



## R&D policy: Switzerland

### Abstract

*Switzerland is Europe's leader in innovation. In 2007, it obtained the highest number of patents per capita among industrialized countries, roughly three times higher than the OECD average. According to the Global Benchmark Report 2011, Switzerland is the most competitive country in the world, ahead of Canada, Australia, the United States, and Sweden (Confederation of Danish Industry 2011). There are several factors that made Switzerland stand out among industrialized countries. First, Switzerland started early. Its emphasis on research and innovation has a long history. The first two institutions funding university-based research were established in or shortly after 1943. Second, there are strong public-private links in the funding and conduct of research, and Switzerland has more private spending. Swiss companies spend twice as much on R&D than the EU27 average (Switzerland spends 2.2 percent GDP; EU27, 1.1 percent GDP). Third, Switzerland has some outstanding universities: with population of 8 million, it has four universities in the top 100 of The Times Higher Education World University 2010 ranking. In part due to its R&D policies, Switzerland may be Europe's most innovative country. Switzerland is Europe's most innovative country and the rest of the continent should take note.*

A country's innovation performance is directly linked to the willingness of companies and academic centers to develop, implement, and share new ideas. Cutting-edge solutions are possible when governments set the right mix of legal environment and business incentives. Switzerland shows how to combine the best results in innovation with economic growth.

### Swiss excellence

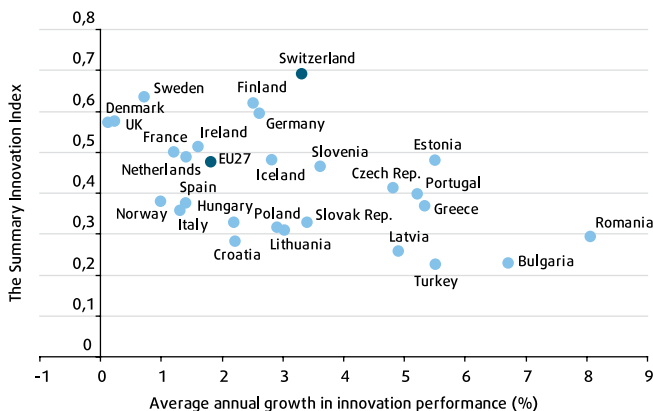
Among European nations, Switzerland is the leader in terms of innovation. In 2007, it obtained the highest number of patents per million inhabitants among industrialized countries (118), roughly three times higher than the OECD average (42). According to the Global Benchmark Report 2011, Switzerland was named the most competitive country in the world, ahead of Canada, Australia, the United States, and Sweden (Confederation of Danish Industry 2011).<sup>1</sup> Switzerland was ranked number one in the European Innovation Scoreboard 2009 ranking, with its innovation performance growth outpacing most of the EU15 countries (Swiss growth: 3.3 percent; EU27 average: 1.8 percent) (figure 35).<sup>2</sup> A rise in venture capital funding as well as community trademarks were the main contributors to this growth.

In the EU industrial R&D Innovation Scoreboard 2010, which ranks companies worldwide according to their R&D spending, 2 out of top 10 enterprises were based in Switzerland. This same metric also found that Swiss companies accounted for 4.4 percent of the world's R&D investment. Finally, innovation plays an important role in the economy itself as, in 2007, 45 percent of the active population was employed in science and technology.<sup>3</sup>

### Leading in Europe

There are several factors that make Switzerland stand out. First, the emphasis on research and innovation has a long history. First two institutions funding university-based research were established in or shortly after 1943.<sup>4</sup> Switzerland's innovation performance is highly influenced by both the public sector and private enterprises and the links between the two.

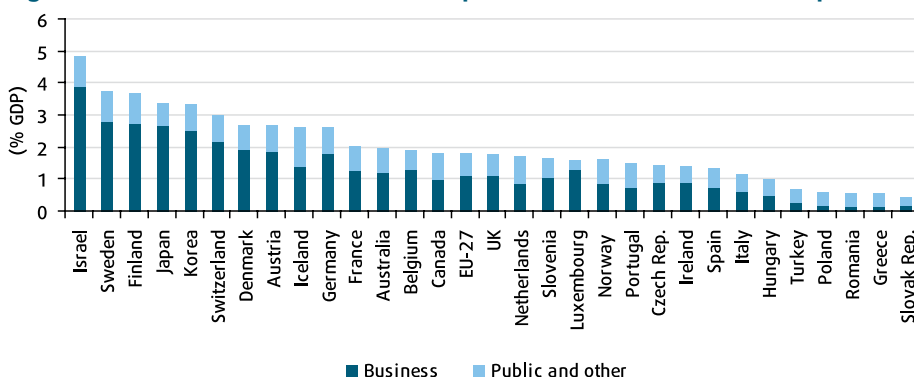
**Figure 35: Innovation performance in Europe: The Summary Innovation Index and average annual growth in innovation performance**



Source: European Innovation Scoreboard 2009.

Government expenditure focuses on generic research (in most cases the expenditure does not target specific thematic areas) and collaboration between private and public sector. There are several agencies involved in R&D policies, including, among others, the State Secretariat for Education and Research, the Swiss National Science Foundation, the Federal Development of Economic Affairs, and the Swiss Science and Technology Council. The first two are responsible for supporting basic research and higher education institutions. The Federal Development of Economic Affairs is in charge of applied research, technology transfer, and the general competitiveness of the Swiss economy. The Swiss Science and Technology Council serves as an advisory body to federal and cantonal administration on R&D issues. In total, gross spending on R&D stood at 3 percent of GDP in 2008, in comparison to the EU27 average of 1.8 percent (figure 36). In the recent years, the majority of the public spending on R&D has been focused on universities.

