



## FSO News

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### 4 National Economy

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# Public Funding of Research in Switzerland 2000–2010

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# 1 Introduction

This publication presents a new statistical approach to the public funding<sup>1</sup> of research in Switzerland and its role as an instrument to promote research.

This is the first time that the Federal Statistical Office (FSO) issues a publication dealing with government research and development (R&D) expenditures, with a specific focus on funding. Direct R&D expenditures by the Confederation have been presented on a regular basis in standard publications dealing with R&D survey results,<sup>2</sup> but the topic of public funding of research in Switzerland has never been addressed as such.

Public funding includes direct R&D funding by the Confederation (R&D carried out by the Confederation itself [intramural] or by third parties [extramural]) as well as funding by the Confederation and the cantons of R&D in the higher education sector (indirect funding).

Beyond its interest at the national level, public funding of R&D is a key theme for various statistical expert groups of the Organisation for Economic Cooperation and Development (OECD) and the Statistical Office of the European Union (Eurostat). For all OECD countries, R&D plays an increasingly important role as an engine of economic growth and a key factor in building a knowledge economy.

Data on government budget appropriations or outlays for R&D, collected every two years by the FSO, make it possible to describe overall public funding of research over time. The new breakdown of these data, by funding mode, makes it possible to take the analysis further: the data broken down in this manner highlight how the government supports R&D and allow an international comparison of Switzerland's results.

This publication describes the financial efforts undertaken between 2000 and 2010 by the Confederation and the cantons to support research in Switzerland and abroad. It presents the instruments used by the government to fund R&D as well as the main beneficiaries of these funds. Lastly, it compares the Swiss results with those of other OECD countries.

The term "government" is often used below. It refers both to the Confederation and the cantons. This generic term is used to make the text more readable.

<sup>1</sup> In this paper, the term "public funding" of R&D refers to the source of funding from the government sector according to the definition of the Frascati Manual (OECD, Paris, 2002) which includes, in the case of federal governments, the federal and sub-national levels (regional or cantonal).

<sup>2</sup> For example: FSO (2009), "Les dépenses de la Confédération. Finances et personnel 2008", FSO News, Neuchâtel.

## 2 Government budget appropriations or outlays for R&D

This chapter presents the overall public funding of R&D in Switzerland in the 2000–2010 period and – in 2008 – compares this financial effort with that of a number of OECD countries. The analysis is based on statistics on government budget appropriations or outlays for R&D.

### 2.1 Definition

Government budget appropriations or outlays for R&D (GBAORD) comprise all appropriations for R&D which are financed by the Confederation or the cantons. They cover four major expenditure groups:

1. intramural R&D expenditures, which fund research carried out within the federal administration,<sup>3</sup>
2. R&D contracts allocated by the government to third parties,
3. Grants to fund R&D activities awarded by the government to institutions outside the federal administration, either in Switzerland or abroad,<sup>4</sup>
4. General university funds (GUF).

The GUF are based on three elements: (a) basic grants awarded by the Confederation to the higher education institutions in accordance with Federal University Funding Act (LAU/UFG), (b) the regular budgets of the federal institutes of technology (EPF/ETH) and their research institutions, and (c) the funds disbursed by the cantons in the form of budgetary envelopes or under the Intercantonal Agreement on Universities (AIU/IUV).

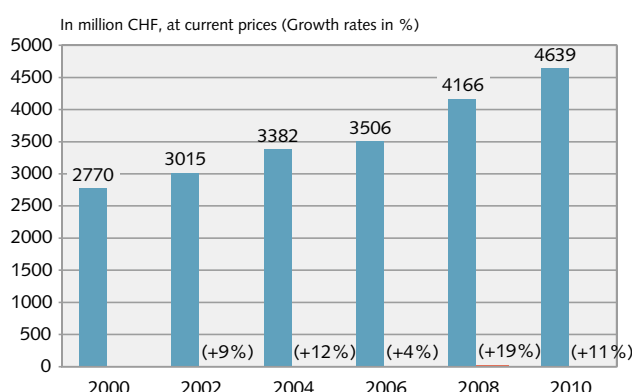
Of these various amounts, only the portion used to fund R&D activities is taken into account in the GBAORD.

### 2.2 Change over time

Between 2000 and 2010, GBAORD increased by almost CHF 2 billion, from CHF 2.770 billion to CHF 4.639 billion, i.e. an average annual growth rate of +5.3%.<sup>5</sup>

**Government budget appropriations or outlays for R&D, 2000–2010**

**G 1**



Source: FSO

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As shown in Graph 1, an increase in the amounts of GBAORD can be observed over the entire period. To put this growth in a broader context, it is possible to compare it with the growth of gross domestic product (GDP), which is the aggregate benchmark of a country's economic growth. Between 2000 and 2010, GDP grew by an average of 2.9% per year, a markedly lower rate than that observed for GBAORD (+5.3%). Expressed as a percentage of GDP, GBAORD experienced growth, as shown in Graph 2.

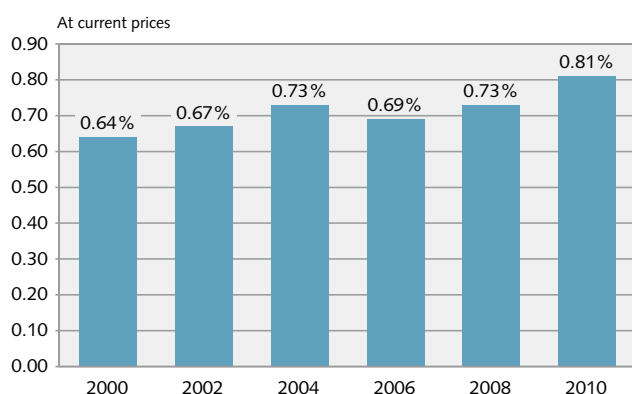
<sup>3</sup> No data on intramural R&D expenditures are collected from the cantons.

<sup>4</sup> The sum of contracts and grants constitutes the extramural R&D expenditures.

<sup>5</sup> All amounts in this publication are expressed in current prices. Consequently, they are not adjusted for inflation.

GBAORD as % of GDP, 2000–2010

G 2



Source: FSO

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While the share of GBAORD in GDP tended to increase over the period as a whole, there was a decline in the ratio between 2004 and 2006. This decline was the result of two factors: On the one hand, the increase in GBAORD observed between 2004 and 2006 was the lowest during the period (+3.7%). On the other hand, GDP showed particularly strong growth during the same period (+9.2%). The combination of these two factors resulted in a decrease in the “GBAORD/GDP” ratio.

Conversely, the opposite phenomenon was observed for the 2008–2010 period when, following an economic downturn, GDP virtually stagnated (+1.1%) while GBAORD increased by 11.4%.

In conclusion it is possible to assert that the government continues to make efforts to promote R&D independently of economic trends and is constantly increasing the amounts allocated to research.

## 2.3 International comparison

GBAORD expressed as percent of GDP make it possible to draw international comparisons, because the ratio takes account of large differences in the size of the economies of the countries being considered.

