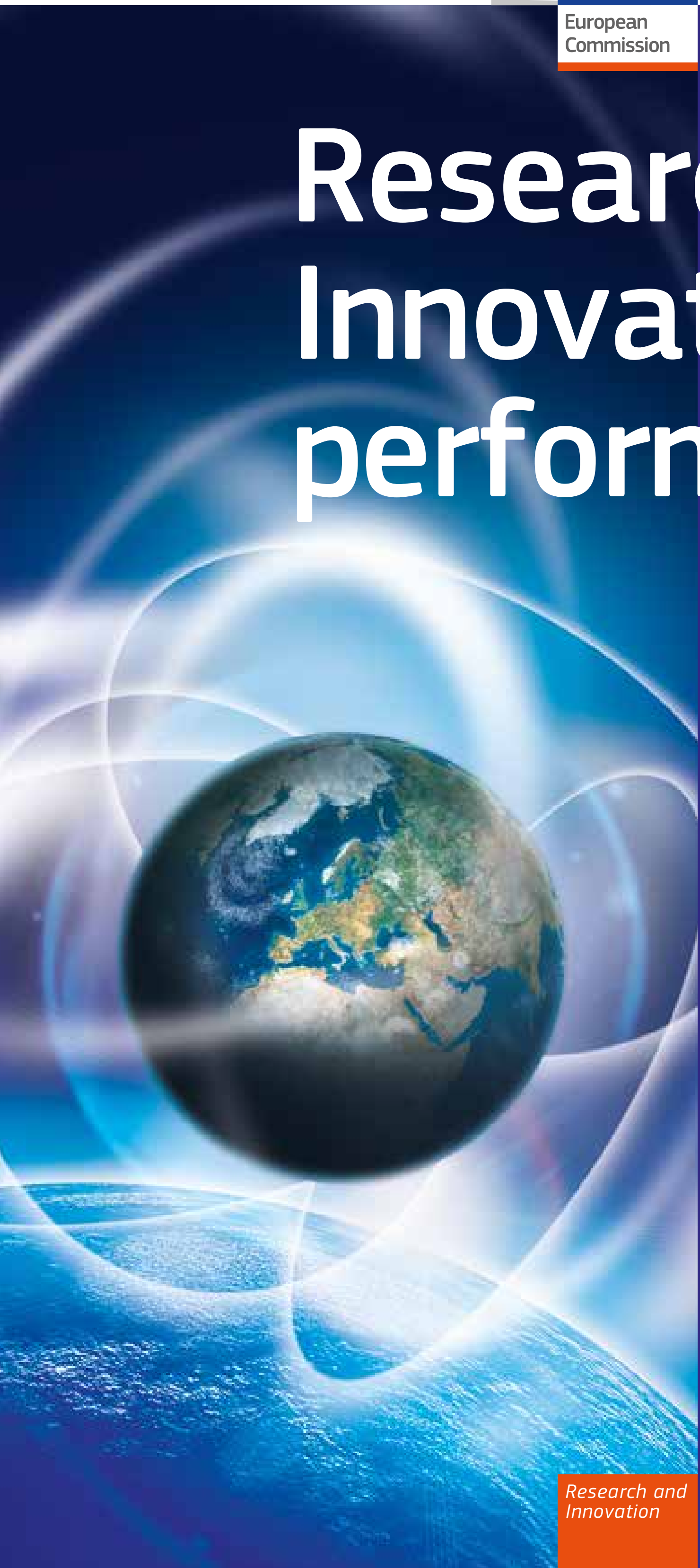
European Commission

Research and Innovation performance in

Hungary

Country Profile

2014



Research and Innovation

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Hungary

Improving the effectiveness of national research system and fostering innovation in enterprises

Summary: Performance in research and innovation

The indicators in the table below present a synthesis of research and innovation (R&I) performance in Hungary. They relate knowledge investment and input to performance and economic output throughout the innovation cycle. They show thematic strengths in key technologies and also the high-tech and medium-tech contribution to the trade balance. The indicator on excellence in science and technology takes into consideration the quality of scientific production as well as technological development. The Innovation Output Indicator covers technological innovation, skills in knowledge-intensive activities, the competitiveness of knowledge-intensive goods and services, and the innovativeness of fast-growing enterprises, focusing on innovation output. The indicator on knowledge-intensity of the economy focuses on the economy's sectoral composition and specialisation and shows the evolution of the weight of knowledge-intensive sectors and products.