**Figure 36: Government and business expenditure on R&D in 2008 as a percentage of GDP<sup>5</sup>**



Source: European Innovation Scoreboard 2009.

Second, Switzerland has more private spending. Swiss companies spend twice as much on R&D than the EU27 average (Switzerland spends 2.2 percent GDP; EU27, 1.1 percent).<sup>6</sup> And they continued to spend on R&D even in the times of crisis. According to the EU industrial R&D Innovation Scoreboard, Swiss companies increased industrial R&D spending in 2009, while it



fell in other European countries. The majority of Swiss companies active in the R&D field are relatively large (employing more than 100 people) and belong to the medium-high innovation sector.<sup>7</sup> However, small and medium-size enterprises (SMEs) do not lag behind; between 2004 and 2008 the SME sector increase its R&D expenditure by more than 50 percent.<sup>8</sup> Thanks to a substantial pharmaceutical sector, with multinationals such as Roche and Novartis, the country also tapped part of the high R&D intensity sector. In 2008 pharmaceutical companies accounted for nearly 40 percent of total private R&D expenditure.<sup>9</sup>

Companies are heavily involved in innovation processes, and not only at the enterprise level. Business leaders serve on the boards or advisory bodies of research and science institutions. A good example of how companies engage in education and research is the Avenir Suisse—a think-tank established by 14 Swiss enterprises in 1999 that focuses on recognizing new, cutting-edge ideas and possible research policy proposals.

Third, Swiss innovation processes are connected to its education system. The country of 8 million citizens has four universities in the top 100 of The Times Higher Education World University 2010 ranking.<sup>10</sup> Swiss universities are successful in attracting international students; in 2008 approximately one in seven students enrolled in tertiary studies was foreign. The country also invests heavily in education, with the second largest level of spending on tertiary education per student among OECD, after the United States.<sup>11</sup>

### Competing with the world

Although Global Benchmark Report 2011 ranks Switzerland the highest in the world, country faces increased competition from abroad. Asian innovators seem to be catching-up at a remarkable pace, making the competition for the best R&D location harder. In 2009, Swiss companies increased their industrial R&D spending by 2.5 percent, in comparison to 40 percent in China and 27 percent in India. Naturally, developing countries start from a very low level of expenditure that allows for high growth rates.

There are several impediments along the way. Swiss productivity growth slowed, increases in R&D spending were smaller in the recent years, and GDP growth seems to be very irregular (figure in appendix). The OECD estimates that between 1995 and 2000, productivity rose on average by 1.6 percent, against the EU15 average of 1.8 percent, and then slowed to 1.0 percent between 2000 and 2006, against the EU15 average of 1.3 percent.

Additionally, a lack of competition in the sheltered sectors may discourage companies from investing in new ideas. Too many stakeholders involved in the innovation processes may hamper the development and lengthen the country's response to changing global trends. On the tertiary education's side, there is a growing need for greater governance, increased research efforts, and a lessening the reliance on public spending.

## Sources

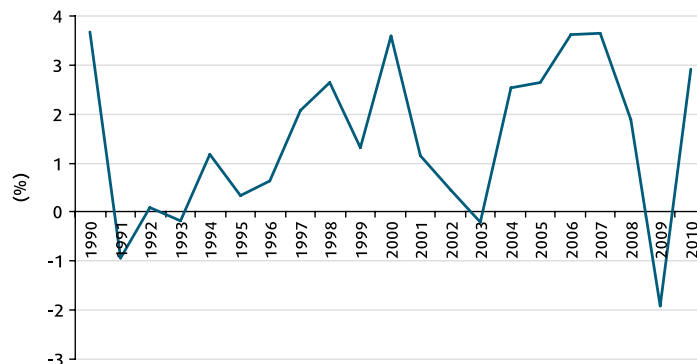
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## Notes

- 1 The report assesses the competitiveness based on following areas: human resources, finance and support, firm investments, linkages and entrepreneurship, throughputs, innovators, and economic effects.
- 2 Measure: The Summary Innovation Index comprises 29 indicators. Due to the lag in data availability, the data from European Scoreboard 2009 reflect performance from 2007/2008.
- 3 Half of the population employed in science and technology sector attained tertiary education.
- 4 The Commission for Technology and Innovation was funded in 1943 (present name from 1996), and the Swiss National Science Foundation was set up in 1952.
- 5 For all countries the data is from 2008, except Australia (2006) and Greece (2007).
- 6 OECD, reference year 2008.
- 7 The medium-high innovation sector is defined by the EU Industrial Investment Scoreboard as a sector with R&D intensity between 2 percent and 5 percent (e.g., automobiles, electronics and electrical equipment, aerospace).
- 8 R&D expenditure understood as intramural spending (spending on activities carried out within one entity, excluding contracts with outside research organizations).
- 9 High-level innovation sector is defined by the EU Industrial Investment Scoreboard as a sector with R&D intensity above 5 percent (e.g., pharmaceuticals, health care equipment, technology hardware, computer software).
- 10 The ranking has following criteria: teaching (learning environment), international diversity (staff and students), industry income (innovation), research (volume, income and reputation), and citations (research influence).
- 11 OECD, spending in all tertiary education (including R&D) per student for all services. Unit: USD PPP; reference year: 2007.

## Appendix

Figure 37: GDP growth in Switzerland, 1990-2010



Source: IMF WEO.