



# Switzerland's Participation in the 6<sup>th</sup> European Research Framework Programme

## Facts and Figures



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
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Swiss Confederation

Federal Department of Home Affairs FDHA  
**State Secretariat for Education and Research SER**

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ISSN: 1662 - 2634



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# Switzerland's Participation in the 6<sup>th</sup> European Research Framework Programme

Facts and Figures

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# 1 Summary

Over 1900 participations in the 6<sup>th</sup> EU Research Framework Programme (FP) came from Switzerland between 2003 and 2006, one third of which from Federal Institutes of Technology (FIT) or associated research institutes, one quarter from universities and a further quarter from private companies. The subsidies received from FP6, which amounted to CHF 793 million, were mainly used to fund research in the areas of information technologies (CHF 225 million, or 28.4% of the subsidies), life sciences and health (CHF 160 million, 20.2%) and nanotechnologies (CHF 92 million, 11.6%). Swiss tertiary-level institutions, i.e. universities, Federal Institutes of Technology and universities of applied sciences (UAS) were the main beneficiaries of these subsidies (CHF 507 million, 63.9%), followed by SMEs, which received CHF 111 million (14.0%) in funding.

The Confederation's contribution to funding FP6 amounted to CHF 780 million, distributed over the course of the four-year duration of the programme. Switzerland therefore made a positive net financial return.

The European research projects are collaborative in nature. Within this framework, Switzerland collaborated for the most part with Germany, whether it be in the form of partnerships or coordinating projects, followed by France, the UK and Italy, which were, in other respects, the key players in FP6. Institutions from different backgrounds also collaborated with one another. FP6 therefore generated no fewer than 273 research partnerships between academic institutions and companies within the country between 2003 and 2006.

In international comparison, Switzerland shows itself to be very open in its choice of countries with which it has project partnerships, very well integrated at the heart of the collaborative network established by the great Western countries and an all-rounder in the research topics tackled. FP6 has therefore generated no fewer than 32 000 project partnerships between researchers based in Switzerland and other European researchers, across virtually all of the research topics.

In 2004, the year in which Switzerland became associated to FP6, the total gross domestic expenditure on R&D was close to CHF 13.1 billion, 69.8% of which was funded by private companies and 22.7% of which was funded by the Confederation and the cantons.<sup>1</sup> Switzerland dedicated 2.9% of its GDP to R&D activities led by almost 52 250 people (full-time equivalents, FTE)<sup>2</sup>, or approximately 12 FTE per thousand labour force in Switzerland. The average annual contribution made by Switzerland to FP6 (CHF 195 million) puts it in second place, behind the National Science Foundation, in terms of money spent by the Confederation on the direct funding of R&D. In return, the annual average amount of subsidies awarded to Switzerland-based researchers, as part of FP6, represents some CHF 198 million, or approximately 1.5% of the total gross domestic expenditure on R&D.

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<sup>1</sup> R&D statistics, Swiss Federal Statistical Office, 2004

<sup>2</sup> MSTI database, OECD, 2006

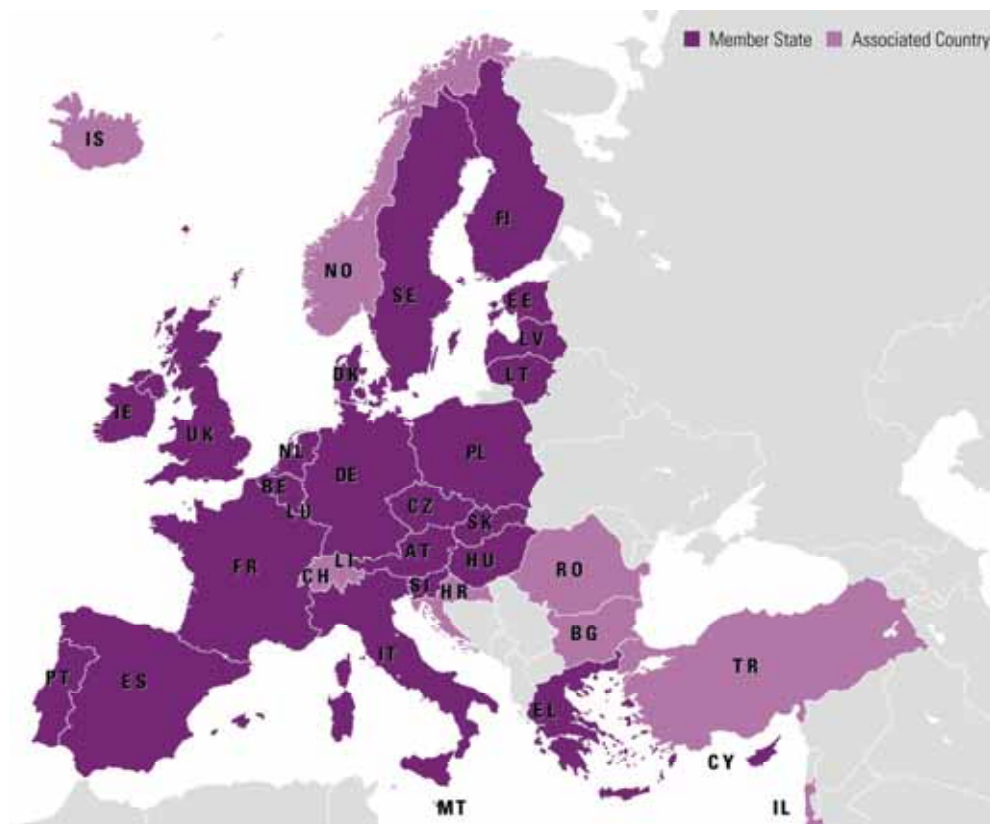
## 2 General information on FP6

At a summit in Lisbon in March 2000, the political leaders of the European Union set themselves the objective of becoming “*the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion*”<sup>3</sup> within the space of a decade. This objective should be achieved in particular by creating a true European Research Area (ERA), specifically designed to promote careers in research, to encourage industry to invest more in research and to make a significant contribution to generating growth and sustainable employment.

“Framework Programmes for Research, Technological Development and Demonstration Activities” (FP) are the main funding schemes for research in the European Union and form, in this respect, the backbone of the European Research Area (ERA). Six FPs, each lasting four years, have taken place successively since 1984. FP6 covered the period from 2003 to 2006. As for FP7, it commenced on 1 January 2007 and will last for 7 years.

Participation in the FP research projects is open to researchers from EU Member States and also to so-called Associate Countries which have signed a bilateral cooperation agreement with the EU. Switzerland concluded such an agreement with the EU, which entered into force on 1 January 2004 during FP6. This agreement has been renewed for the entire duration of FP7. This agreement not only allows Swiss researchers to participate in European research projects, but also to put forward proposals for European research projects and to coordinate them. As far as FP6 is concerned, a distinction is therefore made between Switzerland’s participation on a “project-by-project” basis for 2003, when the Confederation was still awarding subsidies directly to Swiss participants taking part in European projects, and Switzerland’s “full” participation from 2004 onwards, where Swiss researchers have been funded directly by the EU, with the Confederation paying a fixed annual contribution to the EU.

Figure 1: Map of participating States in the 6<sup>th</sup> European Research Framework Programme in 2006



Source : European Commission, see annex C for the list of country abbreviations

<sup>3</sup> Presidency Conclusions Lisbon European Council, 23 and 24 March 2000 ([http://www.europarl.europa.eu/summits/lis1\\_en.htm](http://www.europarl.europa.eu/summits/lis1_en.htm), page consulted on 30 October 2007).

## 2.1 FP annual budgets

The budgets of the FPs have not stopped growing since they were established in 1984. Whereas FP1 had a budget of EUR 593 million for its first year, the budget for FP6 increased from EUR 4.0 to 5.3 billion from 2003 to 2006, equivalent to a total of EUR 19.1 billion over the four years. This upward trend is continued with a projected annual budget for FP7 of between EUR 5.1 and EUR 9.9 billion for the period from 2007 to 2013.

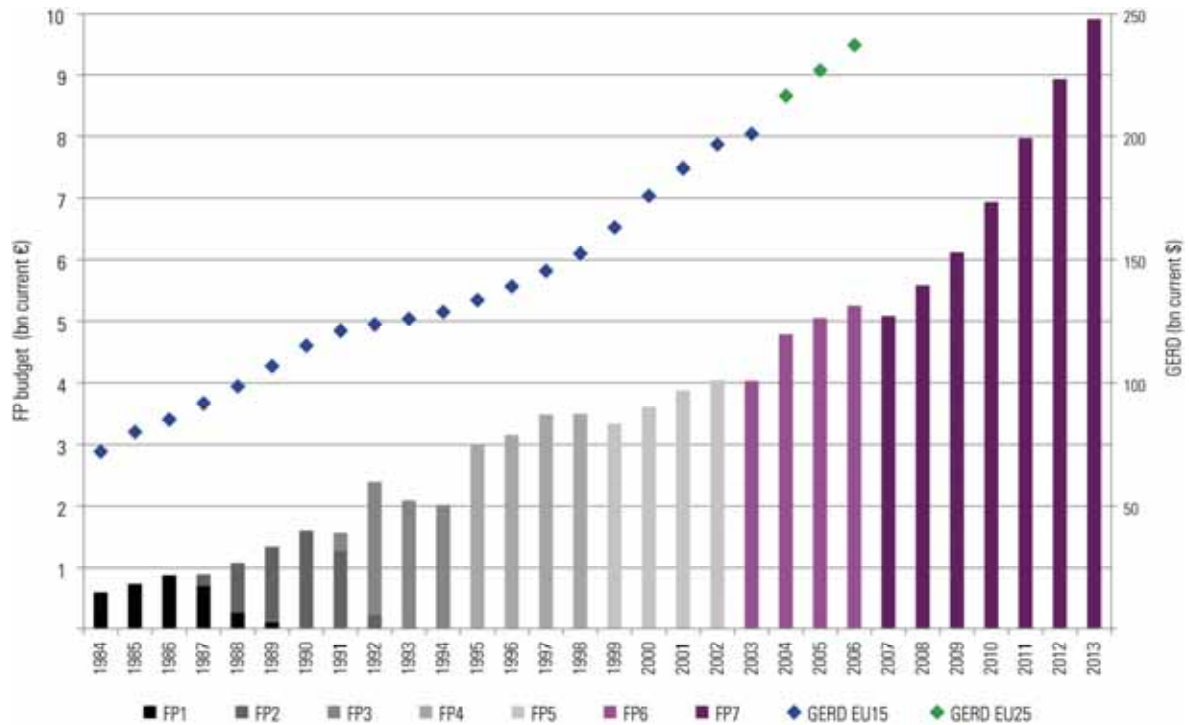
Did you know?

19.1

billion euros is the total budget for FP6

The Framework Programmes also represented a growing share of the total EU budget, rising from 2.1% in 1984 to 4.6% in 2006. However, a comparison with the total expenditure on research and development (GERD) in all of the EU Member States shows that the increase in FP budgets accompanies the general trend of EU Member States increasing their R&D spending. In fact, the FP budgets are proportional to the total expenditure on R&D in Europe from 1984 to 2006, with the exception of the period from 1992 to 1999, when the expenditure on R&D had a tendency to stagnate.

Figure 2: Budgets of the European Research Framework Programmes (bn EUR, bars) and Gross Domestic Expenditure on Research and Development (GERD) of the European Union (bn USD, points)



Source : European Commission (COM(2004) 533, 786/2004/CE, COM(2005) 119 final) for FP budgets, OECD (MSTI 2006) for GERDs, see Table 1

### 2.1.1 Relative distribution of the FP budgets by research area

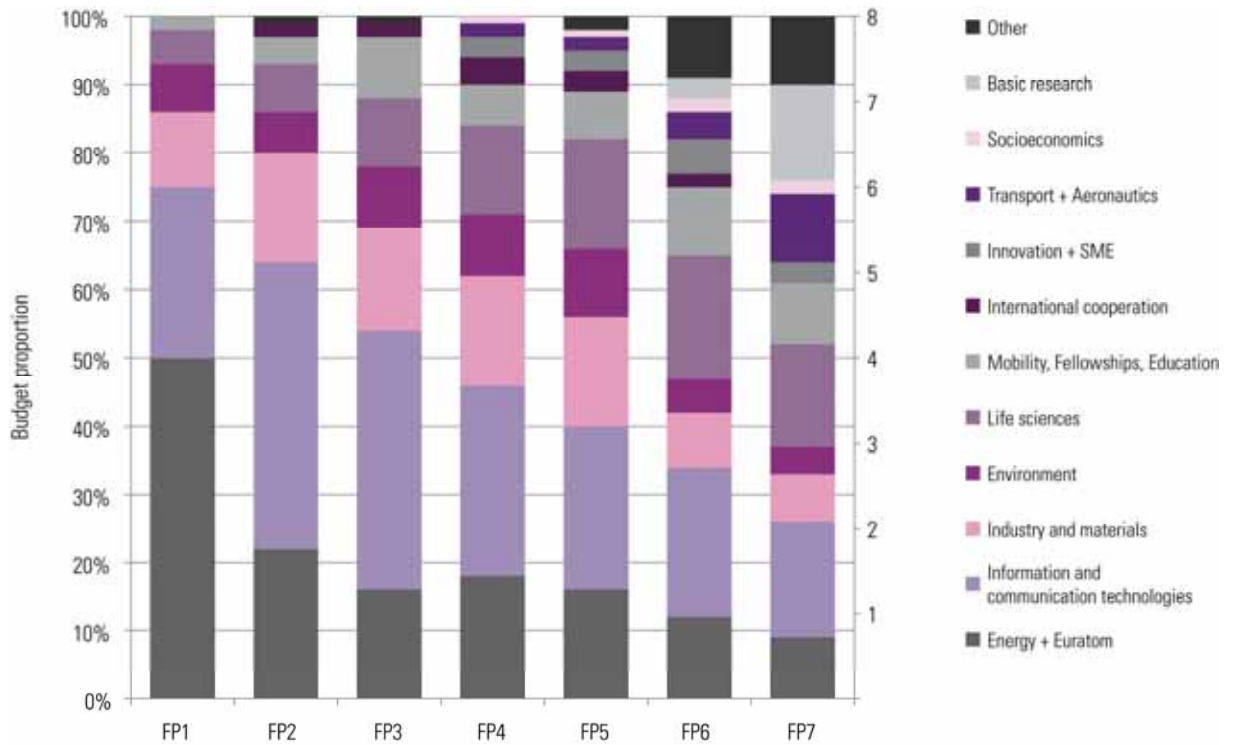
The research projects funded by the FPs are part of work programmes that are dedicated to certain given research topics. These topics are grouped according to priorities, which vary slightly from one Framework Programme to another. Annex B shows the list of priorities of FP6.

The research priorities of the FPs may be grouped according to a few principal areas, shown in the graph below. Half of the financial resources of FP1 were used to fund research into energy, primarily to fund the EURATOM programme which is dedicated to nuclear energy. The relative importance of this type of research rapidly decreased until it reached 12% in FP6.

Following a relative increase in the budget allocated to information and communication technologies, this has also decreased since FP4.

The above-mentioned relative decreases in the budget allocated to these two areas have been made to the benefit of life sciences and fundamental research, which really begins to feature in FP7 with the launch of the European Research Council, as well as to the benefit of various other areas that have appeared.

Figure 3: Relative importance (in proportion of the budgets) of the research areas in the different European Research Framework Programmes

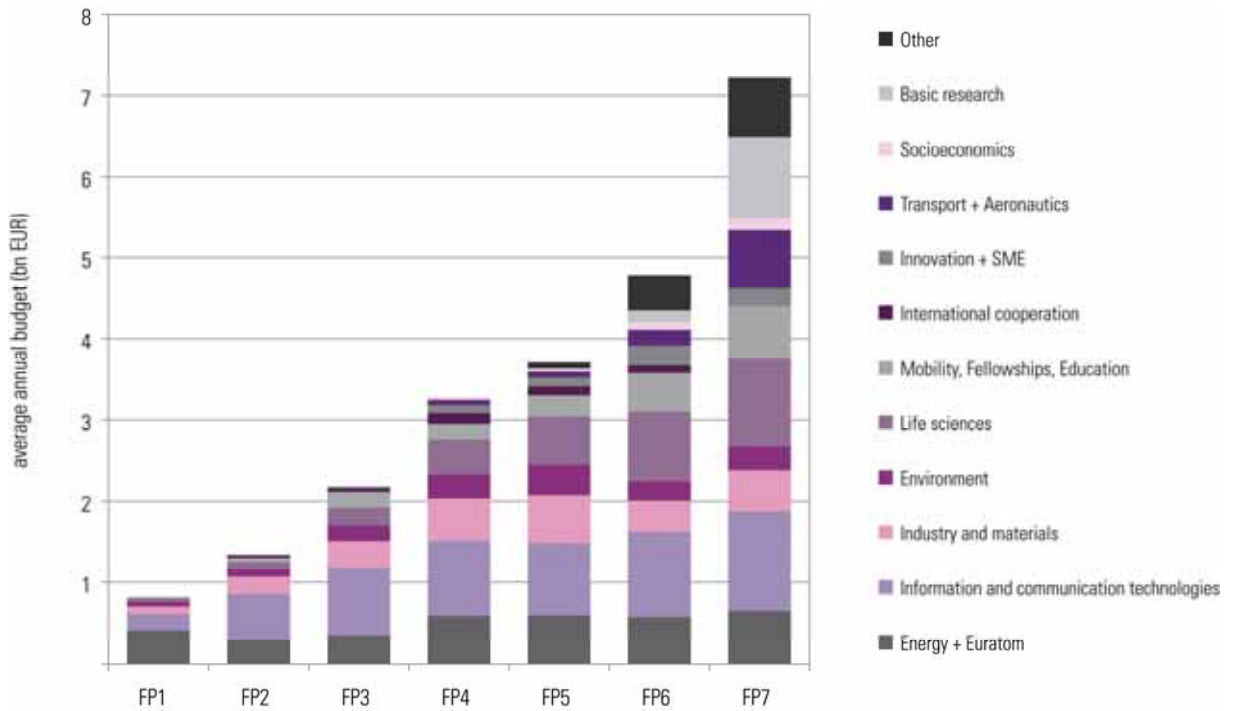


Source :European Commission, State Secretariat for Education and Research, see Table 2



However, it is necessary to bear in mind that the average annual budgets for the FPs are almost 9 times greater for FP7 than they were for FP1, which means that the majority of areas whose relative share of the budget is decreasing, are in fact seeing ever increasing amounts of resources being attributed to them in terms of absolute value (Figure 4).

Figure 4: Breakdown of the average annual budgets of the European Research Framework Programmes by research area



Source : European Commission, State Secretariat for Education and Research, see Table 2

## 2.2 Research Priorities of FP6

The priorities and instruments of FP6 (Annex B) were selected so as to achieve two objectives: to strengthen the scientific and technological foundations of industry in order to develop its ability to compete at an international level and to promote research activities designed to support other European policies. These choices have resulted in research priorities being structured into three main blocks. The first block (priorities 1.1 to 1.8) covers the areas in which the EU intends to become the most competitive and dynamic economy. The aim of the second block, whose priorities (2.1 to 2.4) are transversal, is to eliminate structural weaknesses in European research. The activities of the third block aim to boost the consistent development of the research policies by coordinating research programmes within Europe. In fact, the EURATOM programme (priority 4), which is dedicated to research into nuclear energy, and whose research into fission is co-funded by the Framework Programmes, and the activities of the Joint Research Centre (JRC, priority 5), which are also funded by the FPs, can also be added to this list.

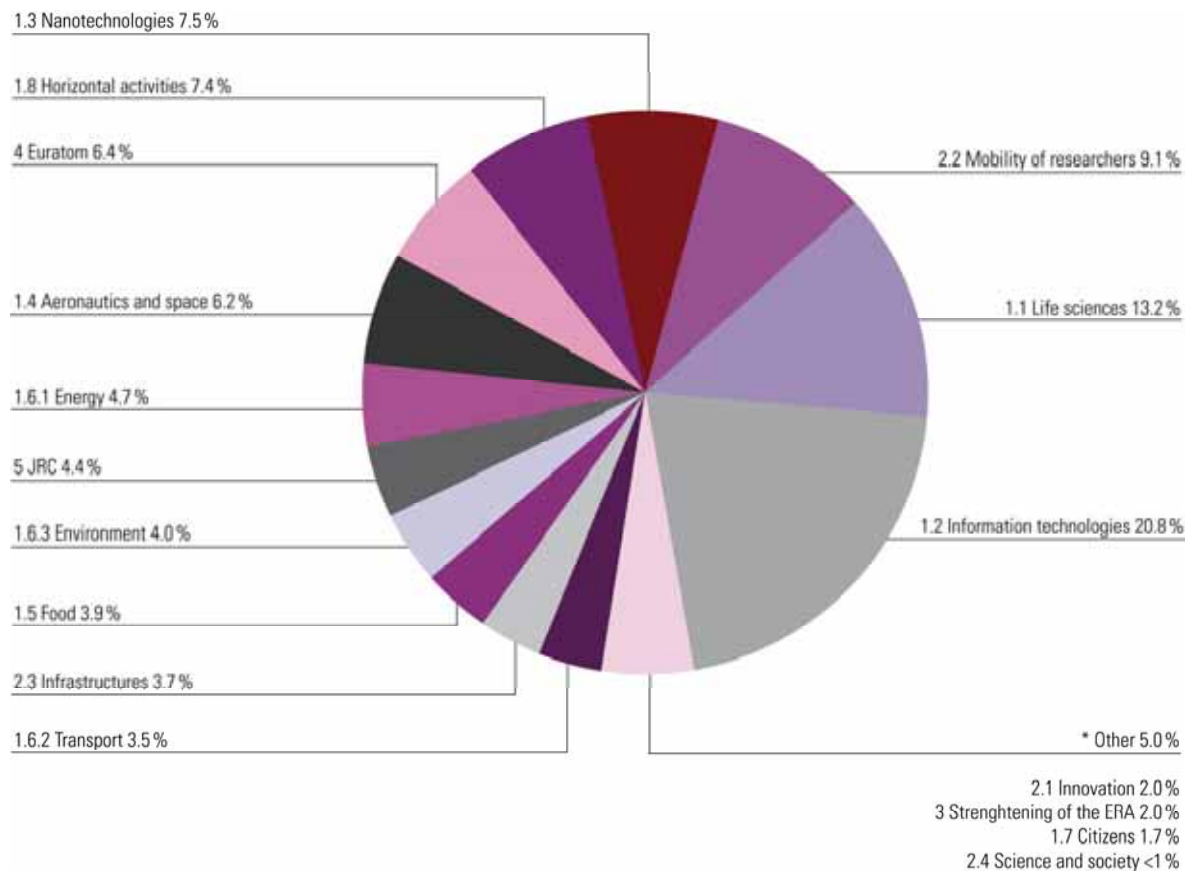
As far as the budgets are concerned (see pie chart below), the two main areas covered are information technologies (priority 1.2, EUR 4.0 billion, or 21% of the budget for FP6) and life sciences and health (priority 1.1, EUR 2.5 billion, or 13% of the budget), whilst the third main area, to which 9% of the budget is allocated, is dedicated to the mobility of researchers (priority 2.2, EUR 1.7 billion). There are large inequalities in the amounts allocated to the seven remaining priorities in block 1 (nanotechnology, aeronautics and space, food, energy, transport, environment, citizens and governance), ranging from 1.3% to 7.5% of the budget.

Did you know?

1/5

of FP6 resources were dedicated to information technologies

Figure 5: Breakdown of the budget of the 6<sup>th</sup> European Research Framework Programme by research priorities



Source : European Commission (786/2004/CE), see Table 3

### 3 Historical perspective

#### 3.1 Switzerland's participation in the FPs (1992-2007)

The trend has been for the number of Swiss researchers<sup>4</sup> participating in European research projects to continue to grow since 1992: the average number rose from 148 for 1992 to 1995 to an average of 474 for 2003 to 2006. For the entire duration of FP6, the number of Swiss participants rose to over 1900. This increase accompanies the one in FP budgets, which causes an increase in the number of projects funded and therefore in the number of opportunities to participate.

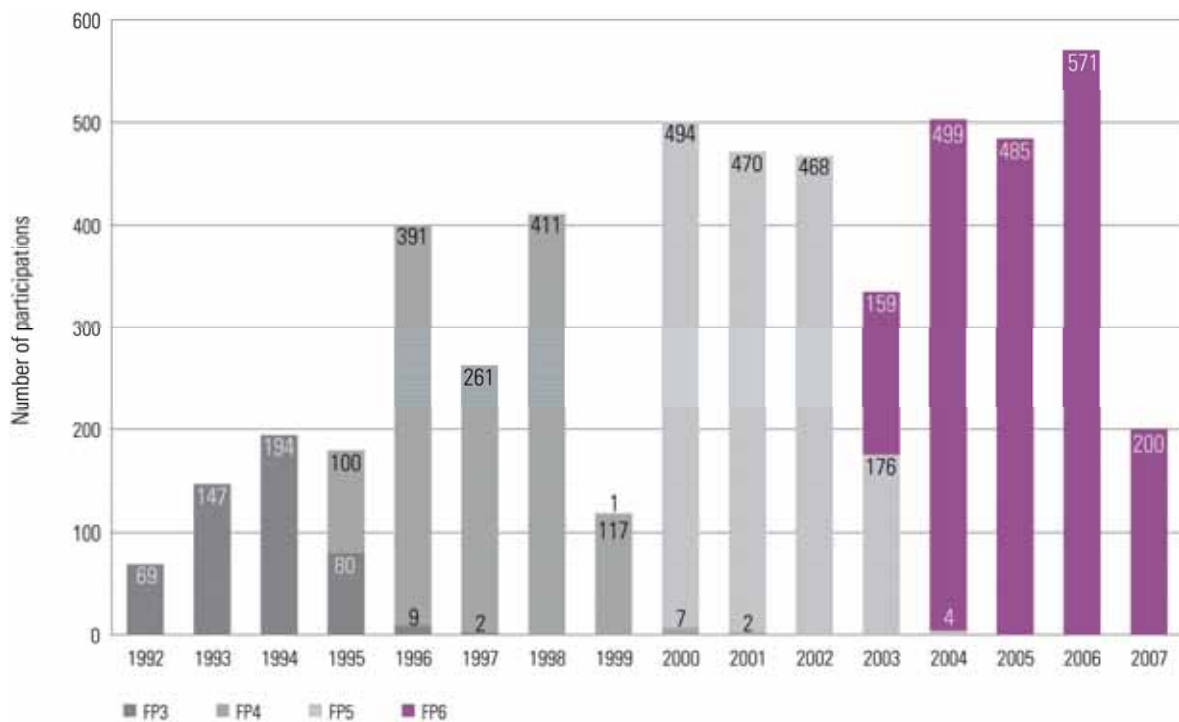
Did you know?

