infrastructures are under-developed: Hungary has 20 fixed broadband and 10 wireless subscribers per 100 inhabitants ($1^{(k)(l)}$). The e-government readiness index is below the OECD median, similar to Slovenia and the Czech Republic ($1^{(n)}$).

Recent changes in STI expenditures: Hungary's GERD was 1.16% of GDP in 2010, well below the Barcelona target of 3%. However, GERD grew by a robust 4% a year between 2005 and 2010, one of the highest growth rates in the EU. As part of its Europe 2020 Strategy, Hungary has targeted GERD to increase to 1.8% of GDP by 2020. In 2010, a relatively high 47% of GERD was funded by industry, 39% by government, and 12% from abroad.

Overall STI strategy: Hungary's innovation policy has undergone regular changes over the past decade. The New Széchenyi Plan (ÚSzT) revised and updated the official S&T Innovation Policy Strategy in early 2011 and is currently the main strategy document. It focuses on selected key technology areas and has as its overriding objectives to increase R&D intensity and to increase innovation by firms.

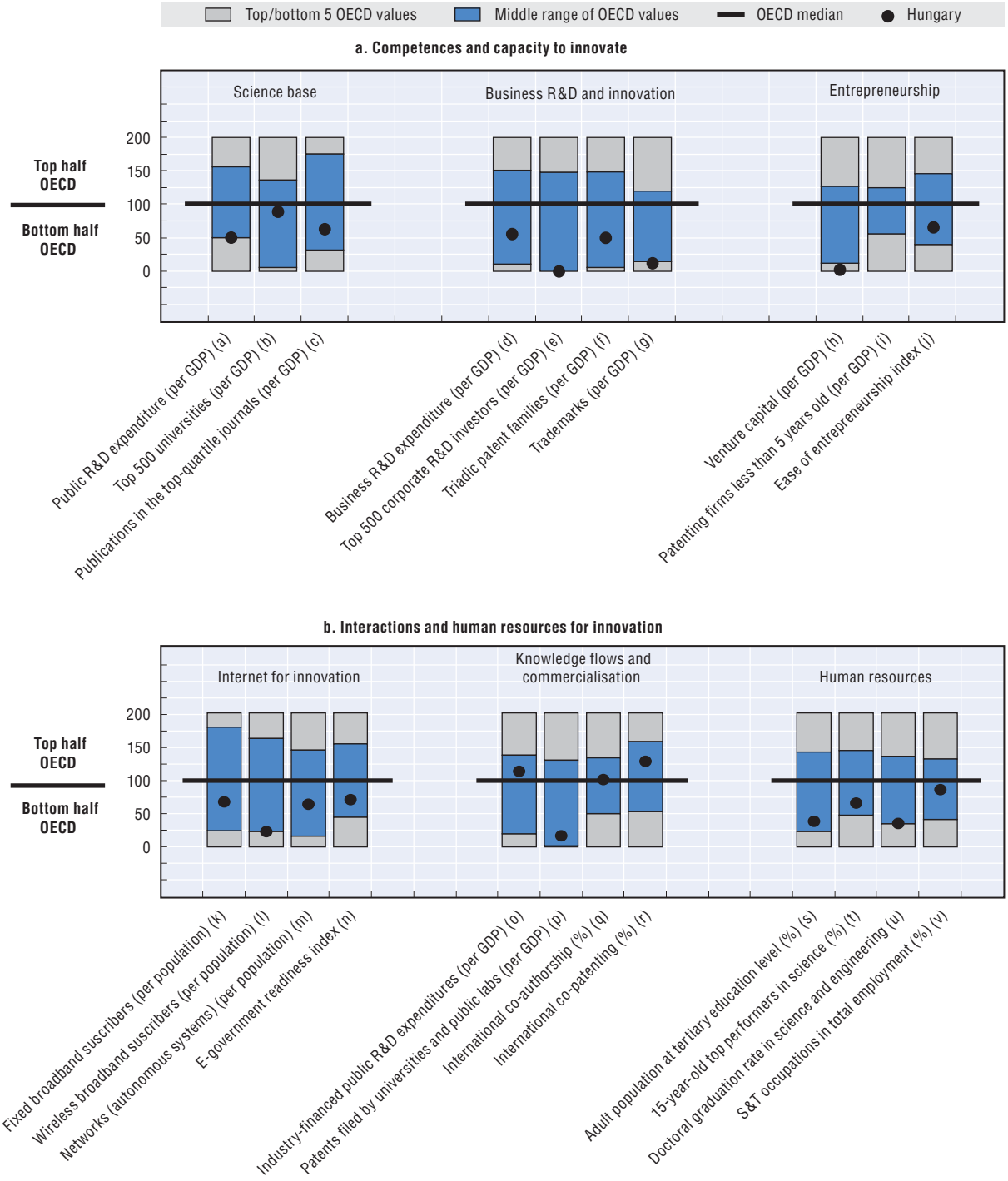
STI policy governance: STI policy governance arrangements have also changed regularly over the last two decades, and have even been modified twice since 2009. Currently, the National Research, Innovation and Science Policy Council (NKITT) provides long-term strategic advice to government. Four ministries (National Economy, National Development, National Resources and Public Administration and Justice) are represented on the NKITT. The National Innovation Office (NIH) is a key policy organisation. The Hungarian Academy of Sciences (HAS), with its network of scientific research institutes, oversees the Hungarian Scientific Research Fund (OTKA).