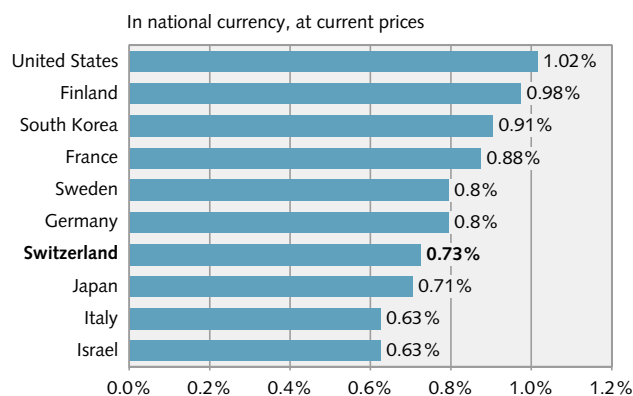
Thus, this measure makes it possible to evaluate each government's support for R&D activities within its territory.

Graph 3 shows the relative importance by country, of the level funding of R&D in the national economy as a whole.<sup>6</sup> The United States and Finland rank at the top, with public funding of R&D corresponding to 1.02%

<sup>6</sup> In the interest of readability, graphs 3 and 4 present a selection of countries.

GBAORD as % of GDP, international comparison, 2008

G 3



Sources: FSO; OECD

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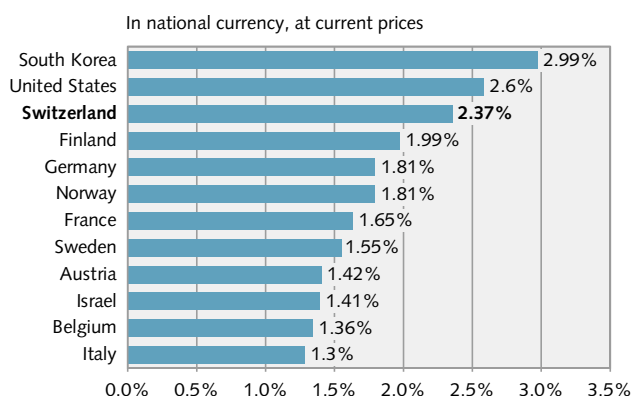
and 0.98% of GDP, respectively. With 0.73% of its GDP dedicated to public funding of R&D, Switzerland ranks 11th out of 31 OECD countries for which data are available for 2008.

This ratio does not, however, give any indication of the importance the government attaches to R&D compared with other budget items. To analyse this aspect, one can compare GBAORD with total government expenditures. Thus, this ratio expresses the amount of GBAORD as a percentage of total expenditures budgeted by the government. The higher the ratio, the more the government spends relative to its budget to support research.

Graph 4 shows that Switzerland ranks third, with 2.37% of the total government budget dedicated to research. Only South Korea and the United States allocate a larger share, with 2.99% and 2.60%, respectively, of total government budgets.

GBAORD as % of total government expenditures, international comparison, 2008

G 4



Sources: FSO; OECD

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This positive track record and the dynamic development of public funding of R&D over time in Switzerland are in particular the fruit of the Confederation's contribution to research conducted by the higher education institutions. By allocating funds, the Confederation enables universities to pursue various activities (teaching, research, services, etc.). This support increased in the 1990s based on the "new public management" trend that encourages the contractualisation and networking of institutions, particularly in the higher education sector. This scheme aims to increase the autonomy of the recipient organisation's overall financial framework. In fact, the higher education institutions are free to manage their own budgets, provided they comply with the standards that have been prescribed for them. The creation of large research networks in specific fields dates to this period. The National Centres of Competence in Research (NCCR) established by the State Secretariat for Education and Research (SER) and the Swiss National Science Foundation (SNSF) in 1999, and in 2000, the "projet triangulaire lémanique" (the "triangular Lake Geneva project", a coordination project between the University of Lausanne, the University of Geneva and the Federal Institute of Technology of Lausanne) are concrete examples of this. Two rationales for public support of research have emerged over time: one focused on support for **R&D performing institutions** and the other on **R&D programmes/projects**.



## 3 System of public funding of R&D in Switzerland

The amount of GBAORD in Switzerland and its evolution presented in chapter 2 give an idea of the importance the government attaches to research and development. However, these figures provide no information on how the government performs its task of supporting R&D.

To better understand the government's R&D promotion policy, this chapter describes the system of public funding of R&D in Switzerland. A model outlines this system and highlights the three levels and the two main channels of funding for research through which the government distributes its financial resources to the R&D performers. This model will be illustrated below with the new indicators on R&D funding that have been recently developed by the OECD. In these new indicators, calculated for the first time in Switzerland by the FSO, the GBAORD are broken down by funding mode.

### 3.1 Funding system model

To make Switzerland more competitive in the international market and more active in national and international research networks, the Federal Council intends to increase the effectiveness of the promotion of R&D. It can intervene on three levels:

- either at the level of the **objects** of research, through the definition of various types of national programmes, for example by promoting applied research,
- or at the level of the **organisation** of research, for example pursuant to the provisions of the Federal University Funding Act or the procedures to establish research networks;

– or through **public funding** of R&D. Funding takes place on three levels:

1. As a **government R&D funding agency**, the **government** acts mainly through three bodies: the State Secretariat for Education and Research (SER), the Federal Department of Economic Affairs (FDEA) and the Swiss Agency for Development and Co-operation (SDC).
2. **Intermediary R&D funding agencies**, such as the Swiss National Science Foundation (SNSF) and the Commission for Technology and Innovation (CTI).
3. **The R&D performers**, as sectors of performance of R&D (business enterprises, higher education institutions, private non-profit institutions, etc.).