1914

Swiss participations were funded by FP6

The number of participations in years that coincide with the start of a FP is noticeably lower than in other years because there is always a certain amount of time between the publication of initial calls for proposals for a Framework Programme and the first projects commencing. A relatively large number (200) of new participations has been noted for 2007, despite the fact that FP6 was concluded at the end of 2006. This is explained, on the one hand, by the fact that certain contracts that were signed in 2006 relate to projects that did not commence until 2007, and on the other hand, by the fact that a certain number of FP6 contracts were only signed in 2007. It must be noted that the number of Swiss participations for 2007 should increase noticeably when the FP7 participations are also taken into consideration.

Figure 6: Number of new Swiss participations in the European Research Framework Programmes 1992-2007



Source : European Commission, State Secretariat for Education and Research, see. Table 4

<sup>4</sup> For ease of readability, "Swiss researchers" is used to refer to all researchers whose host institution is based in Switzerland (with the exception of international organisations, see annex A)

### 3.2 Committed subsidies according to type of participant in the various FPs

The following graph shows the breakdown of committed subsidies in projects carried out by Swiss participants according to the different participant categories. The relative participation of the different types of Swiss research institutions has remained remarkably stable over the past ten years, with the exception of 1992 and 1995 when the number of large companies taking part proved to be exceptionally high to the detriment of the number of universities taking part (which was due to the low number of participants and to the exceptional participation of two large companies).

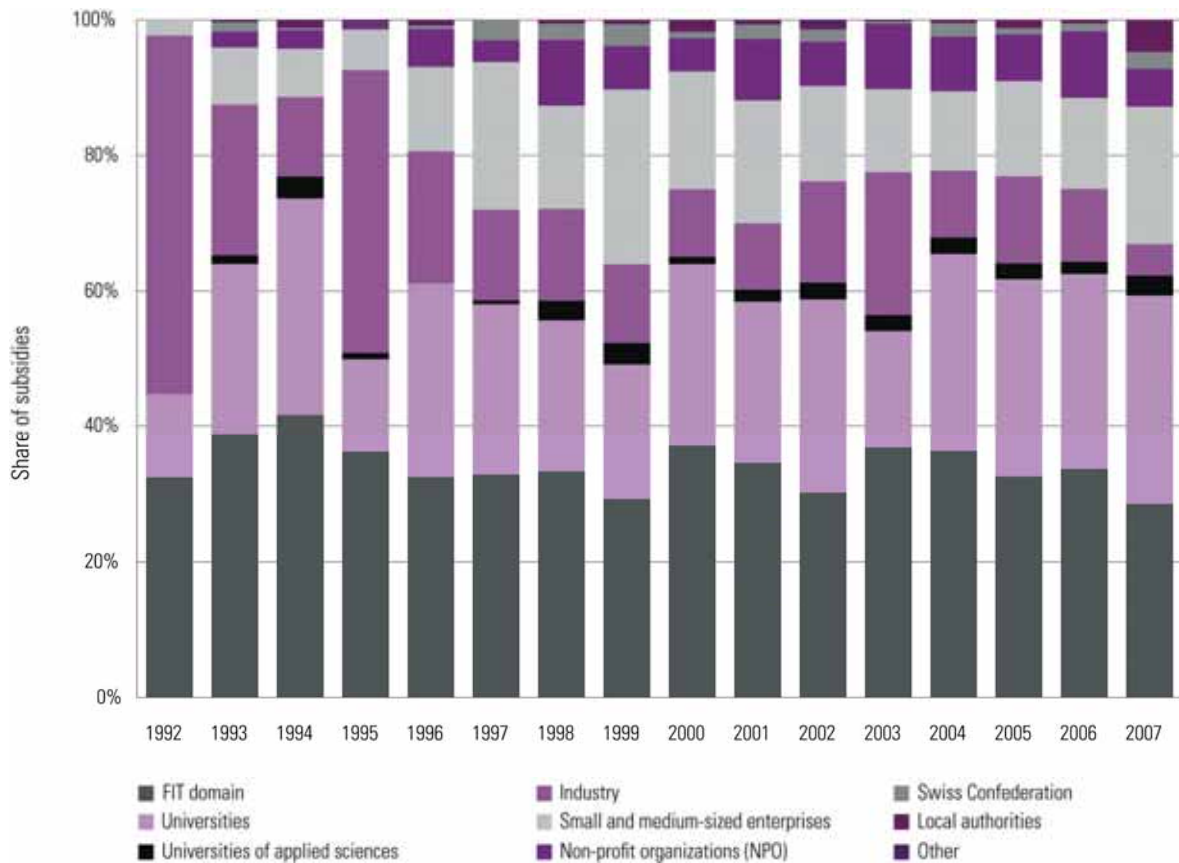
Did you know?

64%

of Swiss research conducted within FP6 was carried out by Swiss tertiary-level institutions

Over the entire course of FP6, Swiss tertiary-level institutions received approximately 64% of the subsidies annually, with over half of these, or 34%, going to institutions belonging to the FIT domain<sup>5</sup>, followed by SMEs (14.4%), which were slightly ahead of large companies (11.8%). Among the other types of institution, two are particularly noteworthy: on the one hand, non-profit organisations have long represented a consistent share of no more than 10% of the annual subsidies; on the other hand, universities of applied sciences continue to have an ever fading presence on the European research scene.

Figure 7: Proportion of subsidies of the European Research Framework Programmes committed for the different Swiss research institution types between 1992 and 2007



Source : European Commission, State Secretariat for Education and Research, see Table 5

<sup>5</sup> The FIT domain comprises Switzerland's two Federal Institutes of Technology (i.e. the EPF in Lausanne and the ETH in Zurich) and their associated research institutes: the Research Institute for Material Science and Technology (EMPA), the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL), the Swiss Federal Institute of Aquatic Science and Technology (EAWAG) and the Paul Scherrer Institute (PSI).

### 3.3 Supporting Swiss research through the FPs (1992-2007)

As the second source of direct public funding for Swiss research (see Paragraph 4.7), the EU Research Framework Programmes act as a real driving force behind national public R&D initiatives. During the period under review, European projects run in Switzerland received funding to the tune of CHF 1.75 billion, CHF 793.4 million of which were solely for FP6. This contribution has generally been increasing very rapidly since 1992. In fact, an average of CHF 47 million were awarded in subsidies per year between 1992 and 1995 compared to an average of over CHF 187 million per year between 2003 and 2006. This is equivalent to Swiss researchers being awarded almost four times the amount in the latter period compared to the previous one. This increase is due to the increase in the budget allocated to the Framework Programmes (Paragraph 2.1), but especially due to the increase in the number of Swiss participants (Paragraph 3.1) that was witnessed during this very period.

Did you know?

793

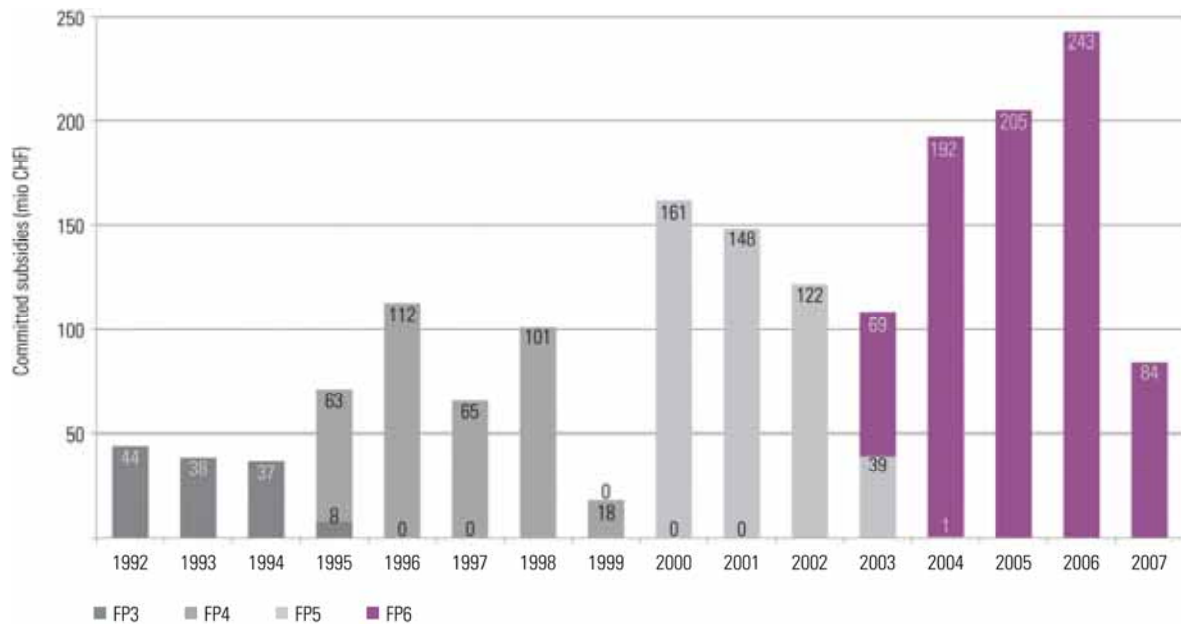
**million Swiss francs of**

FP6 subsidies were used to

fund Swiss research

The reduction in the subsidy amounts for the years corresponding to the start of a new Framework Programme (in particular 1999, 2003 and 2007) are only outward discrepancies and simply highlight the time interval between the first projects of a FP being approved and them actually commencing. The same phenomenon can be seen as far as the number of Swiss participations is concerned (Paragraph 3.1).

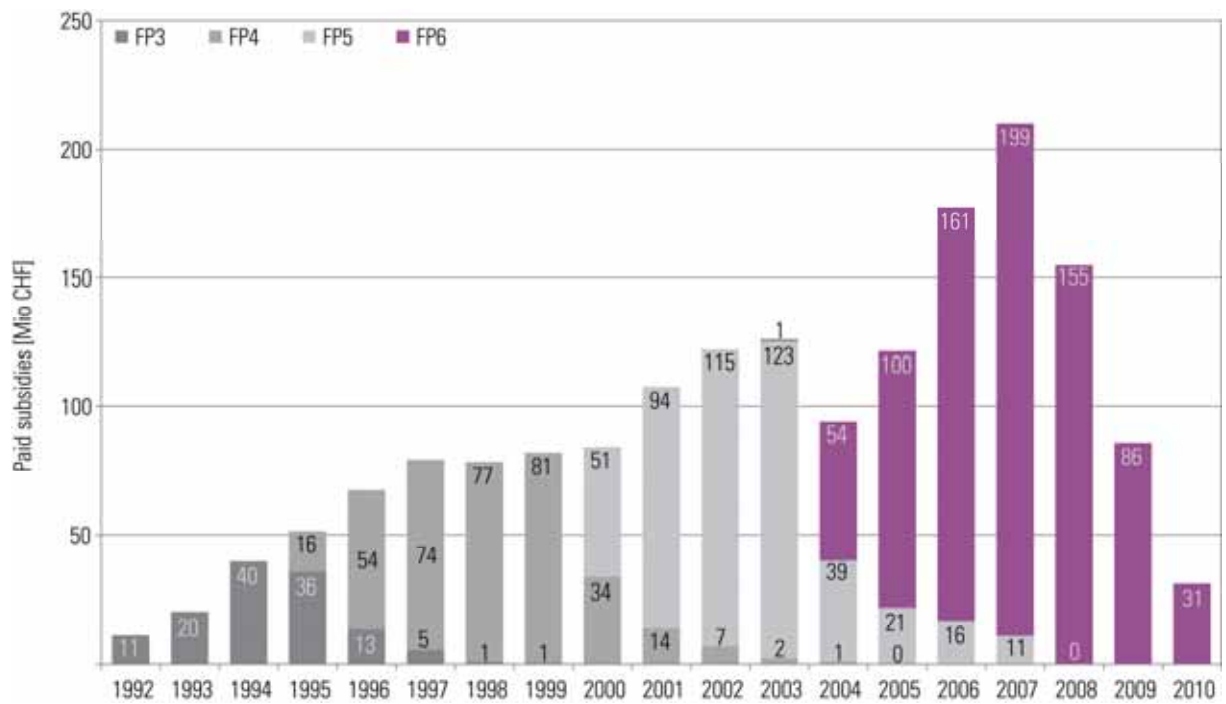
Figure 8: Subsidies committed for Swiss researchers since the 3rd European Research Framework Programme



Source : European Commission, State Secretariat for Education and Research, see Table 6

If one considers the actual payments made (Figure 9), one will notice that the financial support granted to researchers does not fluctuate to such an extent, but rather follows a regular upward pattern. This representation also highlights the fact that the lifespan of a Framework Programme extends far beyond the date on which it officially comes to an end. It is to be noted, for example, that certain FP5 projects were still running in 2007. It is also necessary to point out that the amounts of the commitments and the payments made from 2007 to 2010 are still expected to increase by the contributions from FP7.

Figure 9: Subsidies paid to Swiss researchers since the 3rd European Research Framework Programme



Source : European Commission, State Secretariat for Education and Research, see Table 7

Note : For FP6, payments are estimated by distributing uniformly commitments over projects' durations.

## 4 Switzerland's participation in FP6

### 4.1 Introduction

A European research project is the fruit of the collaboration of several research teams that form a consortium managed by a project coordinator. In order to give an idea of the scale which we are dealing with (see Table 8), there were an average of 19.1 teams taking part in the FP6 projects with Swiss participation. These teams were generally from a number of different countries (8.6 different countries on average). The average length of such projects is 3 years and 5 months, with average funding of CHF 414 500 per team.

Two instruments: Integrated Projects (IP) and Networks of Excellence (NoE) were introduced as part of FP6 with the aim of grouping together a particularly large number of partners. The Integrated Projects and Networks of Excellence in which Switzerland was involved therefore distinguished themselves from other FP6 projects by their size (an average of 29.0 and 36.7 partners respectively) and by their extended geographical coverage (11.6 different countries on average are involved in each Integrated Project and 14.0 different countries are involved in each Network of Excellence).

#### Did you know?

19

is the average number of teams involved in an FP6 project in which Switzerland is taking part

## 4.2 Awarding of subsidies to Swiss participants

The subsidies awarded as part of the Framework Programmes are used to fund research carried out by both Swiss tertiary-level institutions and private companies in Switzerland. Institutions belonging to the FIT domain and universities were the main beneficiaries, receiving CHF 270.4 million (34.1%) and CHF 219.1 million (27.6%) respectively, for FP6 as a whole.

One quarter of the subsidies (25.5%) was allocated to companies, which is equivalent to CHF 202.4 million, CHF 110.9 million (14.0%) of which were allocated to SMEs. As far as FP6 was concerned, the aim of the European Commission was to reserve at least 15% of the subsidies for SMEs and this aim was successfully achieved by the end of the Framework Programme<sup>6</sup>. With respect to this result, the participation of Swiss SMEs can be classed as satisfactory.

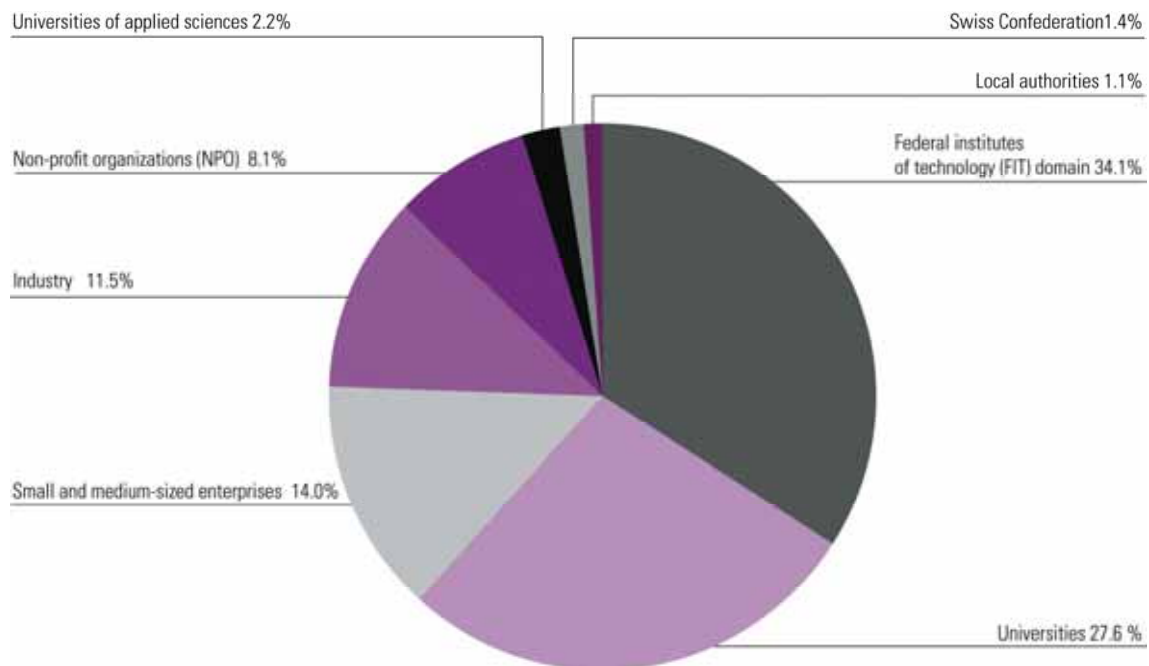
Finally, non-profit organisations, universities of applied sciences and public administrations were also included amongst the other types of institutions that benefited from receiving European subsidies. The remaining 13% of subsidies were divided among such institutions.

Did you know?

111

million Swiss francs were allocated to R&D in Swiss SMEs, and a total of CHF 202 million to all companies

Figure 10: Breakdown of subsidies committed for Swiss participants by institution type in the 6<sup>th</sup> European Research Framework Programme



Source : European Commission, State Secretariat for Education and Research, see Table 9

The relative size of the research projects for each type of participating institution can be evaluated by relating the total amount of subsidies received to the number of participations for each of these types of institution. The resulting relationship (Figure 11) very closely resembles that of direct proportionality, with three notable exceptions.

First of all, public administrations receive on average less funding per project compared to other types of institution, due to the fact that they are involved for the most part in smaller projects.

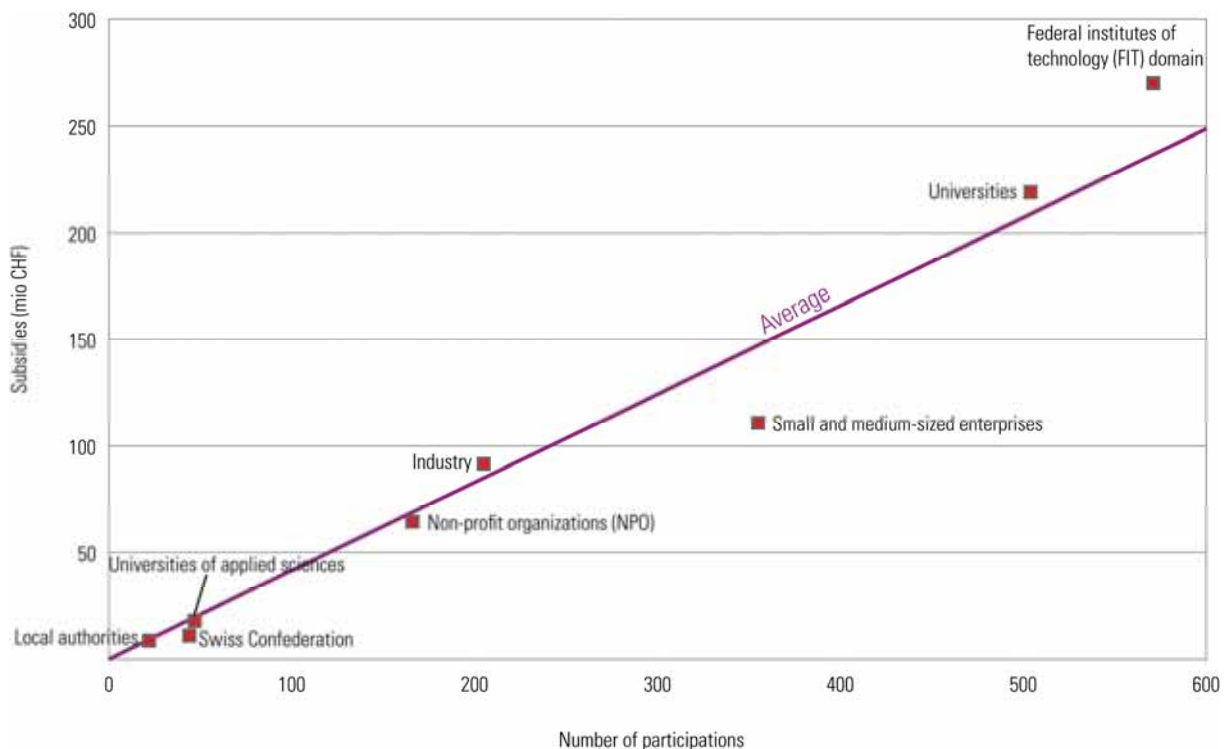
<sup>6</sup> "Supporting SME Participation in Research Framework Programmes", European Commission, 2007.



Secondly, SMEs also receive on average less funding per project compared to other types of institution. The modest size of the projects in which they participate only partially explains this state of affairs. In fact, it is also necessary to add that the costs borne by SMEs (as is the case with those borne by industry) for a research project are only reimbursed by FP6 up to 50%.

Thirdly, due to the fact that institutions belonging to the FIT domain prefer to take part in large projects, they receive more funding per project than the average received for Swiss projects.

Figure 11: Committed subsidies as a function of the number of participations for the different Swiss research institutions types participating to the 6<sup>th</sup> European Research Framework Programme. The average subsidy per Swiss participation is CHF 414 500.

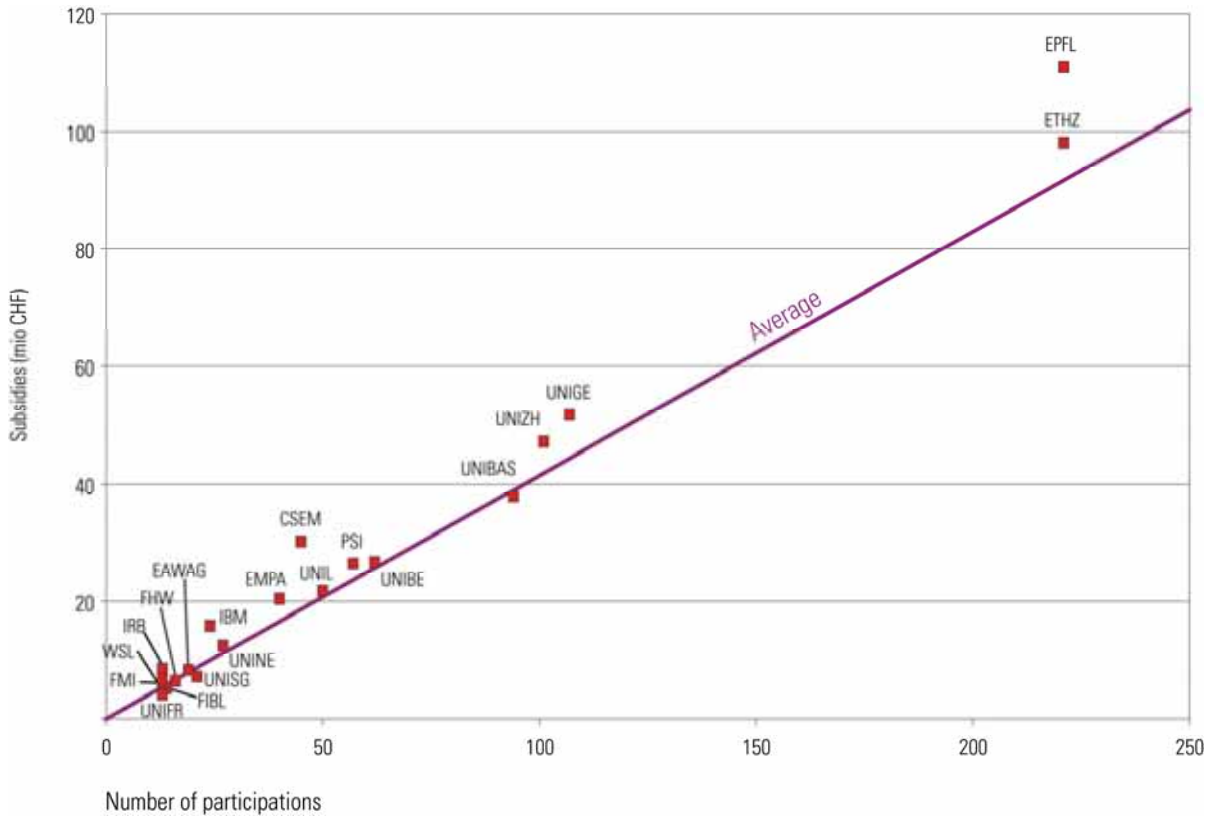


Source : European Commission, State Secretariat for Education and Research, see Table 9

The same analysis was carried out for each individual institution and revealed that the two most active Swiss participants in FP6 (in terms of the number of participations) were the EPF in Lausanne and the ETH in Zurich. They were also the ones that received more funding per project (CHF 502 400 per project for the EPF and CHF 443 700 per project for the ETH) than the average received for Swiss projects, which is approximately CHF 414 500 per project.