Key indicators of research and innovation performance	
R&D intensity 2012: **1.30 %** (EU: 2.07 %; US: 2.79 %) 2007-2012: **+5.7 %** (EU: 2.4 %; US: 1.2 %)	***Excellence in S&T***[1] 2012: **31.5** (EU: 47.8; US: 58.1) 2007-2012: **+2.4 %** (EU: +2.9 %; US: -0.2)
Innovation Output Indicator 2012: **92.0** (EU: 101.6)	***Knowledge-intensity of the economy***[2] 2012: **54.4** (EU: 51.2; US: 59.9) 2007-2012: **+2.3 %** (EU: +1.0 %; US: +0.5 %)
Areas of marked S&T specialisations: Food and agriculture, automobiles, health, and environment	***HT + MT contribution to the trade balance*** 2012: **5.6 %** (EU: 4.23 %; US: 1.02 %) 2007-2012: **+4.5 %** (EU: +4.8 %; US: -32.3 %)

Over the last decade, the Hungarian R&I system has made obvious progress in the level of private-sector investment and in overall R&D intensity, as well as in scientific quality, patent revenues and structural change towards a more knowledge-intensive economy. Although public sector R&D intensity and the internationalisation of science remains less dynamic than the EU average, Hungary's innovation performance improved in 2007-2012, despite some fluctuations.

Hungary is still facing some key challenges in R&I. These include: weaknesses in the knowledge base and knowledge production; a low level of innovation activity, especially by small and medium-sized enterprises (SMEs), together with a low level of cooperation in innovation activities among the key actors; unfavourable framework conditions for innovation, in particular an unstable business environment, a high administrative burden, and competition not conducive to innovation; and insufficient human resources for research. The policy evaluation culture is weak in Hungary and the separation between science policy and R&I policy makes it difficult to coordinate the overall STI policy governance. Moreover, public R&D funding has fallen in Hungary since 2007 which points to some risks regarding the continuous policy commitment needed to further address these important challenges.

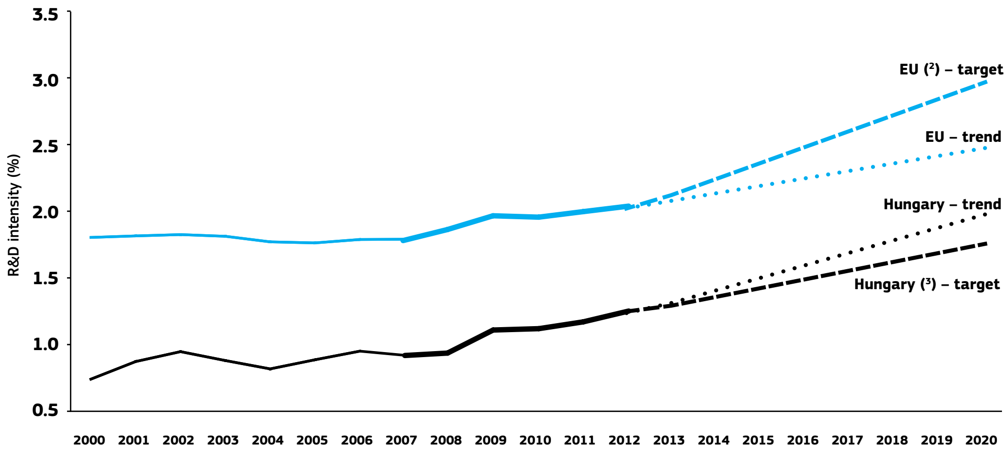
The new Innovation Strategy 2013-2020 focuses on three main areas of intervention: knowledge creation, knowledge transfer, and knowledge utilisation. Encouraging intelligent specialisation, building a sustainable system able to create equal opportunities, providing stable financing conditions, raising public awareness and strengthening the acknowledgment of knowledge and technology, and creating a stable, innovation-friendly economic and regulatory environment – these could all lead to rising levels of R&D intensity in the coming years. The strategy and its implementation are being supplemented by the Strategy of Intelligent Specialisation (S3) which is currently being developed. The Science Policy Strategy 2014-2020 (under preparation) aims to enhance the attractiveness of the research environment, increase scientific excellence, and reverse the brain drain.

[1] Composite indicator that includes PCT per population, ERC grants per public R&D, top universities and research institutes per GERD and highly cited publications per total publications.

[2] Composite indicator that includes R&D, skills, sectoral specialization, international specialization and internationalization sub-indicators.

Investing in knowledge

Hungary – R&D intensity projections: 2000–2020 ([1])



Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: DG Research and Innovation, Eurostat, Member State
Notes: ([1]) The R&D intensity projections based on trends are derived from the average annual growth in R&D intensity for 2007–2012.
([2]) EU: The projection is based on the R&D intensity target of 3.0 % for 2020.
([3]) HU: The projection is based on a tentative R&D intensity target of 1.8 % for 2020.
([4]) HU: There is a break in series between 2004 and the previous years.

In the recently adopted National Research and Development and Innovation Strategy (2013-2020), entitled 'Investment into the Future', Hungary commits to increasing its research and development expenditure to 1.8 % of the GDP by 2020 and to 3 % by 2030. A complementary target for the strategy is that BERD will reach 1.2 % by 2020. Moreover, the implementation of the R&D&I Strategy aims to reach the R&D intensity targets as priority indicators for an investment in the future.