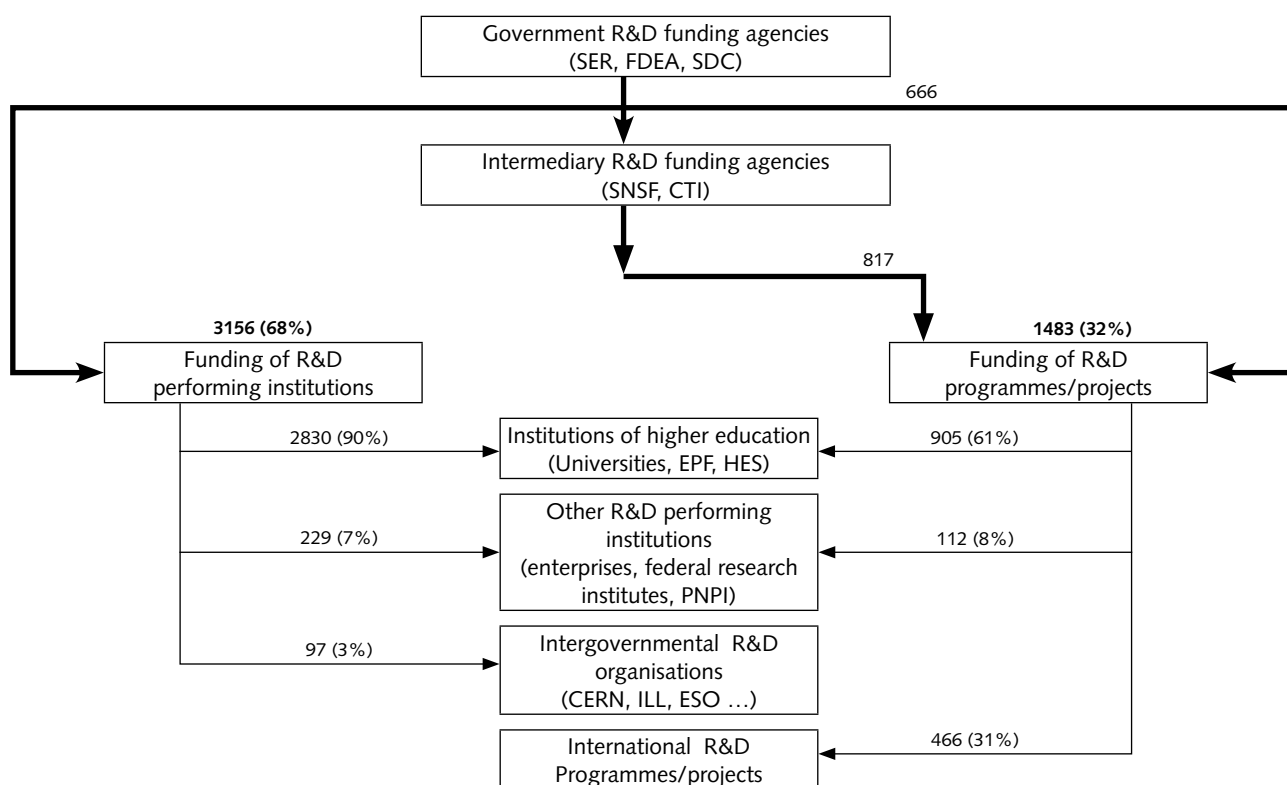
Thus, to disburse the budgeted amounts to the R&D performers, the government bodies can either fund the R&D performers directly or, alternatively, they can finance R&D funding agencies that function as intermediaries between the government and the researchers. In Switzerland, for example, the State Secretariat for Education and Research, which is a government agency that funds R&D, provides funding to universities but also awards grants to the SNSF, which then undertakes to redistribute the money to researchers.

The funding agencies do not all use the same funding channel. Whereas government agencies generally make global payments to R&D performing institutions, intermediary funding agencies tend to fund R&D programmes/projects.

**Diagram 1: Model of the system of public funding of R&D in Switzerland, 2010**

In million CHF, at current prices

Relative shares in %

**Total: CHF 4639 million**

Source: Data FSO according to B. Lepori's model, 2011

Diagram 1 traces the flow of R&D funding in Switzerland in 2010. When the funding is presented in this form, the flows are difficult to analyse over time and international comparisons are not possible due to the heterogeneity of systems and organisations in the countries studied.

New indicators on public funding of R&D have been developed to facilitate the analysis of public funding of R&D from the perspective of budgetary policy on re-

search. GBAORD data are broken down into four funding modes, which are shown in the cells on Table T1\* below.

In Table T1\*, the two main variables are, first, the funding channel (rows) and, second, the geographical destination of funds (columns). The intersection between these two variables results in four modes of public funding of R&D, which are described in the paragraphs below.

**T1\* Modes of public funding of R&D**

	R&D funded on the national territory	R&D funded abroad (incl. extraterritorial R&D)
R&D performing institutions	Public funding of domestic R&D performing institutions	Public funding of R&D performing institutions abroad (incl. intergovernmental R&D organisations)
R&D programmes/projects	Public funding of domestic R&D programmes/projects (= national and international R&D programmes/projects without cross-border flows of funds)	Public funding of international R&D programmes/projects abroad (with cross-border flows of funds)

This new typology not only facilitates an analysis of changing funding modes, but also makes it possible to draw international comparisons thanks to standard methods to estimate flows of funds.

## 3.2 Funding channels

The government has two main channels to fund R&D performers: by funding of R&D performing institutions and by funding R&D programmes/projects.

### 3.2.1 R&D performing institutions

R&D performing institutions are entities that conduct R&D intramurally (in-house). They can also award R&D contracts or R&D grants to other R&D performing institutions. Public funding of R&D performing institutions is generally done directly by a government R&D funding agency. In Switzerland, R&D performing institutions can be divided into two main groups:

- **Higher education institutions:**
  - 10 universities (HEU/UH),
  - 2 federal institutes of technology (EPF/ETH),
  - 7 universities of applied sciences (HES/FH),
  - 14 universities of teacher education (HEP/PH),
  - and 4 research institutes within the EPF/ETH domain (ER-EPF).
- **Research institutions outside the higher education sector:** the offices of the federal administration, the 4 federal agricultural research stations, the MeteoSwiss weather service, as well as research laboratories of private enterprises, research centres created as private non-profit making institutions and intergovernmental research organisations such as the European Organisation for Nuclear Research (CERN) and the European Southern Observatory (ESO).

Funding from R&D performing institutions generally gives R&D performers complete freedom in choosing what research to carry out with public funds.

### 3.2.2 R&D programmes/projects

R&D programmes are research activities whose framework conditions (topics, goals, rules, etc.) are set by the funder. The programmes/projects are subject to calls for proposals and are allocated on a competitive basis.

R&D programmes are defined by:

- a particular topic;
- major objectives of either advancing knowledge in general or to obtain application-oriented results;
- rules for the funding agency relating to calls for proposals, the evaluation of projects, their selection and the conclusion of contracts;
- procedures for research groups relating to the submission of R&D projects, project management and the writing of reports;
- a specific budget;
- a specific time frame (programmes are limited in time).

The funding channel entitled “funding of R&D programmes/projects” also comprises the funding of R&D contracts. This funding channel enables the funder (the government) to encourage R&D in areas which are useful to it or which are useful to the economy or society in general. As far as the funding of R&D contracts is concerned, the contractor (the government) has a direct interest in the results of R&D to further its own activities. Besides the topic of the research, it may exercise control over and monitor its performance.

With respect to R&D programmes, the selection of the topics of certain programmes allows the government to guide, in general terms, the areas of research in line with national requirements and to fund R&D programmes on these topics. This raises the question of how to evaluate research projects linked to grant applications. For practical reasons, the government delegates this work to intermediary R&D funding agencies: the SNSF and CTI. These agencies fund the R&D projects that are submitted to them by the higher education institutions. They also make calls for proposals and evaluate and fund R&D projects within the framework of large national or international programmes. By allocating public funds in a competitive manner, they contribute to high quality research in Switzerland.

