Pirjo Niskanen

Finnish universities and the EU Framework Programme – Towards a new phase

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Keywords research, universities, cooperation, European Union, EU framework programmes, impact, survey

Abstract

This report presents the results of a study on the impacts of EU framework programmes for Finnish universities as viewed by heads of units and other academics within 36 university departments and research units. The study is based on surveys and interviews conducted 1999–2001 and was carried out by the VTT Group for Technology Studies.

Participation by Finnish universities in EU framework programmes has contributed to increased international research collaboration and to the increased international visibility of Finnish research. In addition, collaboration with companies has increased awareness among academics of the commercial exploitation of research results.

The views of Finnish academics concerning the academic quality of EU projects vary from positive to critical. Half of Finnish EU participants considered EU projects to be of an internationally high-standard, while a third thought them to be of low quality. Perceptions among EU participants and non-participants are rather similar, even though participants have somewhat more positive views concerning the research quality and appropriateness of EU projects than non-participants do.

Regarding the use of EU participation as a criterion for allocating national research funding, the results indicate that it facilitates raising national funds, but only to a limited extent. Most academics thought that EU participation should not receive too much weight as a criterion of national research funding.

The interest among Finnish academics in participating in EU framework programmes continues to be at a high level. Competition for research funding, pressure towards tighter collaboration with end-users of research and pressure to

internationalise are notable incentives encouraging academics to join EU programmes. Excessive bureaucracy, inflexibility in the implementation of programmes, the application orientation of the projects and a shortage of basic resources in the units are the major disincentives to EU participation among Finnish academics.

Niskanen, Pirjo. Finnish universities and the EU Framework Programme – Towards a new phase [Suomalaisten yliopistojen osallistuminen EU:n tutkimuksen puiteohjelmiin]. Espoo 2001. Valtion teknillinen tutkimuskeskus, VTT Publications 440. 86 s. + liitt. 20 s.

Avainsanat research, universities, cooperation, European Union, EU framework programmes, impact, survey

Tiivistelmä

EU:n tutkimusohjelmien vaikutuksia kartoittanut tutkimus vahvistaa aiempien tutkimusten kuvaa EU:n puiteohjelmien vaikutuksista Suomen tieteen kansainvälistymiseen. EU-osallistuminen on auttanut yliopistoja luomaan uusia kansainvälisiä kontakteja ja lisännyt laitosten tunnettuvuutta – ei vain Euroopassa vaan maailmanlaajuisesti. Päinvastoin kuin on oletettu, EU-osallistuminen ei ole vienyt resursseja muulta kansainväliseltä yhteistyöltä, vaan se on pikemmin monipuolistanut ja vahvistanut yhteistyötä.

Yliopistotutkijoiden näkemykset EU-hankkeiden laadusta ja tieteellisestä tasosta vaihtelevat suuresti. Noin puolet vastaajista pitää hankkeita kansainvälisesti korkeatasoisina, kun taas noin kolmannes arvio ne huonotasoisiksi. EU-hankkeisiin osallistuneiden ja osallistumattomien vastaajien näkemykset poikkeavat yllättävän vähän toisistaan. Osallistuneiden arviot ovat kuitenkin myönteisempiä kuin osallistumattomien. Biotieteiden edustajat suhtautuivat EU-hankkeisiin myönteisimmin. He pitivät EU-hankkeita muita tieteenaloja useammin korkealaatuisina ja hyödyllisinä.

Tutkimus osoittaa, että aikaisempi kokemus kansainvälisestä yhteistyöstä ja laitoksen tunnettuus edistävät puiteohjelmiin osallistumista. Sen sijaan sillä, onko laitos suuntautunut perus- tai soveltavaan tutkimukseen, näyttäisi olevan odotettua vähäisempi merkitys laitoksen osallistumisaktiivisuuden kannalta.

Yliopistotutkijoiden kiinnostus osallistua EU:n puiteohjelmiin on edelleenkin suurta. Osallistumista motivoivat erityisesti kilpailu niukoista tutkimusvaroista, kansainvälistymisen tarve sekä vaatimukset lisätä yhteistyötä yritysten ja tutkimuksen hyödyntäjien kanssa. Osallistumisen esteitä puolestaan ovat hakuprosessin monimutkaisuus, hankkeiden suuri työmäärä, rahoituksen helpompi saanti muista rahoituslähteistä ja ohjelmien soveltumattomuus omalle

alalle. Yliopistotutkijoiden vaatimukset ja odotukset EU-osallistumisesta ovat selvästi suuremmat nyt kuin osallistumisen alkuaikoina.

Raportti perustuu vuosina 1999–2000 kerättyyn kysely- ja haastatteluaineistoon. Kyselyyn vastasi kaikkiaan 189 yliopistotutkijaa (vastausprosentti 60) 36 yliopistolaitoksesta. Näistä 103 vastaajalla oli omakohtaista kokemusta EU-osallistumisesta, 86 vastaajalta osallistumiskokemus puuttui. Lisäksi haastateltiin 34 yliopistolaitoksen johtajaa ja 44 tutkijaa. Tutkimus toteutettiin VTT:n Teknologian tutkimuksen ryhmässä.

Foreword

This report presents the results of a study focusing on the impacts of EU collaboration on Finnish university departments and research units. It is a continuation of several studies carried out by the VTT Group for Technology Studies on the theme of research collaboration in European research programmes. The studies have provided information on the objectives, achievements and impacts of research collaboration on Finnish organisations and companies as well as the factors contributing to successful collaboration.

As the preceding studies have focused on the impacts of research collaboration for different types of organisations in general, this study aimed at highlighting intended and unintended consequences of EU collaboration and illuminating the broader significance of such collaboration for university research. Special attention has been paid to the quality and relevance of EU-funded research projects for universities. In addition, the study examined the influence of EU collaboration on other international collaboration.

The study was co-funded by the VTT (Technical Research Centre of Finland), the Ministry of Education and the Academy of Finland. The study greatly benefited from the advice and active input of a steering group that represented funding agencies and universities. The following members were in the steering group during the study: Mirja Arajärvi (Ministry of Education), Eeva Ikonen (Academy of Finland), Esko-Olavi Seppälä (Science and Technology Policy Council), Veijo Ilmavirta (Helsinki University of Technology), Leila Risteli (University of Oulu) and Terttu Luukkonen (VTT Group for Technology Studies). This report, as it now stands, owes a great deal to a number of other people. The work benefited a great deal from valuable discussions and collaboration with Johanna Hakala and Erkki Kaukonen of the University of Tampere. My special thanks goes also to my colleague Soile Kuitunen for her insightful and constructive comments on earlier versions of the text, and to Marjo Uotila and Joan Lofgren for checking the language of the text. Finally, I am deeply indebted to the survey respondents and the interviewed heads of units and researchers for their willingness to contribute to this study.

Pirjo Niskanen

Summary

This report presents the results of a study of Finnish participation in EU framework programmes carried out by the VTT Group for Technology Studies. The study analysed intended and unintended consequences of EU research collaboration for Finnish university research. The focus was on the views of university researchers and heads of departments and research units concerning such questions as: the quality and relevance of EU projects; the impact of EU collaboration on other international collaboration; and the future attractiveness of EU-funded research. The study also drew attention to the researchers' views on the commercialisation of research as well as collaboration with private companies.

The study is based on a survey and interviews with staff in 36 university units, including both unit heads and other academics. The number of university researchers surveyed was 189 and the response rate was 60 percent. Of all respondents, 103 had been personally involved in EU projects, while 86 had no personal experience of EU collaboration. Additionally, 78 interviews were carried out to complement the survey results.

The study showed that:

1. Given the size of the unit and the discipline, earlier experience of international research collaboration is one of the most important factors facilitating the activity of an individual researcher or university unit in EU research programmes. Expectedly, the EU research programmes attracted especially university researchers who had earlier collaborated with firms.

2. Researchers' views on the quality and relevance of EU research projects vary a lot from positive to critical. Less than half of the respondents considered EU projects as being of an internationally high-standard, while a third thought of them as of an internationally low-standard. Perhaps surprisingly, the differences among the participants and non-participants were quite small, reflecting the fact that Finnish researchers have quite realistic views on EU collaboration. As to the differences between discipline groups, researchers from the life sciences and multidisciplinary fields were most positive towards the high quality of EU-

funded research, whereas respondents from the social sciences and technology were the most critical.

3. The study revealed also that researchers' views on the relevance of EU programmes for their own field range a lot. Quite obviously, the respondents representing more application-oriented fields, such as biotechnology, applied chemistry, microbiology, and food sciences, were the most satisfied with EU programmes, whereas the respondents from more basic research-oriented fields were the most critical towards the relevance of EU programmes for their own field.

4. The study confirmed an earlier finding that EU research collaboration has effectively contributed to increased international research collaboration and the international visibility of Finnish research. Even though new scientific knowledge is still quite rarely an important benefit of the projects, EU collaboration has opened up new collaboration possibilities and strengthened the knowledge base. In contrast, EU funding has enabled university researchers to take part in the commercialisation of research results only to a lesser extent. However, respondents generally considered collaboration with end-users as useful and beneficial for their research.

5. The study resulted in an unexpected finding concerning the steering effect of EU participation on university research. According to the study, respondents generally found that EU-funded research corresponds to the objectives of their units. Furthermore, only less than ten percent thought that EU participation has focused attention away from issues of national importance. Based on the interview data, few respondents thought that EU collaboration had brought some applied elements into their research rather, they considered the steering effect to be minor. Even though the researchers believed that EU participation influences the allocation of national research funding – positively or negatively – the interview data supported the conclusion that the actual influence has been moderate.

6. An important finding of the study was that EU collaboration has not reduced other international research collaboration, rather intensifying and diversifying it in all fields. Participation in EU projects has provided new opportunities for international collaboration and increased the visibility of Finnish science.

Consequently, Finnish researchers have become more ambitious towards international collaboration. This is reflected in the opinion among researchers that EU research programmes should be directed towards more ambitious and scientifically rewarding projects instead of just contacting people.

7. The majority of the university researchers was satisfied with the information dissemination in Finland about EU programmes. Expectedly, the participants were more satisfied than non-participants were. Respondents wanted national organisations to disseminate more targeted and focused information at the grassroots level. Weaknesses in and barriers to EU collaboration most often mentioned by the researchers were the workload in EU projects, lack of relevance, the complex application process and the unsuitability of the EU programmes for their own research. The need for accelerating and simplifying the application procedure was stressed by both participants and non-participants.

8. Despite the criticism towards the rigidity and research orientation of EU collaboration, Finnish university researchers were interested in participating in EU collaboration in the future. Especially interviewed heads of units perceived EU collaboration as an important channel through which to obtain research funding for their units and to gain prestige. The participation of universities depends on the availability of other research funding – from national or other international sources. A decline in the research funding is likely to increase researchers' interest in seeking EU funding, whereas the availability of other funding may decrease its relative attractiveness.

Contents

1. Introduction

Since the early 1990s, several impact studies of the EU framework programmes have been carried out in EU member countries. These studies have shown, among other conclusions, that EU research programmes have been successful in promoting cross-sector collaboration, strengthening the science base and promoting the education and training of young scientists and engineers (Luukkonen & Niskanen, 1998; Peterson & Sharp, 1998; Luukkonen & Hälikkä, 2000).

Despite the fact that these studies have provided further insights into the forms of linkages and various impacts of EU collaboration, there is still a lack of information on the scientific quality of EU-funded research. In addition, there has been little probing into the unintended consequences of EU collaboration for different types of organisations.

The aims of the report

This report sheds light on the intended and unintended consequences of EU collaboration for Finnish universities. Compared to previous studies, the present study addresses the importance of EU collaboration at the unit level within universities. As EU collaboration increases, the impact of collaboration on research groups and university units will become more and more important. This study deals with several questions: What kinds of university units are most active in EU collaboration? What are the characteristics and especially scientific quality of EU projects? Does EU collaboration shift university research away from fundamental research towards more application and practically oriented research? How does EU collaboration influence other international collaboration? What are the main barriers to EU collaboration and future prospects from the university viewpoint?

The questions outlined above are approached according to the perceptions of Finnish university researchers regarding EU collaboration independent of whether they have been involved in EU programmes or not. This approach provides a more detailed picture of the overall influences of EU collaboration not only on individuals but on university units as well. Studying the perceptions of non-participants helps in evaluating the adequacy of both Finnish and EU

science and technology policies in relation to the priorities, attitudes and resources of various research communities. In addition, studying the barriers to EU participation may help universities to develop their information services and other supportive mechanisms, enabling researchers to participate in EU framework programmes in the future.

Participation of Finnish universities in EU framework programmes

Since Finland joined the EU in 1995, Finnish participation in EU framework programmes has increased considerably. Finnish participation in the Fourth Framework Programme (carried out in 1994–98) was almost four times higher than in the Third Framework Programme. In total, 2637 Finnish organisations participated in 1850 projects in the Fourth Framework Programme (Luukkonen & Hälikkä, 2000). In terms of the country's contribution to the EU budget, Finland belonged to the most intensive countries in the EU Fourth Framework Programme (Luukkonen & Hälikkä, 2000).

One explanation for Finland's high level of activity in European programmes is that internationalisation of science has been one of the most important priorities in Finnish national policy since the mid-1980's. It is believed that "with the help of international research co-operation, results and knowledge can be obtained which are outside the possibilities of domestic research" (Finland: A Knowledge-based …, 1996, 29). Also, according to the Second Community Innovation Survey (Communication …, 2000), Finnish firms seemed to be more inclined to make collaboration agreements with universities and research centres than firms in other EU countries. This experience has probably promoted the participation of Finnish universities in EU consortia (cf. Luukkonen & Hälikkä, 2000).

EU funding used by Finnish universities grew rapidly from 1995 to 1997 but since then has maintained the same level (Research and Development, 1995; 1997; 1999). In 1999, universities in Finland received FIM 141 million (€24 million) in EU funding, which accounted for 3.6 percent of the total university research expenditure in Finland. The share of EU funding was largest in the natural sciences and technology. Together their share comprised 50 percent of the total EU funding to Finnish universities in 1999. That year the share of EU funding in the total research expenditure was highest in agriculture and forestry

(14 %), followed by the natural sciences, technology, the social sciences (4 % in each), medicine (3 %) and humanities (2 %). Of the total foreign funding to Finnish universities, EU funding comprised 63 percent.