Since the R&D intensity grew in 2007-2012 each year by 5.7 % on average to reach 1.3 % of GDP in 2012, Hungary is on track to achieve its national R&D intensity target of 1.8 % by 2020. This is mainly due to an increasing trend in business expenditure on R&D which grew by 11.4 % on average during 2007-2012. However, public R&D intensity (public-sector expenditure on R&D as % of GDP) fell from 0.48 % in 2009 to 0.43 % in 2012. Hungary, Bulgaria and Croatia are the only EU countries in which public R&D intensity has declined since 2007. This trend threatens to undermine the already weak supply of human resources for science and technology and the quality of the research performed.

In 2009-2012, the breakdown of total R&D expenditure by funding source and performance sector was similar to the EU-28 average. The share of R&D financed and performed by the business enterprise sector increased from 57.2 % to 65.6 % during this period, which is above the EU average of 63.0 %. On the other hand, the share of R&D performance by Higher Education Institutes (HEIs) decreased from 21.7 % in 2009 to 18.4 % in 2012, receding from the EU average of 23.8 %. The research performance of the government sector also fell in the period 2009-2012 from 20.1 % to 14.4 % which is close to the EU average of 12.4 %.

Up to February 2014, Hungary's participant success rate in the EU's Seventh Research Framework programme (FP7) reached 20.2 %, which is close to the EU-28 average of 20.5 %. However, the Hungarian EC financial contribution success rate of 15.0 % is lower than the EU-28 rate of 19.1 %. Structural Funds are an important source of funding for R&I activities. Of the EUR 24.908 billion of Structural Funds allocated to Hungary over the 2007-2013 programming period, around EUR 2.126 billion (8.5 % of the total) relate to RTDI[3].

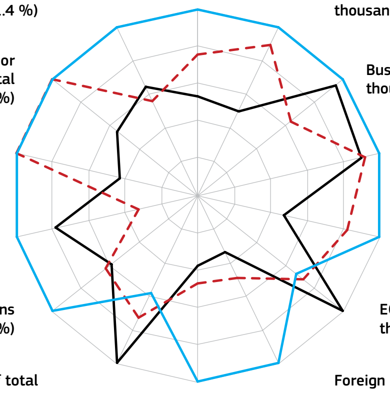
[3] RTDI includes the following sectors: (01) RTD activities in research centres, (02) RTD infrastructures and centres of competence, (03) Technology transfer and improvement of cooperation of networks, (04) Assistance to RTD, particularly in SMEs (and RTD services in research centres), (06) Assistance to SMEs for the promotion of environmentally-friendly products and processes, (07) Investment in firms directly linked to research and innovation, (09) Other methods to stimulate research and innovation and entrepreneurship in SMEs, and (74) Developing human potential in the field of research and innovation.

An effective research and innovation system building on the European Research Area

The graph below illustrates the strengths and weaknesses of Hungary's R&I system. Reading clockwise, it provides information on human resources, scientific production, technology valorisation and innovation. Average annual growth rates from 2000 to the latest available year are given in brackets.

Hungary, 2012 (1)

In brackets: average annual growth for Hungary, 2007–2012 (2)



Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: DG Research and Innovation, Eurostat, OECD, Science-Metrix/Scopus (Elsevier), Innovation Union Scoreboard.
Notes: (1) The values refer to 2012 or to the latest available year.
(2) Growth rates which do not refer to 2007–2012 refer to growth between the earliest available year and the latest available year for which comparable data are available over the period 2007–2012.
(3) Fractional counting method.
(4) EU does not include EL.

Hungary is below the EU average in most of the areas. However, the rate of BERD financed from abroad and EU FP7 funding are significantly higher than the EU average. The share of employment in knowledge-intensive activities and the number of business enterprise researchers are very close to the EU average.

Vulnerable areas include human resources, scientific production, innovation, and technology production. Innovation activities in small firms are at a low level with only around 14.7 % of Hungarian small and medium-sized enterprises (SMEs) innovating by introducing a new product or a new process and 22.4 % introducing marketing or organisational innovation.