These are followed by the Universities of Geneva and Zurich, to which the same applies. Other universities receive average subsidies per project. Details of the number of participants per tertiary-level institution and for each research priority are given in Table 9. The Swiss Centre for Electronics and Microtechnology (CSEM) distinguishes itself by the relatively large sums that it raises compared to the number of projects in which it participates.

Figure 12: Committed subsidies as a function of the number of participations for the 20 most frequently participating Swiss institutions in the 6<sup>th</sup> European Research Framework Programme. The average subsidy per Swiss participation is CHF 414 500



Source : European Commission, State Secretariat for Education and Research, see Table 10

### 4.3 Who participated in FP6?

#### 4.3.1 Proportion of participants and coordinators according to type

In terms of the number of participants and coordinators taking part in the European research projects by type of institution, the involvement of Swiss researchers in FP6 is distributed in a similar manner to the way in which the subsidies are distributed (Paragraph 4.2): 56.2% of Swiss participations come from FITs or universities, and 29.3% come from private companies.

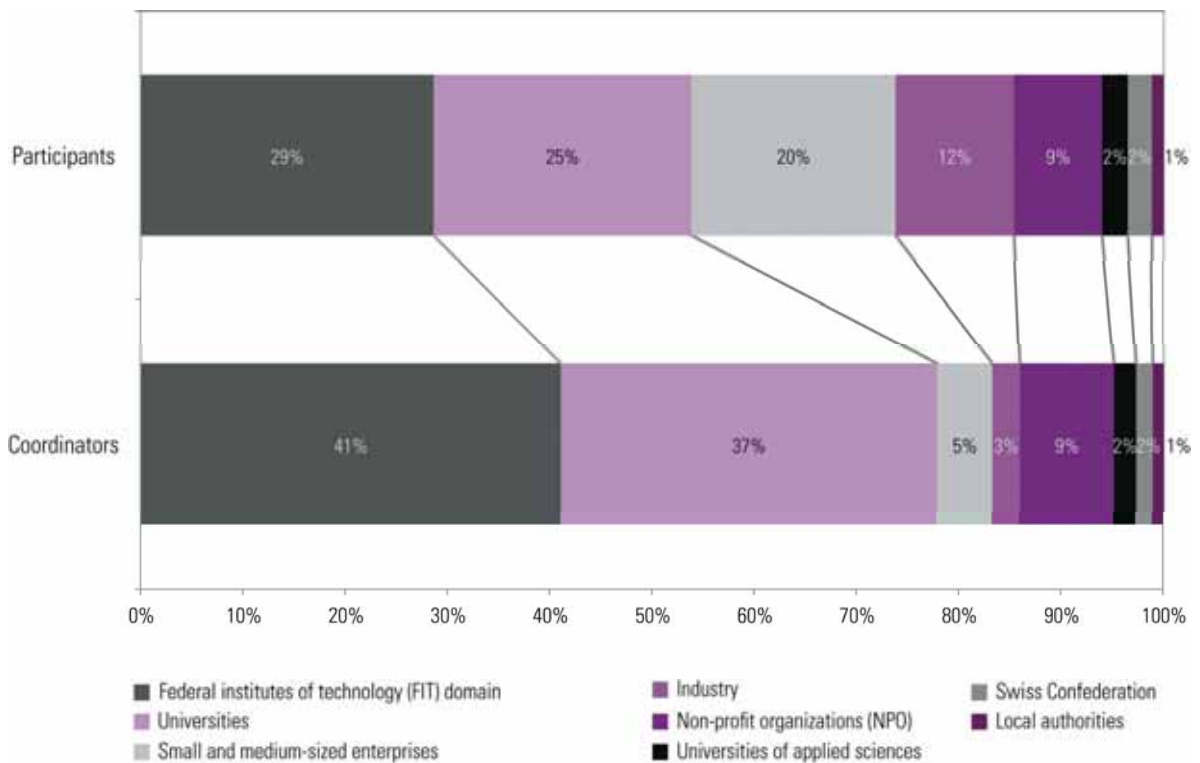
Did you know?

185

Swiss researchers led a European project during the course of FP6

One of the partners in a European project takes on the specific role of project coordinator. This role means that he/she is responsible for the general management of the project and is often the partner who submitted the project proposal and therefore also got together the necessary partners. This role has only been open to Swiss researchers since Switzerland became associated to the FPs in 2004. If one considers the roles of project coordinator and participant separately, this significantly changes the picture of Swiss participations. Indeed, whilst FITs and universities represent a combined total of approximately 53.8% of participants, they represent 77.8% of Swiss coordinators. The reverse is true for companies (irrespective of size), which represent 31.5% of the participants, but only 8.1% of Swiss coordinators.

Figure 13: Proportion of Swiss participants and coordinators by type in the 6<sup>th</sup> European Research Framework Programme



Source : European Commission, State Secretariat for Education and Research, see Table 11

### 4.3.2 Collaboration between the different types of institution

One of the aims of the Framework Programmes is to bring together a number of partners in joint research projects, in order to achieve critical masses for ambitious projects, but also in order to promote collaboration between research institutions, in particular between the public and private sectors. Collaboration between institutions – as well as collaboration between countries, see Paragraph 4.5.3 – is quantified as follows. One collaboration link between two institutions is counted each time they are named as partners on one and the same project. There are therefore many more collaborative links than there are participations<sup>7</sup>.

Did you know?	
1/3	of FP6 collaborative research efforts took place between Swiss public and private institutions

As part of FP6, a large number of institutions of the same type collaborated with one another (91 collaborations took place between universities and 54 between FITs, see Table 12), but collaborations also took place between the two types of Swiss tertiary-level institutions (108 projects where universities and FITs collaborated with one another). As far as the public sector collaborating with the private sector is concerned, a great deal of interaction can be seen between FITs and SMEs (97), and, to a lesser extent, between FITs and large companies (65). The total number of partnerships between public research institutions (FITs, universities, universities of applied sciences) and private institutions (companies of all sizes) in the FP6 projects amounted to 273 out of a total of 831. One third of the collaborative efforts therefore involved Swiss institutions from both of these categories working together. Of course, there were other partnerships between public and private institutions involving foreign institutions, in addition to these. These cannot be taken into consideration due to a lack of data.

#### Collaborative affinities

These figures, whilst they are certainly informative, do not make it possible to separate the size effects from the affinity effects between types of institution. Whilst a large number of collaborative links can be witnessed between FITs and universities, for example, does this demonstrate a real willingness to cooperate or is it simply due to the fact that these two types of institution are the ones that participate the most in the Framework Programme? The collaboration index (CI)<sup>8</sup> shown in Figure 14 makes it possible to answer this question by removing the effects of the size of institutions. The collaboration index therefore measures the propensity of two types of institution to collaborate with one another, using a value between -1 and +1. The value -1 is reached when two types of institution have never collaborated with one another on an FP6 project, 0 is reached when the number of collaborations is medium compared to the respective number of participations of both institution types and +1 denotes that each time one of the institutions has taken part, this has been done systematically in collaboration with the other one.

This analysis shows that the collaborative affinities between institutions belonging to the FIT domain and universities have been average (CI=0.11). At first sight, it seems that some institutions (UAS, Confederation, local authorities) have a tendency to collaborate preferentially with themselves. This could be only an artefact, due to their small total number of participations. On the other hand, the collaborations between FITs (IC=-0.27) are largely under-represented, as it is the case for the collaborations between SMEs (-0.26). It is also to be noted that the universities collaborate relatively little with the UAS (-0.56) and with the industry (-0.39).

<sup>7</sup> More specifically, a project having n participants produces  $n(n+1)/2$  collaborative links

<sup>8</sup> See note 1, p. 61

Figure 14: Collaboration indices (CI) between the different types of Swiss institutions taking part in the 6<sup>th</sup> European Research Framework Programme

Type	Federal Institutes of Technology (FIT) domain	Universities	Universities of applied sciences	Industry	Small and medium-sized enterprises	Non-profit organizations (NPO)	Swiss Confederation	Local authorities
Federal Institutes of Technology (FIT) domain	■	□	□	□	□	□	■	■
Universities	□	□	■	■	□	□	□	■
Universities of applied sciences	□	■	■	□	□	□	□	■
Industry	□	■	□	□	□	■	■	■
Small and medium-sized enterprises	□	□	□	□	■	□	■	■
Non-profit organizations (NPO)	□	□	□	■	□	□	■	□
Swiss Confederation	■	□	□	■	■	■	■	□
Local authorities	■	■	■	■	■	□	□	■

Colour code : ■ : Inexistent or very weak collaboration (-1 to -0.6),  
 ■ : Weak collaboration (-0.6 to -0.2),  
 □ : Average collaboration (-0.2 to 0.2),  
 ■ : Strong collaboration (0.2 to 0.6)  
 ■ : Exclusive or very strong collaboration (0.6 to 1)

Source : European Commission, State Secretariat for Education and Research, see Table 13

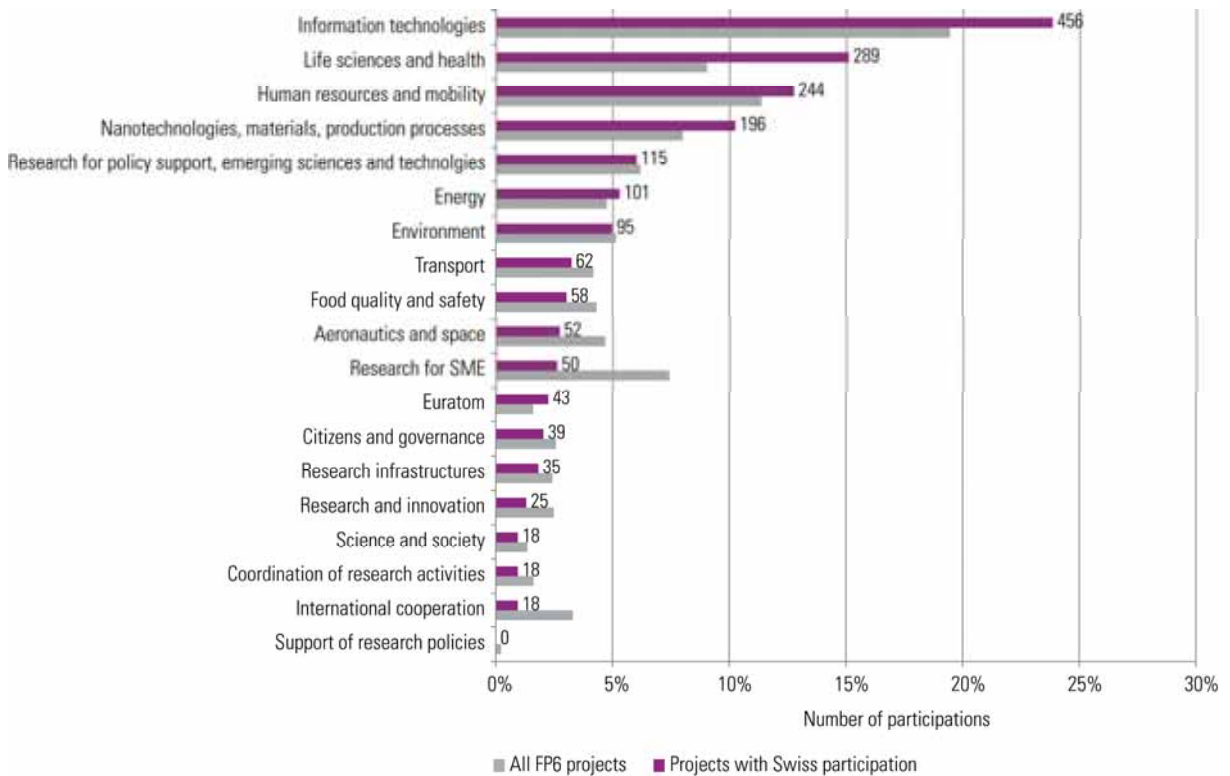
## 4.4 Areas of activity in which Swiss participants are involved

### 4.4.1 Number of participants by research priority

The breakdown of the number of Swiss participants by research area shows that the area in which Swiss researchers are the most active in FP6 is clearly information technologies with 456 Swiss participations. This is the equivalent of 23.8% of all Swiss participations. The second key area is life sciences and health, with 289 Swiss participations (15.1%). Compared with other European countries, Switzerland is distinguished by a relatively high number of participants in the following areas: life sciences and health, nanotechnologies and information technologies (see Paragraph 4.6.4). It is worth to mention the low number of Swiss participants (50) in the area of “research for SMEs”. In contrast to the conclusions that could be drawn from this, this does not mean that research in Swiss SMEs is in bad shape. In fact, the relatively high level of participation of SMEs mentioned in Paragraph 4.2 suggests that Swiss SMEs wishing to take part in a European project are able to do so by participating normally in one of the seven main priorities of FP6. They therefore make little use of the “research for SMEs” programme which is equipped with instruments specifically aimed at helping SMEs with a reduced research capacity.

Let us make it clear that the priority “coordination of research activities” refers to the coordination of national research programmes by national research funding agencies and not to the act of coordinating a research project by one of the project partners (see Paragraph 4.3.1).

Figure 15: Distribution of the number of participations in research projects of the 6<sup>th</sup> European Research Framework Programme by research priority



Source : European Commission, State Secretariat for Education and Research, see Table 14

#### 4.4.2 Subsidies by research priority

The research areas in Switzerland that receive the highest amount of subsidies from FP6 are, to a large extent, those that have the highest number of Swiss participations. The main topics therefore include: information technologies, which account for CHF 225.3 million (28.4% of all subsidies paid to Swiss researchers for the entire duration of FP6) and life sciences and health (CHF 160.5 million, 20.2% of the subsidies).

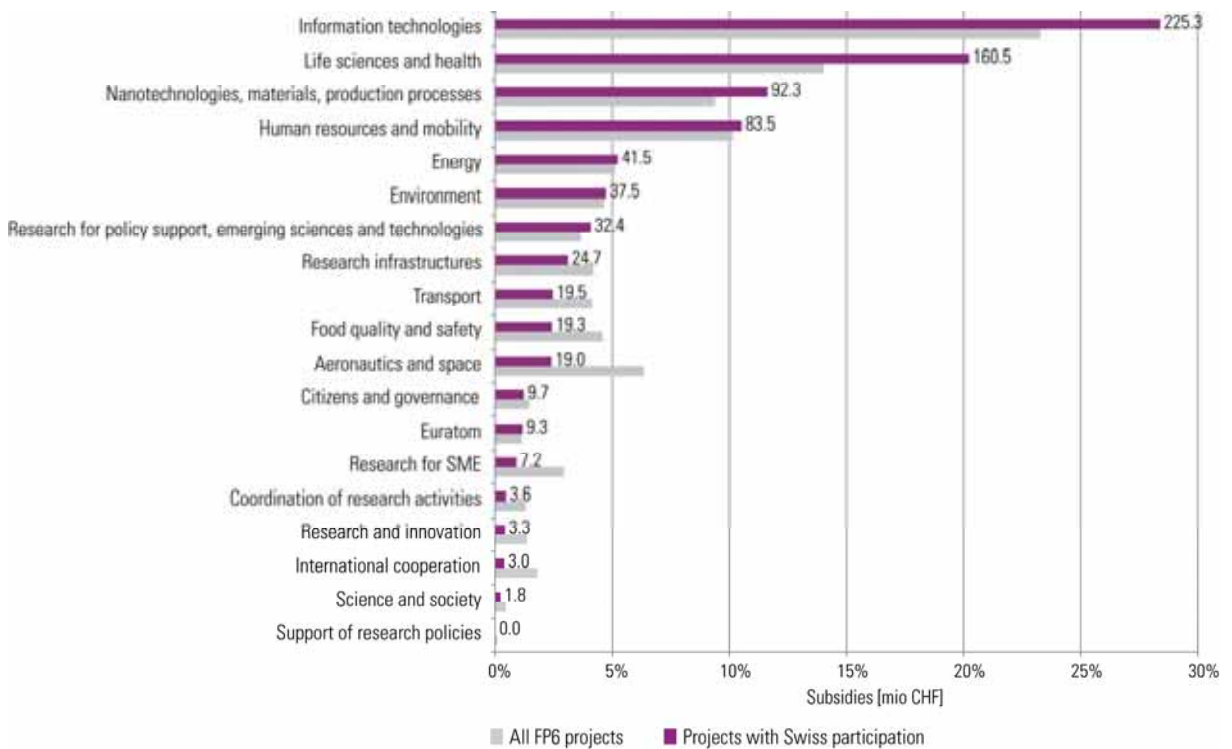
In comparison with other countries in Europe, there is higher than average Swiss activity in the areas of life sciences and health, nanotechnologies, information technologies and the area of “research for policy support, new and emerging science and technologies”. Switzerland’s thematic specialization is discussed in more detail in Paragraph 4.6.4.

Did you know?

49%

of FP6 subsidies awarded to Swiss researchers were devoted to information technologies or life sciences and health

Figure 16: Distribution of subsidies to research projects of the 6<sup>th</sup> European Research Framework Programme by research priority (in million CHF for Swiss participations and in percents)



Source : European Commission, State Secretariat for Education and Research, see Table 15

However, a comparison of the two graphs shown above highlights certain differences between the significance of a sector in terms of the number of participants and in terms of funding. In fact, the size of the projects may vary considerably from one area to another. Whilst the average subsidy received by a project with Swiss participation is approximately CHF 414 500 (see Paragraph 4.1), this can increase to more than CHF 704 000 for research infrastructure projects or to more than CHF 555 000 for life sciences and health projects. At the other end of the scale, each project related to the areas of science and society, research and innovation or research for SMEs receives an average of between CHF 100 000 and CHF 150 000.

#### 4.4.3 Thematic specialization of Swiss participants

Up until this point, we have painted a picture of the Swiss researchers that took part in FP6. Thanks to this, we know the type of research institutions involved and the research topics tackled. However, which topics were tackled by which institutions? The amounts of subsidies committed by topic and by type of institution give an initial indication of the strengths of each one, but this interpretation is biased by the size effects: It is necessary to take account of the fact that the large sums awarded to FITs and universities in one particular area signify above all a research activity that is generally important at these institutions, and not a specialism. In order to neutralise the effects of the size of institutions, we give the specialization indices<sup>9</sup> of each type of Swiss research institution in Table 16. This index equals -1 when an institution does not conduct any research in a particular area, 0 when its activity in this area is average and +1 when an institution conducts research exclusively in a particular area. These indices are represented for each type of institution in the following graphs (Figure 17).

It is recognised first of all that many areas are not being researched in all types of institution (e.g. no research is being carried out in the area of aeronautics and space in Swiss universities of applied sciences). However, no type of institution is active exclusively in one single area for the entire duration of FP6. Public administrations appear to be highly specialised in particular areas (these are not the same at the cantonal and national level) but completely absent from many others. On the other hand, institutions belonging to the FIT domain and universities have a much more general profile of activity.

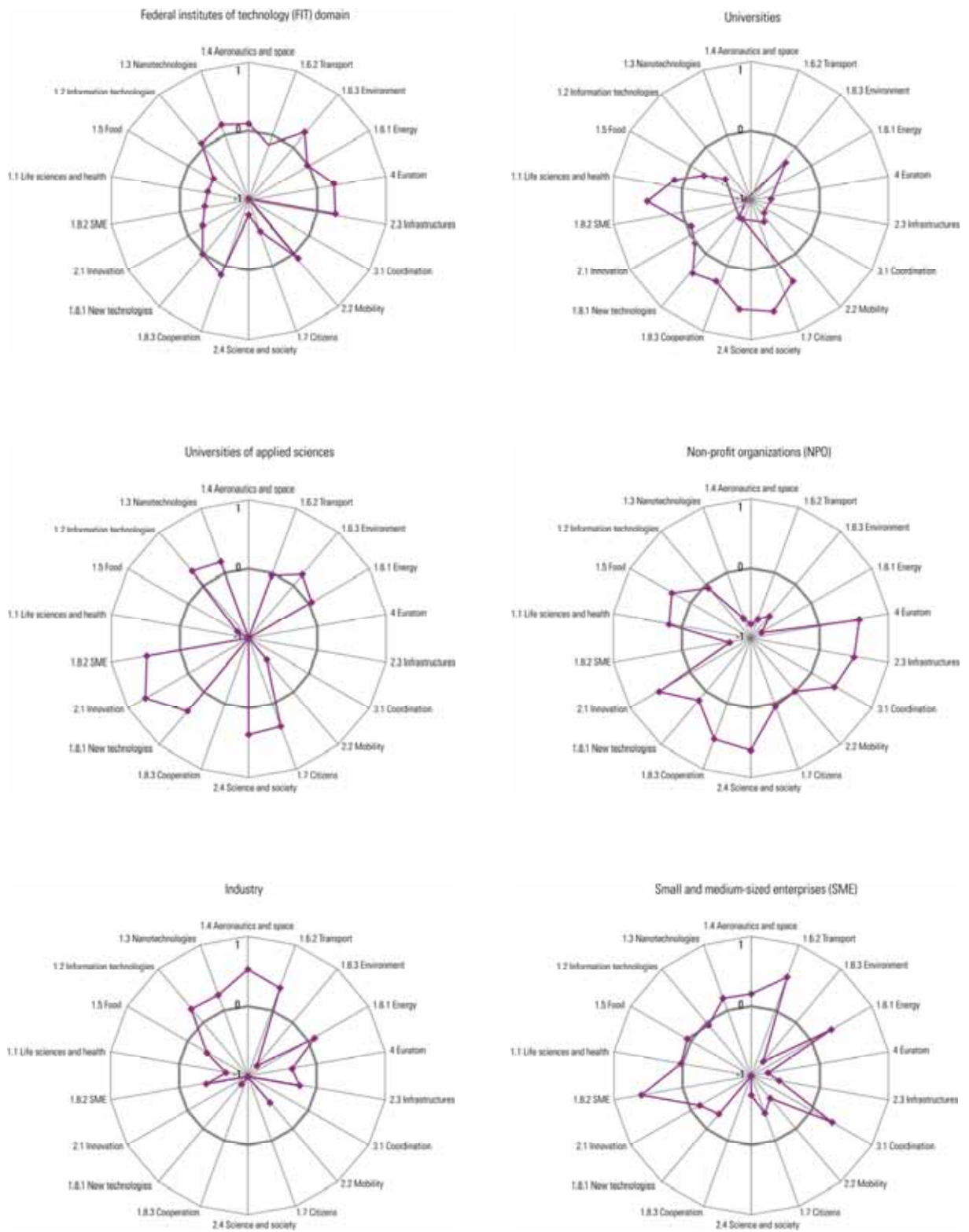
Certain areas are exclusively dealt with by one particular type of institution. Therefore, for example, large companies mostly specialize in aeronautics and space, non-profit organisations specialize in international cooperation and the Confederation specializes in the coordination of research activities. In other areas, subsidies are awarded in a more cross-sector manner in the majority of institution types, as in the case of information technologies and the mobility of researchers.

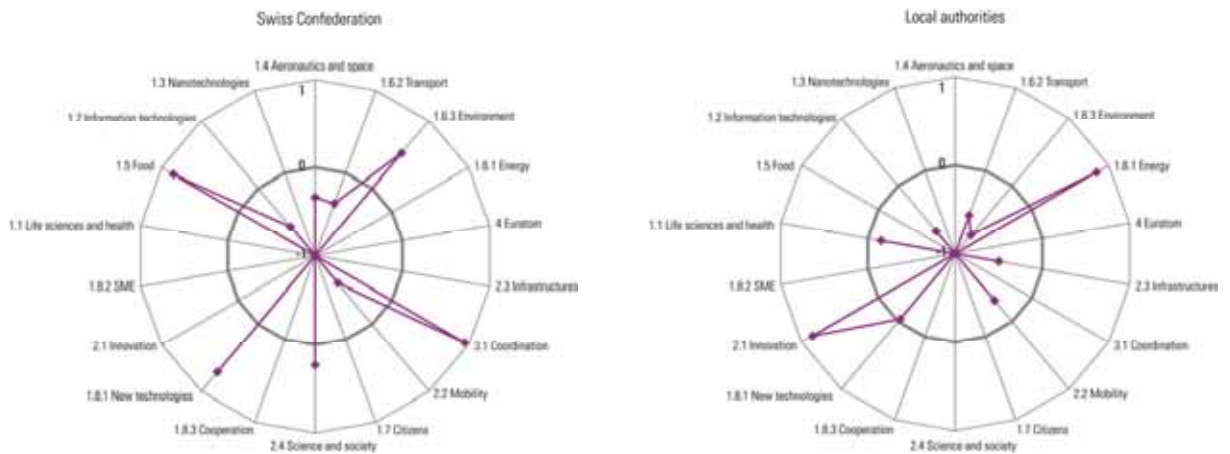
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<sup>9</sup> See note 2, p. 61



Figure 17: Relative specialization of the Swiss types of institutions participating in the 6<sup>th</sup> European Research Framework Programme. Extremities of the stars located beyond the circle of abscissa 0 denote a research area in which the considered institution type is specialized.