The latest data provided by the Finnish EU-R&D secretariat indicates that participation by Finnish universities is still growing in the EU Fifth Framework Programme. By spring 2001, Finnish universities were involved in 1300 applications in the Fifth Framework Programme, over 300 of which were approved for funding (Finnish EU R&D Secretariat). The share of universities among all participating organisations in Finland (N=1057) was 30 percent, which is higher than in the Fourth Framework Programme (cf. Luukkonen & Hälikkä, 2000).

Structure of the report

The report is structured as follows. Chapter 2 describes the data used in this study. Chapter 3 analyses the relationship between EU participation and researchers' research orientations and environments. Chapter 4 draws on the results from the survey and interviews in order to assess the quality of EU research projects and the intended and unintended consequences of EU participation for the university units. The consequences of EU collaboration for national research funding allocation are also discussed in this chapter. Chapter 5 summarises researchers' views on the implementation of EU framework programmes and future prospects for EU research collaboration. Finally, Chapter 6 draws conclusions on the basis of all the findings of this study.

2. Materials and methods

2.1 Data collection

Perceptions of EU research collaboration were studied by conducting a survey and interviews with staff in 36 university units, including both unit heads and other academics. A postal questionnaire was sent to 314 Finnish university researchers, of whom 189 returned it. The response rate among the survey respondents was 60 percent. The number of interviewees was 78. The university units are listed in Appendix Table 3. The units were chosen on the basis of the VTT–Tekes database on the Fourth Framework Programme. These units represent different disciplines and different levels of activity in the Fourth EU Framework Programme. Furthermore, the sample includes both departmental units and research institutes. By definition, departmental units (N=28) represent traditional university faculty units that are responsible for research and higher education, while research institutes (N=8) are typically independent units directly under the central administration of the university, which are often exempt from obligatory teaching duties.

The survey questionnaire and the interview schema contained both structured and open-ended questions. The survey and interview questions dealt with the importance of EU collaboration from the particular unit's viewpoint. The interviews also pursued specific questions related to the unit's research tradition and research performance, including international collaboration, collaboration with private companies and other end-users and the commercialisation of research results.

2.2 Representativeness of data

The data consists of information from 189 survey respondents and 78 interviewees. Of the total survey respondents, 54 percent had participated in EU collaboration (Table 1). The numbers of survey and interview respondents by discipline group are listed in Table 2.

Table 1. Survey respondents by experience of EU collaboration and by unit type.

	Departmental unit		Research unit		Total	
	N	%	N	%	N	%
EU participants	84	82	19	22	103	54
Non-participants	73	71	13	15	86	46
Total	157	83	32	17	189	100

Table 2. Survey and interview respondents by discipline group.

	Survey respondents		Interview respondents		All	
	N	%	N	%	N	%
Natural sciences	69	37	11	14	80	30
Technology	35	19	14	18	49	18
Medicine	14	7	12	15	26	10
Agriculture and forestry	18	10	16	21	34	13
Social sciences	21	11	14	18	35	13
Humanities	3	2	1	1	4	1
Multidisciplinary	29	15	10	13	39	15
Total	189	100	78	100	267	100

Those responding to the survey come from nine different universities (Appendix Table 1). The single largest group of respondents is from the University of Helsinki (41%). Over two thirds of the survey respondents work in departmental units and 17 percent work in research units. Of the total, the number of female respondents is 49 (26 %) and male 140 (74 %). The average age of the survey respondents is 44. The youngest survey respondent is 25 years and the oldest 68. (Appendix Tables 2, 5–6)

The data is subject to some limitations. The respondents are predominantly from the higher level of the university hierarchy. Half of the respondents in the sample are professors and two-thirds work as a group leader. Nearly 80 percent of the respondents have a doctoral degree (Ph.D.) and six percent a licentiate's degree (that is, a lower doctoral degree). In addition, not only are young scientists and lecturers weakly represented in the sample, but also scientists from

the humanities are conspicuous in their absence. Their share of all respondents is less than two percent (Appendix Tables 7–9). Thus, one should be cautious in making any broader generalisations regarding the humanities or different groups of university employees.

3. Participation in EU framework programmes and research performance

This chapter offers insights into the characteristics of the Finnish university units that may facilitate their participation in EU framework programmes. Specifically, it highlights how relevant the research orientation and research environment are in explaining the behaviour of university researchers regarding EU participation. It must be acknowledged that measuring the factors influencing EU participation is a difficult task. First of all, the definition of research orientation is controversial. For example, in many cases a person can carry out research that can be described as both basic research and application-oriented or theoretically and practically oriented. Also, measuring the influence of the research environment on EU participation is difficult because the environment often includes qualitative aspects that are not easy to measure.

3.1 Research orientation

Assuming that the EU framework encourage inventions with practical applications, interdisciplinarity, organisational diversity and sensitivity to the broader socio-economic implications of scientific discovery, the differences between the research orientations of participants and non-participants were analysed. Figure 1 represents the characteristics of research orientations among all respondents and Figure 2 the differences between participants and non-participants. The majority of respondents characterises their research as innovative, long-term and internationally acknowledged. An interesting observation is that quite a large number of respondents (60 %) perceived their own research to be interdisciplinary. Even the respondents from physics and English philology considered their research to be interdisciplinary. This latter result may imply more the ambiguity of the concept of interdisciplinarity rather than its breadth.

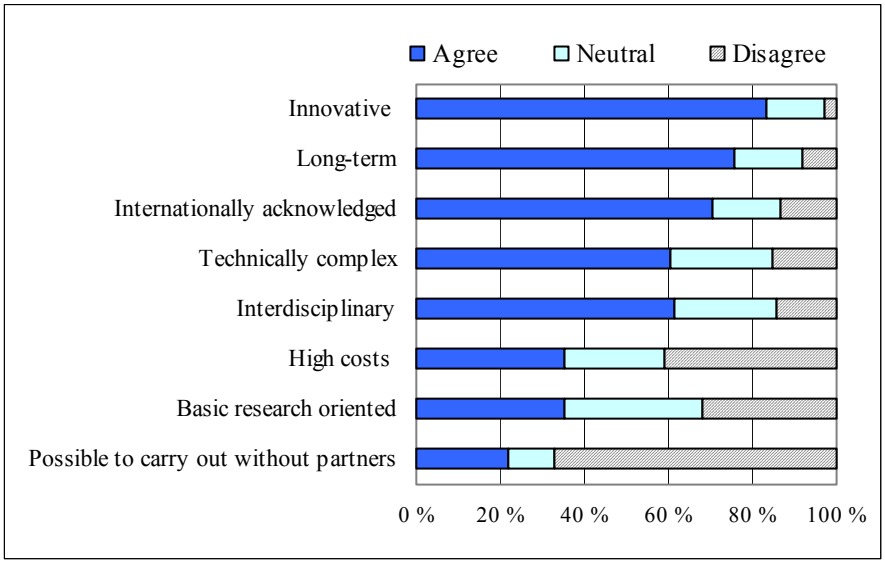

Figure 1. Characteristics of one's own research, all respondents (%).

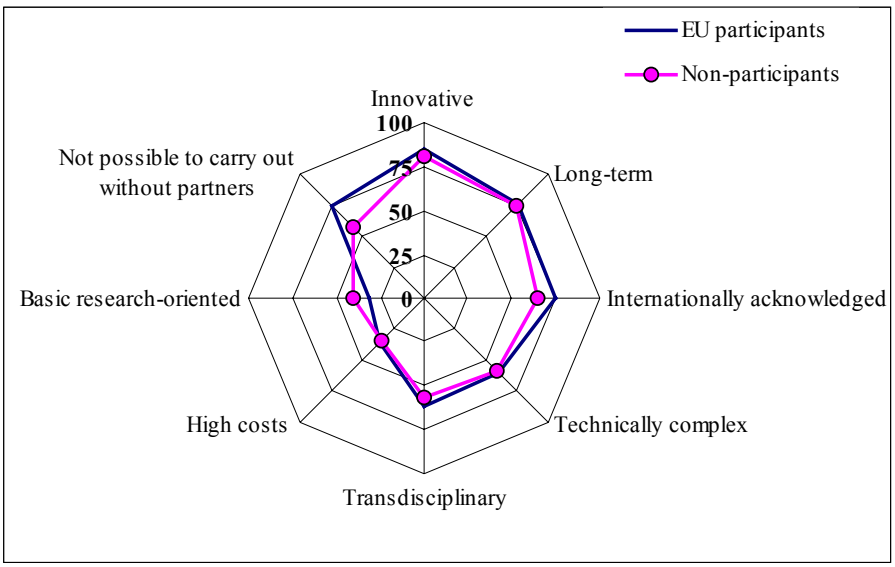

Figure 2. Characteristics of own research by experience in EU collaboration. Share of respondents who fully or partly agreed with the statement (%).

Only two differences between participants and non-participants were found. Compared to the non-participants, the participants characterised their research more frequently as internationally acknowledged and conducted in groups than the non-participants did. The difference in their basic research orientation was unexpectedly small (40 % vs. 31 %). As for the interdisciplinarity and complexity of the research, neither were any significant differences found between these two groups (see Appendix Table 10).

3.2 Research environment

The relationship between the research environment and involvement in EU framework programmes was examined by analysing the characteristics of the units where the respondents worked. It was assumed that unit-level factors such as size, organisational structure, leadership, different purposes and responsibilities for teaching are important factors that influence the researchers' interest in participation and opportunity to participate in EU research programmes.

In order to examine the specific features of different types of units and their relation to EU participation, units were classified into two groups: units active in the EU and units less active in the EU. The criteria used in the distribution was based on the share of EU funding in the unit's total research funding and the number of EU projects that the unit was involved in. The unit was included in the EU-active category if EU funding comprised ten percent or more of the unit's total research funding and if the unit had taken part in at least three EU projects in 1999. It should be noted that each unit group involves both participant and non-participant respondents.

Figure 3 shows that success in raising EU funds is closely connected with the size of the unit. A tentative explanation is that greater success is due to better management and organisational capabilities in the larger units. A study conducted by Geuna (1998) has shown that larger units can cope with the international organisation of R&D co-operation and with the related administrative workload better than smaller units.

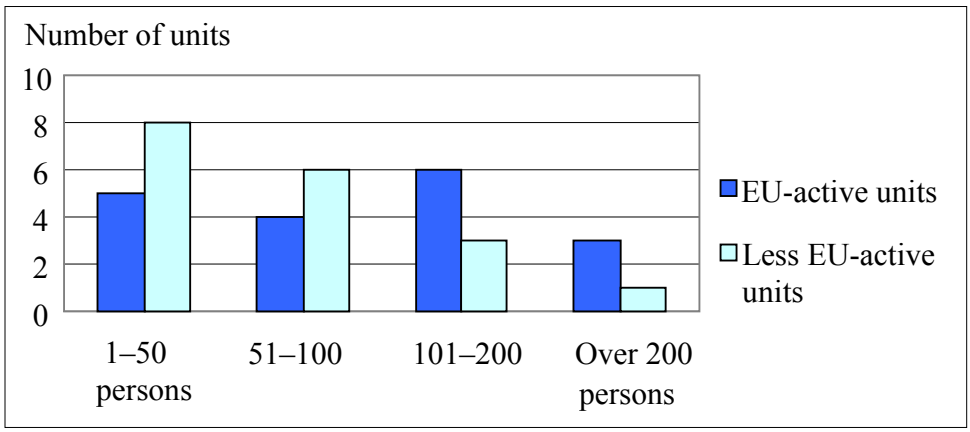

Figure 3. EU activity of the unit by size of the unit's personnel.

The relationship between EU participation and the type of unit is evident in Figure 4 below. Departmental units that have more teaching duties are less active in EU collaboration than units that emphasise research.

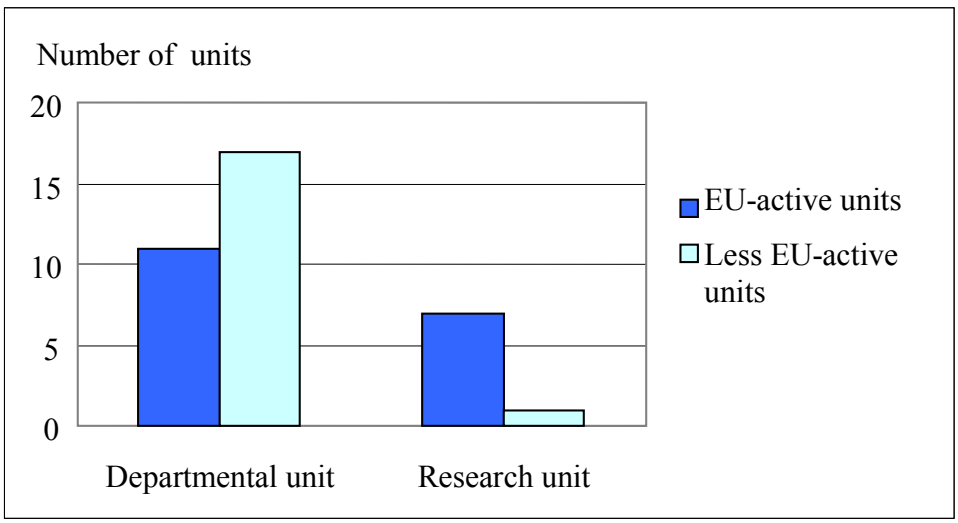

Figure 4. EU activity of the unit by unit type.

A comparison between units that are more or less active in EU collaboration by discipline group shows that units representing technology, the natural sciences and multidisciplinary fields are most active in EU collaboration (Figure 5).

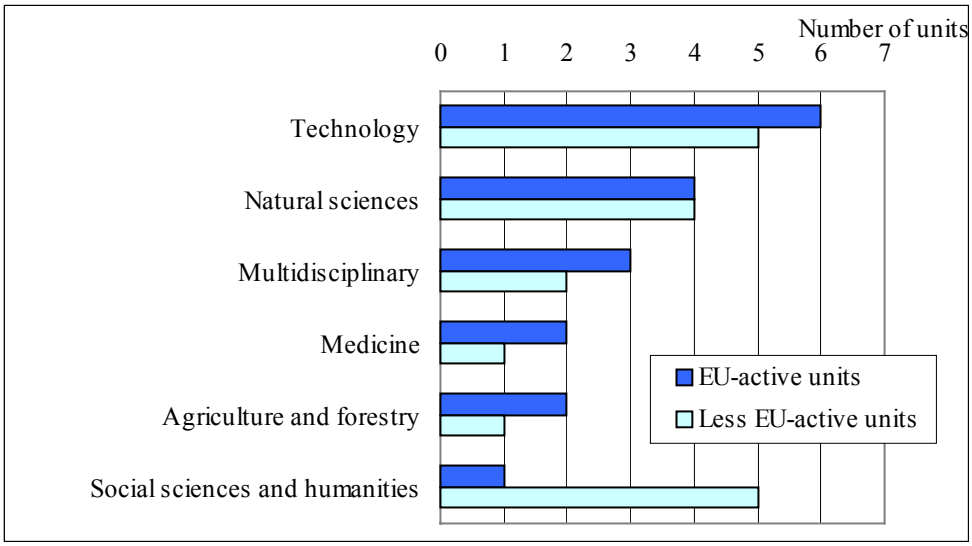

Figure 5. EU activity of the unit by discipline.