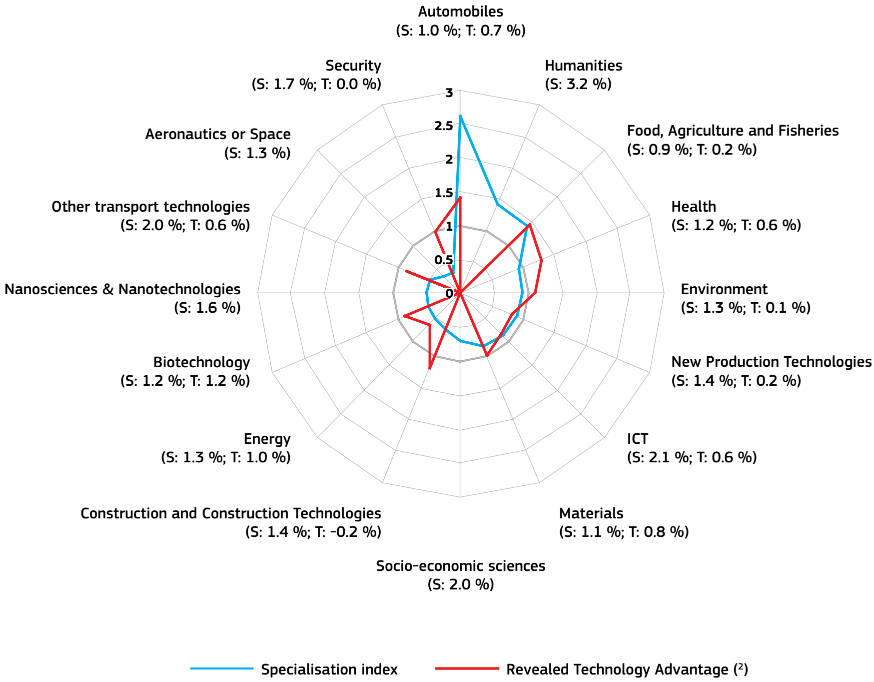
Only 5.2 % of Hungarian scientific publications are in the top 10 % of most-cited scientific publications, compared to the EU average of 11.0 %. Hungary has a low level of PCT patent applications and this trend is on the decline. The country performs better in terms of licence and patent revenue from abroad (not shown on the graph), which is probably due to the increased role of large foreign-owned enterprises in business R&D investment.

Hungary seems to be relatively well integrated in pan-European research collaborations in FP7. The top collaborations involving Hungarian researchers are mainly with colleagues from Germany, the United Kingdom, Italy, France and Spain.

Hungary's scientific and technological strengths

The graph below illustrates the areas, based on the Framework Programme thematic priorities, where Hungary shows scientific and technological specialisations. Both the specialisation index (SI, based on the number of publications) and the revealed technological advantage (RTA, based on the number of patents) measure the country's scientific (SI) and technological (RTA) capacity compared to that at the world level. For each specialisation field it provides information on the growth rate in the number of publications and patents.

Hungary – S&T National Specialisation (1) in thematic priorities, 2000–2010
in brackets: growth rate in number of publications (3) (S) and in number of patents (4) (T)



Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: Science-Metrix Canada; Bocconi University, Italy
Notes: (1) Values over 1 show specialisation; values under 1 show a lack of specialisation.
(2) The Revealed Technology Advantage (RTA) is calculated based on the data corresponding to the WIPO-PCT number of patent applications by country of inventors. For the thematic priorities with fewer than 5 patent applications over 2000–2010, the RTA is not taken into account. Patent applications in 'Aeronautics or Space' refer only to 'Aeronautics' data.
(3) The growth rate index of the publications (S) refers to the periods 2000–2004 and 2005–2009.
(4) The growth rate in number of patents (T) refers to the periods 2000–2002 and 2003–2006.

Comparison of the scientific and technological specialisation in selected thematic priorities shows a mixed situation with some co-specialisations as well as some mismatches. Technology production is strongly specialised in food, agriculture and fisheries, health, environment, construction and construction technologies, security and automobiles. A strong corresponding scientific S&T co-specialisation is noted for automobiles, food and agriculture, while a marked potential for co-specialisation is observed for health, and the environment.

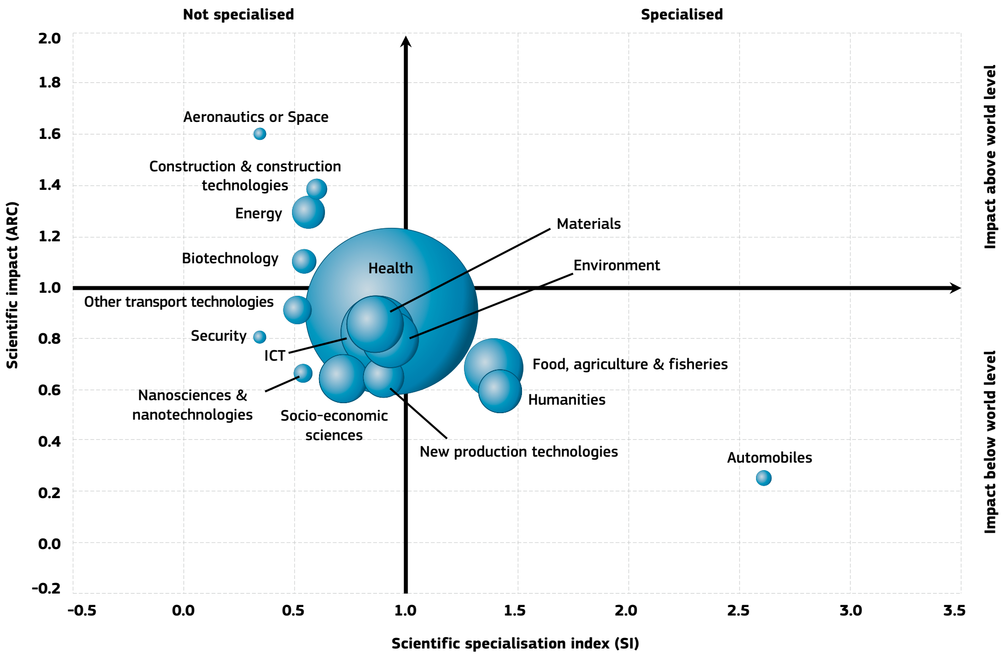
Together with the Czech Republic, Slovakia, Slovenia and Italy, Hungary is classified as having a medium-low knowledge capacity with an important industrial base[4]. Among those countries, Hungary does not exhibit a broader technology development compared to the country's science base. Given that the general quality of science is not high, it may be the case that industry's technological base is founded less on high-tech and medium-tech products than in the other three countries in the same group (except Slovenia).