Source : European Commission, State Secretariat for Education and Research, see Table 16

#### 4.4.4 Institutions' specializations map

The relationship between different research topics and types of institution in which this research is conducted can be depicted in the form of a graph by means of a correspondence factor analysis (CFA) based on the subsidies committed by institution and by research topic<sup>10</sup>. This synthetic representation of all of the thematic specialization indices makes it possible in particular to highlight the groups of institutions that preferred to work on the same research topics for the entire duration of FP6. The map obtained shows both the types of institution and the research topics, in such a way that:

- the more the same types of institution prefer to work on two topics, the closer these topics appear together;
- the more two types of institution prefer to work on the same research topics, that is to say the more they have the same specialization profile, the closer they appear together;
- the more a type of institution specializes in a topic, the closer it is to this topic.

The first axis (horizontal) contrasts institutions that are more fundamental in character (universities and non-profit organisations) with institutions that are focused on applied or industrial research (industry, universities of applied sciences, and to a lesser extent, SMEs and FITs). The first institutions specialize in the topics represented on the right hand side of the graph, such as science and society, citizens and governance, life sciences and health or food, and are not very active in the areas represented on the left hand side of the graph, in particular aeronautics and space, transport, energy and nanotechnologies. The opposite is true for institutions situated on the left hand side of the graph. The second axis (vertical) separates research areas rather than institutions: It shows that the areas of research for SMEs and coordination of research activities (and transport to a lesser extent) are specifically addressed by institutions (SMEs and public administrations) that have only very little involvement in the topics of nuclear energy (Euratom), research infrastructures, international cooperation and the environment. These are the areas in which FITs and NPOs specialize. For example, it is noticeable that the topics "Science and society", "Citizens" and "Life sciences and health" are addressed a great deal by universities, but very little by large companies, or the opposite, that large companies and universities of applied sciences both work on the topics "Aeronautics and space", "Nanotechnologies" and "Information technologies", which feature very little in the research activities of universities.

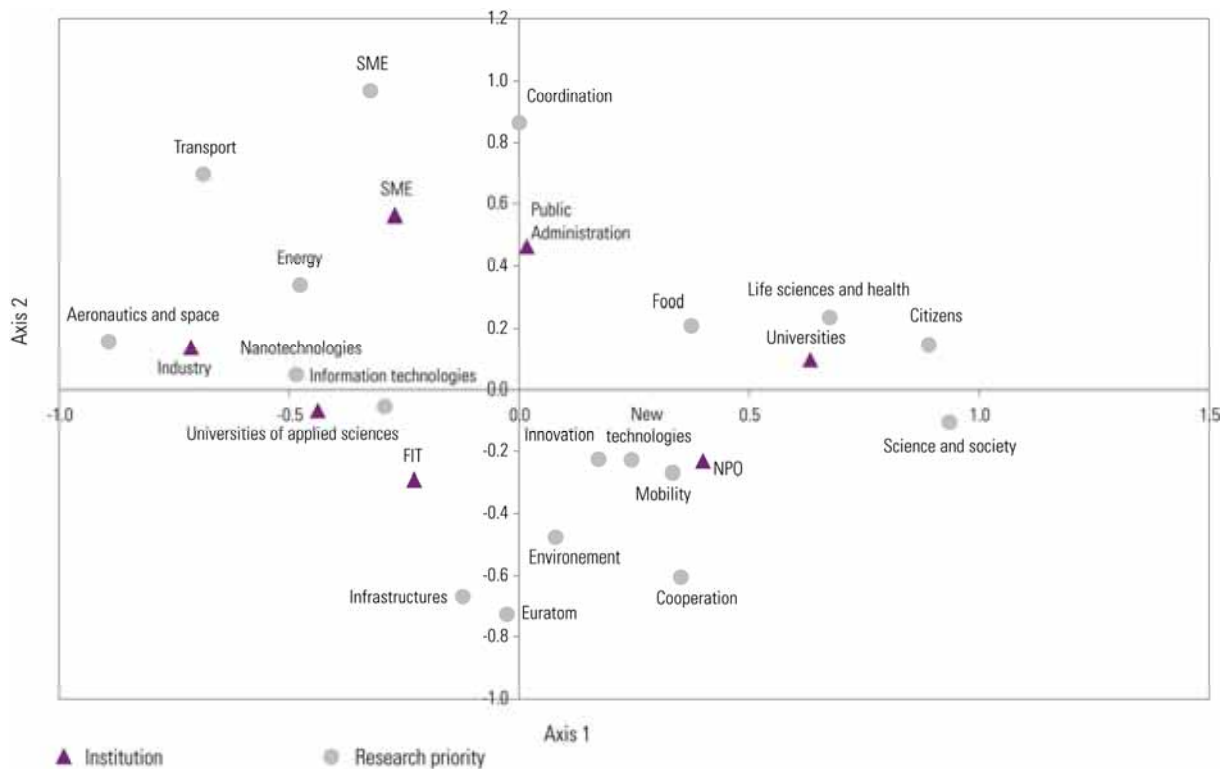
<sup>10</sup> See note 3, p. 62

On a map of this kind compiled by means of CFA, the two following properties are also true:

- an institution is situated further away from the origin of the graph the more specialized it is;
- a research topic is situated further away from the origin of the graph, the more it is dealt with by a limited number of institution types.

Therefore, the topics situated on the edges of the graph (Aeronautics and space, Transport, SMEs, Coordination, Citizens, Science and Society, Cooperation, Euratom and Infrastructures) are only dealt with by certain types of institution, whilst the areas of information technologies, innovation or new technologies, which are situated more towards the centre of the graph, are dealt with more widely by all types of institution. As for the institutions, these are distributed relatively evenly on the graph, at approximately the same distance from the origin of the graph (the vertical and horizontal scales are different). This shows simultaneously that the specialization of each type of institution complement one another and that overall, these institutions cover the entire spectrum of research areas featured in FP6 (with the exception of the support for a coherent development of research and innovation policies, see Paragraph 4.6.4).

Figure 18: Map of thematic proximities for research priorities and Swiss types of participants in the 6<sup>th</sup> European Research Framework Programme (correspondence analysis of table 16). The more an institution type is specialized in a research priority, the closer they are on the map.



Source : European Commission, State Secretariat for Education and Research

## 4.5 Networks of scientific collaboration

### 4.5.1 Nationalities of participants in Swiss coordinated projects

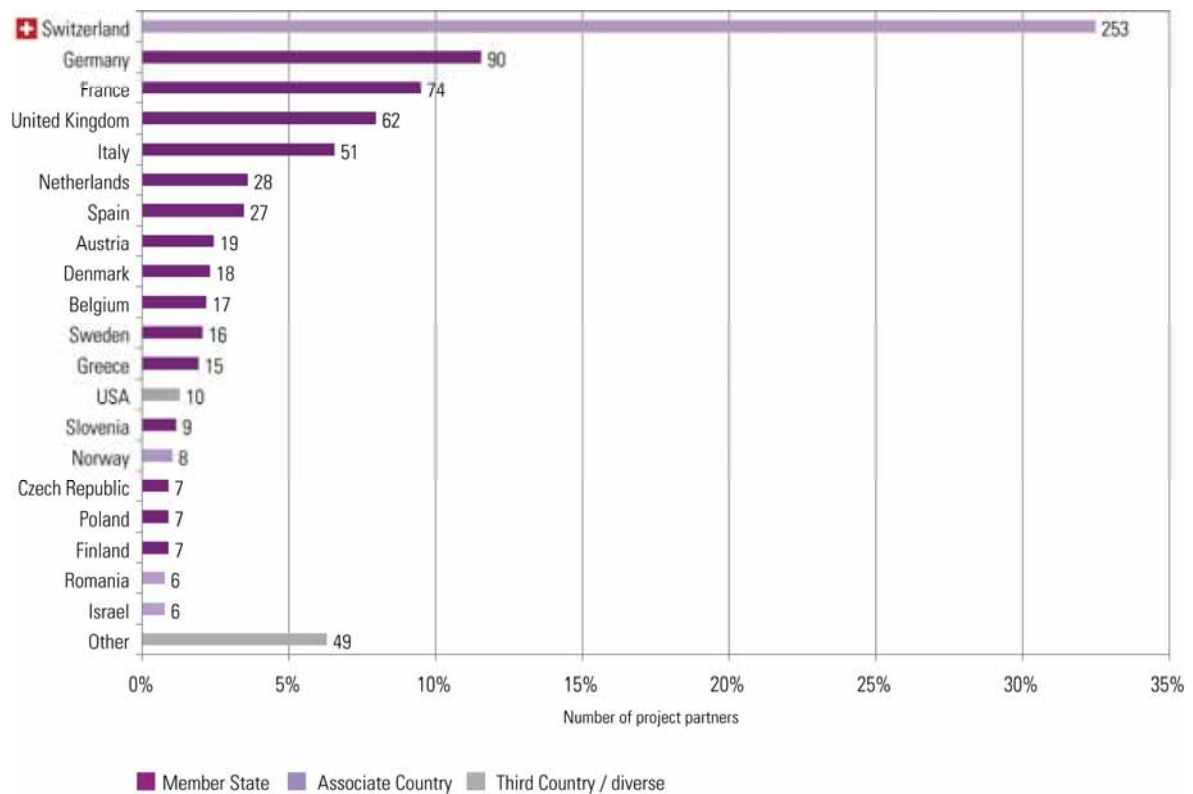
An essential component of European research projects is their collaborative aspect, which results in various partners being integrated into international networks of collaboration. It is often the project manager who brings together the different partners. In the 185 projects of FP6 that are coordinated by Swiss researchers (see Paragraph 4.3.1), it is unsurprisingly the Swiss partners who are the best represented, with an average proportion of 32.5%. Swiss researchers account for more than twice the number of the best represented foreign partner, Germany, with 11.6%. In general, even if the best represented nationalities in the projects coordinated by Switzerland are the large EU Member States, the United States, the best represented third country in the list of partners, is ahead of certain other European countries, in particular countries from former Eastern Europe (some of which are not shown on the graph).

Did you know?

1/3

of project partners are Swiss in the case of projects coordinated by Swiss teams

Figure 19: Number of partners by nationality in Swiss coordinated projects of the 6<sup>th</sup> European Research Framework Programme



Source : European Commission, State Secretariat for Education and Research, see Table 17

#### 4.5.2 Nationalities of coordinators of projects with Swiss participation

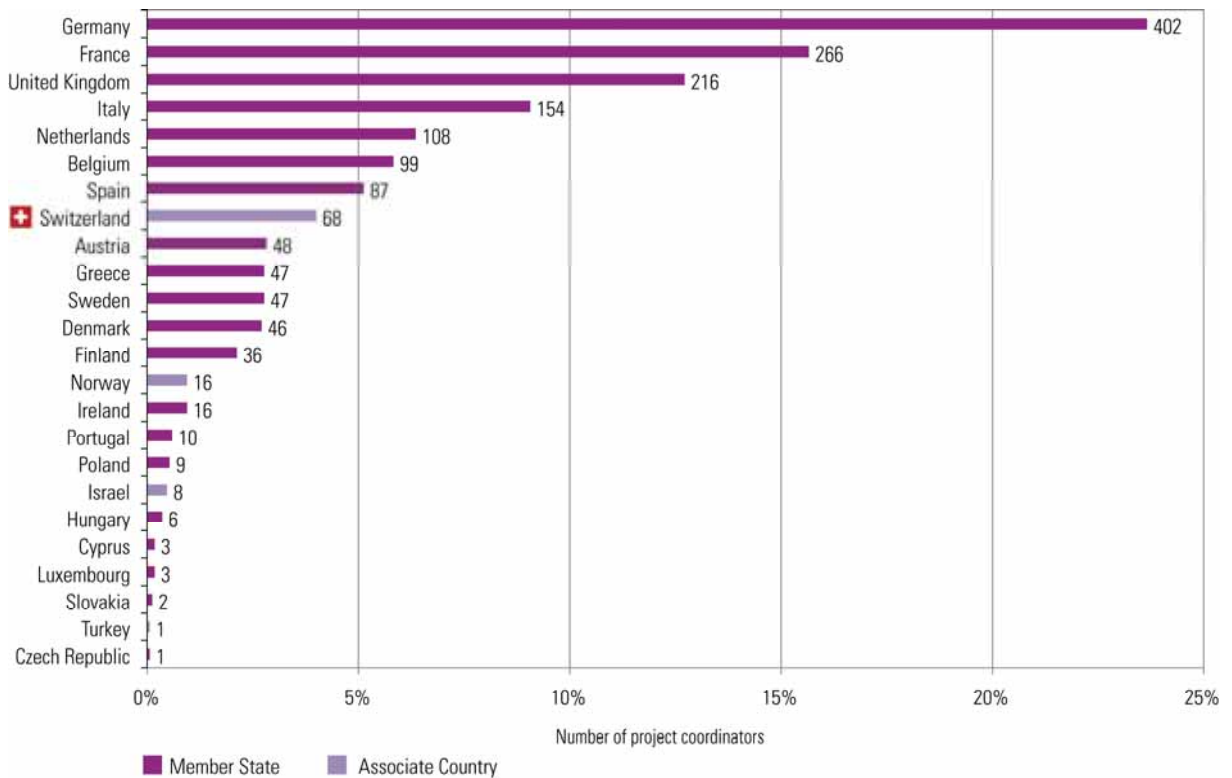
The previous paragraph gives rise to the following question: what country do the project coordinators forming partnerships with Swiss researchers come from? It is very clearly German researchers who coordinate almost one quarter (23.7%) of the projects in which Switzerland is involved that come out in first place once again. The other coordinators primarily come from France (15.7%), the UK (12.7%) and Italy (9.1%). This is hardly surprising in so far as they coordinate a total of almost 53% of all FP6 projects (see Paragraph 4.6.2). As for Switzerland, it appears in 8th place (4.0%) as far as the number of coordinators of projects with Swiss participation is concerned, but only appears in 13<sup>th</sup> place (1.9%, see Paragraph 4.6.2) when all of the FP6 projects are taken into consideration. Once again, this reflects the natural affinity that Swiss coordinators have with Swiss project partners.

Did you know?

1/4

of the projects with Swiss participation are coordinated by German teams

Figure 20: Nationalities of coordinators of projects with Swiss participation in the 6<sup>th</sup> European Research Framework Programme



Source : European Commission, State Secretariat for Education and Research, see Table 18

### 4.5.3 Number of collaborations with foreign teams

The number of collaborative links across all of the FP6 projects acts as a more precise indicator of the extent to which many countries are collaborating. One collaborative link is counted between two countries each time two teams from these countries are partners (irrespective of whether this is as participants or coordinators) on the same FP6 project<sup>11</sup>. Switzerland collaborates the most (Table 19) with Germany (5 550 collaborations), France (3 955), the UK (3 950) and Italy (3 188). The fact that it collaborates a great deal with these countries is not specific to Switzerland; these countries are simply very actively involved in FP6, as we have already seen. The size effects have been neutralised in order to focus upon the collaborative affinities that exist between the various countries, by taking into account the collaboration indices between countries<sup>12</sup> presented in Table 20 and in the figure below.

Relatively high values prevail diagonally across Table 20 (containing the collaboration indices between one country and itself). This confirms the observation that participants from the same country working on one and the same project are over-represented. This therefore signals a tendency to establish projects on the basis of national partnerships backed up by partners from other countries rather than on a truly international basis.

Once the size effects have been eliminated, Switzerland demonstrates the behaviour of an average partner and has no particular affinity with one or another country, with the exception of Liechtenstein. However, the Switzerland-Switzerland collaboration index (-0.06) is fairly low compared to the indices of other countries collaborating with themselves (which can increase to over 0.8 for Iceland and Luxembourg). This low index shows that Switzerland has a less marked tendency than other countries to seek to collaborate with national teams and is therefore much more open to collaborating with other countries. Switzerland collaborates the least with the following countries (Table 20): Malta (IC=-0.31), Latvia (-0.25), Turkey (-0.25), Hungary (-0.24), Slovakia (-0.21) and Luxembourg (-0.20).

Did you know?

32 223

was the number of research collaborations taking place between Switzerland and Member States and Associate Countries during FP6

Figure 21: Collaboration indices (CI) between Switzerland, Member States (bold) and Associate Countries for projects of the 6<sup>th</sup> European Research Framework Programme

	<b>AT</b>	<b>BE</b>	BG	CH	<b>CY</b>	<b>CZ</b>	<b>DE</b>	<b>DK</b>	<b>EE</b>	<b>EL</b>	<b>ES</b>	<b>FI</b>	<b>FR</b>	HR	<b>HU</b>	<b>IE</b>	IL
CH																	
	IS	<b>IT</b>	<b>LI</b>	<b>LT</b>	<b>LU</b>	<b>LV</b>	<b>MT</b>	<b>NL</b>	NO	<b>PL</b>	<b>PT</b>	RO	<b>SE</b>	<b>SI</b>	<b>SK</b>	TR	<b>UK</b>
CH																	

- Colour code :
- : Inexistent or very weak collaboration (-1 to -0.6),
  - : Weak collaboration (-0.6 to -0.2),
  - : Average collaboration (-0.2 to 0.2),
  - : Strong collaboration (0.2 to 0.6)
  - : Inexistent or very weak collaboration (0.6 to 1)

Source : European Commission, State Secretariat for Education and Research, see Table 20

<sup>11</sup> More precisely, when a project has  $n$  participants from one country and  $m$  from another, this results in  $n \cdot (n-1)/2$  collaborative links between the first country and itself,  $m \cdot (m-1)/2$  collaborative links between the second country and itself and  $n \cdot m$  collaborative links between the first country and the second. Overall, a project involving  $p$  partners produces  $p \cdot (p-1)/2$  collaborative links.

<sup>12</sup> This collaboration index is calculated in a similar manner to the collaboration index between the different types of institution (see note 1, p. 61, replace "type" by "country")

#### 4.5.4 FP6 collaborations in Europe

The collaboration indices give an indication of the level of bilateral cooperation taking place between the countries considered.

However, the groups of countries that might have the greatest collaborative links with one another, can only be determined with great difficulty. A correspondence factor analysis (CFA) based on the collaboration<sup>13</sup> indices makes it possible to draw up a map on which all of the Member States and Associate Countries are positioned in such a way that:

- Two countries are positioned closer together the more they collaborate intensively with one another;
- A country is positioned further away from the origin of the graph, the more specialized its collaboration profile is.

The analysis is a fairly accurate reflection of the geographical map of Europe which conveys the fact that the majority of FP6 collaborations (not including a country's internal collaborations) took place between neighbouring countries. In other words, geographic proximity has a highly positive impact on collaborative affinities.

The first axis (horizontal) contrasts the former Eastern European countries and the new Member States with the countries of Western Europe. These two groups form two fairly distinctive blocks. The second axis (vertical) contrasts the countries of Northern Europe with those of Southern Europe. It is very clear that there are three groups of countries that are very selective in terms of the countries with whom they collaborate:

- 1) around Estonia (EE), Latvia (LV) and Lithuania (LT);
- 2) around the countries of South Eastern Europe: Bulgaria (BG), Turkey (TR), Romania (RO), Croatia (HR), Cyprus (CY) and Malta (MT). It is noticeable here that whilst Israel (IL) is situated geographically in the far South East of Europe, it is closer to the centre of Europe in terms of its collaborations;
- 3) around Hungary (HU), Slovenia (SI), Luxembourg (LU) and Slovakia (SK);

and a fourth group that is made up of Western European countries that are not very selective when it comes to choosing the countries with whom they collaborate. However, this fourth group reveals particular affinities between Scandinavian countries (Norway (NO), Denmark (DK), Sweden (SE) and Finland (FI)) and between Southern European countries (Greece (EL), Italy (IT), Portugal (PT), Spain (ES) and Israel (IL)).

By virtue of its central position on the map, Switzerland is both very well integrated into the network of large Western European countries and not very selective when it comes to choosing the nationality of its partners. This, coupled with the fact that Switzerland is not very specialised in terms of the research topics with which it deals (see Paragraph 4.6.4), is welcome news: despite the fact that the country is small, Switzerland is a "large-scale researcher": Switzerland-based researchers collaborated willingly with all of the other countries that took part and was actively involved in virtually all of the research priorities offered as part of FP6.

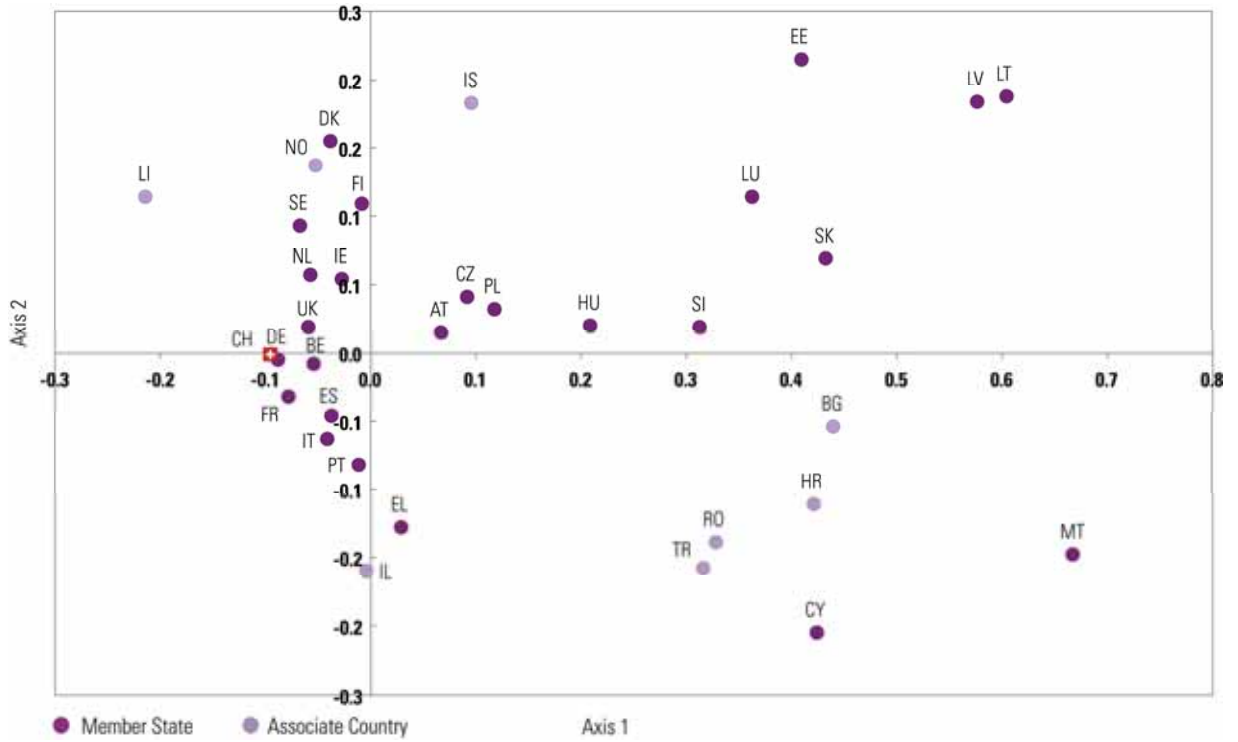
#### Did you know?

Swiss researchers collaborated with researchers from all of the other countries that participated in FP6 and were actively involved in virtually all of the research priorities.

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<sup>13</sup> See note 4, p. 62

Figure 22: Collaboration proximities map of the Member States and Associate Countries (correspondence factor analysis of Table 19). The closer two countries are on the map, the more they collaborated in projects of the 6<sup>th</sup> European Research Framework Programme.