The unit's previous experience in collaboration with private companies corresponds also to its level of activity in EU collaboration. The EU-active units had collaborated more often with private companies than the less active ones (Table 3). A further observation is that the EU-active units have foreign visitors more often in their unit than the less active ones (Table 4).

Table 3. Co-operative projects with private companies in 1999 by unit type.

Number of projects in 1999	EU-active units		Less EU-active units	
	N	%	N	%
1–5 projects	3	17	3	17
6–20 projects	7	39	3	17
Over 20 projects	3	17	0	0
Total	13	72 (n=18)	6	33 (n=18)

Table 4. Foreign visitors in 1999 by unit type.

Number of visitors in 1999	EU-active units		Less EU-active units	
	N	%	N	%
1–10 visitors	5	28	8	44
11–20 visitors	3	17	1	6
Over 20 visitors	6	33	0	0
Total	14	78	9	50
		(n=18)		(n=18)

In addition to the statistical information obtained from annual reports and financial statements, a number of statements were proposed to the respondents in the questionnaire in order to analyse the qualitative features of the unit. The statistical analyses of responses highlighted nine statements that represented statistically significant differences between active and less active units. Figure 6 shows the share of those respondents who fully or partly agreed with the proposed statements.

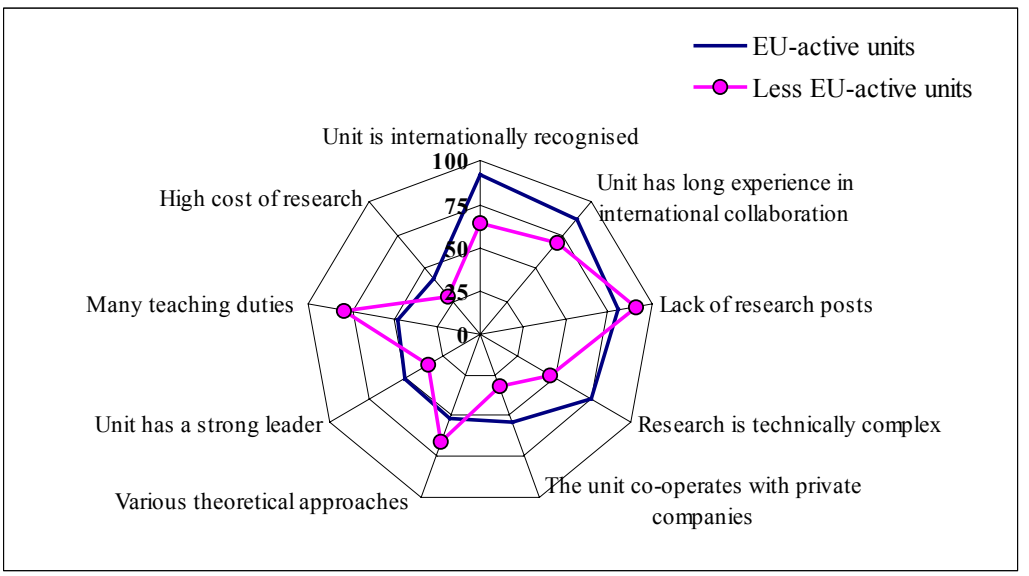

Figure 6. Characteristics of the unit by level of EU activity. Share of respondents who fully or partly agreed with the statement (%).

Five overall observations can be made based on the survey results. First, previous experience in international research collaboration seems to be an important factor in explaining the unit's level of activity in EU research programmes. This result is evident both in the survey responses and interview data. EU-active units are distinctly more internationally experienced and acknowledged in the past and present than the less active units.

A second observation is related to the characteristics of research: EU-active units carry out more often costly and technically complex research. Thirdly, with regard to the level of co-operation with private companies, EU-active units have more often co-operative projects with companies than the less active units. This observation is in line with the statistical information about the units obtained from annual reports. Thus, longstanding collaboration with Finnish or foreign companies is likely to promote university participation in EU programmes.

A fourth observation is related to the unit's leadership. EU-active units are more often lead by a strong leader than the less active units. According to many interviewed heads of units and researchers, the importance of good leadership appears to be increasing in the complex research community, where competition to get projects funded seems to be growing.

The fifth difference is related to educational responsibilities. Compared to the active units, less active ones have more obligatory teaching duties. However, it has to be noted that many of the EU-active units take part in postgraduate training through hiring doctoral students to work in the research projects. Teaching duties are also most often regarded as an obstacle to EU participation (this is discussed in more detail in Chapter 5, section 3).

In the context of EU research programmes, it is relevant to discuss the advantages and disadvantages of being theoretically homogenous or a group of people with diverse research interests. The survey results reveal that respondents from the less active units reported more often than others that they had different theoretical approaches in their unit. This may indicate that the less EU-active units are closer to the ”traditional” way of organising research at the university while the more EU-active units appear to represent a new context of research carried out in groups.

Considering the fact that the focus of EU programmes is on applied research, it was somewhat surprising that the differences between the two types of units regarding their basic or applied research orientations were minor.

Based on the interview data, one noteworthy difference between EU-active and less active units is the informal knowledge transfer and communication in the latter and regular seminars, meetings and workshops and more formal presentations of research projects in the former. Also, interviews with the heads of the units gave the impression that compared to the less active units, the EU-active units are more often dynamic and research activities are better co-ordinated at the unit level. In the less EU-active units there appears to be no urgent need perceived to make changes in their working culture, management system or to integrate various research tasks at the unit level.

The co-ordination of research tasks and activities at the unit level and a tendency to create a research strategy seem to be common features especially for EU-active units. In the EU-active units, it is assumed that a research strategy improves the capability of the unit to bring together the knowledge of different kinds of people and research groups. Another strength of the active units seems to be the continuity of expertise and know-how. This means the availability of highly skilled research personnel and a broad knowledge base. The head of a less EU-active unit points to the vulnerability of a small unit in the following interview excerpt:

> *Our weakness is that everything lies too much on the shoulders of a few persons. We do not have enough critical mass to form a shelter for know-how. I am easily overburdened because I should be able to give advice to every one at the same time. In research, it is quite a risky situation that there is someone who becomes irreplaceable. (Agriculture and forestry)*

Even though the above results seem to support the idea that the EU-active units are more effective and more capable of meeting new challenges, they do not necessarily indicate the quality of research conducted in these two types of units. Rather than reflecting the quality of research, the previous findings indicate that EU programmes favour certain types of units and research cultures – that is, those with good co-ordination, good leadership and sufficient human resources.

3.3 Research funding and resources

When we look at the importance of different funding sources for these two groups, Tekes, EU framework programmes and private industrial funding have a greater importance for EU-active units than for less active units (see Figure 7). This result corresponds not only to the unit level but also to the individual level. As to the importance of EU framework programmes, the differences between the participants and non-participants are even more profound: 54 percent of EU participants compared to 11 percent of non-participants thought that such programmes were important. Unexpectedly, attitudes towards private enterprise funding are similar among participants and non-participants (39 % and 35%, appendix Table 11). An interesting observation based on the figure below is that funding provided by the Academy of Finland is equally important for both types of units. It is also noticeable that funding provided by the Academy of Finland is the most appreciated funding source among all respondents.

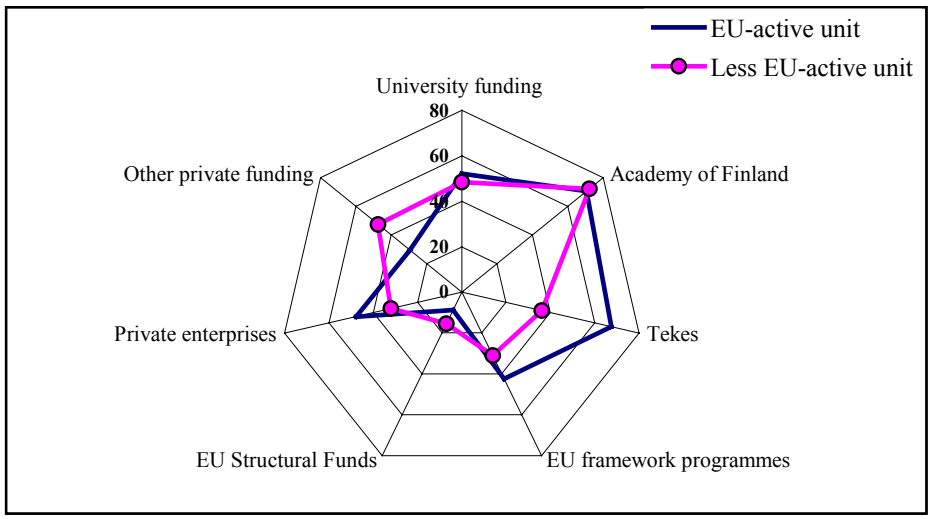

Figure 7. Importance of research funding source by level of EU activity of the unit. Share of respondents who considered research source as important (%).

The respondents were requested to assess the development of research funding and resources in their own field. Figure 8 shows that the EU-active units seem to have much better facilities for carrying out research than the less active units. Respondents from the less EU-active units thought more often than others that

research funding was insufficient, they lacked teaching and research posts, and their budgetary funding had decreased.

University units differ quite widely in terms of how much they invest in research. This is partly explained by their orientation but also by the relevance of their research focus. It is often easier for units with a fashionable research theme, or a commercial or engineering orientation, to secure external funding than it is for traditional university fields that rely more heavily on core funding. The unevenness in the financial situation was expressed by many interviewees from the less EU-active units.

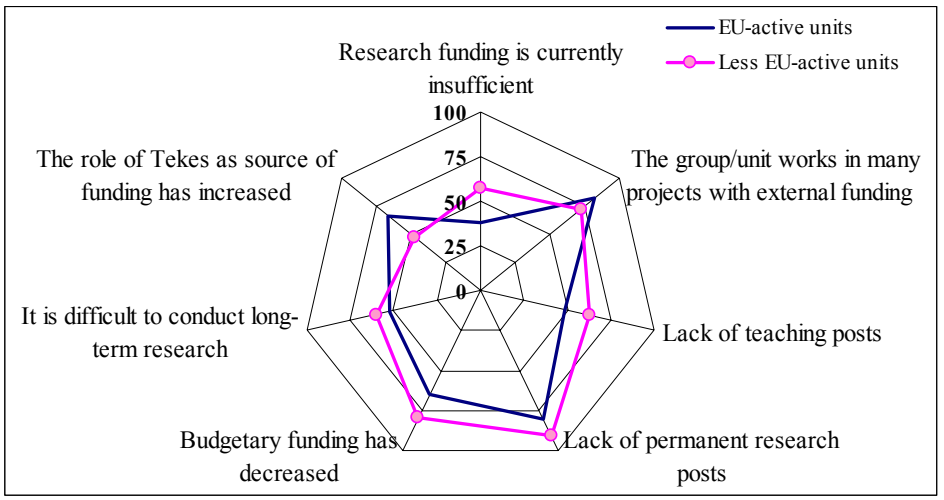

Figure 8. Perceptions among Finnish academics of the development of research resources in their own field of research by level of EU activity of the units. Share of respondents who fully or partly agreed with the statement (%).

> *There may be such unevenness that some groups or some persons have a lot (of funding). I do not mean that they would splash it around, they use it for the salaries of their staff also. And then there are others who have nothing or very little. For instance, the person in the neighbouring room has been able to buy a good PC with external funding, whereas I have received research funding but not for a PC. That is why I still use this old PC which belongs to the university. We haven't been able to obtain any equipment*

for our department with university funding for three years. As the years go by, it means that we are going down all the time. Reducing staff is one thing, that is, the teaching load becomes heavier, but the other thing is that with this equipment you cannot conduct any research that could be read without laughing. (Agriculture and Forestry, non-participant)

To sum up, the opportunity for university researchers to succeed in obtaining EU research funding is not only dependent on their own motivation to take part in EU collaboration but also on organisational factors. Given size and discipline, other factors are important for explaining the different frequency in participation. Among others, previous experience in international collaboration, previous contacts with private companies, sufficient research facilities (including human resources and equipment) as well as good co-ordination and management of the unit are important factors that facilitate joining EU research programmes. Furthermore, the conclusion can be drawn that EU-active units appear to be more diverse, most likely because of various funding sources, and their research is more often conducted in groups compared to the traditional academic way of carrying out research with one or two faculty members and four or five students. However, a straightforward relationship between EU participation and multidisciplinarity or interdisciplinarity in approaches cannot be drawn.

The research of the EU-active units versus the less active ones provide some further evidence of the characteristics of a good research environment. As Asmervik et al. (1997) have pointed out, a good research environment is dynamic, demanding and courageous. In short, a good research environment should consist of many different people, comprising older, experienced researchers as well as the young and curious, and visiting scholars. Moreover, researchers should be willing to make efforts to maintain, develop and renew knowledge both independently and co-operatively, daring to measure themselves against the international elite. A courageous research environment means that researchers are able to act in ambivalent circumstances. Flexible management, co-ordination of various tasks and encouragement by the leader of the unit towards international collaboration are also factors that facilitate carrying out high quality research.

4. Perceptions among Finnish academics of EU framework programmes

This chapter provides insights into the quality aspects of EU framework programmes as well as into the intended and unintended impacts of EU research collaboration on university units.

4.1 Research quality

Alongside increasing Finnish university participation in EU framework programmes, it has become more and more important to pay attention to the quality aspects of EU research collaboration. As mentioned earlier, internationalisation has been seen as one of the key elements in developing the Finnish innovation system. International collaboration is believed to contribute to the development of the innovation system and to improve the quality and relevance of Finnish research (Finland: A Knowledge-based …, 1996, 29). Thus, the focus here will be on two questions: firstly, is the quality of EU research comparable to that of domestic and other international research? Secondly, what are the perceptions of university researchers regarding the research focus and time horizon of EU projects?