### 3.3 Geographical destination of funding

The model also seeks to show where these public R&D funds end up, that is to say where (within the national territory or abroad) the R&D funded by the government is performed. In fact, this funding may be destined not only for R&D in Switzerland (domestic R&D) but also for R&D abroad (including extraterritorial R&D, i.e. R&D carried out by intergovernmental research organisations such as CERN).

### 3.4 Funding modes in 2010

The intersection between the funding channel and the geographical destination of funds results in four modes of public funding of R&D, which are presented in Table T1\*.

Swiss data on GBAORD broken down by these four funding modes show that in 2010, public funding of R&D (CHF 4.6 billion) mainly flowed (66%) through the channel of the funding of domestic R&D performing institutions in the amount of CHF 3.1 billion. Domestic R&D programmes (national or international programmes funded in Switzerland) received 22% of public research appropriations (CHF 1.0 billion). 0.6 billion (12%) was earmarked for R&D abroad, including intergovernmental R&D organisations (cf. Graph 5).

### 3.5 Importance of higher education institutions

Among domestic R&D performing institutions that receive public funding, the universities (HEU/UH) and federal institutes of technology (EPF/ETH) are the main beneficiaries. In fact, in 2010, 90% of the CHF 3.1 billion destined for domestic R&D performing institutions were earmarked for higher education institutions.

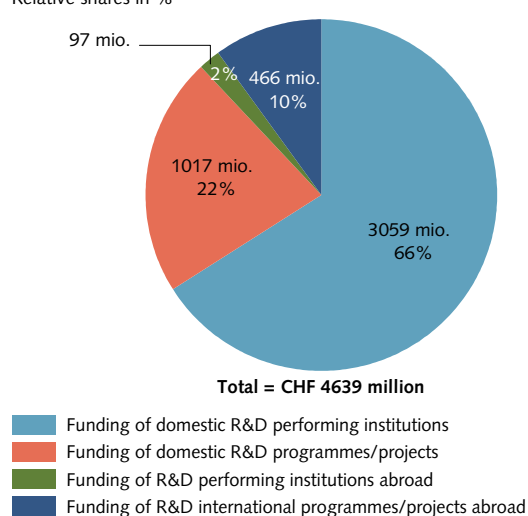
The importance of the higher education institutions in public funding of research in Switzerland is confirmed by an analysis of the GBAORD by sectors receiving the funds. In fact, these data can also be broken down by sectors receiving funding from the government. According to this more traditional breakdown of GBAORD, which groups the funding of institutions and the funding of R&D programmes/projects by sector receiving the funds, the higher education sector does indeed account for a large majority of public funding: CHF 2.830 billion were allocated to the higher education sector through the channel for funding institutions and CHF 905 million were allocated by the SNSF and the CTI to R&D projects submitted by researchers in higher education institutions. The sum of funds from these two funding modes (CHF 3.735 billion) allocated to the higher education institutions corresponds to 81% of total GBAORD (cf. Diagram 1).

**GBAORD by funding mode, 2010**

**G 5**

In million CHF, at current prices  
Relative shares in %

**2010**



Source: FSO

© Federal Statistical Office (FSO)

## 4 Funding modes: evolution and international comparison

Chapters 2 and 3 showed that the government's efforts to promote R&D have risen steadily over the past 10 years and that in 2010, funding of R&D through general funding of domestic R&D performing institutions was the government's preferred funding mode.

But did the Confederation give preference to the same funding mode during the entire period under review? This chapter describes, within the overall evolution of GBAORD presented in Chapter 2, the evolution of the modes of public funding of R&D presented in Chapter 3. It then compares this breakdown with the results of other OECD countries.

### 4.1 Evolution of funding modes

From 2000 to 2010, the structure of funding modes underwent considerable change. In 2000, almost three quarters (73%) of public funding of R&D was earmarked for domestic R&D funding institutions. In 2010, this funding mode represented only two thirds (66%) of total public funding of R&D.

This structural change was particularly marked from 2004 onwards. In fact, the relative share of funding for domestic institutions fell from 75% in 2002 to 68% in 2004. This phenomenon is attributable in particular to Switzerland's full participation in European framework programmes for research. Therefore, funding earmarked for these programmes competes with other funding modes.

Thus, although total GBAORD increased by 68%, public funding of domestic R&D performing institutions grew by "only" 51% between 2000 and 2010.

Funding of institutions abroad (intergovernmental R&D organisations), for its part, declined by 9% over 10 years. This decline led to a 2-percentage point drop (from 4% to 2%) in this funding mode's relative share in total GBAORD.

During the same period, the relative shares of funding of domestic R&D programmes/projects (R&D programmes/projects in Switzerland) and of international R&D programmes/projects abroad increased from 19% to 22% and 4% to 10%, respectively. In absolute terms, the funding of R&D programmes in Switzerland almost doubled and that of international R&D programmes abroad almost quadrupled (cf. Table T2\*).

Thus, while the funding of institutions remains the preferred funding mode in Switzerland, the relative share of the funding of programmes in Switzerland and abroad has grown rapidly from 23% to 32%. In absolute terms, the funds earmarked for programmes are much smaller than those earmarked for institutions, but they have nonetheless shown rapid growth (132% in 10 years, compared with 48% for the funding of institutions).

The same observation can be made when comparing funding in Switzerland with funding abroad. The sums earmarked for funding R&D in Switzerland are considerably larger than those earmarked for funding R&D abroad, but they are growing less rapidly (+60% compared with +147% for funding abroad). In relative shares, funding in Switzerland declined from 92% to 88%, whereas funding abroad increased from 8% to 12%.

To better understand the evolution of the R&D funding modes presented above, the paragraphs below describe the compositions of these four funding categories and the separate evolution of the items they contain.<sup>7</sup>

#### 4.1.1 Public funding of domestic R&D performing institutions

The public funding of domestic R&D performing institutions is composed of the funding of the government intramural R&D expenditure, R&D grants awarded to higher education institutions<sup>8</sup> and grants to other R&D performing institutions in Switzerland. These grants do not include grants awarded by the SNSF and to the CTI.

<sup>7</sup> Detailed data are available in the appendix.

<sup>8</sup> Under the Federal University Funding Act and through the budgets of the research institutes within the EPF/ETH domain.