## 4.6 Switzerland's position within the European Research Area

### 4.6.1 Number of participants by country

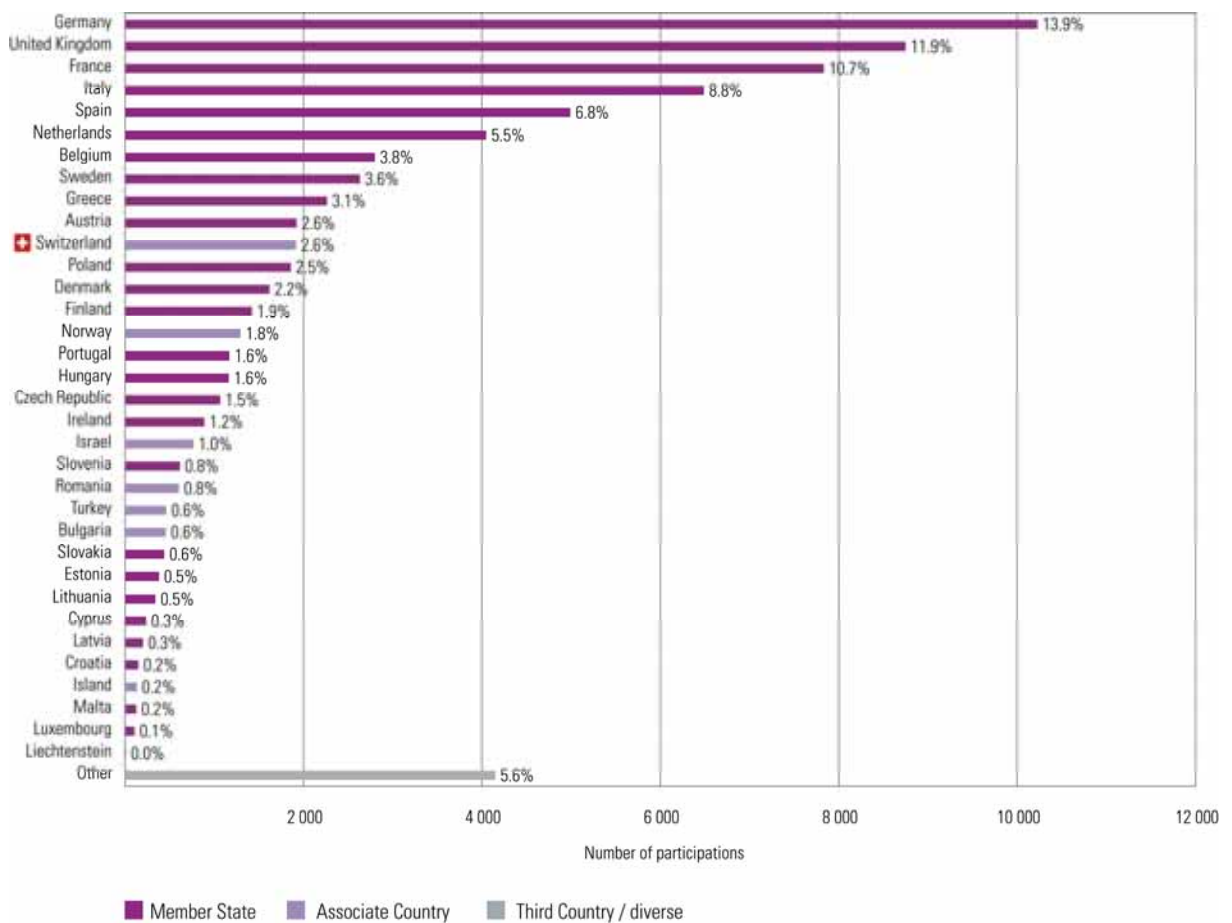
When all of the countries that took part in FP6 are ranked according to the number of participations, Switzerland appears in 11th place. Swiss researchers taking part in FP6 accounted for 2.6% of participations. This is the equivalent of 1914 participations in 1355 different research projects. The proportion of participations is over 10% in the case of Germany (13.9%), the UK (11.9%) and France (10.7%), which occupy the top three places in this ranking.

Did you know?

2.6%

of all participations in FP6 were Swiss

Figure 23: Number of participations (coordinations included) by country in the 6<sup>th</sup> European Research Framework Programme



Source : European Commission, State Secretariat for Education and Research, see Table 21

#### 4.6.2 Number of coordinations by country

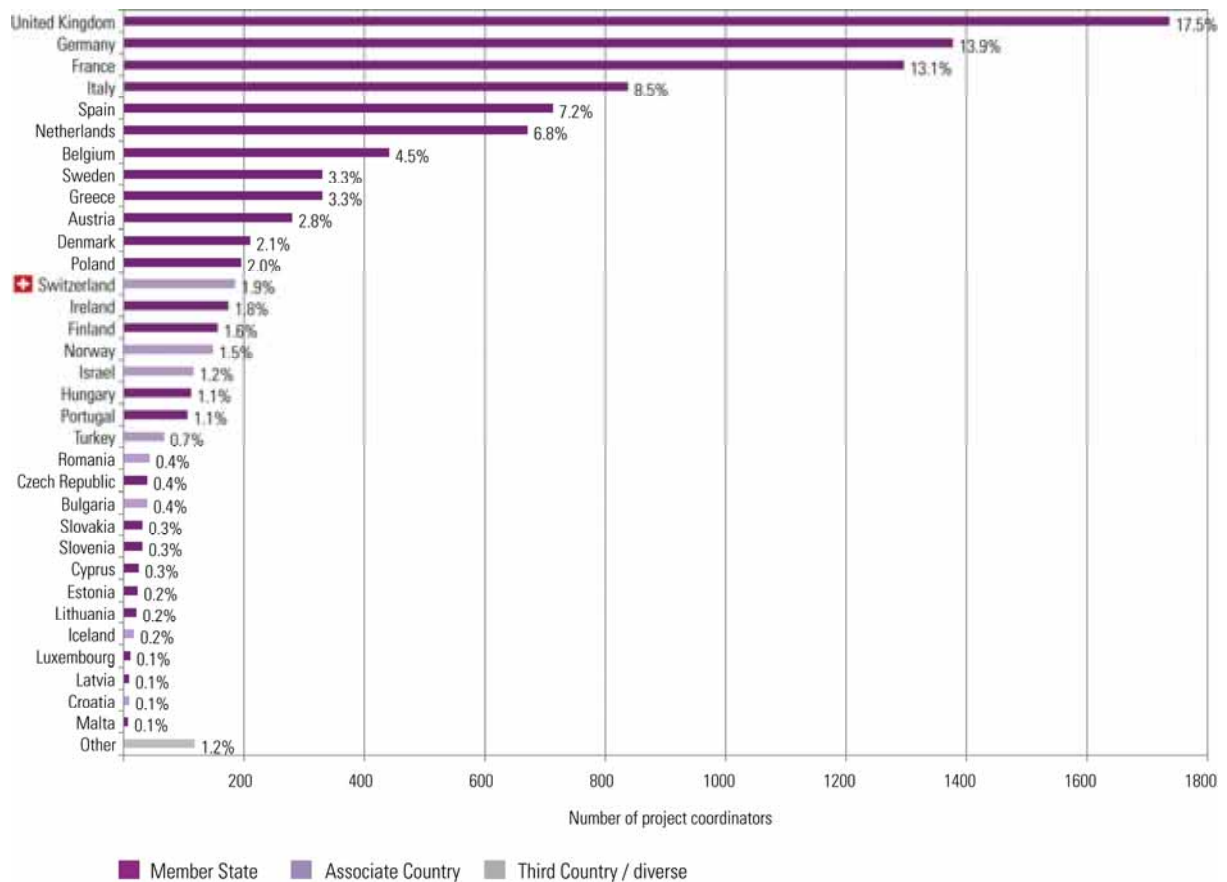
The ranking of all of the countries according to the number of coordinations produces very similar results to the ranking according to the number of participations, with the particular exception of Switzerland's position in the ranking. Switzerland coordinated only 1.9% of FP6 projects. Let us remember here that the role of project coordinator has only been open to Swiss researchers since 2004, the first year that Switzerland was fully associated to FP6. It is therefore necessary to consider that the figure 1.9% accounts for the number of projects coordinated over three years for Switzerland, and four years for other countries.

Did you know?

1.9%

of FP6 projects were coordinated by teams from Switzerland.

Figure 24: Number of project coordinators by country in the 6<sup>th</sup> European Research Framework Programme



Source : European Commission, State Secretariat for Education and Research, see Table 21

### 4.6.3 Committed subsidies in the participating countries

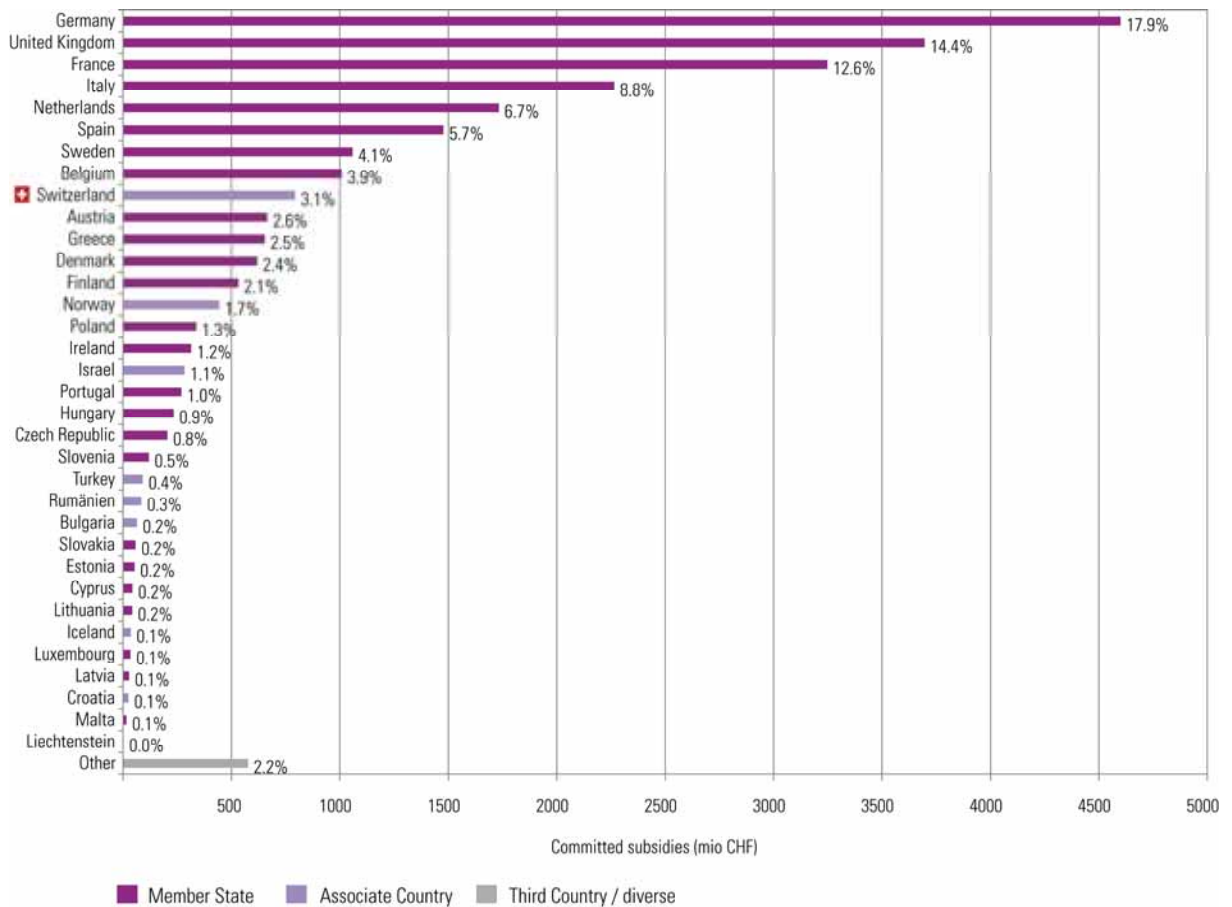
Of the countries receiving the most subsidies from FP6, Switzerland is ranked number 9, whereas it appears in 11<sup>th</sup> place in the ranking according to the number of participations. It is Austria and Greece that come to be ranked behind Switzerland in comparison to the first ranking. This is explained by the fact that, compared to the researchers from these two countries, Swiss researchers are, on average, involved in larger projects. The three largest participants that have already been mentioned receive between 12.6% (France) and 17.9% (Germany) of all of the European subsidies, whilst 3.1% of these go to Swiss researchers. This proportion represents a total of CHF 793 million for the entire duration of FP6.

Did you know?

9<sup>th</sup>

is where Switzerland ranks in the list of countries receiving the most subsidies from FP6

Figure 25: Committed subsidies by country in the 6<sup>th</sup> European Research Framework Programme



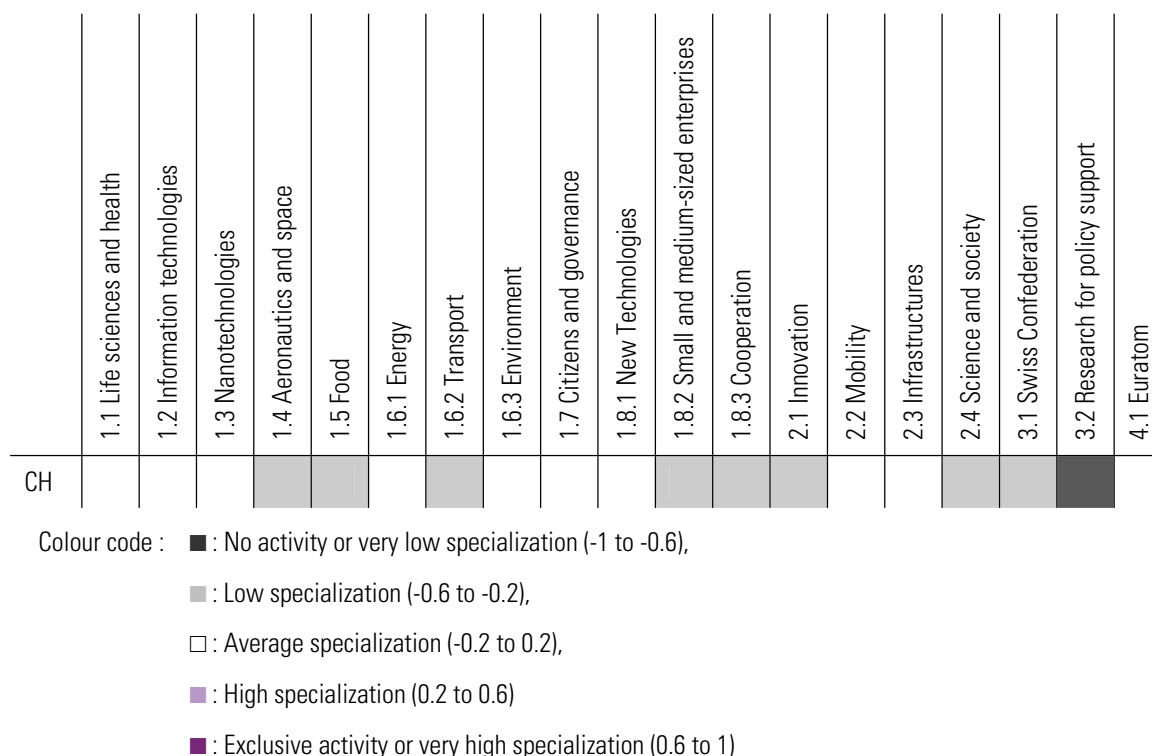
Source : European Commission, State Secretariat for Education and Research, see Table 21

#### 4.6.4 Switzerland's thematic specialization compared to other countries

In Paragraph 4.4.3, we characterised the thematic specialization of different types of Swiss research institutions within a purely national context. It is also interesting to see whether the Swiss R&D system as a whole is specialized in relation to other European countries as far as taking part in FP6 projects is concerned. In this regard, we consider the specialization indices (SI)<sup>14</sup> of the Member States and Associate Countries, which are defined in a similar manner to the specialization indices of the types of Swiss institutions, on the basis of the number of subsidies received per country and by research area. These indices are presented in Table 22 and in the figure below.

Of the seven thematic research priorities (1.1 to 1.7), it is noted first of all that Switzerland is not heavily specialized in any one particular area, even though it is involved in a far greater number of activities than the European average in the area of life sciences and health (SI=0.18), nanotechnologies (0.10) and information technologies (0.09). However, it has relatively little involvement in aeronautics and space (SI=-0.45), food (-0.30) and transport (-0.26). Swiss researchers show themselves to be less actively involved in the remaining priorities than their European counterparts as far as innovation (IS=-0.53) and the coordination of national research programmes (-0.49) are concerned. Finally, two areas in which Switzerland's specialization index is particularly low are: firstly, research activities for SMEs (IS=-0.53), which is primarily aimed at SMEs that do not have the necessary resources to conduct the research that they require. Switzerland's relatively low participation in this area is therefore rather a sign that Swiss SMEs are in good form (see Paragraph 4.4.1). Secondly, the area of development of research and innovation policies (IS=-1.00), in which Switzerland is not involved at all, focuses on developing European policies. It can therefore be reasonably expected *a priori* that Swiss researchers will be less interested in this area than other Member States, as is demonstrated by the fact that a certain number of other small Associate Countries are also not involved in this thematic area (Table 22).

Figure 26: Thematic specialization indices (SI)<sup>14</sup> of Switzerland in relation to Member States and Associate Countries, calculated on the basis of committed subsidies in the 6<sup>th</sup> European Research Framework Programme



Source : European Commission, SER, see Table 22

<sup>14</sup> The specialization index of a country for a given area is defined in a similar manner to the one of an institution type for an area (see note 2, p. 58, replace « institution type » by « country »).

## 4.7 Financial aspects

### 4.7.1 The FPs and the promotion of Research and Development in Switzerland

The graph below takes account of the financial resources invested by the Confederation in order to promote research, with the particular exception of basic funding for Swiss tertiary-level institutions and research projects conducted directly by the federal administration. For 2006, the total contribution made by the Confederation to European Framework Programmes amounted to CHF 274 million, whereas CHF 435 million were allocated to the National Science Foundation (NSF). European research therefore occupies second place behind research and development that is supported by funding from Switzerland. Following the regular growth of FP budgets, expenditures for the FP could even get closer to the expenditures of the NSF in the near future.

A large amount of the research carried out by Switzerland is carried out by Swiss tertiary-level institutions - which are also subsidised by the Confederation - or by companies. The total expenditure on R&D in Switzerland was close to CHF 13.1 billion for 2004, CHF 9.1 billion (69.8%) of which came from the private sector and 3.0 billion (22.7%) from the public authorities<sup>15</sup>. Although the contribution made by Switzerland to the Framework Programmes accounts for a large part of the national budget allocated to promoting research, it still only represents around 2% of the total expenditure on research and development in Switzerland.

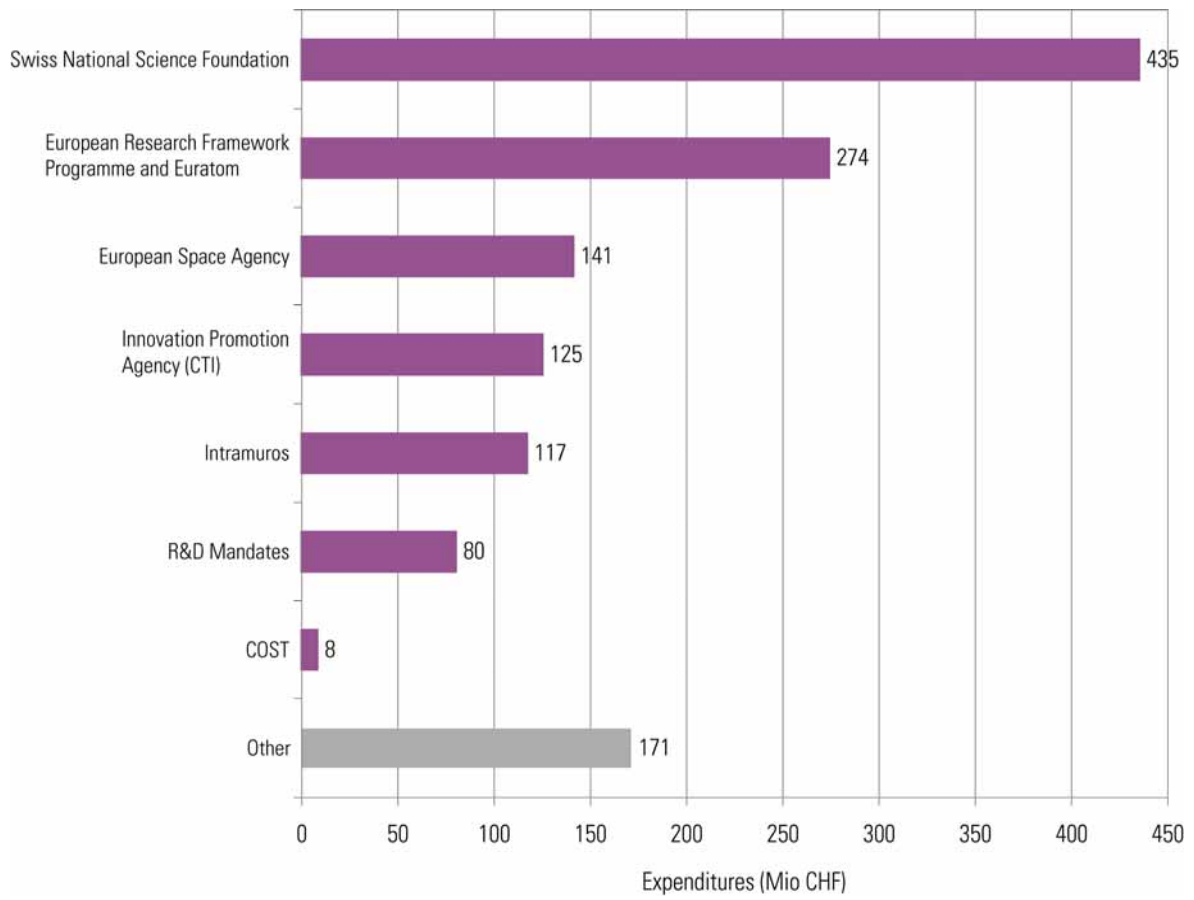
Switzerland's expenditure on European research (FP6) presented in Figure 27 includes its contribution to the Euratom programme, as well as support measures designed to encourage Switzerland's participation in European research projects. These measures include in particular:

1. Funding the information network Euresearch, which is aimed at motivating, informing and advising Swiss researchers participating, or wishing to participate, in a European project. In 2006, the final year of FP6, over 11 000 people were constantly kept informed, via an electronic alert system, of the various opportunities for taking part and more than 5000 bilateral contacts were established between Swiss researchers and one of the Euresearch offices established by the ten universities and two FITs in Switzerland;
2. Encouraging Swiss researchers to coordinate a project through the payment of a one-off allowance of CHF 6000, designed to partially cover the additional costs associated with project administration. 84 Swiss coordinators benefited from this allowance over the entire course of FP6;
3. Encouraging SMEs to take part by providing funding to the tune of CHF 6000 to cover project preparation costs for SMEs participating in a European project for the first time. This allowance was paid to 155 Swiss SMEs during FP6.

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<sup>15</sup> R&D Statistics, Swiss Federal Statistical Office, 2004

Figure 27: Swiss public expenditures in direct support of research in 2006 (mio CHF)

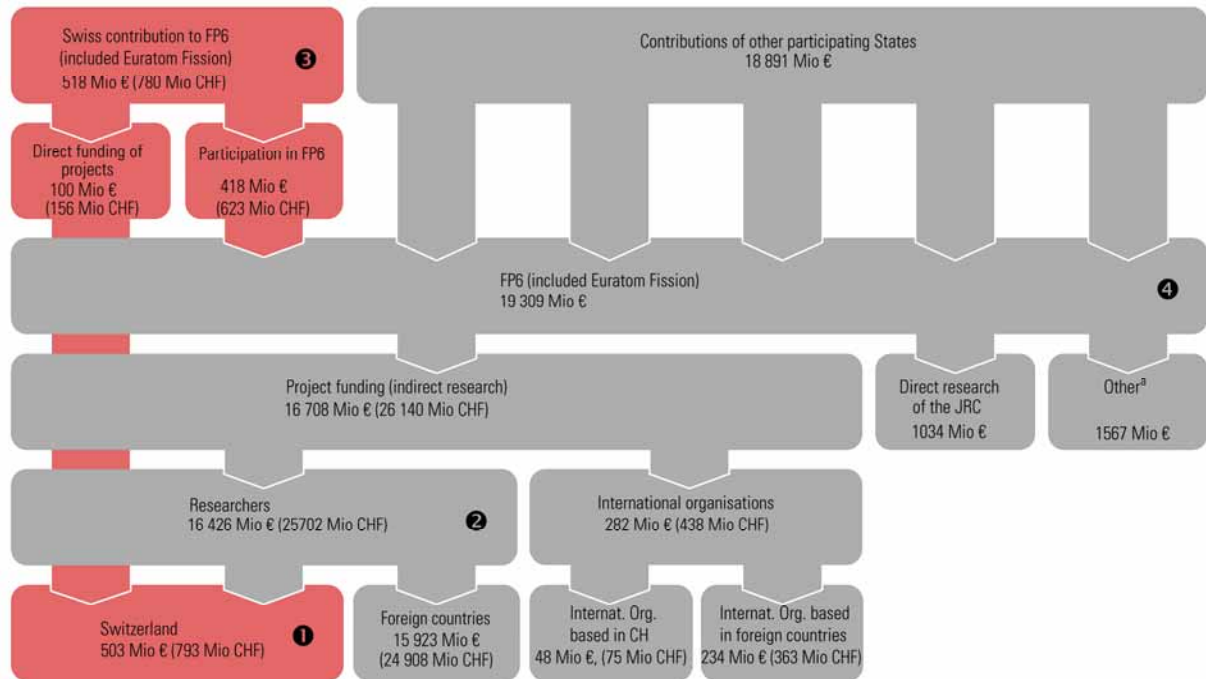


Source : Flux financiers 2006 dans le domaine de la formation tertiaire, de la recherche et de la technologie, SER

#### 4.7.2 Flow of financial resources in FP6

Prior to Switzerland's association to FP6, Swiss researchers taking part in a European project were funded directly by the State Secretariat for Education and Research (SER). These projects required financial investment from the Confederation to the tune of CHF 156 million (this sum still varies very slightly as the actual payments are made). The second part of Switzerland's financial contribution to FP6 was made in the form of payments to the European Union, which had, in turn, funded Swiss researchers since Switzerland's association. These contributions, which amounted to CHF 623 million (not including Euratom Fusion), were paid between 2004 and 2006.

Figure 28: Flow of financial resources in the 6<sup>th</sup> European Research Framework Programme



Source : EUR-Lex, State Secretariat for Education and Research

<sup>a</sup> Evaluation, monitoring and administration of projects, INTAS contribution, contracts resulting from calls for tenders rather than calls for proposals, contracts still missing in the current database.