Key figures

Labour productivity, GDP per hour worked in USD, 2010	**26.1**	**GERD, as % of GDP, 2010**	**1.16**
(annual growth rate, 2005-10)	(+0.8)	(annual growth rate, 2005-10)	(+4.0)
Environmental productivity, GDP per unit of CO_2 emitted in USD, 2009	**4.21**	**GERD publicly financed, as % of GDP, 2010**	**0.46**
(annual growth rate, 2005-09)	(+3.6)	(annual growth rate, 2005-10)	(–0.6)

Figure 10.18. **Science and innovation in Hungary**

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: Hungary has a relatively small science base which is equally distributed between higher education and the institutes of the Hungarian Academy of Sciences (Panel 4). Public expenditures on R&D are low (1[(a)]); this is reflected in university rankings and international publications, both of which are below the OECD median (1[(b)(c)]).

Business R&D and innovation: The global financial crisis has significantly affected Hungary's R&D and innovation policy. In 2010, around USD 77 million (almost 37% of the STI budget) of the Research and Technological Innovation Fund (KTI) were blocked and some schemes were suspended. Business R&D instruments include direct funding such as competitive grants, equity financing and venture capital, and innovation vouchers, as well as a tax credit for R&D.

Entrepreneurship: The technological level of a large proportion of Hungarian firms, especially SMEs, is obsolete and underdeveloped. Increasing the share of innovative domestic firms is one of the main objectives of Hungary's STI policy. The Complex Enterprise Technology Development Initiative targets this area with a budget of USD 278 million.

ICT and scientific infrastructures: Spending on Hungary's research infrastructure was weak during the transition period. More recently, initiatives have been put in place to improve the quality of public research laboratories, including the Social Infrastructure Operational Programme (SOIP) and the National Research Infrastructure Survey and Roadmap (NEKIFUT). The National Information Infrastructure Development Institute (NIIF) is a supercomputer grid dedicated to research, and the Electronic Information Service (EISZ) facilitates access to data for higher education and scientific research institutions.

Clusters and regional policies: Cluster policy initiatives are a key pillar of regional policy. The Pole Programme supports clusters of firms with export potential in the main cities. The Economic Development Operational Programme (EDOP) and the Central Hungary Operational Programme (CHOP) also support cluster activity. There is also support for innovation and technology parks.

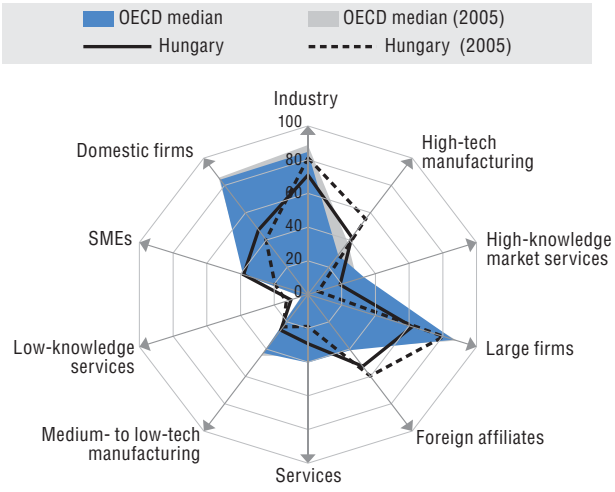
Knowledge flows and commercialisation: Initiatives that improve research and technology commercialisation include the Corvinus First Innovation Venture Capital Fund (CELIN), which assists start-up SMEs, and the Start Equity Guarantee Fund. The Hungarian Intellectual Property Office (HIPO) oversees intellectual property protection and has prepared the Action Plan Promoting Industrial Property Competitiveness of Entrepreneurs (Vivace) to address the country's weak IPR and innovation culture.