Figure 9 shows that attitudes of Finnish university researchers towards the characteristics of EU research projects are divergent and projects are considered to be of high scientific quality only in certain aspects. Over two thirds of the respondents knew that EU projects are carried out in groups. The data also reveals that half of the respondents consider EU projects to be costly, useful and ambitious. Regarding the quality of EU projects, less than half of the respondents considered EU-funded research as internationally high-standard, whereas 17 percent thought they are internationally low-standard, corresponding to findings of the survey conducted by Luukkonen & Hälikkä (2000), which studied the experiences of the Finnish participants in the Fourth Framework Programme.

As for the research orientation of EU projects, less than 10 percent of all respondents considered them to be basic research-oriented and over 60 percent of the respondents considered them to be application-oriented. This corresponds to the findings of a Swedish study in which 10 percent of participants thought that EU-funded research could be characterised as oriented toward pure basic research (Kvalitativa aspekter …, 1999). The question of basic versus applied research is also connected to the time horizon of EU research, the opinions on which vary significantly among the respondents. Less than a third of the respondents regarded EU projects as short-term, whereas a third considered them to be long-term.

In comparison to the university respondents' views on their own research (see Figure 1 on page 20) EU-funded research is considered to be less innovative, more short-term, more application-oriented and technically less complex.

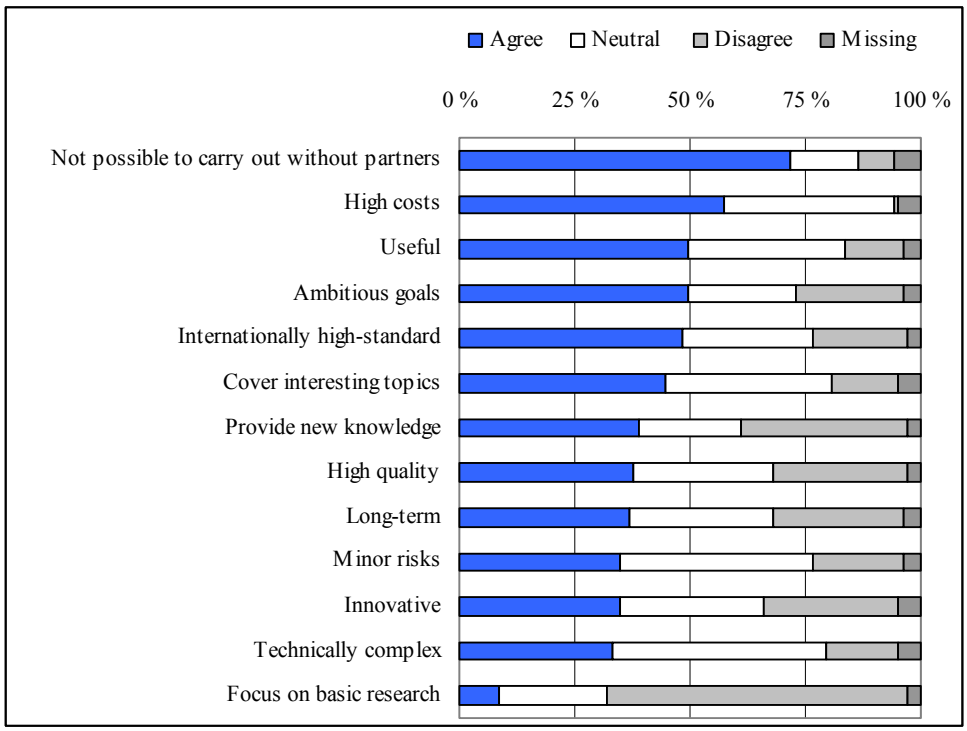

Figure 9. Perceptions among Finnish EU participants of the characteristics of EU projects (%).

The cross-tabulation of research quality and research orientation shows that there is a connection between opinions regarding these features of EU projects (Table 5). Two thirds of those who assessed their projects as being basic research-oriented also considered their project to be of an internationally high-standard. In contrast, only a third of those who considered the project application-oriented regarded it as of a high standard internationally. These results suggest an interpretation that EU projects are at the forefront of international research when they concern basic research and less so when they are application-oriented. This result is not surprising, considering that applied research draws on the available knowledge base to solve problems of practical relevance and that basic research aims to advance knowledge. Still, the fact that about a third of the researchers involved in application-oriented projects considered their projects to be at the international forefront demonstrates that the relationship between the application orientation and international quality is not straightforward.

Table 5. The relationship between research orientation and research quality of EU projects. Share of respondents who agreed with the view that there was a relationship between the research orientation and research quality (%).

	Focus on basic research	Focus on both basic and applied research	Focus on applied research
Internationally high-standard	73	50	36
Internationally of average quality	20	41	40
Internationally low-standard	7	9	24
	100	100	100
	N=15	N=56	N=110

p = .026

In order to obtain a more detailed picture of the perceptions of different groups, e.g., participants and non-participants, discipline groups and different types of units, different items delineating the characteristics of EU-funded research were classified into five categories: **research quality, research focus, collaboration orientation, resource intensity and time horizon**. The validity of the category concerning ”research quality” was tested by using reliability analysis. The results of the reliability analysis are shown in Appendix 1.

Figure 10 illustrates the percentage frequencies of the new characteristic categories formed on the basis of the reliability analysis. Figure 10 is based on the percentages of the answers that indicated the average of the each item. If the average is between 1–3, it means that the respondent fully or partly agreed the statement.

Figure 10 shows that the views on the characteristics of EU-funded research are surprisingly similar between participants and non-participants. The views of the non-participants on the quality and time horizon of EU research projects are close to the views of participants, but the participants emphasise more often an applied research orientation than non-participants.

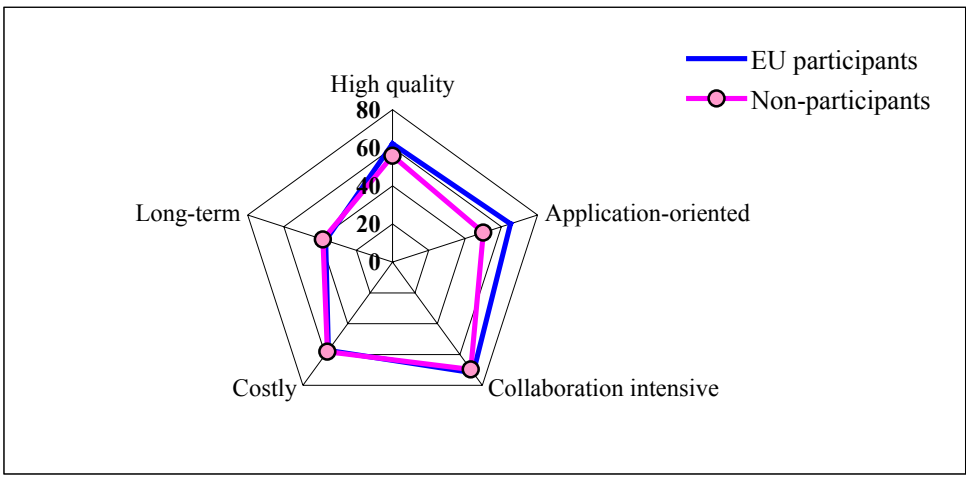

Figure 10. Characteristics of EU-funded research projects by experience in EU collaboration (%).

As to the differences among discipline groups, the respondents from multidisciplinary fields and agriculture and forestry had the most positive views on the international high-standard of EU projects, whereas respondents from the social sciences and humanities were the most critical towards EU-funded research (Figure 11). This observation was expected, since the promotion of research in the social sciences and the humanities has had a markedly lower

priority in EU programmes. Another interesting observation is that those respondents who considered industrial funding to be an important research funding source appreciated EU-funded research more often than those who considered industrial funding to be less important (see Appendix Table 47). Being an evaluator of EU projects had no effect on the assessment of quality (see Appendix Table 48).

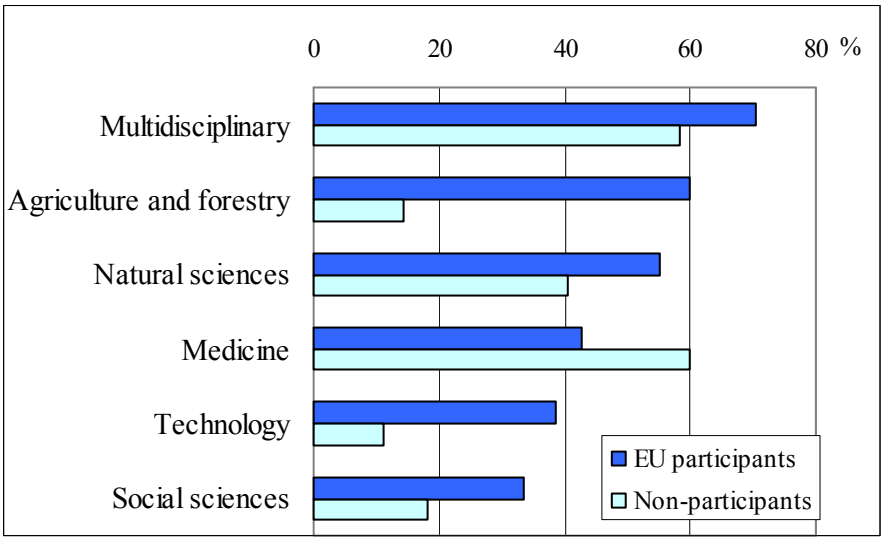

Figure 11. Views on the international standard of research by experience in EU collaboration. The share of respondents who fully or partly agreed with the view that EU projects are of an internationally high-standard.

Respondents who represented more application-oriented fields (e.g., applied chemistry, food sciences, information technology, and microbiology) tend to see the quality of EU projects more positively than others. Further perspectives on the quality and research orientation of EU projects are provided by the interview data. The positive views regarding the quality of EU projects were supported by the interviewed persons from these fields:

> *[EU projects] can be of good quality, of very good quality. For instance, if we find new bioactive substances [in this project], I think we can publish the results in very high quality journals. The*

same applies to all other projects as well… There is the application stage in the end, so that we do basic research and then in the end we apply it in the way the EU wants. (Microbiology, participant)

In contrast, especially interviewees from medicine and the natural sciences thought that EU projects are not on the forefront of science. The critical views on the quality of EU projects are illustrated in the following citations:

Top-quality research is not brought into the sphere of EU collaboration because of knowledge leakage. Also the national funding agencies see to it that top-quality research will be funded from national sources. It is also in the national interest that the top-quality research is carried out with national funding. (Natural sciences, participant)

The reason why the EU funds research is to obtain instruments to conduct its own policies. Research work is conducted for the needs of the bureaucracy, and that is why the scientific ambitions are left in the background. There is no time to search for new knowledge, instead the project involves reorganising and applying the currently existing knowledge to the objectives given to the project and to the directions in which the EU is leading you. Someone once said that you have to complete the research work first and then afterwards apply for the EU funding for it in order to be able to carry out that project." (Agriculture and forestry, participant)

The quality of the EU projects is reduced by the fact that the companies are afraid to offer any really important projects. That is why the projects often become only mediocre. (Technology, participant)

These critical views indicate that the most novel and interesting ideas are not necessarily brought into an EU project because researchers prefer to carry out the most promising projects with national or other international funding. Furthermore, many interviewed persons held the view that EU projects are

aimed at solving practical problems and supporting political decision-making. This view corresponds to the stated objectives of EU-RTD policy. However, unlike R&D policymakers in the EU, the interviewees tend to see a clear contrast between these objectives and the production of new scientific knowledge.

Regardless of the criticism towards the research quality and applied research orientation of EU projects, many of the interviewed persons thought that EU projects were worth pursuing. The appreciation of EU projects was based on the view that severe competition will ensure the high quality of EU projects. The medical scientists, however, argued that the evaluation system of the EU Framework Programmes is inefficient and less objective in comparison to, for instance, the European Molecular Biology Organisation or the National Institutes of Health in the US. This latter finding is compatible with earlier findings concerning the efficiency of the EU evaluation process (cf. Hakala 1998, 67).

Overall, one of the major findings from the data is that the perceptions of Finnish academics concerning the quality of EU research are divergent and that not all EU research can be considered to be of high academic quality. The data also reveals that the non-participant perceptions of the quality of EU-funded research are surprisingly congruent with those of the participants. This reflects the fact that most Finnish academics, even those who have not been involved in EU collaboration, have a realistic view of what EU-funded research is about. Furthermore, although the majority of respondents consider EU projects useful for Finnish university units, not all are satisfied with the current focus of EU programmes. From the university viewpoint, EU projects are oriented forwards technological or societal applications and industrial product development instead of producing new scientific knowledge.

4.2 Impacts of EU participation on university research

A number of studies (cf. de Montgolfier & Husson, 1995; Luukkonen & Niskanen, 1998; Luukkonen & Hälikkä, 2000) have focused on evaluating the industrial implications of EU-funded research, paying little attention to the impacts of EU collaboration on university units. There are reasons to believe,

however, that EU research collaboration has both intended and unintended consequences, not only for the behaviour of individuals, but for departments and research units as well.

The benefits of EU collaboration for the units, as seen by the respondents with experience in EU projects, are generally similar to those discovered in previous studies on EU participation (cf. Luukkonen & Niskanen, 1998; Peterson & Sharp, 1998; Luukkonen & Hälikkä, 2000). Strengthening international collaboration, strengthening the knowledge base and obtaining funding for research were mentioned as the most important benefits of EU collaboration for university units (Figure 12).