#### 4.7.3 Financial return for Switzerland

All of the Swiss researchers that took part in FP6 received subsidies totalling CHF 793 million. Switzerland therefore made a positive net financial return, which is very likely to increase once the final Swiss participations are known. This is equivalent to EUR 503 million (①), or 3.06% of the EUR 16.43 billion (②) available for funding researchers of all nationalities (with the exception of international organisations). Additional EUR 48 million were awarded to international organisations based in Switzerland (mainly CERN, the UN and affiliated agencies).

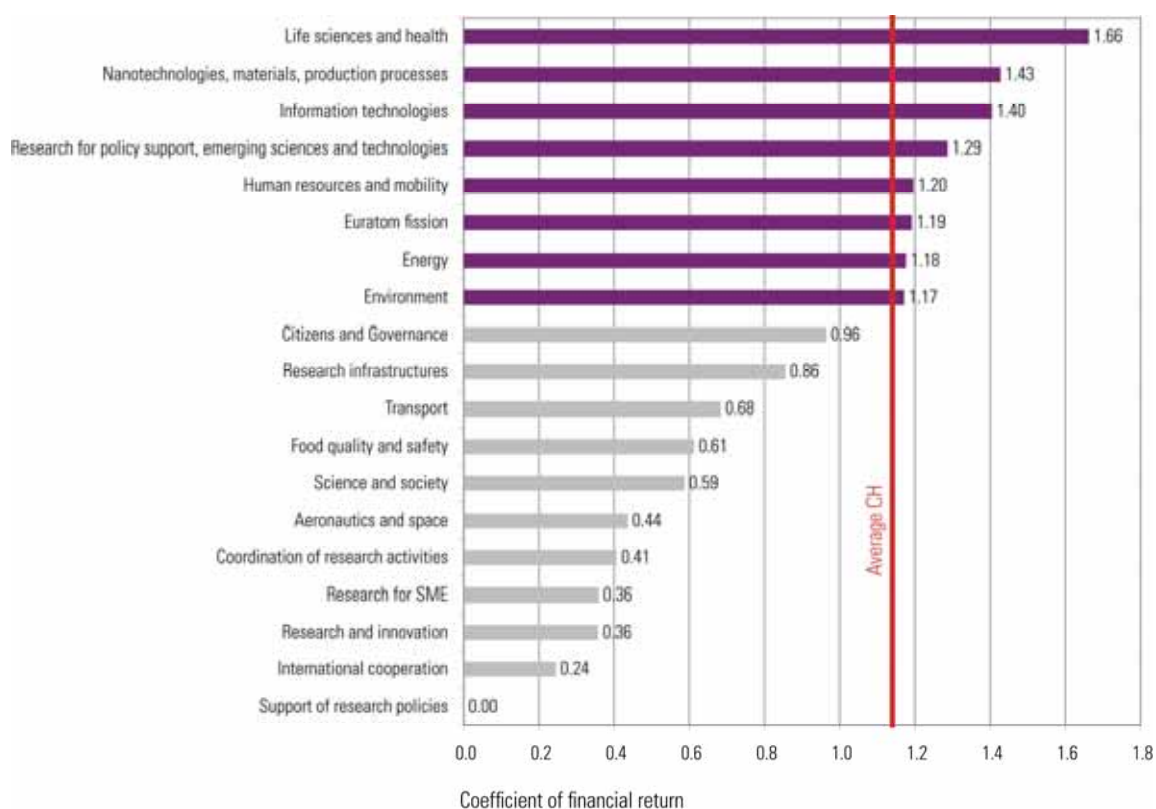
The total contributions made by Switzerland to FP6, as far as participation on a project by project basis and as an Associate Country was concerned, amounted to CHF 780 million, or EUR 518 million (③). This sum represents 2.68% of the EUR 19.31 billion (④) that were effectively spent by the European Union to fund FP6 (i.e. not including the Euratom Fusion programme).

It is possible to estimate the competitiveness of Swiss researchers in relation to all of the participants in terms of ability to raise European funding by means of the coefficient of financial return. The coefficient of financial return is calculated as the ratio of the proportion of subsidies awarded to Swiss researchers divided by the share of contribution made by Switzerland to the funding of FP6 and is therefore equal to  $3.06\%/2.68\% = 1.14$ . This index is equal to 1 if all of the participants in FP6 are taken into consideration or if the researchers of a certain country

receive exactly the same proportion of the subsidies as the share of contribution made by their country to the funding of FP6. Swiss researchers are therefore more competitive than the average participant when it comes to raising European funds compared to the level of investment made by Switzerland.

The coefficient of financial return can be calculated in a similar manner for each of the research areas from the proportion of investments awarded to Swiss researchers per area (Table 15). This gives the following figures:

Figure 29: Coefficient of financial return by research priority for the 6<sup>th</sup> European Research Framework Programme. Violet bars (■) represent priorities for which the coefficient is greater than the “juste retour” of 1



Source : European Commission, State Secretariat for Education and Research)

The areas in which the coefficient of financial return is greater than 1 are also those whose coefficient is greater than the Swiss average of 1.14. This graph clearly shows that Switzerland is very competitive in the three areas in which it is most active, namely, life sciences and health, nanotechnologies and information technologies. The coefficient of financial return for these three areas exceeds the 1.4 mark and even reaches 1.66 for life sciences and health.



## Annex A Methodological notes

Prior to Switzerland's association to the FPs, Swiss researchers taking part in a European project were funded directly by the State Secretariat for Education and Research (SER). The SER set up a database of Swiss participants that took part in Framework Programmes for Research dating as far back as FP3 (EuroIMS), in order to manage the administration of this funding. Since Switzerland gained Associate Country status, Swiss researchers taking part in the FPs have been funded directly by the European Union. The European Commission regularly supplies the SER with a database containing all of the details of the participants taking part in FP6. The data relating to Swiss participants contained in this database is then verified and corrected at the SER. Unless otherwise specified, the data used in this report is taken from the SER internal database (extracted on 12 December 2007) for participants taking part prior to Switzerland's affiliation and from the European Commission database (issue dated 26 November 2007) for participants taking part after Switzerland's association. The latter database contains over 99% of the projects that form part of FP6. Information on the remaining projects is expected in May 2008. This relative delay is due to the fact that, even though FP6 formally covers the period from 2003 to 2006, some contracts were still being signed up until the end of 2007. The date on which projects commenced whose contracts were still at the negotiation or preparation stages on 26 November 2007, is obviously missing from the database for the time being. We allocate the arbitrary date of 31 December 2007, the final deadline for signing a FP6 contract, to these projects.

The EUR/CHF exchange rate used to compare the subsidies paid in euros by the European Commission and those paid in Swiss francs by the Confederation is the average rate for the month in which each project commenced. The contributions made by Switzerland to FP6, calculated in euros, were paid at an exchange rate that varied between CHF/EUR 1.49 and 1.55 between 2004 and 2006. Moreover, unless otherwise specified, all of the subsidy amounts published here refer to the financial commitments and not to actual payments received by researchers.

International organisations are not taken into account for the purposes of establishing the results published here. This is due, on the one hand, to the fact that researchers submitting a European project whose host institution is an international organisation are difficult to attribute to any given country, and on the other hand, to the fact that research carried out at an international organisation is not necessarily carried out in the country in which this organisation is based. It is often therefore the case that the funding associated with the research is not used in the country in question. International organisations received subsidies totalling EUR 282 million as part of FP6, EUR 48 million of which went to international organisations based in Switzerland.

In fact, the figures presented in this document do not take into account research into nuclear fusion carried out by Euratom. This organisation is subject to a specific European Treaty and has its own Research Framework Programme to which Switzerland makes a financial contribution that is separate to the one made to European Research Framework Programmes.

## Annex B List of the research priorities of FP6

FP6: Three Main Blocks of Activities							
Block 1: Focusing and Integrating European Research							
7 Priority Thematic Areas						Specific activities Covering a Wider Field of Research	
1.1 Life sciences, genomics and biotechnology for health	1.2 Information society technologies	1.3 Nanotechnologies and nano-sciences, knowledge-based functional materials, new production processes and devices	1.4 Aeronautics and space	1.5 Food quality and safety	1.6 Sustainable development, global change and ecosystems 1.6.1 Energy 1.6.2 Transport 1.6.3 Environment	1.7 Citizens and governance in a knowledge-based society	1.8.1 a) Research for policy support , b) New and emerging science and technologies (NEST)  1.8.2 Specific research activities for SMEs  1.8.3 Specific international co-operation activities
Block 2: Structuring the ERA						Block 3: Strengthening the foundations of ERA	
2.1 Research and Innovation	2.2 Human resources and Mobility (Marie Curie actions)	2.3 Research infrastructures	2.4 Science and society	3.1 Co-ordination of research activities	3.2 Development of research/innovation policies		
Block 4 : Euratom Programme							
4.1 Euratom Fission			4.2 Euratom Fusion				
Block 5 : Activities of the Joint Research Centre (JRC)							

Source: CORDIS

## Annex C Index of the abbreviations used

CERN	European Laboratory for Particle Physics
CORDIS	Community Research and Development Information Service ( <a href="http://cordis.europa.eu/en/home.html">http://cordis.europa.eu/en/home.html</a> )
ERA	European Research Area
FIT	FIT domain: Switzerland's two Federal Institutes of Technology (i.e. the EPF in Lausanne and the ETH in Zurich) and their associated research institutes: the Research Institute for Material Science and Technology (EMPA), the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL), the Swiss Federal Institute of Aquatic Science and Technology (EAWAG) and the Paul Scherrer Institute (PSI)
EURATOM	European Atomic Energy Community (which funds its own Research Framework Programme)
UAS	Universities of applied sciences
NPO	Non-profit organisation (most often a research institution that is funded by a foundation)
JRC	Joint Research Centre of the European Commission
OECD	Organisation for Economic Co-operation and Development
UN	The United Nations
FP	European Framework Programme for Research, Technological Development and Demonstration Activities
SMEs	Small and medium-sized enterprises
EU	European Union

### Abbreviations of country names

Abk.	Status	Name	Abk.	Status	Name
AT	Member State	Austria	IS	Associate Country	Iceland
BE	Member State	Belgium	IT	Member State	Italy
BG	Associate Country	Bulgaria	LI	Associate Country	Liechtenstein
CH	Associate Country	Switzerland	LT	Member State	Lithuania
CY	Member State	Cyprus	LU	Member State	Luxemburg
CZ	Member State	Czech Republic	LV	Member State	Latvia
DE	Member State	Germany	MT	Member State	Malta
DK	Member State	Denmark	NL	Member State	Netherlands
EE	Member State	Estonia	NO	Associate Country	Norway
EL	Member State	Greece	PL	Member State	Poland
ES	Member State	Spain	PT	Member State	Portugal
FI	Member State	Finland	RO	Associate Country	Romania
FR	Member State	France	SE	Member State	Sweden
HR	Member State	Croatia	SI	Member State	Slovenia
HU	Member State	Hungary	SK	Member State	Slovakia
IE	Member State	Ireland	TR	Associate Country	Turkey
IL	Associate Country	Israel	UK	Member State	United Kingdom

## Annex D Tables

The tables are available in electronic format at the following web address:  
[http://www.sbf.admin.ch/hm/themen/international/eu-frp\\_en.html](http://www.sbf.admin.ch/hm/themen/international/eu-frp_en.html)

Table 1: Budgets of the European Research Framework Programmes (bn current ECU/EUR) and Gross Domestic Expenditure on Research and Development (GERD) of the European Union (bn current purchasing power parities USD)

	FP1	FP2	FP3	FP4	FP5	FP6	FP7	Total	GERD
1984	593,0							593,0	72,1
1985	735,0							735,0	80,1
1986	874,0							874,0	85,1
1987	701,8	188,1						889,9	91,7
1988	260,8	810,6						1 071,4	98,6
1989	101,1	1241,3						1 342,4	106,8
1990	4,9	1 596,9						1 601,8	115,1
1991		1 270,7	296,0					1 566,7	121,1
1992		230,9	2 160,5					2 391,4	123,6
1993		14,8	2 079,5					2 094,3	125,9
1994		3,9	2 014,7					2 018,6	128,7
1995		0,2	1,0	2 982,5				2 983,7	133,5
1996				3 153,5				3 153,5	139,1
1997				3 485,6				3 485,6	145,4
1998				3 499,3				3 499,3	152,5
1999					3 337,5			3 337,5	163,0
2000					3 607,4			3 607,4	175,9
2001					3 870,8			3 870,8	187,0
2002					4 038,0			4 038,0	196,7
2003						4 029,3		4 029,3	201,0
2004						4 784,5		4 784,5	216,4
2005						5 047,8		5 047,8	226,8
2006						5 251,5		5 251,5	237,3 <sup>b</sup>
2007							5 082,0	5 082,0	
2008							5 579,1	5 579,1	
2009							6 119,1	6 119,1	
2010							6 932,7	6 932,7	
2011							7 968,1	7 968,1	
2012							8 926,0	8 926,0	
2013							9 914,0	9 914,0	
<b>Total</b>	<b>3 270,6</b>	<b>5 357,4</b>	<b>6 551,7</b>	<b>13 120,9</b>	<b>14 853,7</b>	<b>19 113,0</b>	<b>50 521,0</b>	<b>112 788,3</b>	

Source : European Commission (COM(2004) 533, 786/2004/CE, COM(2005) 119 final) for FP budgets, OECD (MSTI 2006) for GERDs

<sup>a</sup> 1984-2003 : EU15, 2004-2006 : EU25

<sup>b</sup> estimation

Table 2: Breakdown of the average annual budgets of the FPs by research area (mio EUR)

		FP1	FP2	FP3	FP4	FP5	FP6	FP7
Energy + Euratom	Budget	409	295	349	590	594	573	650
	%	50 %	22 %	16 %	18 %	16 %	12 %	9 %
Information and communication technologies	Budget	204	563	830	918	891	1'051	1 227
	%	25 %	42 %	38 %	28 %	24 %	22 %	17 %
Industry and materials	Budget	90	214	328	525	594	382	505
	%	11 %	16 %	15 %	16 %	16 %	8 %	7 %
Environment	Budget	57	80	197	295	371	239	289
	%	7 %	6 %	9 %	9 %	10 %	5 %	4 %
Life sciences	Budget	41	94	218	426	594	860	1 083
	%	5 %	7 %	10 %	13 %	16 %	18 %	15 %
Mobility, Fellowships, Education	Budget	16	54	197	197	260	478	650
	%	2 %	4 %	9 %	6 %	7 %	10 %	9 %
International cooperation	Budget	-	27	44	131	111	96	-
	%	0 %	2 %	2 %	4 %	3 %	2 %	0 %
Innovation + SME	Budget	-	13	22	98	111	239	217
	%	0 %	1 %	1 %	3 %	3 %	5 %	3 %
Transport + Aeronautics	Budget	-	-	-	66	74	191	722
	%	0 %	0 %	0 %	2 %	2 %	4 %	10 %
Socioeconomics	Budget	-	-	-	33	37	96	144
	%	0 %	0 %	0 %	1 %	1 %	2 %	2 %
Basic research	Budget	-	-	-	-	-	143	1 010
	%	0 %	0 %	0 %	0 %	0 %	3 %	14 %
Other	Budget	-	-	-	-	74	430	722
	%	0 %	0 %	0 %	0 %	2 %	9 %	10 %
<b>Total</b>	<b>Budget</b>	<b>818</b>	<b>1 339</b>	<b>2 184</b>	<b>3 280</b>	<b>3 713</b>	<b>4 778</b>	<b>7 217</b>
	<b>%</b>	<b>100 %</b>	<b>100 %</b>	<b>100 %</b>	<b>100 %</b>	<b>100 %</b>	<b>100 %</b>	<b>100 %</b>

Source : European Commission, SER

Table 3: Breakdown of the FP6 budget by research priorities (mio EUR)

Research priority	Budget	%
1.1 Life sciences and health	2 514	13,2 %
1.2 Information technologies	3 984	20,8 %
1.3 Nanotechnologies, materials, Production processes	1 429	7,5 %
1.4 Aeronautics and space	1 182	6,2 %
1.5 Food quality and safety	753	3,9 %
1.6.1 Energy	890	4,7 %
1.6.2 Transport	670	3,5 %
1.6.3 Environment	769	4,0 %
1.7 Citizens and governance	247	1,3 %
1.8 Horizontal activities	1 409	7,4 %
2.1 Research and innovation	319	1,7 %
2.2 Human resources and mobility	1 732	9,1 %
2.3 Research infrastructures	715	3,7 %
2.4 Science and society	88	0,5 %
3 Strengthening of the ERA	347	1,8 %
4 Euratom	1 230	6,4 %
5 Activities of the Joint Research Center (JRC)	835	4,4 %
<b>Total</b>	<b>19 113</b>	

Source : European Commission (786/2004/CE).

Table 4: Number of new Swiss participations in the FPs

Year	FP3	FP4	FP5	FP6	Total
1992	69				69
1993	147				147
1994	194				194
1995	80	100			180
1996	9	391			400
1997	2	261			263
1998		411			411
1999		117	1		118
2000		7	494		501
2001		2	470		472
2002			468		468
2003			176	159	335
2004			4	499	503
2005				485	485
2006				571	571
2007				200	200
<b>Total</b>	<b>501</b>	<b>1 289</b>	<b>1 613</b>	<b>1 914</b>	<b>5 317</b>

Source : European Commission, SER

Table 5: Subsidies to Swiss participants since FP3 (mio CHF)

Year	Federal Institutes of Technology (FIT) domain		Universities		Universities of applied sciences		Industry		Small and medium-sized enterprises		Non-profit organizations (NPO)		Swiss Confederation		Local authorities		Other	
1992	14,3	32,5 %	5,4	12,2 %	0,0	0,0 %	23,2	53,0 %	1,0	2,3 %	0,0	0,0 %	0,0	0,0 %	0,0	0,0 %	0,0	0,0 %
1993	14,8	38,7 %	9,7	25,3 %	0,5	1,3 %	8,5	22,3 %	3,2	8,4 %	0,9	2,3 %	0,5	1,4 %	0,1	0,2 %	0,1	0,1 %
1994	15,2	41,6 %	11,7	32,1 %	1,2	3,2 %	4,3	11,8 %	2,6	7,1 %	1,0	2,8 %	0,1	0,3 %	0,4	1,0 %	0,1	0,2 %
1995	25,7	36,2 %	9,8	13,7 %	0,7	0,9 %	29,7	41,7 %	4,2	6,0 %	0,7	1,0 %	0,1	0,1 %	0,0	0,0 %	0,2	0,3 %
1996	36,7	32,6 %	32,2	28,6 %	0,0	0,0 %	21,9	19,5 %	14,0	12,4 %	6,3	5,6 %	0,6	0,5 %	0,8	0,7 %	0,1	0,1 %
1997	21,6	32,9 %	16,6	25,2 %	0,4	0,6 %	8,8	13,3 %	14,4	21,8 %	2,1	3,2 %	2,0	3,0 %	0,0	0,0 %	0,0	0,0 %
1998	33,7	33,4 %	22,5	22,3 %	2,9	2,9 %	13,7	13,6 %	15,4	15,3 %	9,7	9,6 %	2,4	2,4 %	0,5	0,5 %	<0,05	0,0 %
1999	5,2	29,3 %	3,5	19,8 %	0,6	3,2 %	2,1	11,7 %	4,6	25,8 %	1,1	6,4 %	0,6	3,2 %	0,1	0,5 %	<0,05	0,1 %
2000	60,0	37,1 %	43,4	26,9 %	1,8	1,1 %	16,1	9,9 %	28,1	17,4 %	7,9	4,9 %	1,5	0,9 %	2,8	1,7 %	0,1	0,0 %
2001	51,3	34,6 %	35,3	23,8 %	2,6	1,8 %	14,5	9,8 %	26,9	18,2 %	13,4	9,0 %	3,1	2,1 %	0,9	0,6 %	0,1	0,1 %
2002	36,8	30,2 %	34,8	28,5 %	3,0	2,5 %	18,2	14,9 %	17,1	14,1 %	7,9	6,5 %	2,2	1,8 %	1,0	0,8 %	0,8	0,6 %
2003	39,9	36,9 %	18,6	17,2 %	2,6	2,4 %	22,8	21,0 %	13,3	12,3 %	10,4	9,6 %	0,4	0,4 %	0,0	0,0 %	0,2	0,2 %
2004	70,0	36,3 %	56,2	29,2 %	4,6	2,4 %	18,9	9,8 %	22,6	11,7 %	15,5	8,0 %	3,8	2,0 %	0,9	0,5 %	0,0	0,0 %
2005	66,9	32,6 %	59,9	29,2 %	4,7	2,3 %	26,2	12,8 %	29,0	14,2 %	14,0	6,8 %	1,9	0,9 %	2,5	1,2 %	0,0	0,0 %
2006	81,8	33,7 %	70,1	28,9 %	4,2	1,7 %	26,0	10,7 %	32,8	13,5 %	23,7	9,8 %	2,8	1,2 %	1,2	0,5 %	0,0	0,0 %
2007	24,1	28,6 %	25,9	30,7 %	2,5	2,9 %	3,9	4,7 %	17,1	20,3 %	4,7	5,6 %	2,1	2,5 %	3,9	4,7 %	0,0	0,0 %

Source : European Commission, SER

Note : For FP6, the table gives committed subsidies, not effective payments.

Table 6: Subsidies committed for Swiss researchers since FP3 (mio CHF)

	FP3	FP4	FP5	FP6	Total
1992	43,9				43,9
1993	38,2				38,2
1994	36,6				36,6
1995	7,8	63,3			71,1
1996	0,1	112,5			112,6
1997	0,3	65,5			65,7
1998		101,0			101,0
1999		17,7	<0,05		17,7
2000		0,3	161,3		161,5
2001		0,1	148,2		148,2
2002			121,8		121,8
2003			39,0	69,3	108,3
2004			0,7	191,9	192,6
2005				205,1	205,1
2006				242,8	242,8
2007				84,3	84,3
<b>Total</b>	<b>126,8</b>	<b>360,2</b>	<b>470,9</b>	<b>793,4</b>	<b>1 751,3</b>

Source : European Commission, SER

Table 7: Subsidies paid to Swiss researchers since FP3 (mio CHF)

	FP3	FP4	FP5	FP6	Total
1992	11,1				11,1
1993	20,0				20,0
1994	39,7				39,7
1995	35,6	15,9			51,5
1996	13,4	53,9			67,4
1997	5,4	73,8			79,2
1998	0,9	77,5			78,4
1999	0,6	81,3	0,1		82,0
2000	<0,05	33,6	50,7		84,3
2001	<0,05	13,7	93,8		107,6
2002		6,8	115,2		122,0
2003		2,2	123,1	0,7	126,0
2004		1,0	39,0	53,8	93,9
2005		0,4	21,4	99,6	121,4
2006		<0,05	16,5	160,9	177,4
2007			11,0	198,7	209,7
2008			<0,05	154,8	154,8
2009				85,8	85,8
2010				30,9	30,9
2011 and +				8,2	8,2
<b>Total</b>	<b>126,8</b>	<b>360,2</b>	<b>470,9</b>	<b>793,4</b>	<b>1 751,3</b>

Source : European Commission, SER

<sup>a</sup> for FP6, payments are estimated by distributing uniformly commitments over projects' durations.