4 Source: Innovation Union Competitiveness report 2011.

Following this rationale, Hungary will benefit both from intensifying efforts to attract Foreign Direct Investment (FDI) for more knowledge-intensive activities and from continuing to improve the quality of the science base in order to create the basis for raising knowledge-transfer from science to technology and industry.

The graph below illustrates the positional analysis of Hungary publications showing the country's situation in terms of scientific specialisation and scientific impact over the period 2000-2010. The scientific production of the country is reflected by the size of bubbles, which corresponds to the share of scientific publications from a science field in the country's total publications.

Hungary – Positional analysis of publications in Scopus (specialisation versus impact), 2000–2010



Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: Science-Metrix Canada, based on Scopus
Note: Scientific specialisation includes 2000–2010 data; the impact is calculated for publications of 2000–2006, citation window 2007–2009.

It would appear there is room for improvement regarding the scientific impact of some of the sectors in which Hungarian science is strongly specialised, i.e. automobiles, food, agriculture and fisheries, humanities, and health. It is very interesting to note the high level of scientific excellence attained by the country in aeronautics, energy, construction, and biotechnology, although all those fields have a rather low scientific specialisation index. Taking into account Hungary's technological specialisation in energy and construction, it would probably benefit from fostering a scientific specialisation in those fields.

As its excellence in research is correlated to more cooperation with researchers from other European countries and beyond, Hungary would benefit from actively supporting and providing incentives for its researchers to connect to Horizon 2020 networks. Considering its share of grants in FP7 fields, there is room for improvement, for example in the ICT sector.

From the EU perspective, production fragmentation and the specialisation of different countries and regions in certain production activities can yield overall benefits for all the partners involved. Hungary, together with Germany, Austria and a number of Eastern European countries, has used this strategy to develop an automobile cluster which enables these countries to integrate their respective production lines.

Policies and reforms for research and innovation

The recently adopted new national RDI Strategy (2013-2020) entitled 'Investments into the Future' aims to raise RDI investments and, as result, to mobilise the Hungarian economy and strengthen its competitiveness. To ensure that the public and private resources spent on the country's RDI sector will be profitable for its economy, the strategy builds around three priority axes: internationally competitive knowledge bases which can underpin economic and social progress; cooperation in knowledge and technology transfer which is efficient at both national and international levels; and innovative enterprises intensively utilising the results of modern science and technology.

The strategy focuses on knowledge creation and knowledge transfer and aims to reconsider and renew the incentive system to promote market-driven and society-driven innovation processes. By proposing measures explicitly directed at innovative enterprises, the strategy aims to overcome the main weakness in the Hungarian RDI system which is the low share of domestic innovative companies. According to the strategy, Hungary will increase its gross domestic expenditure on R&D to 1.8 % by 2020 and to 3 % by 2030. Moreover, the results expected for the specific targets set in the strategy are the stimulation of RDI demand, establishment of an efficient support and funding system, as well as completion of the start-up ecosystem.

The strategy is the guiding document for planning the budget allocations for RDI for the next programming period 2014-2020. The regional-technological-sectoral aspects of the RDI Strategy will be determined by the national Smart Specialisation Strategy (S3). Preparations for this began at the beginning of 2013, with the drawing up of strategy documents by the Regional Innovation Agencies and, according to the government resolution on the collaborative governance of the planning of the Smart Specialisation Strategy, draft S3 should be ready by the end of September 2014. The correct implementation of the newly introduced and planned strategies will be crucial for the creation of an effective national R&I ecosystem.

The new advisory body, the National Science Policy and Innovation Board (NTIT) was established by government decree in September 2013 with the aim of providing advice, evaluation, and making recommendations on strategic issues concerning RDI programmes. The president of the NTIT is the prime minister, co-chaired by the president of the Hungarian Academy of Sciences (MTA). However, to date the NTIT has not held any meetings, and one activity in the RDI Strategy action plan is actually to revise the governance system for the STI policy.