Expectedly, the participants had a considerably more positive opinion of the benefits and they perceived a larger variety of benefits more frequently than the non-participants. (see Appendix Table 21). However, also non-participants thought that EU collaboration is useful for their unit, even though to a lesser extent. The interviews reveal a host of benefits of EU collaboration not only for individual researchers but for units as well:

> *One of the benefits is the increase in volume. It is possible to keep the researchers by offering them interesting work; they do not disappear altogether and when the project is over, people may stay here after all. (Information sciences, non-participant)*

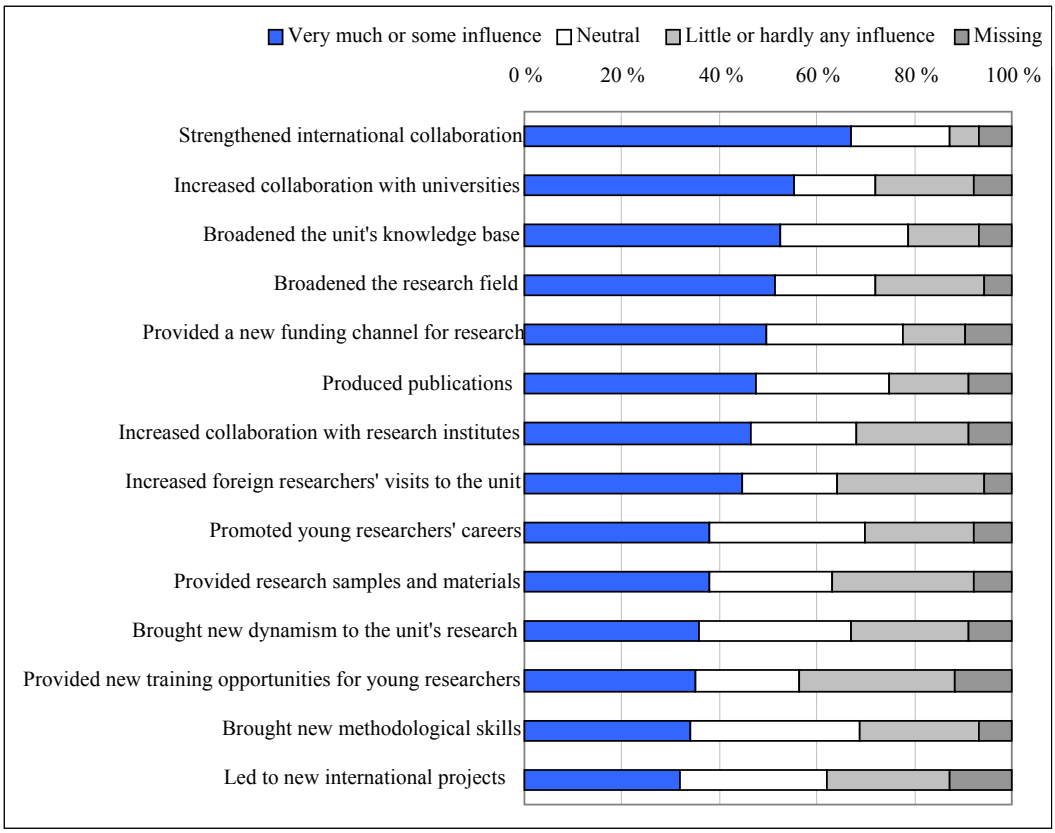

Figure 12. Views of Finnish EU participants on the benefits of EU collaboration (%).

To obtain a more detailed picture of the impact profiles of the disciplines and types of units, a factor analysis of the different benefits of EU collaboration was carried out. Factor analysis is a multivariate method to determine interrelations among a set of variables. The results of the factor analysis are outlined in Appendix 2.

The factor analysis revealed five impact categories that illustrate the main impacts of EU collaboration on university units. These are **internationalisation; strengthening the knowledge base; redirection of research; collaboration with end-users; and commercial exploitation of research**. Figures 13 and 14 illustrate the percentage frequencies of the new impact categories formed on the basis of the factor analysis. The percentage shares are based on the average

percentages of the answers that indicated that the impact items included in each factor had either a strong or moderate influence on the unit's activity.

Respondents from the life sciences and EU-active units tended clearly to have a more positive view of the benefits of EU collaboration than respondents from other fields and those working in less active units.

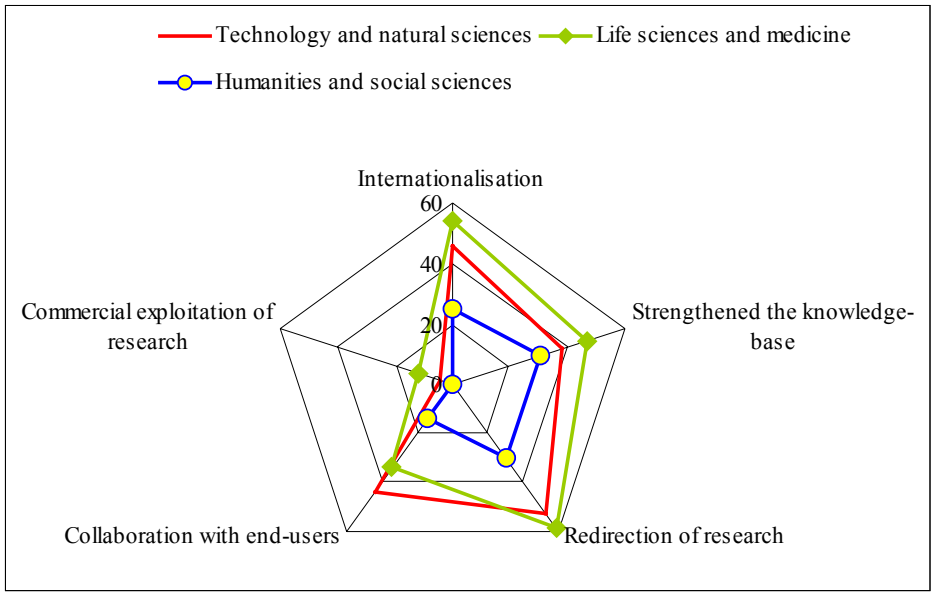

Figure 13. Benefits of EU collaboration for university units in three disciplinary groups (%).

In comparison to the classification of the impacts of EU collaboration used in previous studies[1] carried out by Luukkonen & Niskanen (1998) and Luukkonen & Hälikkä (2000), these new categories seem to better illustrate the impacts of EU collaboration especially on universities. Each of these five categories will be discussed in more detail in the following sub-sections by combining the survey data and interview data.

[1] Various impacts of EU collaboration were grouped into four categories: business-related, knowledge-related, resource-related and networking.

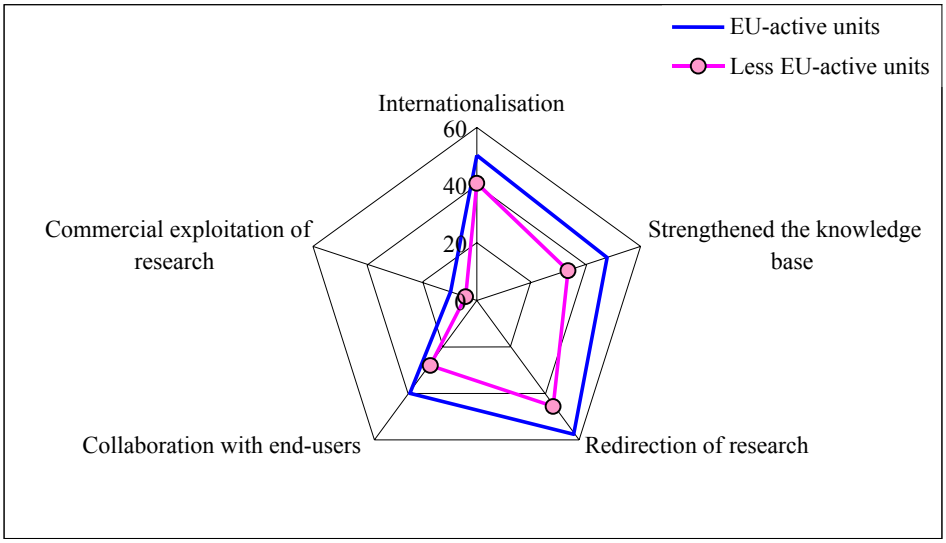

Figure 14. Benefits of EU collaboration for university units by experience in EU collaboration (%).

4.2.1 Internationalisation

Taking into account that the process of internationalisation is slow and contains different phases, the importance of EU collaboration is likely to be divergent among disciplines and the units according to their previous experience in international collaboration. Based on the interview data, for less internationalised researchers and units, EU programmes have provided an opportunity to create new foreign contacts and increase their reputation and visibility at the European level.

> *The EU project was important for us in the sense that we have been able to show our research results to national funding sources and to the EU that we were able to transfer our research results to global products. This has led to contacts with European companies, and we have been able to use these contacts later. (Technology, participant)*

In contrast, internationally renowned units are seeking complementary skills and additional funding from EU collaboration. According to the representatives of these units, an important premise for joining EU programmes is that the EU project is in the core research area of the unit. Particularly in the fast-growing areas, such as biotechnology and information technology, EU collaboration is considered important because it may have considerable pull when it comes to attracting graduate students and post-doctorates to Finland.

The fear that EU collaboration has been carried out at the expense of other international collaboration is exaggerated. On the contrary, the most prevalent view among respondents is that EU collaboration has not reduced other international collaboration but in many cases has reinforced and diversified it. Over half of the respondents thought that EU collaboration has not decreased other international collaboration, while 10 percent thought the opposite (Appendix Table 22). The results are in accordance with a recent bibliometric study on scientific publishing in Finland (Persson et al. 2000). The study showed that there had been a rapid increase in international collaboration overall, but most growth in collaboration in the 1990s took place with EU countries (Persson et al., 2000, 20).

In medicine and the natural sciences, where contacts with US counterparts are particularly strong, EU collaboration is seen as just one of the many sectors of international research collaboration. EU research programmes have increased collaboration with European countries to some extent, but it has not occurred at the expense of collaboration with the US. As one department head put it:

> *Mobility within the EU has grown enormously. Mobility to non-EU countries – in our case, mainly to the US – has not been influenced by EU collaboration. It has grown as well, but independent of the EU. (Technology, participant).*

However, European collaboration is considered valuable not only because of the availability of EU research funding, but also because it provides a welcome alternative to the United States hegemony in medicine and the life sciences. It is argued that EU programmes have opened up possibilities for co-operation and for the mobility of young Finnish scientists. Germany, France and the UK are emphasised as the most popular countries as collaborating partners in Europe.

Also, the respondents in medicine stressed that the European research institutes have improved their international competitiveness, visibility and scientific status during the 1990s and this, in turn, has increased their importance as collaborating partners. Geographical and cultural proximity, especially with Northern European countries, were also mentioned as factors that favoured collaboration with Europeans instead of Americans.

On the basis of the interviews, it seems that in technical fields, where contacts with the US also have a long tradition, the focus of international collaboration momentarily shifted to EU countries in the early 1990s. But in the late 1990s it was shifted back to the US, Japan and Eastern Europe. For example, in the fields of information technology and telecommunications, the most important partners are currently from the US. Moreover, the neighbouring countries and Russia have become more and more important partners for technical fields because of their high theoretical knowledge base in mathematics and physics.

> *Before the EU period we had a fair number of contacts with Japan, the University of Tokyo. Then came the EU stuff and we turned towards the EU; actually already before Finland became a member state. That was a good time for us. When Finland joined the EU, the business calmed down and we could look elsewhere again. We have been looking East and West and everywhere in between. (Technology, participant)*

This quote reflects the survey finding that, in comparison to other ”hard fields”, technical fields tend to have more diverse geographical patterns of research collaboration (cf. Hakala et al., 2001). In the late 1990s, contacts with Japan have also been actively developed, partly due to support provided by the National Technology Agency (Tekes).

In the humanities and social sciences, where EU collaboration has so far been moderate compared to other fields, the effects on other international activities have been minor. However, it seems that EU programmes have increased collaboration with other than English-speaking countries, in particular with France and Germany. A major shift that has occurred in these fields, however, is the overall growth in international collaboration. A professor representing the

social sciences describes the development of international collaboration in his own unit as follows:

> *Contacts have multiplied in the short term. We have obtained several new contacts from all around the world and not only from the EU countries. Different groups are visiting our unit and our own researchers are invited to international conferences. This phenomenon has emerged in the 1990s… It does not derive only from EU participation but from other things too. (Social sciences, non-participant)*

To sum up, interviewees from all fields agree that EU collaboration has strengthened, intensified and formalised their international collaboration. Nevertheless, even if EU collaboration has not always been very successful or has not brought about direct benefits for the unit, it is still thought to be useful. Like other international collaboration, European research collaboration is expected to have far-reaching consequences primarily in generating new research projects but also in bringing researchers closer together.

4.2.2 Strengthening the knowledge base

As was shown in previous studies on the impacts of EU framework programmes, universities, in particular, have emphasised the importance of producing scientific knowledge (Luukkonen & Hälikkä, 2000). When studying the outcomes of EU collaboration for the university units, half of the participants agreed with the view that EU participation had strengthened the knowledge base of the unit, but only 22 percent thought that it had promoted objectives related to basic research (Appendix Table 21).

EU collaboration is said to be of importance for research training and the promotion of research careers. Based on the feedback from the heads of the units, EU collaboration seems to benefit especially young scientists who can acquire new professional skills and qualifications by collaborating with European top scientists. The respondents think that the most recent ideas, methods and models are transferred through EU consortia. The advantages of being involved in an EU project are reflected in the following:

Without a doubt, the EU project increases their opportunities to collaborate and get good contacts with international groups. If they continue their careers as researchers, the fact that their publications are prepared jointly with someone from another country increases the importance of their publications. This is definitely positive. (Microbiology, participant)

Especially in information technology, where young academics are increasingly persuaded to move from universities to private companies, EU projects have provided for young academics interesting and attractive work and an opportunity to learn about international collaboration.

For young students who consider working for a company of their friends or for a bit bigger company, it is appealing to them that there are international projects they can join and can travel. It's like being a member of an exclusive club; when older employees think 'do I have to travel again' the students think 'wow, I get to travel! And when you get to travel it is not as if you were inter-railing: you travel by plane and you live in hotels. In my opinion, the hidden meanings related to that are important. That's a way to attract proficient academics. It is a problem, though, that academics are attracted from such fields that are not exactly basic research but such research that would be important for the society within a time-span of five years. We can educate people there, but then they easily go and work for the research units of big companies. They won't stay here. That is a problem, I think. The theoretically oriented ones stay here, and it's good that they do. It causes problems in terms of the products of research. This has been typical for this field all the time. There's nothing new in it. (Information science)

Even though most EU projects are carried out by young academics under senior supervision, there are, however, problems in adjusting the objectives and time frames of EU-funded research projects to carrying out research for doctoral theses. Some comments touched upon the unsuitability of EU projects for doctoral students:

> *Now that this project has to be pre-defined to a great extent…the project leaders plan the issues ahead and then they are carried out, there is no space for a doctoral thesis. (Agriculture and forestry, participant)*

Completing a doctoral thesis in an EU project is problematic because the aims of EU projects are defined by the members of consortia in advance, following the principles of the EU programme. Secondly, EU projects necessitate competence, experience and know-how in carrying out international research projects because the project should be carried out fast and with a limited timetable. Therefore, EU projects seem to fit much better those researchers who have already shown their research competencies.