Human resources: Hungary's skills levels and human resource indicators are low. The New Széchenyi Plan aims to improve the quality of human resources in the academic sector. The government has increased support for PhD study, corporate scholarships, and post-doctoral job opportunities. Other initiatives to improve the education system include funding for Momentum: "From Brain Drain to Brain Gain" directed at talented young researchers, while the Campus Hungary Programme supports international student mobility.

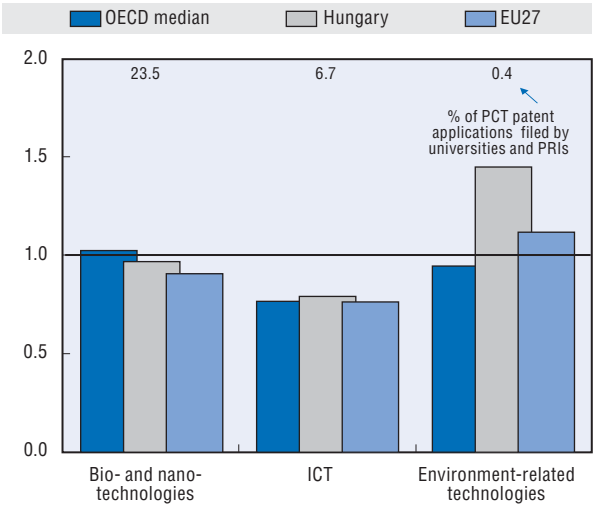
Emerging technologies: Hungary has taken steps to improve nanotechnology research (the NAP Nano Scheme) through an International Research and Development Agreement in 2005 with the Russian Federation. The National Technology Programmes and Platforms are further measures to support the state-of-the-art technologies that are expected to play a decisive role in Hungary's economic development.

Green innovation: Green economic development is one of the seven focus areas of the New Széchenyi Plan. Hungary's National Sustainable Development Strategy (2007) encourages R&D in future energy sources. Other green initiatives include the Hungarian National Renewable Energy Action Plan, the National Environmental Technology Innovation Strategy (2011-20) and the National Energy Strategy (2030).

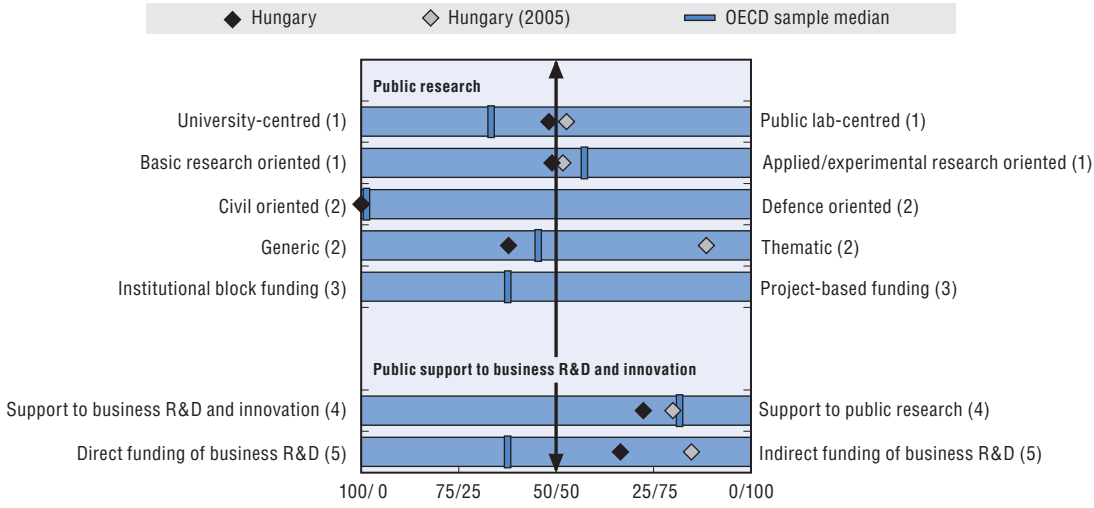
Panel 2. Structural composition of BERD, 2009
As a % of total BERD



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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