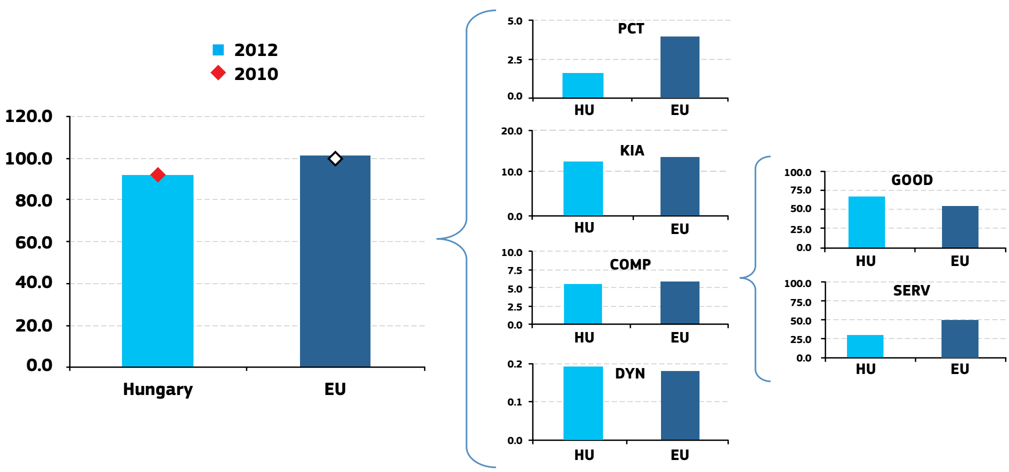
A new scheme 'Start-up_13' was launched in June 2013 in order to support the development of young, technology companies. Based on an international peer-review organised by the National Innovation Office (NIH), in October 2013, four companies received the title of 'accredited technology incubator' which would enable them to participate in the Start-up_13 programme.

Until now, the allocation of institutional funding to higher education institutions and research-performing organisations is based on student numbers, disciplines taught, number of full-time professors and the number of professors holding scientific degrees, meaning that the allocation of academic funding is not based on competition. A working group was set up for the preparation of a science policy strategy which aimed to improve the system for supporting fundamental research and financing in the academic sector. This strategy will also improve access to scientific information and publications, strengthen the links between science and business, and foster international cooperation and networks. Moreover, the 'TOP 200 programme' aims to develop the scientific, research and innovation capacity at major universities to enhance their international prominence.

Innovation Output Indicator

The Innovation Output Indicator, launched by the European Commission in 2013, was developed at the request of the European Council to benchmark national innovation policies and to monitor the EU's performance against its main trading partners. It measures the extent to which ideas stemming from innovative sectors are capable of reaching the market, providing better jobs and making Europe more competitive. The indicator focuses on four policy axes: growth via technology – (patents); jobs (knowledge-intensive employment); long-term global competitiveness (trade in mid/high-tech commodities); and future business opportunities (jobs in innovative fast-growing firms). The graph below enables a comprehensive comparison of Hungary's position regarding the indicator's different components:

Hungary – Innovation Output Indicator



Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: Eurostat, OECD, Innovation Union Scoreboard 2014, DG JRC
Notes: All data refer to 2012 except PCT data, which refer to 2010.
PCT = Number of PCT patent applications per billion GDP, PPS.
KIA = Employment in knowledge-intensive activities in business industries as % of total employment.
DYN = Innovativeness of high-growth enterprises (employment-weighted average).
COMP = Combination of sub-components GOOD and SERV, using equal weights.
GOOD = High-tech and medium-high-tech products exports as % total exports. EU value refers to EU-28 average (extra-EU = 59.7 %).
SERV = Knowledge-intensive services exports as % of total service exports. EU value refers to EU-28 average (extra-EU = 56 %).

Hungary is a medium performer in the European innovation indicator scoring slightly below the EU average. This is the result of an above-average performance in two components and below-average performance in patents and knowledge-intensive service (KIS) exports. The country's performance is currently stagnating.

The relatively low performance in patents is linked to limited research capacity, economic structure and the division of work within international companies, including motor-vehicle producers which have production facilities in Hungary but tend to do research and patenting in the headquarter country. The export of power-generating machines, telecommunication equipment, and road vehicles results in high scores as regards the share of medium-high/high-tech goods in total goods exports (the highest share in the EU).