The role of EU programmes in promoting research training is regarded as very important, but there seems to be ignorance of the current opportunities to obtain funding for research training, as the following citation indicates:

> *I think it is important, because Finland is a very small country. If a doctoral programme has an important but small course, that could get 4–5 students from Finland, it is no use organising it if one could organise it together with the other Nordic countries or with the EU countries. Then there would be maybe 20 students. (Life sciences, non-participant)*

For instance, IHP (a programme for Improving the Human Research Potential and the Socio-Economic Knowledge Base) in the Fifth Framework Programme provides funding for the appointment of young researchers with support for networking (www.cordis.lu/Improving/). Funding for common research training programmes at the European level would be worthwhile, because it would benefit both junior researchers by bringing them together and senior researchers, who can have a new channel to disseminate their expertise and know-how.

4.2.3 Redirection of research

From the university research viewpoint, it is relevant to ask whether EU collaboration shifts university research away from basic research towards more

application-oriented. Although EU projects are considered more often to be application-oriented than basic research-oriented, a direct conclusion that the university research focus has shifted away from fundamental research cannot be drawn. Firstly, the share of EU funding of all university research expenditure is still rather small. EU funding accounted for less than four percent of the total funding for Finnish university research in 1999 (Research and development…, 1999). Secondly, it should be kept in mind that international co-operation has for a long time been an important part of scientific research, but different fields may have contacts and collaboration in different directions, just as different countries typically have more contacts with certain countries (Luukkonen et al., 1992).

The survey results indicate that EU collaboration has not directly influenced the focus of university research. The objectives of EU projects most often correspond to the objectives of the unit (Appendix Table 22). It is assumed that the societal or socio-economic relevance of the research projects is an important consideration when participating in EU collaboration. However, only 17 percent of the participants thought that EU collaboration has directed their research toward socially topical issues.

Almost 60 percent of the respondents thought that EU collaboration has not focused attention away from issues of national importance, while the proportion of respondents who thought that EU projects are not nationally important was as low as five percent (Appendix Table 22). The views of the non-participants were similar to the participants. One can thus conclude that EU-funded research does not contradict national interests and the fear that EU funded research narrows down or distorts research agendas seems to be exaggerated. On the contrary, most of the interviewed heads of units thought that EU collaboration has in many cases complemented and supported their unit's research agenda.

Some interviewees noted, however, that it is very difficult to assess whether EU collaboration has influenced their own research or the research focus of their unit. Other interviewees thought, however, that EU collaboration had brought some applied research elements into their research and that EU collaboration had taken resources and attention away from basic research and put them into applied research, nonetheless considering the steering effect to be marginal.

The steering effect is quite marginal. But when you start thinking of the collaborating partners, there is an effect, and it may lead to finding partners who would not be found otherwise. (Medicine, participant)

As for the other positive effects of EU collaboration on university units, both the survey and interview data indicate that collaboration has broadened research areas and brought new dynamics into university research. In some fields it has opened up new research areas in the unit:

We have one EU project in which we have clearly plunged into an area where we have previously done nothing. …We have made this experiment consciously, to find out whether to expand our research sphere or stick to the earlier one. (Technology, participant)

One should keep in mind reservations concerning subjective assessments and that EU funding accounts for only four percent of Finnish university expenditure (though its actual share may be somewhat larger). Thus the influence of EU collaboration on the research foci of Finnish universities is in general rather limited. Based on the interviews, EU collaboration seemed to have a greater importance for those units that had just started learning international collaboration than for more internationally experience units. Therefore, assessment of the effects of EU collaboration is also influenced by previous experience in international collaboration.

4.2.4 Collaboration with private companies and other end-users

For Finnish university departments, the importance of funding from private companies and various non-profit institutions such as public sector institutions, municipalities, associations and foundations has increased. During the period 1995 to 1999, total research funding received by universities from the business sector increased from FIM 85 million to FIM 256 million, reflecting a nominal increase of 67 percent. In the same period, the share of the funding increased from four percent to 5.6 percent. Currently, the most significant role of private

company funding is in technology, where its share of total external funding accounted for 18 percent in 1999 (Science and Technology…, 2001).

The most important factor in facilitating collaboration between universities and companies has been the funding provided by the National Technology Agency (Tekes) (Science and Technology…, 2001; The State and Quality …, 2000). Tekes is the principal source of public funding for applied technological research and industrial R&D, promoting co-operative projects between companies and research organisations. During the period from 1991 to 1999, Tekes funding for universities increased 84 percent in nominal terms. The growth of national industrial funding has been followed by a period in which the European Commission has contributed increasingly to industrial research. This section analyses the perceptions among university researchers of the impacts of among increased collaboration with companies on university research, not only in EU projects but in general as well.

Two thirds of the respondents with EU experience had collaborated with firms in EU projects (Appendix Table 28). A third of the respondents who had collaborated with private companies in EU projects thought that EU collaboration has increased collaboration with private companies and knowledge related to the commercialisation of research (Appendix Table 29). The framework programmes have particularly attracted academics who have earlier collaborated with firms or other end-users (Table 6).

Collaboration with private companies has been funded most often by Tekes, private companies and the EU, in that order (Appendix Table 31). Collaboration with other end-users (e.g., public organisations) has not increased to the same extent as collaboration with private companies.

Table 6. Collaboration with end-users of research (%).

	EU participants	Non-participants
Finnish companies	47	37
Foreign companies	8	13
Local authority (e.g., town, municipality, federation of municipal authorities)	19	12
Sectoral authority (e.g., ministries, regional environment centres)	36	19
Non-profit organisations (association)	14	9
	n=103	N=86

Almost half of the respondents thought that collaboration with private companies has increased considerably or somewhat in recent years. The main reasons for the increase in university-industry collaboration is said to be the growth of funding provided by the National Technology Agency (Tekes) and the EU (Table 7). The shares of the non-responses regarding the reasons for the increase were fairly large. Over half of the respondents did not respond to these questions at all.

Table 7. Perceived reasons for the increase in university-industry collaboration. Share of respondents who fully or partly agreed with the statement (%).

	EU participants	Non-participants
Funding provided by Tekes has increased collaboration with private companies	36	23
EU collaboration has increased collaboration with private companies	20	2
The number of research commissions from private companies has increased	20	14
Environmental issues have increased private companies' interest in university research	17	7
Researchers have become more interested in commercialising their results	15	9
	N=103	N=86

Some interviewees expressed the opinion that companies are more and more inclined to invest in knowledge and know-how. It was also thought that a reason for companies' interest in collaborating with universities is that companies will get new knowledge and expertise at cheap price. Furthermore, interviewees thought that research organisations have also improved their marketing capabilities, which in turn encourages companies to collaborate with them. It should not be forgotten that very often successful collaboration also gives birth to new projects.

For both participants and non-participants, the reason mentioned most often for collaboration with private companies was obtaining funding. The reason mentioned second-most often was that the collaboration provided an opportunity to apply one's own theoretical knowledge to solving practical problems (Table 8). In contrast, the opportunity to use advanced research equipment was rarely considered as a reason for collaboration with industry.

Table 8. Motives of university researchers for collaboration with private companies. Share of respondents who fully or partly agreed with the statement (%).

	EU participants	Non-participants
Funding	65	57
Opportunity to apply one's own theoretical knowledge to solving practical problems	49	47
Opportunity to obtain research material	33	31
Opportunity to take part in commercialising the results	28	26
Opportunity to learn about developments in the field of study	26	24
Partners were involved in the same project, there was no particular reason	20	19
Opportunity to use advanced research equipment	9	10
	N=82	N=58

Although the funding provided by private companies was welcomed among university researchers, some problems and threats were perceived in the collaborative projects. It was stressed that funding provided by private companies should not be a substitute for basic funding as regards the fulfilment of their primary functions such as teaching and basic research. Thus, it is important to see to it that external funding does not determine the orientation and emphasis of university research. Respondents stressed the importance of strong professional identity and skills in collaboration with companies.

> *We have a strong identity… We do not have to discuss (how to co-operate with private companies), because we know what to do. Take it or leave it. It is a result of a long period of work. We have worked on our own for years and seen it and achieved a position with authority and knowledge of our own. (Social sciences, non-participant).*

The attitudes of the respondents towards collaboration with companies were fairly positive. Two thirds of the respondents who had collaborated with private companies were satisfied and none of the respondents were totally dissatisfied. An interesting observation is that university respondents were more frequently satisfied with collaboration with private companies than with other end-users (Appendix Tables 35 and 36).

Table 9 shows the views on the utility of collaboration among those respondents who have collaborated with private companies. Corresponding to previous observations on the benefits of university-industry collaboration (e.g., Faulkner et al., 1995, 18; Meyer-Kramer & Schmock, 1998), the survey results indicate that collaboration with companies contributes to academic research in four distinct ways: i) by encouraging better awareness of the needs of industry; ii) as a source of new perspectives on the utilisation of research and access to practical research problems; iii) as a source of research funding and improved research infrastructure (research equipment); iv) by promoting new contacts and improved job opportunities for researchers and students. Unexpectedly, the views regarding the utility of collaboration with private companies are surprisingly similar both among the participants and non-participants. Among the university researchers, access to research data or access to advanced research

equipment were not considered to be the most important benefits accruing from collaboration with companies.

Table 9. Perceived utility for universities of collaboration with private companies. Share of respondents who fully or partly agreed with the statement (%).

	EU participants	Non-participants
Created better understanding of the needs of industry	62	60
Brought about funding for research and for employing researchers	57	53
Provided new viewpoints on the subject matter and research material	52	53
Brought about new contacts	51	57
Helped in understanding the possibilities to utilise own research	50	59
Helped combine practical know-how and theoretical knowledge	41	40
Gave access to research data	32	34
Gave access to advanced research equipment	7	9
	N=82	N=52

The most frequently mentioned disadvantage of collaboration with private companies was that the collaboration was time-consuming (Appendix Table 39). Only a few respondents thought that a partner had tried to direct the research according to his/her own interests or tried to obtain possession of the research results. The results also contradict the view that companies try to prevent publishing the results. Indeed, the proportion of respondents who thought that the publishing of the results was postponed due to the involvement of a private company in the project was unexpectedly small, only 16 percent. Also, according to the interviewed respondents, the attitudes of the companies towards publishing the results have changed. Even though publishing the research results was not regarded as a problem of academic/industry collaboration to any great extent, many interviewees stressed the importance of ensuring confidentiality and intellectual property right protection as well as permission for publishing in the early phase of collaboration.

On the one hand, the previous findings may reflect the fact that companies have become more permissive towards publishing the results of research. On the other hand, the universities have developed their research agreement negotiation practices regarding the exploitation of IPR and can better ensure protection of the rights of researchers and universities.

These data tend to confirm that the attitudes and policies of Finnish universities have become more tolerant and supportive towards university-industry collaboration, though they vary a lot from one university and discipline to another. It can also be argued that European framework programmes have encouraged this development by promoting cross-sector collaboration.

Contrary to previous concerns regarding the negative impact of the increasing involvement of academics in the commercial exploitation of research (see e.g. Feller 1990; Ziman 1994), Finnish academics seem to regard collaboration with companies and other end-users as important and useful. Among other reasons, it provides access to monitoring ongoing developments in business R&D laboratories. Collaboration with companies may also provide new job opportunities for young academics. However, better wages available in the private sector may decrease the attractiveness of the university as a workplace and university research as a professional career.

A greater share of business-related funding of academic research is also likely to increase internal tensions between various units within the same institution, because business-related funding seems to concentrate in certain departments or units. In addition, units working on industrial problems may have a better ability to raise research funding from several sources, while the units carrying out basic research will be constrained by research resources which prevent them from developing their capabilities. Thus, there will be far greater variety across university units.

4.2.5 Commercialisation of research results

In the late 1990s, one of the most topical issues both at the national and European levels has been the commercial exploitation of research and the dissemination of research results. As one of the objectives of EU research

programmes is to promote the dissemination of research results and the development of research results into commercial products, this section focuses on the prevalence of participation in the commercialisation of results among university researchers. Moreover, the section explores the views of university researchers on how increasing involvement in the commercialisation of research may have a broader impact on university research as a whole.

Only six percent of the participants stated that EU collaboration has enabled them to take part in the commercialisation of research results (Appendix Table 21). This is compatible with the survey finding of a study by Luukkonen & Hälikkä (2000) which showed that four percent of university participants in the Fourth Framework Programme had taken part in the commercialisation of products within EU projects.

One fifth of the participants had taken part in the commercialisation of research results either in EU or national or other international projects and the same proportion of respondents were planning to take part in commercialisation in other projects. An interest in participating in the commercialisation of research in the future was equally prevalent among participants and non-participants (Appendix Table 44).

Table 10 shows that most respondents agreed with the statement that academics lack the special skills needed in commercialisation. Furthermore, the interviews revealed a widely held view that universities should create explicit rules regarding commercialisation and allocate more financial resources to the management of commercial activities.

A surprisingly small number of respondents thought that participation in commercialisation decreases the reliability of university research or causes problems in teaching (Table 10). The interview data confirms also the observation that academics' attitudes toward commercialisation have become more and more positive. Those who considered participation in commercialisation positively, advocated that it is important to widely disseminate new knowledge in companies and in society. Furthermore, the view that entrepreneurship contributes to the movement of scientific ideas into the commercial market (see, e.g., Blumenthal et al., 1986) was supported by the interviewed academics.

A fear that commercialisation will threaten 'the freedom of academic research' is taken seriously by the interviewees, but not regarded as the most serious concern. Instead, the interviewed academics were more concerned about the fact that people with experience in the commercialisation of research results are more likely to leave the university for their own entrepreneurial activities in the hope of getting better income. Another concern stated by interviewees was that commercialisation and business affairs will take priority and research and teaching will be bypassed.

Based on the interview data, entrepreneurial activities and a favourable entrepreneurial culture are supported most often by the larger units, which have better managerial facilities. The results indicate that the atmosphere in the department and positive attitude of the department's leader play an important role in directing people's behaviour regarding entrepreneurial activities, also corresponding to earlier findings (see, e.g., Louis et al., 1989; Aaltonen, 1998).

Table 10 shows that, compared to the participants, non-participants more frequently expressed a wish that the university should provide more support for researchers' participation in the commercialisation of research. This result can be interpreted in two ways: participants tend to have better knowledge and expertise regarding entrepreneurial activities and/or participants are better aware of services related to entrepreneurial activities.

Table 10. Opinions of Finnish academics on the commercialisation of research results. Share of respondents who fully or partly agreed with the statement (%).