Table 8: Average structure of FP6 projects with Swiss participation

	Number of partners	Projects duration (months)	Commitments per partner (CHF)
Minimum	1	8	0
Maximum	137	72	5 124 279
Median	12	36	231 854
Average	19.1	41.0	414 509
Standard deviation	15.9	11.3	428 480

Source : European Commission, SER



Table 9: Number of participations and financial commitments by institution and priority for FP6

	Number of participations										Paid subsidies (Mio. CHF)											
	1.1 Life sciences and health	1.2 Information technologies	1.3 Nanotechnologies	1.4 Aeronautics and space	1.5 Food	1.6.1 Energy	1.6.2 Transport	1.6.3 Environment	1.7 Citizens and governance	1.8.1 New Technologies	1.8.2 SME	1.8.3 Cooperation	2.1 Innovation	2.2 Mobility	2.3 Infrastructures	2.4 Science and society	3.1 Coordination	4 Euratom	Number of participations	%	Paid subsidies (Mio. CHF)	%
EPFL	14	90	35	6	10	3	4	3	8	3	1	38	3	3	3	1	3	221	11,5 %	111,0	14,0 %	
ETHZ	22	63	13	7	5	9	16	15	15	1	5	54	3	3	1	1	1	221	11,5 %	98,1	12,4 %	
Other institutions of the FIT domain	1	6	21	3	2	17	3	29	6	1	2	13	8	8	17	17	17	129	6,7 %	61,3	7,7 %	
<b>Total FIT domain</b>	<b>37</b>	<b>159</b>	<b>69</b>	<b>16</b>	<b>7</b>	<b>36</b>	<b>12</b>	<b>49</b>	<b>4</b>	<b>29</b>	<b>4</b>	<b>7</b>	<b>1</b>	<b>105</b>	<b>14</b>	<b>1</b>	<b>0</b>	<b>571</b>	<b>29,8 %</b>	<b>270,4</b>	<b>34,1 %</b>	
UNIBAS	32	18	6	2	2	1	3	3	5	1	1	18	3	3	1	1	1	94	4,9 %	37,8	4,8 %	
UNIBE	11	1	2	2	2	2	15	5	5	1	2	15	1	1	1	1	1	62	3,2 %	26,7	3,4 %	
UNIFR	2	2	2	2	1	1	1	1	1	1	1	3	1	1	1	1	1	13	0,7 %	4,1	0,5 %	
UNIGE	32	25	7	7	2	2	2	6	6	2	1	20	3	3	1	1	1	107	5,6 %	51,7	6,5 %	
UNIL	18	4	4	4	2	2	2	5	5	2	1	12	1	1	2	1	1	50	2,6 %	21,8	2,7 %	
UNILU	1	7	2	2	3	3	2	1	1	1	1	8	1	1	1	1	1	1	0,1 %	<sup>a</sup>	<sup>a</sup>	
UNINE	1	11	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	27	1,4 %	12,5	1,6 %	
UNISG	8	8	8	8	9	9	2	2	4	4	1	1	1	1	1	1	1	21	1,1 %	7,2	0,9 %	
UNISI	43	15	3	3	9	9	2	1	4	2	1	20	2	2	1	1	1	11	0,6 %	2,8	0,4 %	
UNIZH	12	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17	0,9 %	7,3	0,9 %	
Other academic institutions	151	93	24	0	13	6	2	27	26	27	5	6	1	99	10	10	1	504	26,3 %	219,1	27,6 %	
<b>Total universities</b>	<b>151</b>	<b>93</b>	<b>24</b>	<b>0</b>	<b>13</b>	<b>6</b>	<b>2</b>	<b>27</b>	<b>26</b>	<b>27</b>	<b>5</b>	<b>6</b>	<b>1</b>	<b>99</b>	<b>10</b>	<b>10</b>	<b>1</b>	<b>504</b>	<b>26,3 %</b>	<b>219,1</b>	<b>27,6 %</b>	
Industry	8	79	34	21	10	15	13	1	3	4	1	10	2	2	2	2	4	205	10,7 %	91,5	11,5 %	
SME	51	80	57	12	14	34	28	5	2	15	34	1	6	9	3	1	2	355	18,5 %	110,9	14,0 %	
NPO	39	18	7	1	6	2	4	7	6	20	1	4	8	17	5	4	4	166	8,7 %	64,3	8,1 %	
Universities of applied sciences	20	5	5	2	1	4	1	2	1	5	2	3	2	2	1	1	1	47	2,5 %	17,7	2,2 %	
Swiss Confederation	3	3	3	2	7	7	3	3	14	14	1	1	1	1	1	1	1	44	2,3 %	10,9	1,4 %	
Local authorities	3	4	4	4	4	4	1	1	2	2	5	1	1	1	1	1	1	22	1,1 %	8,5	1,1 %	
<b>Number of participations</b>	<b>289</b>	<b>456</b>	<b>196</b>	<b>52</b>	<b>58</b>	<b>101</b>	<b>62</b>	<b>95</b>	<b>39</b>	<b>115</b>	<b>50</b>	<b>18</b>	<b>25</b>	<b>244</b>	<b>35</b>	<b>18</b>	<b>18</b>	<b>1914</b>	<b>100,0 %</b>	<b>793,4</b>	<b>100,0 %</b>	
%	15,0 %	23,8 %	10,2 %	2,7 %	3,0 %	5,3 %	3,2 %	5,0 %	2,0 %	6,0 %	2,6 %	0,9 %	1,3 %	12,7 %	1,8 %	0,9 %	0,9 %	100,0 %		793,4	100,0 %	
<b>Paid subsidies (Mio. CHF)</b>	<b>160,5</b>	<b>225,3</b>	<b>92,3</b>	<b>19,0</b>	<b>19,3</b>	<b>41,5</b>	<b>19,5</b>	<b>37,5</b>	<b>9,7</b>	<b>32,4</b>	<b>7,2</b>	<b>3,0</b>	<b>3,3</b>	<b>83,5</b>	<b>24,7</b>	<b>1,8</b>	<b>3,6</b>	<b>9,3</b>				
%	20,2 %	28,4 %	11,6 %	2,4 %	2,4 %	5,2 %	2,5 %	4,7 %	1,2 %	4,1 %	0,9 %	0,4 %	0,4 %	10,5 %	3,1 %	0,2 %	0,5 %	1,2 %				

<sup>a</sup> unpublished for confidentiality reasons

Source: European Commission, SER

Table 10 Number of participations and financial commitments for some institutions for FP6

Abbreviation	Institution	Number of participations	Commitments (mio CHF)
EPFL	École Polytechnique Fédérale de Lausanne	221	111,0
ETHZ	Eidgenössische Technische Hochschule Zürich	221	98,1
UNIGE	Université de Genève	107	51,7
UNIZH	Universität Zürich	101	47,1
UNIBAS	Universität Basel	94	37,8
UNIBE	Universität Bern	62	26,7
PSI	Paul Scherrer Institut	57	26,5
UNIL	Université de Lausanne	50	21,8
CSEM	Centre Suisse d'Électronique et de Microtechnique S.A.	45	30,2
EMPA	Eidgenössische Materialprüfungs- und Forschungsanstalt	40	20,4
UNINE	Université de Neuchâtel	27	12,5
IBM	International Business Machines Corporation	24	15,9
UNISG	Universität St. Gallen	21	7,2
EAWAG	Eidgenössische Anstalt für Wasserversorgung, Abwasserreinigung und Gewässerschutz	19	8,3
FHW	Haute Ecole Spécialisée de Suisse occidentale	16	6,4
FIBL	Forschungsinstitut für Biologischen Landbau	14	5,1
IRB	Istituto di Ricerca in Biomedicina	13	8,5
FMI	Friedrich Miescher Institute for biomedical research	13	6,2
WSL	Eidgenössische Forschungsanstalt für Wald, Schnee und Landschaft WSL	13	6,2
UNIFR	Université de Fribourg	13	4,1
	Other	743	241,7

Source : European Commission, SER

Table 11: Number of Swiss participants and project coordinators by type for FP6

Type	Coordinators	%	Participants	%	Total	%
Federal Institutes of Technology (FIT) domain	76	41,1 %	495	28,6 %	571	29,8 %
Universities	68	36,8 %	436	25,2 %	504	26,3 %
SME	10	5,4 %	345	20,0 %	355	18,5 %
Industry	5	2,7 %	200	11,6 %	205	10,7 %
NPO	17	9,2 %	149	8,6 %	166	8,7 %
Universities of applied sciences	4	2,2 %	43	2,5 %	47	2,5 %
Swiss Confederation	3	1,6 %	41	2,4 %	44	2,3 %
Local authorities	2	1,1 %	20	1,2 %	22	1,1 %
<b>Total</b>	<b>185</b>	<b>100,0 %</b>	<b>1729</b>	<b>100,0 %</b>	<b>1 914</b>	<b>100,0 %</b>

Source : European Commission, SER

Table 12: Number of collaborative links between Swiss research institution types for FP6

Type	FIT	Universities	UAS	Industry	SME	NPO	Swiss Confederation	Local authorities
FIT	<b>54</b>	108	9	65	97	23	2	7
Universities	108	<b>91</b>	3	18	71	40	5	5
UAS	9	3	<b>3</b>	7	15	3	1	4
Industry	65	18	7	<b>27</b>	44	7	1	2
SME	97	71	15	44	<b>43</b>	27	9	17
NPO	23	40	3	7	27	<b>10</b>	4	4
Swiss Confederation	2	5	1	1	9	4	<b>1</b>	1
Local authorities	7	5	4	2	17	4	1	<b>3</b>
<b>Total</b>	<b>365</b>	<b>341</b>	<b>45</b>	<b>171</b>	<b>323</b>	<b>118</b>	<b>24</b>	<b>43</b>

Source : European Commission, SER

Table 13: Collaboration indices (CI)<sup>16</sup> between Swiss research institution types for FP6

Type	FIT	Universities	UAS	Industry	SME	NPO	Swiss Confederation	Local authorities
FIT	<b>-0,27</b>	0,11	-0,12	0,20	0,08	-0,13	-0,51	-0,22
Universities	-0,11	<b>0,06</b>	-0,56	-0,39	-0,04	0,17	-0,07	-0,34
UAS	-0,12	-0,56	<b>0,36</b>	0,13	0,19	-0,11	0,14	0,49
Industry	0,20	-0,39	0,13	<b>0,14</b>	0,07	-0,34	-0,48	-0,44
SME	0,08	-0,04	0,19	0,07	<b>0,26</b>	-0,01	0,25	0,27
NPO	-0,13	0,17	-0,11	-0,34	-0,01	<b>0,01</b>	0,34	0,06
Swiss Confederation	-0,51	-0,07	0,14	-0,48	0,25	0,34	<b>0,43</b>	0,16
Local authorities	-0,22	-0,34	0,49	-0,44	0,27	0,06	0,16	<b>0,40</b>

Source : European Commission, SER

<sup>16</sup> See note 1, p. 58

Table 14: Number of participations by research priority for FP6

Priority	Number of Swiss participations	%	Total Number of participations	%
1.1 Life sciences and health	289	15.1 %	6 632	9.0 %
1.2 Information technologies	456	23.8 %	14 273	19.4 %
1.3 Nanotechnologies, materials, Production processes	196	10.2 %	5 867	8.0 %
1.4 Aeronautics and space	52	2.7 %	3 425	4.7 %
1.5 Food quality and safety	58	3.0 %	3 172	4.3 %
1.6.1 Energy	101	5.3 %	3 472	4.7 %
1.6.2 Transport	62	3.2 %	3 075	4.2 %
1.6.3 Environment	95	5.0 %	3 775	5.1 %
1.7 Citizens and governance	39	2.0 %	1 891	2.6 %
1.8.1 Research for policy support, emerging sciences and technologies	115	6.0 %	4 536	6.2 %
1.8.2 Research for SME	50	2.6 %	5 449	7.4 %
1.8.3 International cooperation	18	0.9 %	2 429	3.3 %
2.1 Research and innovation	25	1.3 %	1 823	2.5 %
2.2 Human resources and mobility	244	12.7 %	8 343	11.4 %
2.3 Research infrastructures	35	1.8 %	1 781	2.4 %
2.4 Science and society	18	0.9 %	997	1.4 %
3.1 Coordination of research activities	18	0.9 %	1 183	1.6 %
3.2 Support of research policies	0	0.0 %	167	0.2 %
4.1 Euratom Fission	43	2.2 %	1 176	1.6 %
<b>Total</b>	<b>1914</b>	<b>100.0 %</b>	<b>73 466</b>	<b>100.0 %</b>

Source : European Commission, SER

Table 15: Committed subsidies by research priority for FP6 (mio CHF)

Priority	Subsidies committed for Swiss researchers		Total committed subsidies	
		%		%
1.1 Life sciences and health	160,5	20,2 %	3 602,0	14,0 %
1.2 Information technologies	225,3	28,4 %	5 984,6	23,3 %
1.3 Nanotechnologies, materials, Production processes	92,3	11,6 %	2 411,7	9,4 %
1.4 Aeronautics and space	19,0	2,4 %	1 630,1	6,3 %
1.5 Food quality and safety	19,3	2,4 %	1 174,9	4,6 %
1.6.1 Energy	41,5	5,2 %	1 318,3	5,1 %
1.6.2 Transport	19,5	2,5 %	1 063,4	4,1 %
1.6.3 Environment	37,5	4,7 %	1 194,5	4,6 %
1.7 Citizens and governance	9,7	1,2 %	373,8	1,5 %
1.8.1 Research for policy support, emerging sciences and technologies	32,4	4,1 %	938,7	3,7 %
1.8.2 Research for SME	7,2	0,9 %	753,1	2,9 %
1.8.3 International cooperation	3,0	0,4 %	462,7	1,8 %
2.1 Research and innovation	3,3	0,4 %	347,3	1,4 %
2.2 Human resources and mobility	83,5	10,5 %	2 606,1	10,1 %
2.3 Research infrastructures	24,7	3,1 %	1 075,9	4,2 %
2.4 Science and society	1,8	0,2 %	116,7	0,5 %
3.1 Coordination of research activities	3,6	0,5 %	334,8	1,3 %
3.2 Support of research policies	0,0	0 %	21,8	0,1 %
4.1 Euratom Fission	9,3	1,2 %	291,2	1,1 %
<b>Total</b>	<b>793,4</b>	<b>100,0 %</b>	<b>25 701,7</b>	<b>100,0 %</b>

Source : European Commission, SER

Table 16: Specialization indices (SI)<sup>17</sup> of Swiss research institution types in FP6

Priority	Swiss Confederation	Federal Institutes of Technology (FIT) domain	Universities of applied sciences	Industry	Local authorities	Small and medium-sized enterprises	Non-profit organizations (NPO)	Universities
1.1 Life sciences and health	-1,00	-0,40	-1,00	-0,68	-0,15	0,02	0,19	0,34
1.2 Information technologies	-0,57	0,05	0,26	0,27	-0,67	-0,05	-0,05	-0,21
1.3 Nanotechnologies, materials, Production processes	-1,00	0,13	0,17	0,24	-1,00	0,18	-0,69	-0,41
1.4 Aeronautics and space	-0,33	0,08	-1,00	0,54	-1,00	0,17	-0,79	-1,00
1.5 Food quality and safety	0,85	-0,42	-0,82	-0,32	-1,00	0,06	0,31	0,07
1.6.1 Energy	-1,00	-0,03	0,04	0,11	0,84	0,33	-0,83	-0,47
1.6.2 Transport	-0,37	-0,16	-0,04	0,35	-0,54	0,51	-0,70	-0,73
1.6.3 Environment	0,52	0,25	0,20	-0,80	-0,72	-0,73	-0,58	0,03
1.7 Citizens and governance	-1,00	-0,51	0,35	-1,00	-1,00	-0,42	0,03	0,43
1.8.1 Research for policy support, emerging sciences and technologies	0,72	0,03	0,36	-0,86	-0,03	-0,28	0,15	0,04
1.8.2 Research for SME	-1,00	-0,36	0,49	-0,39	-1,00	0,60	-0,69	-0,30
1.8.3 International cooperation	-1,00	0,16	-1,00	-1,00	-1,00	-1,00	0,53	-0,03
2.1 Research and innovation	-1,00	-0,24	0,71	-1,00	0,86	-0,15	0,52	-0,27
2.2 Human resources and mobility	-0,60	0,11	-0,60	-0,51	-0,31	-0,58	-0,01	0,19
2.3 Research infrastructures	-1,00	0,26	-1,00	-0,24	-0,50	-0,59	0,50	-0,64
2.4 Science and society	0,23	-0,77	0,39	-1,00	-1,00	-0,72	0,60	0,32
3.1 Coordination of research activities	0,95	-1,00	-1,00	-1,00	-1,00	0,34	0,38	-0,94
3.2 Support of research policies	-1,00	0,24	-1,00	-0,35	-1,00	-0,76	0,58	-0,64

Source : European Commission, SER

<sup>17</sup> See note 2, p. 58

Table 17: Number of partners by nationality in FP6 Swiss coordinated projects

Country	Status	Number of project partners	%
Switzerland	Associate Country	253	32,5 %
Germany	Member State	90	11,6 %
France	Member State	74	9,5 %
United Kingdom	Member State	62	8,0 %
Italy	Member State	51	6,5 %
Netherlands	Member State	28	3,6 %
Spain	Member State	27	3,5 %
Austria	Member State	19	2,4 %
Denmark	Member State	18	2,3 %
Belgium	Member State	17	2,2 %
Sweden	Member State	16	2,1 %
Greece	Member State	15	1,9 %
USA	Third Country	10	1,3 %
Slovenia	Member State	9	1,2 %
Norway	Associate Country	8	1,0 %
Finland	Member State	7	0,9 %
Poland	Member State	7	0,9 %
Czech Republic	Member State	7	0,9 %
Israel	Associate Country	6	0,8 %
Romania	Associate Country	6	0,8 %
Other		49	6,3 %
<b>Total</b>		<b>779</b>	<b>100,0 %</b>

Source : European Commission, SER

Table 18: Nationality of coordinators of projects with Swiss participation for FP6

Country	Status	Number of coordinators	%
Germany	Member State	402	23,7 %
France	Member State	266	15,7 %
United Kingdom	Member State	216	12,7 %
Italy	Member State	154	9,1 %
Netherlands	Member State	108	6,4 %
Belgium	Member State	99	5,8 %
Spain	Member State	87	5,1 %
Switzerland	Associate Country	68	4,0 %
Austria	Member State	48	2,8 %
Sweden	Member State	47	2,8 %
Greece	Member State	47	2,8 %
Denmark	Member State	46	2,7 %
Finland	Member State	36	2,1 %
Ireland	Member State	16	0,9 %
Norway	Associate Country	16	0,9 %
Portugal	Member State	10	0,6 %
Poland	Member State	9	0,5 %
Israel	Associate Country	8	0,5 %
Hungary	Member State	6	0,4 %
Luxemburg	Member State	3	0,2 %
Cyprus	Member State	3	0,2 %
Slovenia	Member State	2	0,1 %
Czech Republic	Member State	1	0,1 %
Turkey	Associate Country	1	0,1 %
<b>Total</b>		<b>1 699</b>	<b>100,0 %</b>

Source : European Commission, SER



Table 19: Number of collaborative links between countries (Member States and Associate Countries) for FP6 projects

Country	AT	BE	BG	CH	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IL	IS	IT	LI	LT	LU	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	TR	UK
AT	1077	1148	221	1013	88	561	5553	671	135	990	1865	623	3029	89	625	359	313	36	2590	2	127	111	89	59	1685	450	878	420	290	1175	381	277	180	3193
BE	1148	1705	288	1287	149	694	6737	1057	190	1555	3254	933	5981	98	762	592	360	58	4551	3	144	112	123	46	3036	872	1151	889	341	1890	391	244	280	5428
BG	221	288	132	154	65	158	795	181	73	360	433	163	556	50	262	90	76	13	628	0	93	15	46	43	43	130	283	151	212	200	137	127	135	741
CH	1013	1287	154	831	85	487	5550	835	104	982	2068	736	3955	42	380	388	373	46	3188	6	98	36	55	29	1833	460	731	470	226	1338	240	129	118	3950
CY	88	149	65	85	55	72	350	80	42	327	264	80	341	27	89	47	54	14	383	0	45	17	36	42	159	67	112	98	75	85	58	49	73	338
CZ	561	694	158	487	72	312	2615	425	94	531	1225	398	1823	38	388	176	135	28	1593	2	119	34	77	37	1032	310	532	263	195	697	196	215	98	2059
DE	5553	6737	795	5550	350	2615	16394	3708	511	5354	11642	3760	20814	236	2339	1754	1721	215	18843	19	467	301	340	153	9913	2884	4402	2711	1159	7357	1223	836	741	19887
DK	671	1057	181	835	80	425	3708	859	182	841	1820	740	2648	56	444	395	228	83	2097	1	140	23	83	35	2048	914	711	451	182	1413	243	155	129	3752
EE	135	190	73	104	42	94	511	182	65	154	306	195	380	24	138	76	54	19	354	0	109	12	69	42	239	170	192	79	89	291	80	77	57	562
EL	990	1555	360	982	327	531	5354	841	154	1576	3026	834	4500	140	558	516	524	71	4490	3	146	63	90	94	1873	848	884	899	576	1330	296	186	372	4346
ES	1865	3254	433	2088	284	1225	11642	1820	306	3026	4641	1649	9551	145	1310	1030	832	143	8732	1	282	57	155	180	4437	1888	2141	1851	730	2894	706	426	483	9384
FI	623	933	169	736	80	398	3760	740	195	834	1649	707	2455	43	409	325	200	48	2123	1	113	40	93	24	1343	588	623	384	180	1438	177	175	140	2887
FR	3029	5991	556	3955	341	1823	20814	2648	360	4500	9551	2455	10953	187	1775	1431	1472	178	13261	4	314	185	243	131	6968	2472	2921	2337	1019	5089	908	574	611	15941
HR	89	98	50	42	27	38	236	56	24	140	145	43	187	21	69	27	42	3	206	0	14	4	20	9	111	56	87	47	55	76	70	31	36	198
HU	625	762	262	380	89	388	2339	444	138	568	1310	409	1775	69	445	218	163	22	1634	0	143	18	101	74	1115	321	598	327	272	635	250	263	142	1933
IE	359	592	90	388	47	176	1754	395	76	516	1030	325	1431	27	218	258	115	39	1193	0	70	31	39	25	854	396	356	309	103	514	108	80	84	1913
IL	313	360	76	373	54	135	1721	228	54	524	832	200	1472	42	163	115	280	33	1184	0	39	19	26	27	588	146	263	209	133	341	92	54	98	1358
IS	36	58	13	46	14	28	215	83	19	71	143	48	178	3	22	39	33	43	152	0	14	8	15	8	123	138	55	74	23	86	20	12	34	272
IT	2590	4551	628	3188	383	1593	18843	2097	354	4490	8732	2123	13261	206	1634	1193	1184	152	8282	5	387	121	197	179	5639	1951	2773	2282	982	3998	814	546	710	12564
LI	2	3	0	6	0	2	19	1	0	3	1	1	4	0	0	0	0	0	5	0	0	0	0	0	8	3	0	0	0	1	1	0	1	6
LT	127	144	93	98	45	119	467	140	109	146	262	113	314	14	143	70	39	14	387	0	117	19	94	33	222	83	220	63	92	172	115	89	55	514
LU	117	112	15	36	17	34	301	23	12	63	57	40	185	4	18	31	19	8	121	0	19	59	12	4	90	34	89	32	17	57	42	32	10	154
LV	89	123	46	55	36	77	340	83	69	90	155	93	243	20	101	39	26	15	197	0	94	12	26	25	160	64	156	66	61	136	67	54	41	296
MT	59	46	43	29	42	37	153	35	42	94	180	24	131	9	74	25	27	8	179	0	33	4	25	15	67	32	61	54	43	49	35	39	62	135
NL	1685	3036	420	1833	159	1032	9913	2048	239	1873	4437	1343	6968	111	1115	854	568	123	5639	8	222	90	160	67	3011	1591	1671	1070	430	2735	491	333	296	8364
NO	450	872	130	460	67	310	2884	914	170	848	1588	588	2472	56	321	396	146	138	1951	3	83	34	64	32	1591	824	618	494	162	1118	160	105	151	3124
PL	878	1151	283	731	112	532	4402	711	192	884	2141	623	2921	87	598	356	283	55	2773	0	220	89	156	61	1671	618	857	586	351	1100	395	306	183	3295
PT	420	889	151	470	98	263	2711	451	79	899	1851	384	2337	47	327	309	209	74	2262	0	63	32	66	54	1070	494	586	533	185	765	171	114	163	2337
RO	290	341	212	226	75	195	1159	182	89	576	730	180	1019	55	272	103	133	23	982	0	92	17	61	43	430	162	351	185	194	293	143	134	147	884
SE	1175	1890	200	1338	85	697	7357	1413	291	1330	2994	1438	5089	76	635	514	341	86	3998	1	172	57	136	49	2735	1118	1100	765	293	1752	296	238	206	5952
SI	381	391	137	240	58	196	1223	243	80	296	706	177	908	70	250	108	92	20	814	1	115	42	67	35	491	160	395	171	143	296	193	122	79	851
SK	277	244	127	129	49	215	836	155	77	186	426	175	574	31	263	80	54	12	546	0	89	32	54	39	333	105	306	114	134	238	122	114	63	627
TR	180	280	135	118	73	98	741	129	57	372	483	140	611	36	142	84	98	34	710	1	55	10	41	62	296	151	193	163	147	206	79	63	114	683
UK	3193	5428	741	3950	338	2059	19887	3752	562	4346	9384	2887	15941	198	1933	1913	1358	272	12564	6	514	154	296	135	8364	3124	3295	2337	884	5582	851	627	663	9822
Total	30303	46359	7437	32223	3866	17619	159284	27630	5144	39335	79331	24633	124997	2357	18222	13911	11532	2126	1066122	67	4732	1858	3155	1891	63985	23324	29591	20864	9978	45447	9551	6826	6765	127380

■ : Member State ■ : Associate Country

Source : European Commission, SER

Table 20: Collaboration indices (C)<sup>18</sup> between countries (Member States and Associate Countries) for FP6 projects