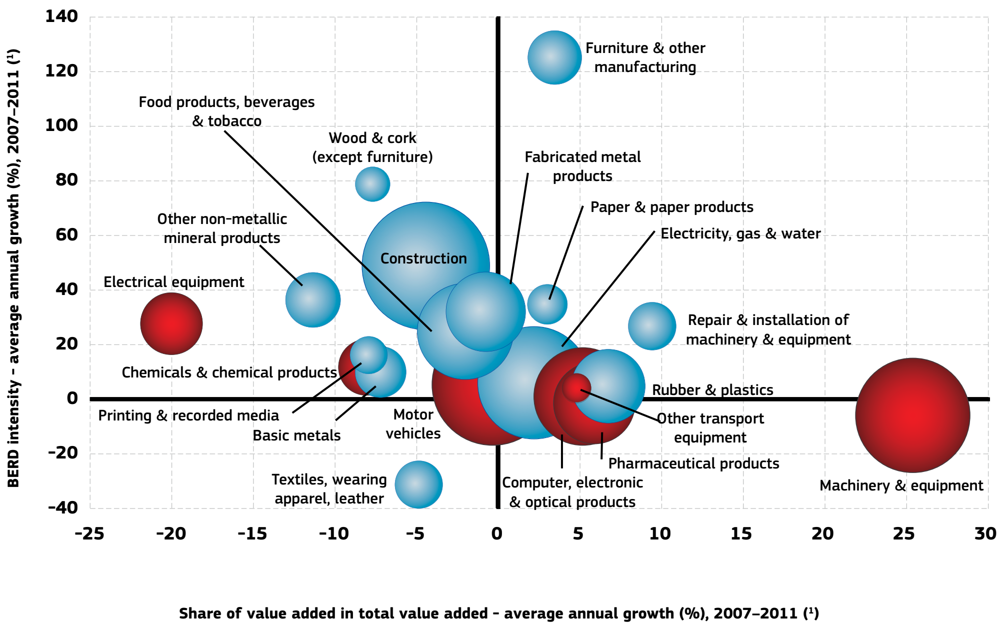
The low share of knowledge-intensive service exports is explained by the relatively high level of non-KIS transport services (road transport) and of tourism-services exports, which are not compensated for by any strongholds in KIS exports.

Hungary performs well regarding the innovativeness of fast-growing firms. This is the result of a high share of employment in innovative sections of the manufacturing sector among fast-growing enterprises, such as the manufacture of motor vehicles and of computer, electronics and optical products.

Upgrading the manufacturing sector through research and technologies

The graph below illustrates the upgrading of knowledge in different manufacturing industries. The position on the horizontal axis illustrates the changing weight of each industry sector in value added over the period. The general trend to the left-hand side reflects the decline in manufacturing in the overall economy. The sectors above the x-axis are those where research intensity has increased over time. The size of the bubble represents the sector share (in value added) in manufacturing (for all sectors presented on the graph). The red sectors are high-tech or medium-high-tech sectors.

Hungary – Share of value added versus BERD intensity: average annual growth, 2007–2011 (1)



Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: Eurostat
Notes: (1) 'Electricity, gas and water', 'Printing and reproduction of recorded media': 2007–2010.
(2) High-tech and medium-high-tech sectors (NACE Rev. 2 – two-digit level) are shown in red.

The graph shows that throughout the economic crisis the shares in total value added of numerous manufacturing sectors declined between 2007 and 2011, which is particularly notable in high-tech and medium-tech sectors such as electrical equipment and chemicals.

On the contrary, 'machinery and equipment' had very good dynamics of strong growth in value added although coupled with a strong decline in R&D expenditure. Manufacturing in Hungary is concentrated mainly in low-skills sectors, such as construction or electricity, although some high-tech sectors, mainly machinery and equipment, motor vehicles and computer, electronic and optical products, display a significant weight in the economy.

It is important to note that Hungary is one of the countries in which business R&D intensity made the most progress between 2007 and 2011 in relation to the 2007 level. The sectors for which R&D intensity increased the most in 2007-2012 include numerous low-tech sectors such as furniture & other manufacturing, wood and cork, and construction. Along with Poland and the Czech Republic, Hungary is one of the countries in which employment in manufacturing has declined the least in recent years.