	EU participants	Non-participants
Academic researchers lack the special skills needed in commercialisation	64	58
University should create explicit rules regarding the commercialisation of results	59	69
Researchers' participation in the commercialisation of research is considered positive by the university management	56	51
The prejudices of the university researchers towards the commercialisation of research results have decreased	45	49
University should give more support to researchers' participation in the commercialisation of research	32	51
The fact that university researchers participate in commercialisation decreases the reliability of university research	28	27
Participation in commercialising research results causes problems in one's teaching work	22	28
	N=103	N=86

Table 11 shows that the participants were more frequently satisfied with the services provided by the university supporting commercial activities than the non-participants.

Table 11. Opinions of Finnish academics on the services related to commercialisation of research results. Share of respondents who agree with the statement (%).

	EU participants	Non-participants
There is a unit providing assistance in issues related to commercialisation at our university	48	51
The services supporting commercialisation of research provided by our university are sufficient	30	20
The services supporting commercialisation of research provided by our university are competent	26	21
The services supporting commercialisation of research should be located in a certain few universities	6	8
	N=103	N=86

The distribution of IPR between the university and members of staff, which is currently a burning issue, was discussed more thoroughly in the interviews. Interviewees were asked to react to two questions regarding the ownership of IP and the development of university practices in IPR matters. Firstly, interviewees were asked to comment on how university researchers should be treated under IP law. Should they be treated in the same way as any other employee: the IPR they generate belongs to their employer unless it is unrelated to their work? Or should academics be excluded from employee ownership provisions? Secondly, it was asked how IPR services should be developed in Finnish universities. Should IPR services be established in every university or only in a few large universities and smaller affiliates around the country?

The most prevalent view among those interviewed on the ownership of IPR generated by academics was that the academics concerned should own the IPR they generate, but the university should have rights to the revenues from IPR royalties. Those in favour of the academics who generated the IPR having ownership rights over them, argued that the academics themselves, rather than their employers, select topics for research and thus are the inventors. Those in favour of more joint ownership articulated reasons connected with infrastructure, including legal advice and financing provided by the university. Most interviewees agreed that academics' ability to exploit IPR alone is unrealistic

and therefore they need some kind of assistance for commercial exploitation. The rationale underlying the allocation of the ownership of employee inventions to the employer was that the employer is likely to be in a far stronger position to exploit it than the employee would be. However, whilst one interviewee was of the opinion that a university is better placed than its employees to commercially exploit IPR, the others challenged this view. It was argued that universities would find it difficult to hire staff capable of generating IPR with commercial potential. Nor will the universities be able to do what is required to ensure that IPR with commercial potential is captured for the maximum benefit. An interviewed academic comments on the urgent need to build up IPR services in Finnish universities as follows:

> *When a person starts working in a place like this, funded by the state, he signs all the papers saying that the university has every right to look at everything that could be patented, and decide if it is the university that takes care of commercialising it, and then the researcher gets his share of it. This is how it all goes. Otherwise no such know-how will come to us. If everyone goes in his/her own direction – each individual when s/he negotiates with firms – s/he is very weak. There has to be a university operating in the background. We have already seen the benefit: we have obtained good licensing agreements; the benefit is that we have the university in the background. We could never have negotiated such agreements otherwise. (Medicine, participant)*

> *The problem is that the university has no money for this. Even a single patent can be so expensive. It is risky money – where does that money come from? The university money lies in the stone buildings and the university funding is cut back all the time. Somehow we should be able to create such a situation. However, some of our patents are directed to a university licensing company which develops this know-how, and they do not have their own lawyers yet. They have to buy these services and they use American lawyers. It is completely outrageous what the costs are in these markets. (Medicine, participant)*

Divergent views were expressed in the interviews on the setting up of IPR services in universities. The most prevalent view was that services ought to be centralised in a few universities but also that each university should have an affiliate unit that helps to find the right contacts and information. Especially the interviewees from biotechnology supported this view. Better IPR services are more necessary and urgent than ever. More qualified staff is needed in IPR management due to tightened international competition in the patenting and commercial utilisation of research. Otherwise, the outcomes of Finnish research will drift away from Finland to benefit other countries.

To conclude, there is little evidence that participation in entrepreneurial activities contradicts scientific productivity or maintaining manifestations of scholarship. As Stokes (1997) points out, research can be supported both for the search for fundamental understanding, and consideration of its end use. However, the growing interest in the commercial exploitation of research among academics raises a number of practical and legal problems for all the parties concerned: the academics, the university and the employer or funding body. The findings from this study clearly indicate that what remain as continuing inhibitors to the effective exploitation of research are the absence of regulations for exploiting IPR and the incompatible interests of the parties involved. Conflicts of interest can be seen to occur not only between academics and the funding source or the sponsoring employer but to a greater extent between academics and the university. The university will be looking increasingly for additional income through patenting and licensing agreements. If an enterprise culture within universities is to be stimulated, more attention should be paid to IP management in universities and to finding out what the best practices might be and how the university might organise them on its own.

4.3 EU participation and national university research funding allocation

One aim of the study was to analyse the relation between EU participation and allocation of national research funding. In particular, it was explored whether participation in EU research projects has facilitated raising research funding from national authorities. Furthermore, the interdependence between the EU and national sources of funds in terms of cumulative phenomena and substitution

effects was discussed. For instance, Geuna (1999) has pointed out that competitive research-funding sources create diverse incentive structures that may reinforce the cumulative process. Competitive resource allocation augments the probability of attracting other competitive research funds for these universities. Similarly, it decreases the attractiveness of the less-supported institutions to external providers of funds. Accordingly, there is a threat that these latter types of units will be pushed to carry out routine contract research funded by industry. This may in turn lead to a reduction in the quality of scientific output and further reduce the probability of attracting research funds targeting high-quality research (Geuna, 1998; 1999).

Figure 15 below shows that the majority of the survey respondents think that EU participation facilitates obtaining funding from national sources. Almost the same number considers it as unacceptable and undesirable. No significant differences existed between the participants and non-participants.

Many interview respondents stressed, however, that success in obtaining EU funding does not necessarily indicate the high-quality of the research, but rather the relevance and importance of the research issue at the European and international levels. The figure below also shows that only a third of the respondents thought that EU projects are valued more than other international projects, indicating that EU projects do not have any special importance compared to any other international collaboration.

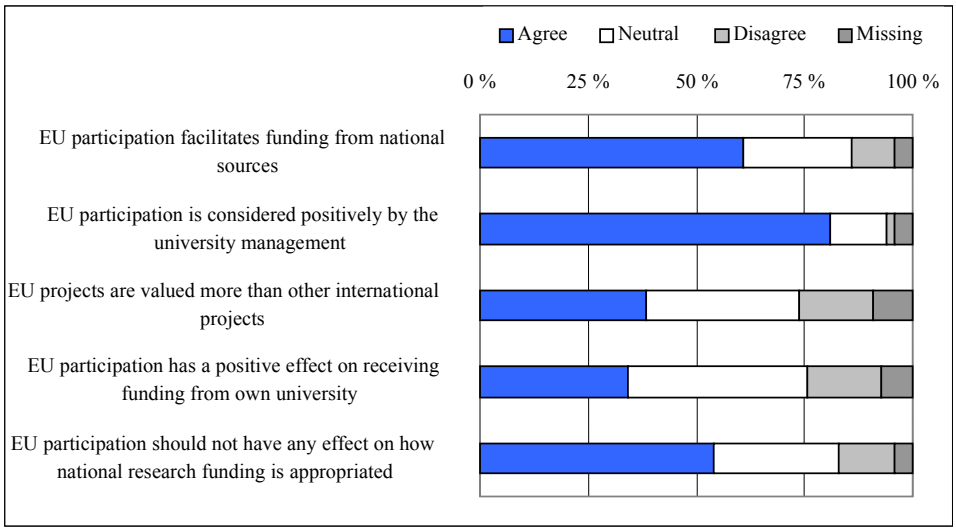

Figure 15. Views of Finnish academics on the influence of EU collaboration on national research funding allocation (%).

Furthermore, several interviewees thought that both the National Technology Agency, Tekes, and the Academy of Finland[2] have adopted a fairly neutral policy towards EU collaboration as regards their initiatives and distribution of research grants. There were, however, a few contrasting views on the influence of EU collaboration on the allocation of Academy funding:

> *They [the Academy] think that now that they have the EU money, "they [the researchers] won't need funding from us", so we will give funding to other national projects. (Life sciences, non-participant)*

A respondent who is a member of a research council in the Academy of Finland confirmed the previous claim:

> *We thought that as the competition for domestic funding is harsh, and there are many excellent units and groups applying for it, and, if the EU gives funding, let the EU give them funding and we'll give funding to something else.*

[2] Academy of Finland is the main governmental funding agency for basic research.

As one unit head noted, EU programmes have helped to obtain funding for those research areas for which it has been difficult to obtain national funding:

> *In fact, we have three persons who have been the most actively involved in EU projects because they have had the most problems in receiving other funding. ... they work within a field of technology for which it is currently quite difficult to obtain (funding) from Finnish sources. (Technology, non-participant)*

The assumptions that EU funding augments the probability of attracting other funding and in turn leads to the concentration of public funding in a few institutions were discussed with the interviewees. Both supportive and contrary arguments towards the claim of research funding concentration were expressed. On the one hand, the concentration of research resources was seen as a natural development in the sciences. The best academics and research groups will be funded from several sources. Furthermore, the success in raising EU funding is taken as an indication by other financiers that the research is worth supporting. On the other hand, the pooling of resources was seen as harmful for the development of science because it may discourage the boldness to support ”risky” research in promising fields.

Even though there is no strong evidence that participation in EU collaboration has facilitated raising national research funds, some interviewees commented on the concentration of research funding. According to the interviewees, research funding tends to be concentrated in a relatively few ”fashionable” research fields such as biotechnology, information technology, functional food or material sciences, and a few elite institutions both at the national and European levels. A negative implication of the concentration of research funding might be that funding would not be used efficiently due to too heavy a workload and due to a scarcity of skilled research personnel in these institutions. The increased work pressure due to carrying out several research projects at once is reflected in the following statement by an interviewee who has succeeded in raising funds from several sources.

> *In particular in universities, where it is difficult to share ultimate responsibilities, there is (for example) one senior researcher and the rest are writing their doctoral dissertations. You become exhausted with this. At one point in 1997 I had five different projects I was responsible for: Academy projects and EU projects; the situation was quite impossible. I should have led everything; to lead the scientific work, to comment on the articles, to be travelling. There was too much weight upon me. In the end I did not want to do anything anymore. (Life sciences, participant)*

Moreover, it was feared that the concentration of research funding would lead to a neglect of research areas of national importance or disciplines, the research results of which are not easily exploitable. Those supporting a better balance between EU and national funding argued that it would be better to concentrate resources on fewer areas where expenditures could have more impact. Furthermore, it was argued by some interviewees that a small country like Finland cannot cover all areas and be competitive in all fields of science.

The research and development policy of the EU appears to increasingly affect the implementation of national policies. Based on the interview data, however, the Finnish national authorities seem to have adopted a fairly neutral policy regarding EU funding as an indicator of research quality or substitution for national funding. The current study does not give strong evidence that EU funds would have been either accompanied by substantial funds from the Finnish government or that EU funding would have substituted for national funding.

While developing a common European research strategy and aiming to increase coherence between EU and national policy, it is also important to promote the balanced development of university research and especially a high level of academic quality. The actual influence of participation in EU projects on national research policy depends in part on the direction of national research policy, but also whether or not EU projects are of high academic quality.

5. Future prospects of EU research collaboration

As the previous sections show, the experiences of university researchers in EU collaboration are divergent. Some researchers are fairly satisfied with collaboration, whereas some are ambivalent towards its benefits. Against this background, it is interesting to know whether Finnish academic researchers would like to see participation in EU activities grow and what the factors are that may contribute to or prevent the growth of EU collaboration.

5.1 Interest in joining EU collaboration in the future

The interest of Finnish university researchers in joining EU research collaboration in the future is closely related with their previous experiences of EU framework programmes. As Figure 16 below shows, eighty percent of the participants had already applied or had intended to apply for funding from the EU Fifth Framework Programme. Expectedly, the non-participants were less motivated to join EU collaboration than the participants were. These observations can be interpreted in three ways: 1) interest in renewed EU participation in the future indicates satisfaction with EU RTD programmes; 2) the participants are much better aware of the opportunities provided by the EU than the non-participants and they have learnt how to apply for EU funding; 3) EU programmes are more appropriate and relevant to the fields that EU participants represent.

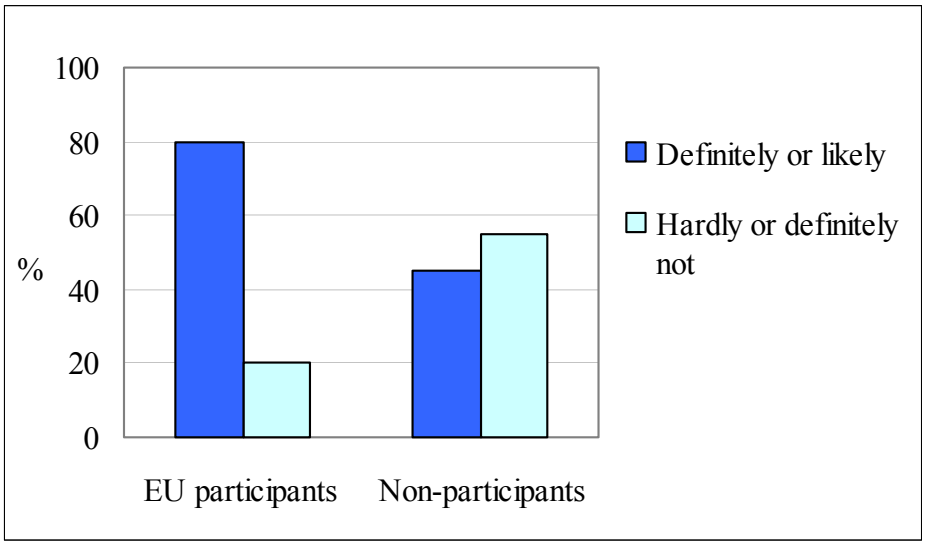

Figure 16. Interest among Finnish academics in joining in EU collaboration by previous experience (%).