**T2\* Government budget appropriations or outlays for R&D (GBAORD) by funding mode, 2000–2010**

In million CHF, at current prices

Relatives shares in %

	2000	2002	2004	2006	2008	2010	Change 2000–2010
Public funding of domestic R&D institutions	2024	2250	2297	2410	2837	3059	51%
Public funding of domestic R&D programmes/ projects	518	504	635	649	854	1017	96%
Public funding of R&D institutions abroad	107	130	119	82	67	97	-9%
Public funding of international R&D programmes/ projects abroad	121	131	331	365	407	466	286%
<b>Total GBAORD</b>	<b>2770</b>	<b>3015</b>	<b>3382</b>	<b>3506</b>	<b>4166</b>	<b>4639</b>	<b>68%</b>
	Share 2000	part rel. 2002	Share 2004	Share 2006	Share 2008	Share 2010	
Public funding of domestic R&D institutions	73%	75%	68%	69%	68%	66%	
Public funding of domestic R&D programmes/ projects	19%	17%	19%	19%	21%	22%	
Public funding of R&D institutions abroad	4%	4%	4%	2%	2%	2%	
Public funding of international R&D programmes/ projects abroad	4%	4%	10%	10%	10%	10%	
<b>Total GBAORD</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	
	2000	2002	2004	2006	2008	2010	Change 2000–2010
Public funding of R&D institutions	2131	2379	2415	2492	2904	3156	48%
Public funding of R&D programmes/projects	639	636	966	1014	1262	1483	132%
<b>Total GBAORD</b>	<b>2770</b>	<b>3015</b>	<b>3382</b>	<b>3506</b>	<b>4166</b>	<b>4639</b>	<b>68%</b>
	Share 2000	Share 2002	Share 2004	Share 2006	Share 2008	Share 2010	
Public funding of R&D institutions	77%	79%	71%	71%	70%	68%	
Public funding of R&D programmes/projects	23%	21%	29%	29%	30%	32%	
<b>Total GBAORD</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	
	2000	2002	2004	2006	2008	2010	Change 2000–2010
Public funding of domestic R&D (in Switzerland)	2542	2754	2932	3059	3691	4076	60%
Public funding of R&D abroad (incl. extraterritorial R&D)	228	261	449	447	474	563	147%
<b>Total GBAORD</b>	<b>2770</b>	<b>3015</b>	<b>3382</b>	<b>3506</b>	<b>4166</b>	<b>4639</b>	<b>68%</b>
	Share 2000	Share 2002	Share 2004	Share 2006	Share 2008	Share 2010	
Public funding of domestic R&D (in Switzerland)	92%	91%	87%	87%	89%	88%	
Public funding of R&D abroad (incl. extraterritorial R&D)	8%	9%	13%	13%	11%	12%	
<b>Total GBAORD</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	

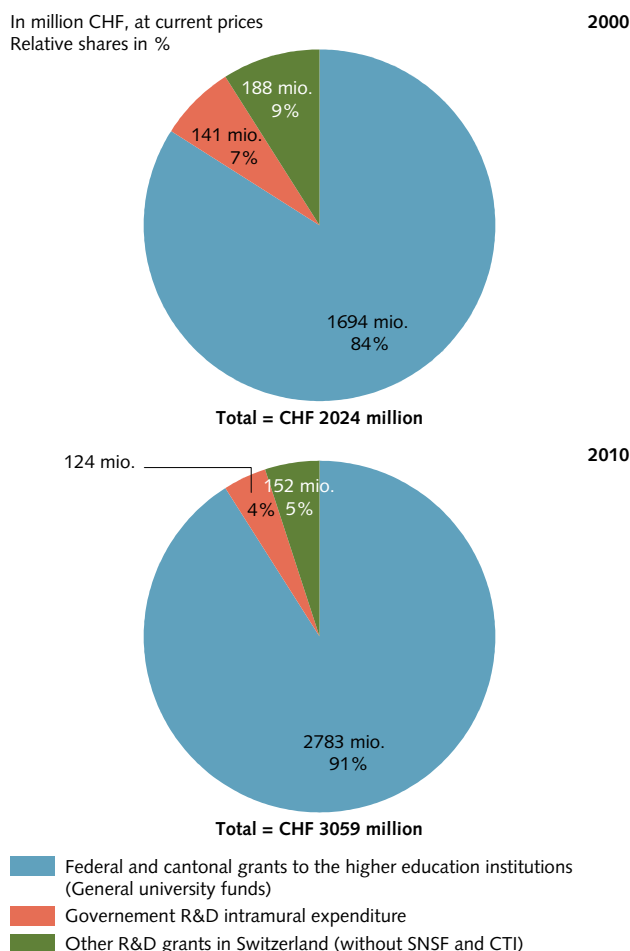
Source: FSO

Over the course of 10 years, the amounts allocated to funding domestic R&D performing institutions went from CHF 2.0 billion to CHF 3.1 billion, i.e. an increase of +51%. This increase was due exclusively to the sharp

increase in funding for higher education institutions, which went from CHF 1.7 billion to CHF 2.8 billion (+64%).

## Public funding of domestic R&D performing institutions by funding component, 2000 and 2010 G 6

In million CHF, at current prices  
Relative shares in %



Source: FSO

© Federal Statistical Office (FSO)

At the same time, the two other components, namely intramural R&D expenditures and R&D grants by the Confederation declined by -12% and -20%, respectively, from a total amount of CHF 330 million to CHF 276 million (cf. Graph 6).

The government is thus increasingly fulfilling its function as a “funder” whereas its role as “performer” is diminishing over the years.

## 4.1.2 Public funding of R&D programmes/projects in Switzerland

Public funding of R&D programmes/projects in Switzerland mainly consists of grants to intermediary funding agencies (SNSF and CTI). These agencies are responsible for managing research programmes and projects at the national and international level. With the grants they receive from the Confederation, they fund research projects run by higher education institutions, irrespective of whether or not these are integrated in national and international research programmes.

The remaining funding in this category is comprised of funding of R&D contracts by the Confederation and the cantons.

Over 10 years, total public funding of R&D programmes/projects in Switzerland almost doubled, from CHF 518 million to CHF 1.017 billion. This increase is mainly attributable to grants from the SNSF and the CTI. Cumulative amounts went from CHF 404 million to CHF 891 million, i.e. an increase of 120% during the period 2000–2010 (cf. Graph 7).

### Box 1

**National research programmes (NRP):** These contribute scientifically substantiated solutions to urgent problems of national significance. Their topics are defined by the Federal Council. CHF 27.6 million were awarded to the NRP in 2010.

**National Centres of Competence in Research (NCCR):** These aim to support long-term research projects in areas that are of strategic importance to the future of science, the economy and society in Switzerland. The competitive tendering process does not impose any particular topics. The researchers are free to choose their research topic. Once the Swiss National Science Foundation has conducted a scientific and structural evaluation, it refers to the State Secretariat for Education and Research the national centres of competence in research whose implementation has been recommended for evaluation from the point of view of research and university policy. CHF 62.5 million were awarded to the NCCR in 2010.

Source: Swiss National Science Foundation, Annual Report 2010

An analysis of these first two funding modes shows a clear decline in R&D expenditures by the federal public sector (intramural R&D expenditures + R&D contracts), accompanied by strong growth in funding of higher education institutions, either through indirect federal public funding and cantonal public funding (funding of institutions), or through the funding of R&D programmes and projects by the SNSF or the CTI.