Key indicators for Hungary

HUNGARY	2000	2005	2006	2007	2008	2009	2010	2011	2012	Average annual growth 2007–2012 (1) (%)	EU average (2)	Rank within EU
ENABLERS Investment in knowledge												
New doctoral graduates (ISCED 6) per thousand population aged 25–34	0.50	0.67	0.63	0.66	0.71	0.86	0.82	0.82	0.90	6.6	*1.81*	24
Performance in mathematics of 15-year-old students: mean score (PISA study)	:	:	491	:	:	490	:	:	477	-13.9 (3)	495 (4)	22 (4)
Business enterprise expenditure on R&D (BERD) as % of GDP	0.36	0.41	0.49	0.49	0.53	0.67	0.70	0.76	0.85	11.4	1.31	15
Public expenditure on R&D (GOVERD + HERD) as % of GDP	0.40	0.50	0.50	0.47	0.46	0.48	0.45	0.44	0.43	-1.8	*0.74*	23
Venture capital as % of GDP	0.10	0.05	0.04	0.05	0.03	0.21	0.05	0.08	0.11	17.0	0.29 (5)	14 (5)
S&T excellence and cooperation												
Composite indicator on research excellence	:	:	:	28.0	:	:	:	:	31.5	2.4	47.8	13
Scientific publications within the 10% most cited scientific publications worldwide as % of total scientific publications of the country	:	4.8	5.3	5.4	4.8	5.2	:	:	:	-1.5	11.0	21
International scientific co-publications per million population	:	313	313	338	341	356	362	396	412	4.0	343	21
Public–private scientific co-publications per million population	:	:	:	22	23	25	31	31	:	8.6	53	15
FIRM ACTIVITIES AND IMPACT Innovation contributing to international competitiveness												
PCT patent applications per billion GDP in current PPS (EUR)	1.7	1.4	1.4	1.6	1.4	1.5	1.5	:	:	-3.0	3.9	16
License and patent revenues from abroad as % of GDP	0.24	0.76	0.49	0.67	0.56	0.65	0.80	0.75	0.88	5.6	0.59	6
Community trademark (CTM) applications per million population	2	17	19	27	28	30	39	36	37	6.9	152	26
Community design (CD) applications per million population	:	4	3	6	5	6	7	5	6	-1.5	29	25
Sales of new-to-market and new-to-firm innovations as % of turnover	:	:	10.5	:	16.4	:	13.7	:	:	-8.8	14.4	13
Knowledge-intensive services exports as % total service exports	:	21.0	23.5	26.0	25.9	26.1	26.5	26.3	:	0.3	45.3	20
Contribution of high-tech and medium-tech products to the trade balance as % of total exports plus imports of products	2.25	4.64	5.74	4.47	5.20	6.15	5.99	5.84	5.56	-	4.23 (6)	3
Growth of total factor productivity (total economy): 2007 = 100	89	100	102	100	100	94	94	95	93	-7 (7)	97	21
Factors for structural change and addressing societal challenges												
Composite indicator on structural change	:	:	:	48.6	:	:	:	:	54.4	2.3	51.2	11
Employment in knowledge-intensive activities (manufacturing and business services) as % of total employment aged 15–64	:	:	:	:	12.8	12.3	12.8	13.0	12.5	-0.5	13.9	16
SMEs introducing product or process innovations as % of SMEs	:	:	16.8	:	16.8	:	14.7	:	:	-6.6	33.8	25
Environment-related technologies: patent applications to the EPO per billion GDP in current PPS (EUR)	0.08	0.08	0.06	0.21	0.14	0.06	:	:	:	-46.5	0.44	18
Health-related technologies: patent applications to the EPO per billion GDP in current PPS (EUR)	0.40	0.29	0.16	0.27	0.21	0.26	:	:	:	-0.4	0.53	14
EUROPE 2020 OBJECTIVES FOR GROWTH, JOBS AND SOCIETAL CHALLENGES												
Employment rate of the population aged 20–64 (%)	61.2	62.2	62.6	62.6	61.9	60.5	60.4	60.7	62.1	-0.2	68.4	24
R&D intensity (GERD as % of GDP)	0.81	0.94	1.01	0.98	1.00	1.17	1.17	1.22	1.30	5.7	*2.07*	17
Greenhouse gas emissions: 1990 = 100	80	81	79	77	75	68	69	67	:	-10 (8)	83	7 (9)
Share of renewable energy in gross final energy consumption (%)	:	4.5	5.0	5.9	6.5	8.0	8.6	9.1	:	11.4	13.0	21
Share of population aged 30–34 who have successfully completed tertiary education (%)	14.8	17.9	19.0	20.1	22.4	23.9	25.7	28.1	29.9	8.3	35.7	19
Share of population aged 18–24 with at most lower secondary education and not in further education or training (%)	13.9	12.5	12.6	11.4	11.7	11.2	10.5	11.2	11.5	0.2	12.7	19 (9)
Share of population at risk of poverty or social exclusion (%)	:	32.1	31.4	29.4	28.2	29.6	29.9	31.0	32.4	2.0	24.8	23 (9)

Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: Eurostat, DG JRC – Ispra, DG ECFIN, OECD, Science Metrix / Scopus (Elsevier), Innovation Union Scoreboard
Notes: (1) Average annual growth refers to growth between the earliest available year and the latest available year for which compatible data are available over the period 2007–2012.
(2) EU average for the latest available year.
(3) The value is the difference between 2012 and 2006.
(4) PISA (Programme for Internatonal Student Assessment) score for EU does not include CY and MT. These Member States were not included in the EU ranking.
(5) Venture capital: EU does not include EE, HR, CY, LV, LT, MT, SI and SK. These Member States were not included in the EU ranking.
(6) EU is the weighted average of the values for the Member States.
(7) The value is the difference between 2012 and 2007.
(8) The value is the difference between 2011 and 2007. A negative value means lower emissions.
(9) The values for this indicator were ranked from lowest to highest.
(10) Values in italics are estimated or provisional.

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