Country	AT	BE	BG	CH	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IL	IS	IT	LI	LU	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	TR	UK	
AT	<b>13</b>	.04	.07	.04	-.09	.08	.12	-.06	-.02	-.04	-.08	-.04	-.06	.16	.11	-.03	.00	-.24	-.06	.04	-.01	.37	.02	.07	-.02	-.17	.04	-.15	.03	-.03	.19	.19	-.01	-.04
BE	-.05	<b>-06</b>	-.04	-.02	-.04	-.03	-.01	-.04	-.06	-.03	-.01	-.05	.07	.00	.00	.01	-.15	-.21	.01	.03	-.16	.18	-.04	-.26	.06	-.06	-.04	.01	-.10	.00	-.01	-.08	-.01	.01
BG	.04	-.04	<b>45</b>	-.17	.43	.14	-.15	-.01	.36	.15	-.10	.01	-.20	.52	.36	-.02	-.01	-.05	-.07	1.00	.49	.37	.54	-.01	-.09	.18	.04	.52	-.21	.36	.47	.50	-.07	
CH	.07	-.02	-.17	<b>-06</b>	-.14	-.03	.09	.02	-.18	-.08	-.05	.01	.04	-.24	-.16	-.02	.05	-.15	.01	.51	-.17	-.20	-.25	-.31	-.01	-.19	-.08	-.13	-.12	.01	-.07	-.21	-.25	.03
CY	-.09	-.04	.43	-.14	<b>51</b>	.08	-.23	-.09	.40	.41	-.02	-.04	-.12	.53	.17	-.02	.15	.31	.01	1.00	.46	.45	.53	.73	-.17	-.10	.04	.15	.37	-.30	.27	.35	.51	-.14
CZ	.08	-.03	.14	-.03	.08	<b>05</b>	.02	-.02	.07	-.08	-.01	.01	-.04	.01	.15	-.11	-.15	-.09	-.03	.30	.23	.07	.21	.10	.01	-.09	.06	-.12	.10	-.02	.13	.33	-.05	.01
DE	.12	.01	-.15	.09	-.23	.02	<b>-17</b>	-.03	-.18	-.03	.01	.03	.07	-.18	-.06	-.07	.02	-.17	.05	.33	-.19	.06	-.14	-.28	.04	-.08	.02	-.05	-.11	.06	-.06	-.08	-.13	.04
DK	-.06	-.04	-.01	.02	-.09	-.02	-.03	<b>11</b>	.17	-.08	-.04	.09	-.08	-.02	-.01	.06	-.12	.22	-.12	-.25	.09	-.34	.03	-.15	.12	.22	-.02	-.07	-.15	.11	.01	-.05	-.13	.08
EE	-.02	-.06	.36	-.18	.40	.07	-.18	<b>17</b>	<b>46</b>	-.08	-.09	.26	-.23	.37	.24	.08	.00	.32	-.17	1.00	.66	.16	.65	.65	-.11	.22	.17	-.10	.32	.16	.29	.42	.29	-.03
EL	-.04	-.03	.15	-.08	.41	-.08	-.03	-.08	<b>06</b>	.04	-.02	.01	-.04	.25	-.07	.02	.12	-.03	.09	.12	-.07	-.02	-.11	.17	-.10	.01	-.09	.10	.24	-.10	-.07	-.13	.22	-.02
ES	-.08	-.01	-.10	-.05	-.02	-.01	.01	-.04	-.09	<b>04</b>	-.10	-.03	.03	-.08	.00	.02	.00	-.03	.07	-.65	-.13	-.40	-.19	.14	-.02	-.03	.01	.11	.01	-.04	.02	-.07	.00	.01
FI	-.04	-.05	.01	.01	-.04	.01	.03	.09	.26	-.02	-.03	<b>13</b>	-.06	-.10	.00	.02	-.12	.01	-.05	-.20	.04	-.02	.14	-.27	.03	.06	-.03	-.09	-.10	.17	-.09	.07	-.04	.01
FR	-.06	.07	-.20	.04	-.12	-.04	.07	-.08	-.23	.01	.03	-.06	<b>-13</b>	-.17	-.07	-.05	.06	-.15	.05	-.31	-.26	-.06	-.19	-.24	-.02	-.03	-.07	.00	-.05	.00	-.09	-.15	-.11	.05
HR	.16	.00	.52	-.24	.53	.01	-.18	-.02	.37	.25	-.08	-.10	-.17	<b>51</b>	.28	-.05	.26	-.20	-.05	1.00	.16	.01	.50	.38	-.10	.06	.16	.03	.44	-.12	.55	.36	.43	-.16
HU	.11	.00	.36	-.16	.17	.15	-.06	-.01	.24	-.07	.00	.00	-.07	.28	<b>20</b>	-.02	-.08	-.23	-.04	1.00	.30	-.26	.32	.41	.03	-.09	.10	-.02	.25	-.08	.23	.40	.12	-.04
IE	-.03	.01	-.02	-.02	-.02	-.11	-.07	.06	.08	.02	.02	.02	-.05	-.05	-.02	<b>19</b>	-.11	.19	-.06	1.00	.08	.14	-.01	.03	.15	-.02	.08	-.10	-.05	-.05	-.03	-.03	-.01	.09
IL	.00	-.15	-.01	.05	.15	-.15	.02	-.12	.00	.12	.00	-.12	.06	.26	-.08	-.11	<b>40</b>	.20	.03	1.00	-.12	-.01	-.12	.16	-.08	-.25	-.08	-.02	.12	-.16	-.04	-.14	.16	.01
IS	-.24	-.21	-.05	-.15	.31	-.09	-.17	.22	.32	-.03	-.03	.01	-.15	-.20	-.23	.19	.20	<b>83</b>	-.15	1.00	.21	.38	.43	.38	.00	.51	-.02	.30	.09	-.01	.04	-.04	.45	.05
IT	-.06	.01	-.07	.01	.01	-.03	.05	-.12	-.17	.09	.07	-.05	.05	-.05	-.04	-.06	.03	-.15	<b>-11</b>	-.13	-.08	-.19	-.21	-.01	-.04	-.07	-.01	.06	.01	-.04	-.06	-.09	.04	.01
LI	.04	.03	1.00	.51	-1.00	.30	.33	-.25	-1.00	.12	-.65	-.20	-.31	-1.00	-1.00	-1.00	-1.00	-1.00	<b>-13</b>	-1.00	-1.00	-1.00	-1.00	-1.00	.35	.36	-1.00	-1.00	-1.00	-.47	.27	-1.00	.42	-.12
LT	-.01	-.16	.49	-.17	.46	.23	-.19	.09	.66	-.07	-.13	.04	-.26	.16	.30	.08	-.12	.21	-.08	1.00	<b>71</b>	.41	.75	.61	-.10	-.09	.27	-.17	.37	-.06	.48	.51	.31	-.03
LU	.37	.18	.09	-.20	.45	.07	.06	-.34	.16	-.02	-.40	-.02	-.06	.01	-.26	.14	-.01	.38	-.19	1.00	.41	<b>50</b>	.39	.12	-.09	-.07	.28	-.04	.01	-.14	.45	.47	-.06	-.16
LV	.02	-.04	.37	-.25	.53	.21	-.14	.03	.65	-.11	-.19	.14	-.19	.50	.32	-.01	-.12	.43	-.21	1.00	.75	.39	<b>49</b>	.65	-.06	-.02	.30	.05	.36	.02	.42	.47	.36	-.10
MT	.07	-.26	.54	-.31	.73	.10	-.28	-.15	.65	.17	.14	-.27	-.24	.38	.41	.03	.16	.38	-.01	1.00	.61	.12	.65	<b>65</b>	-.24	-.11	.09	.21	.43	-.23	.36	.54	.69	-.23
NL	-.02	.06	-.01	-.01	-.17	.01	.04	.12	-.11	-.10	-.02	-.03	-.02	-.10	.03	.03	-.08	.00	-.04	.35	-.10	-.09	-.06	-.24	<b>-10</b>	.08	-.01	-.06	-.14	.02	-.06	-.08	-.14	.06
NO	-.17	-.06	-.09	-.19	-1.00	-.09	-.08	.22	.22	.01	-.03	.06	-.03	.06	-.09	.15	-.25	.51	-.07	.36	-.09	-.07	-.02	-.11	.08	<b>25</b>	.00	.06	-.13	.08	-.11	-.16	.03	.08
PL	.04	-.04	.18	-.08	.04	.06	.02	-.02	.17	-.09	.01	-.03	-.07	.16	.10	-.02	-.08	-.02	-.01	1.00	.27	.28	.30	.09	-.01	.00	<b>04</b>	.03	.14	-.05	.22	.25	.03	-.02
PT	-.15	.01	.04	-.13	.15	-.12	-.05	-.07	-.10	.10	.11	-.09	.00	.03	-.02	.08	-.02	.30	.06	1.00	-.17	-.04	.05	.21	-.06	.06	.03	<b>15</b>	-.01	-.06	-.03	-.06	.12	-.01
RO	.03	-.10	.52	-.12	.37	.10	-.11	-.15	.32	.24	.01	-.10	-.05	.44	.25	-.10	.12	.09	.01	1.00	.37	.01	.36	.43	-.14	-.13	.14	-.01	<b>37</b>	-.17	.25	.37	.41	-.13
SE	-.03	.00	-.21	.01	-.30	-.02	.06	.11	.16	-.10	-.04	.17	.00	-.12	-.08	-.05	-.16	.01	-.04	1.00	-.47	-.06	-.23	-.02	.08	-.05	-.06	-.17	<b>-03</b>	-.14	-.08	-.15	.03	
SI	.19	-.01	.36	-.07	.27	.13	-.06	.01	.29	-.07	.02	-.09	-.09	.55	.23	-.05	-.04	.04	-.06	.27	.48	.45	.42	.36	-.06	-.11	.22	-.03	.25	-.14	<b>40</b>	.35	.15	-.13
SK	.19	-.08	.47	-.21	.35	.33	-.08	-.05	.42	-.13	-.07	.07	-.15	.36	.40	-.03	-.14	-.04	-.09	1.00	.51	.47	.47	.54	-.08	-.16	.25	-.06	.37	-.08	.35	<b>46</b>	.20	-.11
TR	-.01	-.01	.50	-.25	.51	-.05	-.13	-.13	.29	.22	.00	-.04	-.11	.43	.12	-.01	.16	.45	.04	.42	.31	-.06	.36	.69	-.14	.03	.03	.12	.41	-.15	.15	.20	<b>47</b>	-.08
UK	-.04	.01	-.07	.03	-.14	.01	.04	-.08	-.03	-.02	.01	.01	.05	-.16	-.04	.09	.01	.05	.01	1.00	-.12	-.03	-.10	-.23	.06	.08	-.02	-.01	-.13	.03	-.13	-.11	-.08	<b>-20</b>

Source : European Commission, SER

■ : Member State ■ : Associate Country

<sup>18</sup> This collaboration index is calculated in a similar manner to the one between different institution types (see note 1, p. 61, replace « type » by « country »)

Table 21: Committed subsidies, number of participations and number of project coordinators by country for FP6

Countries	Commitments		Number of participations		Number of coordinators	
	(mio. CHF)	%		%		%
Germany	4 600,0	17,9 %	10 227	13,9 %	1 377	13,9 %
Austria	665,1	2,6 %	1 923	2,6 %	280	2,8 %
Belgium	1 008,6	3,9 %	2 799	3,8 %	441	4,5 %
Bulgaria	63,8	0,2 %	455	0,6 %	39	0,4 %
Cyprus	43,2	0,2 %	234	0,3 %	25	0,3 %
Croatia	24,7	0,1 %	147	0,2 %	9	0,1 %
Denmark	618,9	2,4 %	1 618	2,2 %	210	2,1 %
Spain	1 477,3	5,7 %	4 990	6,8 %	713	7,2 %
Estonia	52,9	0,2 %	379	0,5 %	23	0,2 %
Finland	531,3	2,1 %	1 420	1,9 %	156	1,6 %
France	3 247,2	12,6 %	7 831	10,7 %	1 296	13,1 %
Greece	653,3	2,5 %	2 261	3,1 %	330	3,3 %
Hungary	233,3	0,9 %	1 160	1,6 %	112	1,1 %
Ireland	313,3	1,2 %	887	1,2 %	174	1,8 %
Iceland	35,6	0,1 %	130	0,2 %	17	0,2 %
Israel	283,4	1,1 %	764	1,0 %	116	1,2 %
Italy	2 265,3	8,8 %	6 486	8,8 %	838	8,5 %
Latvia	28,0	0,1 %	200	0,3 %	9	0,1 %
Liechtenstein	1,7	0,0 %	6	0,0 %	0	0,0 %
Lithuania	42,1	0,2 %	339	0,5 %	21	0,2 %
Luxemburg	35,0	0,1 %	103	0,1 %	11	0,1 %
Malta	15,6	0,1 %	125	0,2 %	7	0,1 %
Norway	442,8	1,7 %	1 294	1,8 %	148	1,5 %
Netherlands	1 732,4	6,7 %	4 047	5,5 %	671	6,8 %
Poland	336,9	1,3 %	1 857	2,5 %	195	2,0 %
Portugal	268,4	1,0 %	1 166	1,6 %	106	1,1 %
Romania	84,9	0,3 %	601	0,8 %	43	0,4 %
United Kingdom	3 696,5	14,4 %	8 749	11,9 %	1 737	17,5 %
Slovakia	57,3	0,2 %	438	0,6 %	31	0,3 %
Slovenia	119,1	0,5 %	613	0,8 %	31	0,3 %
Sweden	1 058,4	4,1 %	2 631	3,6 %	330	3,3 %
Switzerland	793,4	3,1 %	1 914	2,6 %	185	1,9 %
Czech Republic	204,5	0,8 %	1 066	1,5 %	39	0,4 %
Turkey	91,5	0,4 %	459	0,6 %	67	0,7 %
Other	575,8	2,2 %	4 147	5,6 %	118	1,2 %
<b>Total</b>	<b>25 701,7</b>	<b>100,0 %</b>	<b>73 476</b>	<b>100,0 %</b>	<b>9 905</b>	<b>100,0 %</b>

Source : European Commission, SER

Table 22 : Thematic specialization indices (SI)<sup>19</sup> of Member States and Associate Countries, calculated on the basis of committed subsidies for FP6

	1.1 Life sciences and health	1.2 Information technologies	1.3 Nanotechnologies	1.4 Aeronautics and space	1.5 Food	1.6.1 Energy	1.6.2 Transport	1.6.3 Environment	1.7 Citizens and governance	1.8.1 New technologies	1.8.2 Research for SME	1.8.3 Collaboration	2.1 Innovation	2.2 Mobility	2.3 Infrastructures	2.4 Science and society	3.1 Coordinators	3.2 Research policies	4.1 Euratom Fission
AT	-0,07	0,09	0,07	-0,37	-0,33	0,15	0,18	-0,06	0,18	-0,07	0,13	0,08	0,16	-0,07	-0,49	0,35	0,33	0,42	-0,83
BE	0,03	0,06	0,07	-0,05	-0,02	-0,26	0,04	-0,14	0,22	0,04	-0,19	0,25	0,18	-0,16	-0,20	0,37	-0,16	0,18	0,33
BG	-0,55	0,03	0,04	-0,87	-0,08	0,16	-0,58	0,18	0,63	-0,03	0,24	0,71	0,66	-0,28	-0,01	0,33	-0,15	0,69	0,18
CH	0,18	0,09	0,10	-0,45	-0,30	0,01	-0,26	0,02	-0,09	0,06	-0,53	-0,47	-0,53	0,01	-0,15	-0,32	-0,49	-1,00	0,03
CY	-0,68	0,14	-0,71	-0,17	-0,13	0,08	-0,67	-0,36	0,20	-0,34	0,12	0,54	0,74	0,27	0,14	0,46	0,10	-1,00	-0,30
CZ	-0,06	-0,09	-0,03	0,24	-0,07	-0,19	0,00	0,06	0,24	0,04	0,32	-0,30	0,20	-0,07	-0,18	0,25	-0,21	0,62	0,47
DE	0,00	0,06	0,07	0,06	-0,28	0,08	0,11	-0,05	-0,19	-0,09	-0,08	-0,23	-0,20	-0,13	0,04	-0,05	-0,22	-0,17	0,11
DK	0,17	-0,32	-0,18	-0,70	0,49	0,43	-0,26	0,15	-0,08	0,16	-0,04	0,11	-0,07	-0,01	-0,46	0,15	-0,04	-0,66	-0,58
EE	0,26	-0,24	-0,60	-0,63	-0,41	-0,36	0,24	0,21	0,57	-0,04	0,42	-0,21	0,54	-0,36	-0,04	0,81	0,47	0,88	-0,94
EL	-0,54	0,23	-0,10	0,01	-0,13	0,00	-0,02	0,05	-0,14	-0,10	0,03	0,22	0,07	0,05	-0,22	0,12	-0,37	-0,89	-0,75
ES	-0,15	0,05	0,12	0,00	0,04	0,07	-0,13	-0,04	-0,12	-0,06	0,31	0,04	0,20	-0,10	-0,24	-0,31	-0,16	0,08	-0,01
FI	-0,03	0,04	0,18	-0,74	0,01	0,12	0,10	0,04	-0,09	-0,01	-0,09	-0,08	-0,05	-0,12	-0,30	-0,03	0,43	-0,50	0,30
FR	0,00	0,00	-0,09	0,33	-0,15	-0,17	-0,03	-0,06	-0,21	-0,08	-0,43	-0,24	-0,20	0,00	0,03	-0,20	0,34	0,13	0,28
HR	0,03	-0,31	-0,95	-1,00	-0,04	0,22	0,05	-0,35	0,66	-0,36	-0,37	0,90	0,73	-0,25	0,14	0,35	-0,02	0,66	-1,00
HU	-0,04	0,05	-0,23	-0,63	0,18	-0,32	-0,21	-0,15	0,56	0,23	0,27	-0,40	0,17	0,14	-0,29	0,38	0,10	0,61	-0,06
IE	-0,34	-0,05	0,05	-0,20	0,22	-0,10	-0,39	-0,22	0,00	-0,02	0,10	-0,26	-0,33	0,45	-0,36	-0,26	0,00	-0,07	-0,60
IL	0,19	0,15	0,06	-0,07	0,07	-0,56	-0,70	-0,32	-0,65	0,03	-0,29	-0,11	0,06	-0,05	-0,24	-0,18	-0,17	-1,00	-1,00
IS	0,31	-0,80	-0,89	-1,00	0,54	0,36	-1,00	0,27	-0,53	0,29	0,43	0,33	0,54	-0,04	-0,72	-0,79	0,54	-1,00	-1,00
IT	0,01	0,07	0,08	0,00	-0,02	-0,22	0,17	-0,13	-0,10	-0,04	0,06	-0,10	0,08	-0,18	0,06	-0,12	-0,52	-0,15	-0,32
LI	-1,00	0,08	0,41	-1,00	-0,26	0,80	-1,00	-1,00	-1,00	-1,00	-1,00	-1,00	-1,00	-1,00	-1,00	-1,00	-1,00	-1,00	-1,00
LT	-0,57	0,02	-0,37	-0,59	0,22	-0,02	-0,06	0,01	0,59	0,10	0,53	-0,10	0,61	-0,06	0,06	0,72	-0,08	0,07	-0,17
LU	-0,69	0,10	0,09	-0,51	-1,00	0,40	0,29	-0,80	-0,68	-0,29	-0,14	-0,73	0,88	-0,77	-0,13	0,64	0,22	-1,00	-0,80
LV	-0,13	-0,25	0,05	0,01	-0,15	-0,25	-0,16	0,28	0,69	0,25	0,09	0,08	0,67	-0,41	0,08	0,50	0,37	0,85	-0,72
MT	-1,00	-0,05	-0,48	0,22	0,05	-0,03	-1,00	0,13	0,55	0,06	0,52	0,78	0,74	-0,26	-0,14	0,75	-0,26	-1,00	-1,00
NL	0,08	-0,19	-0,16	-0,17	0,27	0,25	-0,01	0,19	0,08	0,18	-0,13	-0,14	-0,34	-0,01	0,01	0,02	0,12	-0,09	-0,03
NO	-0,39	-0,11	-0,27	-0,35	0,29	0,28	0,30	0,42	0,44	0,08	0,33	-0,11	0,08	-0,20	-0,06	-0,28	0,35	-0,19	-0,89
PL	-0,34	-0,11	0,13	-0,25	0,23	-0,02	-0,02	0,00	0,21	0,06	0,37	-0,43	0,45	0,16	-0,06	-0,11	0,09	-0,03	-0,50
PT	-0,40	0,01	0,21	-0,18	-0,37	0,05	0,05	0,18	0,21	0,04	0,27	0,46	0,13	0,00	-0,40	0,33	0,31	-1,00	-0,72
RO	-0,78	-0,08	0,30	-0,14	-0,48	-0,14	0,02	0,16	0,29	-0,27	0,18	0,80	0,63	-0,14	-0,11	0,40	0,13	0,53	-0,01
SE	0,16	-0,11	0,04	-0,04	0,05	0,13	0,08	-0,06	-0,07	-0,05	-0,13	-0,03	0,07	-0,10	-0,07	-0,02	-0,06	0,11	0,01
SI	-0,24	0,03	0,10	-0,52	-0,04	0,21	-0,07	-0,25	0,48	0,12	0,21	0,20	0,59	-0,17	-0,26	0,31	0,26	0,62	-0,32
SK	-0,31	-0,08	0,01	-0,70	0,00	-0,23	-0,42	0,39	0,30	0,10	0,25	-0,59	0,62	0,18	-0,28	0,47	-0,09	0,82	0,50
TR	-0,74	-0,08	-0,07	-0,48	0,30	-0,20	0,14	0,30	0,44	-0,51	-0,03	0,86	0,62	-0,02	-0,26	-0,34	-0,06	0,55	-1,00
UK	0,06	-0,11	-0,12	-0,03	0,04	-0,29	-0,21	0,01	0,02	0,06	0,08	0,07	-0,25	0,23	0,25	-0,12	-0,22	-0,31	-0,16

Source : European Commission, SER

<sup>19</sup> The specialization index of a country for a given area is defined in a similar manner to the one of an institution type for an area (see note 2, p. 58, replace « institution type » by « country »).

## Annex E Notes

1 The collaboration index ( $CI$ ) between types  $i$  and  $j$  is defined in the following manner. Let's denote by:

- $n_{ij}$  the number of collaborative links between types  $i$  and  $j$ ,
- $n_i$  the total number of collaborative links of type  $i$  with all types ( $n_i = \sum_j n_{ij}$ ),
- $n_j$  the total number of collaborative links of type  $j$  with all types ( $n_j = \sum_i n_{ij}$ ), and
- $n$  the total number of collaborations between all types ( $n = \sum_{i,j} n_{ij}$ )

The relative collaboration between types  $i$  and  $j$  is defined as follows:

$$rc_{ij} = \frac{n_{ij} \cdot n}{n_i \cdot n_j}.$$

The term  $rc_{ij}$  represents the number of collaborative links that would exist between types  $i$  and  $j$  if all of the institutions were collaborating on an entirely equal footing with all other types of institution. In order to obtain a measure between -1 and +1 of the relative collaboration, the collaboration index between types  $i$  and  $j$  is defined as follows:  $CI_{ij} = (cr_{ij} - 1)/(cr_{ij} + 1)$ .

The advantage that the index  $CI_{ij}$  has over the number  $n_{ij}$  is especially due to the fact that the size effects of the institutions is eliminated (for example, even though 9 represents a small number of collaborations compared to the other numbers contained in table 12 (collaborations between SMEs and the Confederation), it is, in fact, higher than it should be if the two types of institution were collaborating in a manner that was proportional to their number of participants, as demonstrated by the value  $0.25 > 0$  in Table 13.

2 The specialization index ( $SI$ ), which is based on the subsidies, measures the proportion of activity of one type of institution in a certain area in relation to the proportion of activity of this type of institution among all of the institutions. It is calculated as follows: let's define

- $s_{ij}$  as the amount of subsidies awarded to the type of institution  $i$  for area  $j$ ,
  - $s_i$  as the total amount of subsidies awarded to the type of institution  $i$  for all of the areas ( $s_i = \sum_j s_{ij}$ ),
  - $s_j$  as the amount of subsidies allocated to the research area  $j$  for all of the institutions ( $s_j = \sum_i s_{ij}$ )
- and
- $s$  as the total amount of subsidies allocated to all of the Swiss participants ( $s = \sum_{i,j} s_{ij}$ ).

The relative specialization  $rs_{ij}$  of a type of institution  $i$  for the research area  $j$  is defined as follows:

$$rs_{ij} = \frac{s_{ij} \cdot s}{s_i \cdot s_j}.$$

In order to reduce the relative specialization to a measure between -1 and +1, the specialization index is defined as:  $SI_{ij} = (rs_{ij} - 1)/(rs_{ij} + 1)$ .

This gives an index of -1 if the type of institution  $i$  is not involved at all in area  $j$ , 0 if it carries out an average level of activity (compared to the total volume of research carried out by this type of institution) and +1 if this type of institution devotes its entire activities to area  $j$ .

- 3 This correspondence factor analysis (CFA) is obtained from the specialization indices (*SI*) matrix for the types of Swiss institutions (principal normalization). The specialization indices make it possible to define a distance between the types of institution and the research topics. The points representing the types of institution and the research topics can then be positioned in a 5-dimensional space so as to comply entirely with these distances. CFA is the technique that makes it possible to draw the projection onto a 2-dimensional space (represented in Figure 18) which best reproduces the starting distances. The CFA in Figure 18 reproduces this way 80.7% of the starting distances (58.3% on the first axis, and 22.4% on the second, the remaining 19.3% being distributed along the 3 dimensions not reproduced). This means that the distances between types of institution and research topics, as measured on this graph, are not the exact distances, but merely represent the closest approximations that are possible in 2-D. It must be pointed out that the category public administration (Confederation, Cantons and Communes) was introduced into this CFA as a supplemental category (i.e. it was put on the graph without having played a part in its construction), due to the fact that many topics are not addressed at all by this type of institution.
- 4 This correspondence factor analysis (CFA) is obtained from the collaboration indices (*CI*) matrix between Member States and Associate Countries (principal normalization). Collaboration indices make it possible to determine a distance between the countries. The points representing each country can then be positioned in a 31-dimensional space so as to comply entirely with these distances. CFA is the technique that makes it possible to draw the projection onto a 2-dimensional space (represented in Figure 22) which best reproduces the starting distances. The CFA in Figure 22 reproduces this way 57.3 % of the starting distances (42.9% on the first axis, and 14.4% on the second, the remaining 42.7% being distributed along the 29 dimensions not reproduced). This means that the distances between the countries, as measured on this graph, are not the exact distances, but merely represent the closest approximations that are possible in 2-D. It must be pointed out that Liechtenstein and Germany were introduced into this CFA as supplemental categories (i.e. they were put on the graph without having played a part in its construction), due to the low amounts of subsidies committed in Liechtenstein, and to the particular collaboration profile of Germany, strongly influencing the analysis.