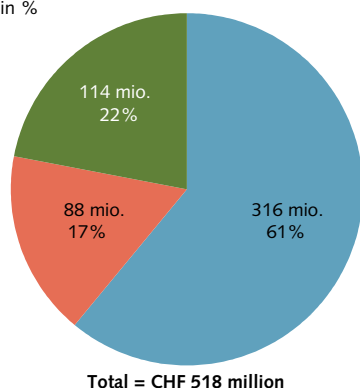


## Public funding of R&D programmes/projects in Switzerland by funding component, 2000 and 2010

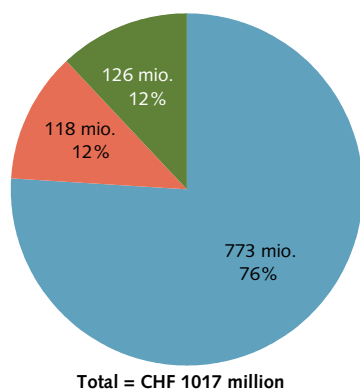
G 7

In million CHF, at current prices  
Relative shares in %

2000



2010



Grants to the SNSF  
Grants to the CTI  
Federal and cantonal contracts in Switzerland

Source: FSO

© Federal Statistical Office (FSO)

The observed trend towards greater funding of R&D programmes and projects in Switzerland may be attributable to the development of several instruments designed to support and oversee research during the 1990s. For example, during this period the “priority research programmes” (PRP) were developed, which were replaced in 1999 by the “national centres of competence in research” (NCCR).

This development has therefore reinforced the importance of this funding mode, whose effects are observable during the period under review. Box 1 provides details on various aspects of the NRP and NCCR.

## 4.1.3 Public funding of international R&D programmes/projects abroad

Public funding of international R&D programmes/projects abroad is mainly comprised of grants to European framework programmes for research (FP) and the programmes of the European Space Agency (ESA).

The FP are the European Union's main instruments for funding research. Researchers from Swiss higher education institutions and companies have been participating in the FP since 1987. In 2004, the bilateral agreement with the European Union stipulated that Switzerland is fully entitled to participate in Framework Programme 6 (FP6). Between 2004 and 2010, Switzerland's contributions to FP grew from CHF 199 million to CHF 310 million (+56%) and their share of total funding of international R&D programmes/projects from 60% to 67% (cf. Graph 8). In this context, it is interesting to compare this funding to the amounts Swiss researchers received from European funding agencies. There is, in fact, no rule that stipulates that a country must receive funds in proportion to those it disburses. On the contrary, European funding agencies allocate their funds on a competitive basis, and only the best projects are selected. However, since FP6 was introduced, the amounts allocated to Swiss researchers have been larger than the national contribution,<sup>9</sup> a fact that may be considered as an implicit recognition of the quality of Swiss research.

As for the ESA, its core activities are funded by financial contributions from Member States. In addition, ESA conducts voluntary programmes that are funded by participating countries. Total contributions by the Confederation to ESA increased by 23% over 10 years. Since they began competing with the FP (from 2004), the relative share of ESA programmes in funding of international R&D programmes/projects abroad as a whole has declined from 38% to 31%. Nevertheless, an increase in funding in absolute terms is observable during this period, from CHF 126 million to CHF 145 million.

The particularities of FP and ESA programmes mean that they are highly complementary to other instruments to fund research in Switzerland (SNSF, CTI), particularly through their focus on international collaborative research.

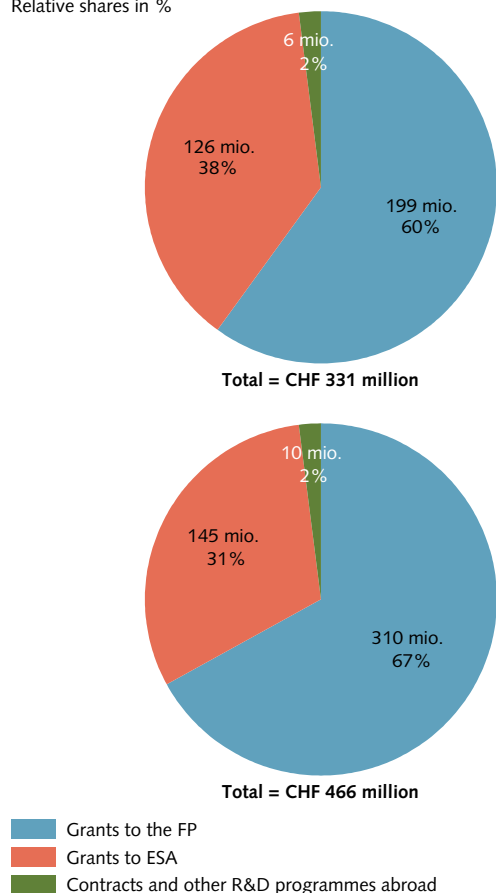
<sup>9</sup> Federal Statistical Office (2011), International aspects of Swiss research and development in 2008, FSO News, Neuchâtel.



## Public funding of R&D international programmes/ projects abroad by funding component, 2004<sup>1</sup> and 2010

G 8

In million CHF, at current prices  
Relative shares in %



<sup>1</sup> The comparison starts from 2004, the year when Switzerland joined FP with full entitlement.

Source: FSO

© Federal Statistical Office (FSO)

### 4.1.4 Public funding of R&D performing institutions abroad

Public funding of R&D performing institutions abroad is solely composed of grants to intergovernmental R&D organisations. Scientific partnerships between countries and these organisations are based on an agreement or international treaty signed by government representatives. These organisations are managed at the international level and funded by international public funds. National governments are not involved in the selection of the R&D performed with these funds or in the management of the institution. These institutions are located within the national territory or abroad.

Switzerland has a long history of participation in international research. It is a member in almost all intergovernmental R&D organisations. The item corresponding to the public funding of R&D performing institutions abroad is mainly composed of annual contributions (dues) to these intergovernmental R&D organisations. Box 2 provides concrete examples of contributions (dues) to important intergovernmental research organisations and international R&D programmes.

Public funding of these organisations fluctuated considerably over 10 years. Thus, following a sharp fall in the preceding years, in 2008-2010, it increased by 45%.

#### Box 2

Examples of international research organisations and programmes funded by Switzerland, with the amounts disbursed in 2010 (in CHF million)

##### Intergovernmental R&D organisations

European Organisation for Nuclear Research – CERN; (36.5)  
European Cooperation in Science and Technology – COST; (6.5)  
European Molecular Biology Laboratory – EMBL; (4.8)  
European Southern Observatory – ESO (5.2)  
European Synchrotron Radiation Facility – ESRF (5.2)  
Institut Laue-Langevin – ILL; (4,6).

##### International R&D programmes

European Space Agency – ESA (145.4)  
European Framework Programmes for research – (FP) (310.3)

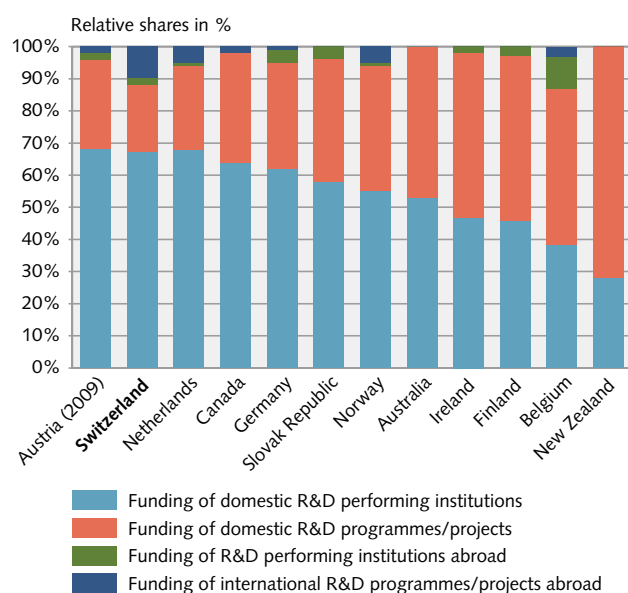
## 4.2 International comparison of funding modes

Because these indicators are relatively new, not all OECD countries have GBAORD data available as yet for the four funding modes of R&D shown above.

Among countries for which data are available, most, including Switzerland, favour the funding mode that funds “domestic R&D performing institutions”. In this ranking, with 68% of GBAORD earmarked for domestic R&D performing institutions, Switzerland is in second place after Austria (cf. Graph 9). In contrast, Ireland, Finland, Belgium and New Zealand prefer to fund R&D through research programmes/projects.

### GBAORD by funding mode, international comparison, 2008

G 9



Sources: FSO; OECD

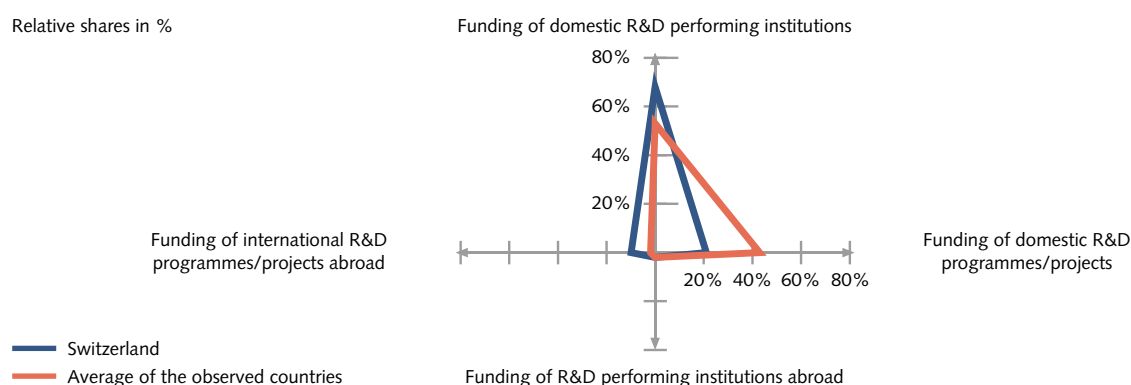
© Federal Statistical Office (FSO)

We note that in international comparison, Switzerland stands out mainly by its greater use of the two funding modes. As noted above, Switzerland tends to favour funding domestic institutions, with a relative share of 68% (compared with 53% on average for the selected OECD countries). Moreover, Switzerland stands out in particular due to its use of the funding mode that funds international R&D programmes/projects. In fact, although as a relative share, this funding mode remains relatively modest in Switzerland (10%), in international comparison it remains well above the average of the other countries examined (2%). This share is attributable to the fact that Switzerland is enterprising and competitive in the field of research. Due to the relatively small size of its economy, Switzerland is perhaps more inclined to take an active part in large-scale research programmes or projects through international collaboration.

The characteristics of public funding of research in Switzerland compared with the other countries surveyed can also be seen in Graph 10. Its four axes show the relative share of each funding mode in Switzerland as well as the average relative shares of the other countries being reviewed.

### GBAORD by funding mode in Switzerland and in the countries being reviewed<sup>1</sup>, 2008

G 10



<sup>1</sup> Australia, Austria, Belgium, Canada, Finland, Germany, Ireland, Netherlands, New Zealand, Norway, Slovak Republic

Sources: FSO; OECD

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## 5 Conclusion

### **Public funding of research increased sharply between 2000 and 2010...**

Over the past 10 years, GBAORD statistics have shown an overall increase in public funding of R&D. However, until now it was difficult to analyse in greater detail this government support for research. The new breakdown of GBAORD by funding mode makes it possible to gain a better understanding of this evolution and the way the government supports and encourages research. The analysis shows that behind the overall increase in public funding of R&D there is a policy to support R&D comprised of four funding modes, each of which has evolved at different rates over the past 10 years.

### **... domestic R&D performing institutions receive the lion's share...**

Since the 1970s and the entry into force of the University Funding Act, the funding mode that provides support to domestic R&D performing institutions has been the Confederation's preferred mode to fund R&D. It should be noted, however, that over the past decade the funding of research programmes/projects has been remarkably dynamic.

### **... the higher education institutions remain the main recipients of public funding of R&D**

The universities are the main beneficiaries of public funding of R&D, either through the channel of grants to higher education institutions in their capacity as institutions or through the channel of R&D programmes/projects. Indeed, these institutions not only receive the funds disbursed by the Confederation under the Federal University Funding Act and the higher education institutions' budgetary envelopes, but also part of the funds disbursed by the government to intermediary funding agencies, which also fund some of the higher education institutions' R&D through their funding of R&D programmes/projects.

### **Funding abroad is becoming increasingly important...**

The growing importance of the funding of R&D programmes/projects is largely due to the funding of European framework programmes for research (FP). Given that the funding of these programmes takes place abroad, funding abroad is also gaining in importance, a fact that reflects Switzerland's willingness to become integrated in major international research networks.

### **... and Switzerland stands out for funding international R&D programmes/projects abroad**

In international comparison, Switzerland stands out from the other countries surveyed because of the relative importance it attaches to the funding mode that funds international R&D programmes/projects abroad. The dynamism of the latter may be associated with Switzerland's high degree of activity in research and the relatively small size of its economy.

These observations were made with the aid of new indicators produced by the FSO which provide information on modes of public funding of research. These indicators will be regularly updated and made available to the public via the system of indicators on science and technology published by the Federal Statistical Office.<sup>10</sup> In the next few years, other OECD member countries will, like Switzerland, continue to develop and measure their own indicators on funding modes.

<sup>10</sup> Cf. [www.statistique.admin.ch](http://www.statistique.admin.ch); topic 4: National economy; "Science & Technology".

## 6 List of abbreviations

<b>AIU/IUV</b>	Intercantonal Agreement on Universities	<b>NGO</b>	Non governmental organisation
<b>CERN</b>	European Organisation for Nuclear Research	<b>NRP</b>	National research programmes
<b>CGIAR</b>	Consultative Group on International Agricultural Research	<b>OECD</b>	Organisation for Economic Cooperation and Development
<b>COST</b>	European Cooperation in Science and Technology	<b>PNPI</b>	Private non-profit institutions
<b>CTI</b>	Commission for Technology and Innovation	<b>PRP</b>	Priority research programmes
<b>EMBL</b>	European Molecular Biology Laboratory	<b>R&amp;D</b>	Research and experimental development
<b>EPF/ETH</b>	Federal institutes of technology	<b>SER</b>	State Secretariat for Education and Research
<b>EPFL</b>	Federal Institute of Technology of Lausanne	<b>SDC</b>	Swiss Agency for Development and Cooperation
<b>ER-EPF</b>	Research institutes within the EPF/ETH domain	<b>SNSF</b>	Swiss National Science Foundation
<b>ESA</b>	European Space Agency		
<b>ESO</b>	European Southern Observatory		
<b>ESRF</b>	European Synchrotron Radiation Facility		
<b>EU</b>	European Union		
<b>FDEA</b>	Federal Department of Economic Affairs		
<b>FSO</b>	Federal Statistical Office		
<b>FP</b>	European framework programmes for research		
<b>GBAORD</b>	Government budget appropriations or outlays for R&D		
<b>GDP</b>	Gross domestic product		
<b>GUF</b>	General university funds		
<b>HEP/PH</b>	Universities of teacher education		
<b>HES/FH</b>	Universities of applied sciences		
<b>HEU/UH</b>	Universities		
<b>ILL</b>	Institut Laue-Langevin		
<b>LAU/UFG</b>	Federal University Funding Act		
<b>NCCR</b>	National centres of competence in research		

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# 8 Appendix

## T1 Swiss government budget appropriations or outlays for R&D (GBAORD) by funding mode, 2000–2010

In million CHF, at current prices

Relative shares in %

	2000	2002	2004	2006	2008	2010
Indirect federal and cantonal public funding (GFU)	1 694 208	1 825 328	1 964 904	2 127 690	2 579 113	2 783 443
Government intramural R&D expenditure	141 292	139 162	139 886	120 800	122 539	124 201
R&D grants in Switzerland, without grants to the SNSF and to the CTI	188 472	285 138	192 020	161 855	135 036	151 546
<b>Public funding of domestic R&amp;D performing institutions</b>	<b>2 023 972</b>	<b>2 249 628</b>	<b>2 296 810</b>	<b>2 410 345</b>	<b>2 836 688</b>	<b>3 059 190</b>
Gouvernement R&D contracts in Switzerland	86 794	76 482	74 541	74 397	78 692	82 857
Grants to the SNSF	316 360	307 603	426 286	439 884	612 156	772 780
Grants to the CTI	87 521	85 950	108 625	108 457	103 735	118 216
Cantonal R&D contracts to higher education institutions in Switzerland	27 457	34 437	25 864	26 339	59 866	43 185
<b>Public funding of domestic R&amp;D programmes/projects (without cross-border flows of funds)</b>	<b>518 132</b>	<b>504 472</b>	<b>635 316</b>	<b>649 077</b>	<b>854 449</b>	<b>1 017 038</b>
R&D grants abroad (without FP and without ESA)	106 778	129 567	118 576	81 627	67 277	97 222
<b>Public funding of R&amp;D performing institutions abroad (incl. intergovernmental R&amp;D organisations)</b>	<b>106 778</b>	<b>129 567</b>	<b>118 576</b>	<b>81 627</b>	<b>67 277</b>	<b>97 222</b>
Grants to the FP	0	0	198 866	218 593	240 146	310 284
Grants to ESA	118 000	123 027	126 417	140 722	155 990	145 355
Federal R&D contracts to higher education institutions abroad	957	1 425	699	1 401	1 392	1 164
Federal R&D contracts to business enterprises abroad	221	583	1 501	2 008	2 429	2 329
International R&D programmes abroad	859	2 227	352	1 325	4 358	2 741
Federal R&D contracts to NGO	0	1 415	1 068	217	1 101	1 423
Other federal R&D contracts abroad	696	2 405	1 979	989	1 713	2 480
<b>Public funding of international R&amp;D programmes/projects abroad (with cross-border flows of funds)</b>	<b>120 733</b>	<b>131 082</b>	<b>330 882</b>	<b>365 255</b>	<b>407 129</b>	<b>465 776</b>
<b>Total GBAORD</b>	<b>2 769 616</b>	<b>3 014 749</b>	<b>3 381 584</b>	<b>3 506 304</b>	<b>4 165 542</b>	<b>4 639 226</b>

Source: FSO

var 00-02	var 02-04	var 04-06	var 06-08	var 08-10	var 00-10	year average rates of change	rel. shares 2000	rel. shares 2002	rel. shares 2004	rel. shares 2006	rel. shares 2008	rel. shares 2010
8%	8%	8%	21%	8%	64%	5%	84%	81%	86%	88%	91%	91%
-2%	1%	-14%	1%	1%	-12%	-1%	7%	6%	6%	5%	4%	4%
51%	-33%	-16%	-17%	12%	-20%	-2%	9%	13%	8%	7%	5%	5%
<b>11%</b>	<b>2%</b>	<b>5%</b>	<b>18%</b>	<b>8%</b>	<b>51%</b>	<b>4%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
-12%	-3%	-0%	6%	5%	-5%	-0%	17%	15%	12%	11%	9%	8%
-3%	39%	3%	39%	26%	144%	9%	61%	61%	67%	68%	72%	76%
-2%	26%	-0%	-4%	14%	35%	3%	17%	17%	17%	17%	12%	12%
25%	-25%	2%	127%	-28%	57%	5%	5%	7%	4%	4%	7%	4%
<b>-3%</b>	<b>26%</b>	<b>2%</b>	<b>32%</b>	<b>19%</b>	<b>96%</b>	<b>7%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
21%	-8%	-31%	-18%	45%	-9%	-1%	100%	100%	100%	100%	100%	100%
<b>21%</b>	<b>-8%</b>	<b>-31%</b>	<b>-18%</b>	<b>45%</b>	<b>-9%</b>	<b>-1%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
4%	3%	10%	10%	29%	56%		0%	0%	60%	60%	59%	67%
49%	-51%	11%	11%	-7%	23%	2%	98%	94%	38%	39%	38%	31%
164%	157%	100%	-1%	-16%	22%	2%	1%	1%	0%	0%	0%	0%
159%	-84%	34%	21%	-4%	954%	27%	0%	0%	0%	1%	1%	1%
	-25%	276%	229%	-37%	219%	12%	1%	2%	0%	0%	1%	1%
246%	-18%	-80%	407%	29%			0%	1%	0%	0%	0%	0%
		-50%	73%	45%	256%	14%	1%	2%	1%	0%	0%	1%
<b>9%</b>	<b>152%</b>	<b>10%</b>	<b>11%</b>	<b>14%</b>	<b>286%</b>	<b>14%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>9%</b>	<b>12%</b>	<b>4%</b>	<b>19%</b>	<b>11%</b>	<b>68%</b>	<b>5%</b>						