Generally speaking, the participation of Finnish universities in EU framework programmes is believed to increase and become more important for the university units in the future. According to the interviews, the growth in EU research collaboration is partly due to the increased competition for research funding and partly due to the increasing importance of international collaboration. The importance of EU framework programmes as a source of university research funding is expressed in the following:

> *We have to be interested, because we have to do research work continuously as much as we can and we have to get the funding from somewhere else. The university, although it pays for 35 % for our income, is unable to do so. (Agriculture and forestry, participant)*

> *If the possibilities to apply for funding remain as they currently are, or expand from the current situation, it is an important matter, because there are not so many sources that grant really large amounts of money. (Medicine, participant)*

In addition to the importance of EU research programmes as an additional research-funding source, several heads of units emphasised EU collaboration

because of its potential influence for increasing the prestige of the unit. There are still a number of university groups that have not joined international collaboration but are interested in joining. EU programmes have, however, lost some of their glory and many say that EU collaboration has gradually become part of the everyday life of university research.

Opposite to the general interest in EU participation, respondents from technical fields and medicine state more often than others that it is not worth applying for EU funding because it is much easier to obtain research funding from national sources or from the US with less of a workload. This implies that EU funding rather complements and competes with national sources of funding than replaces them.

Although university researchers' interest in EU programmes is increasing, there seems to be a declining interest in taking the leading role in an EU project. The task of a co-ordinator is believed to be too laborious and time-consuming compared to the obtained benefits.

> *After the last round we began to think whether there's any point in all this, because it is such a great effort bureaucratically to compile these applications. Every hour that you spend on it will be taken from something else. It does not compensate for the work you've done. The probability of the application to be accepted is low." (Natural sciences, co-ordinator of EU project)*

The study conducted by Luukkonen and Hälikkä (2000) suggests that being a co-ordinator is strongly related to the project success and influence on the project. To utilise EU projects fully, it is important that universities enable Finnish researchers to take a leading role in EU projects in the future.

Inadequacy of funding was considered as an obstacle to EU collaboration. Finnish researchers who had participated in EU projects criticised especially the fact that the different costs of labour and travel expenses are not considered when dividing the project funding between the participating countries.

> *Our situation is the following: our overheads and costs of labour – thanks to taxation and pension payments and other such things –*

are so high that with the amount of money we receive we can employ 1.5 persons, and in the South they can employ 3 persons… we have half of their labour, man-months and working hours… These should be equal." (Life sciences, partner)

In order to conduct and pull through an EU project, some Finnish university researchers have had to apply for additional funding from national authorities, although they (the authorities) have not been very anxious to support and supplement projects started with EU funding.

Interviewed academics felt that in Finland it should be considered how much support the university or the national funding sources should give to an EU project in case the funding provided by the EU proves to be insufficient. Most EU participants stated that it is typical of the EU projects to collect large sets of empirical data and write a short summary of the main results, but the scientific utilisation of the results often remains half-finished or even completely undone.

5.2 Relevance of EU research programmes for universities

Understandably, the participants more frequently regarded EU programmes as appropriate and relevant for their own field than did the non-participants (Figure 17). More than half of the participants thought that EU programmes are well suited to their own field of study, whereas only a third from the non-participants had this view.

A third of the participants considered the EU funding sufficient, whereas 24 percent of the participants were not satisfied with the volume of EU funding. Also, over a third thought that the time horizon of the EU projects was sufficient and an equal proportion had the opposite view. These results further support the view that EU projects are diverse concerning their quality, time horizon and funding.

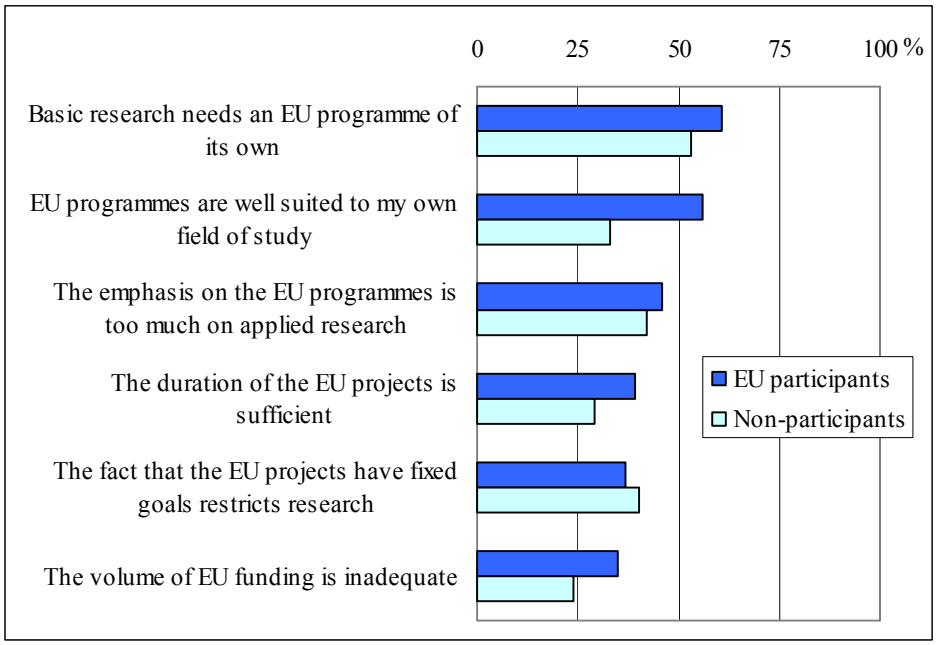

Figure 17. Opinions of Finnish academics on the suitability of EU programmes by experience in EU collaboration. Share of respondents who fully or partly agreed with the statement (%).

As to the research orientation of the EU projects, the majority of the respondents would like more emphasis on basic research within the EU framework programmes. This was expressed most frequently by the participants and respondents from technology, mathematics and physics (Appendix Table 51). According to the interviewed academics, the objectives of EU programmes are currently too narrowly defined and too detailed. That is likely to direct research toward artificial and academically irrelevant topics. Also, several interviewees argued that more space for researchers' own ideas and suggestions about research topics should be allowed within EU programmes. A bottom-up approach, that is, that the research ideas are generated by the researchers and not by the funding agencies, was regarded as much more suitable for the development of EU collaboration than the current practice. A respondent from psychology expressed the importance of defining research objectives by following the life span of research as follows:

> *They are not so well suited to us. We cannot change according to EU funding. ...that is the problem with the project funding,*

> *because it is against scientific principles. It is not the way to conduct good research that first you decide which field of research will be picked to be of importance… Research has a completely different situation as the starting point, and of course there are the social needs. It is not something you can decide upon at the administrative level. (Social sciences, participant)*

A shift to fund more market-oriented research within EU programmes was not seen as a desirable development among the academics. Reaching a balance between the different interests among universities and companies is, however, problematic. University researchers seem to be aware of the appearance of potential conflicting interests between various partners in EU collaboration as the following citation implies:

> *It is easier for us to operate in a research process with a long time-span, i.e., research organisations are not typically good at product development. We are good at thinking of what kind of products will be made or what kind of technology will be needed for the products of the next generation." (Technology, participant)*

A unit head from the field of technology criticises EU collaboration for focusing too much on networking aspects. Genuine research projects and ideas should be encouraged within the EU framework programmes instead of just contacting people.

> *In my opinion the EU has a lot to improve, because the starting point has been to strengthen European science and to upgrade the weak links. This has led to the network idea, which means that the focus has been on social aspects, on researchers' exchange of opinions rather than on good knowledge. There was once a saying that the Americans are laughing at us and saying that the EU programmes were the best gift to American science, which keeps them ahead of Europe for a long time to come. (Technology, participant)*

The survey results confirm that Finnish academics are not very satisfied with the projects that only support networking instead of carrying out concrete collaborative projects. Only a third of the participants thought that projects based on concerted action are useful, while the rest thought they are worthless or had no opinion at all (Appendix Table 23).

Large Scale Facility funding, which gives support to the mobility of European researchers to research institutes with expensive measuring equipment and know-how in utilising it, was generally seen as a good form of collaboration. This form of funding has some problems, however. Large Scale Facility funding is inflexible because a researcher with EU funding can only work for a period of three months in an institute. This means that during the research exchange period a researcher has scarcely any time for the empirical part of the study, and the analysis remains to be done in the home country. Furthermore, in case the measurements related to the study have to be checked later, the hosts of the receiving institutes (the supervising researchers) often have to work extra in order to finalise the exchange researcher's project. Another disadvantage is that it is only possible to invite researchers from the EU countries, whereas in some cases it would be more beneficial for the institute to invite a researcher from a non-EU country instead. The interviewees are thus hoping that the Large Scale Facility funding would become more flexible, in the sense that the unit could determine the length of the visiting researcher's stay, and that it would be possible for the unit to receive researchers from countries outside the EU as well.

5.3 Barriers to EU collaboration

In order to examine the main barriers to EU participation, the non-participants were asked to assess the most important reasons for their unwillingness to join in EU collaboration. The main barriers to non-participation are shown in Figure 18. The main complaints concern the workload of EU projects, non-topicality, the application process and that the research themes of the EU research programmes did not correspond to the areas of interest of the research unit.

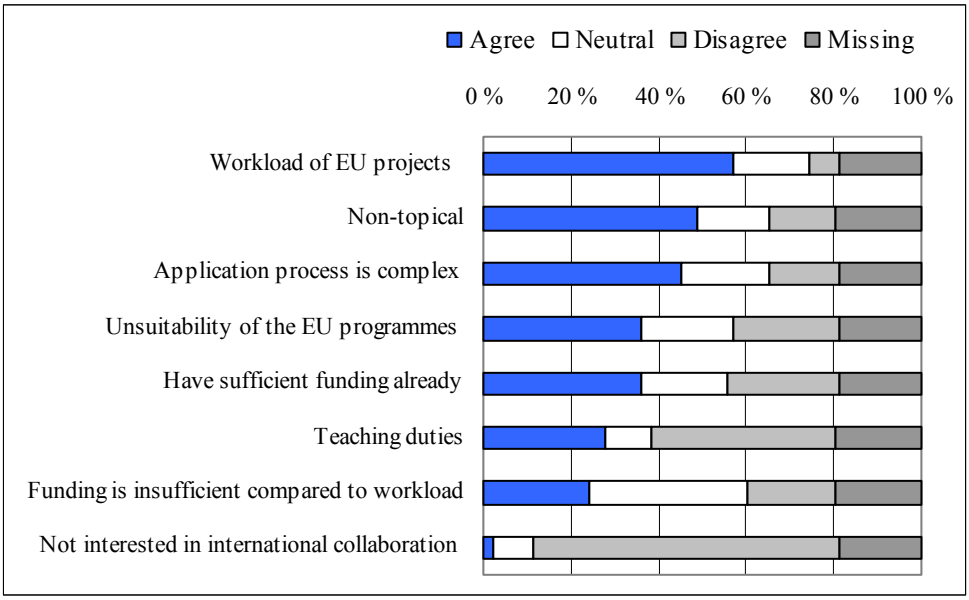

Figure 18. Reasons for non-participation in EU collaboration, %

The problem of preparing and submitting a proposal in the middle of a teaching period was also one of the most recurring themes in the interviews. Many of the non-participant interviewees said that they would have participated if there had not been so much paper work in the application process. Especially those with heavy teaching duties reported that they had no resources – neither time nor funding – to prepare a proposal during the teaching period. The survey results also show that the respondents from departmental units more often mentioned teaching duties as an obstacle to EU collaboration than the respondents from research units (Appendix Table 52).

> *It is very difficult. We would need a substitute teacher and there should be money for it. When the EU application process was underway, I had my teaching duties to take care of ... During the teaching period I cannot think that there would be time for any research. (Natural sciences, non-participant)*

Over 80 percent of the respondents considered the application process to be complex and slow. There is, however, divergence in the views on the competency and objectivity of the evaluation procedure. One third of the respondents assessed the evaluation process as being competent while a third

had the opposite view (Figure 19). There were no significant differences between the participants and non-participants.

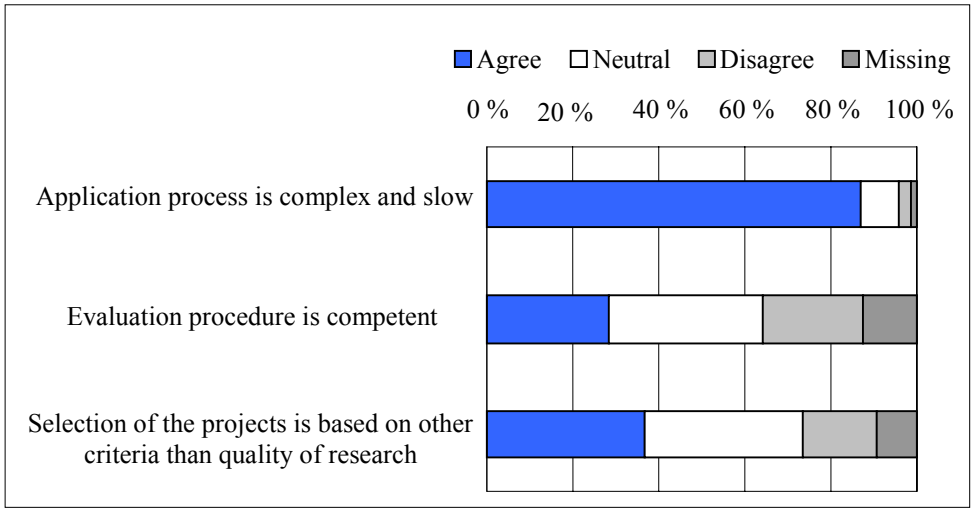

Figure 19. Opinions of Finnish academics concerning EU application and evaluation procedures (%).

Some interviewees also compared EU collaboration with other forms of European collaboration (e.g. EMBO, ESF) which they found to be more flexible and efficient.

> *The evaluation process should be renewed and delegated to a body with scientific expertise, and this European Dimension policy should be abolished. The EU should give some power to such an expert body, which does the job faster and is already used to it. (Medicine, participant)*

The desire for simplification and increased efficiency has been recognised also by the Commission. In the proposal for the arrangement for implementing the new framework programme, the Commission suggests a more decentralised system with longer-term programmes and programmes that meet changing needs. Moreover, the networks of excellence and the integrated projects will be administered to a large extent autonomously by the participants. This allows partners to involve outsiders in the activities which they undertake, define small-

scale projects as components of their research programme and adapt the programme to meet changing needs (Proposal for a Decision …2001, 9).

5.4 Information dissemination concerning the EU research programmes

Figure 20 below shows that the participants were more often satisfied with the information services provided by their university than the non-participants were.

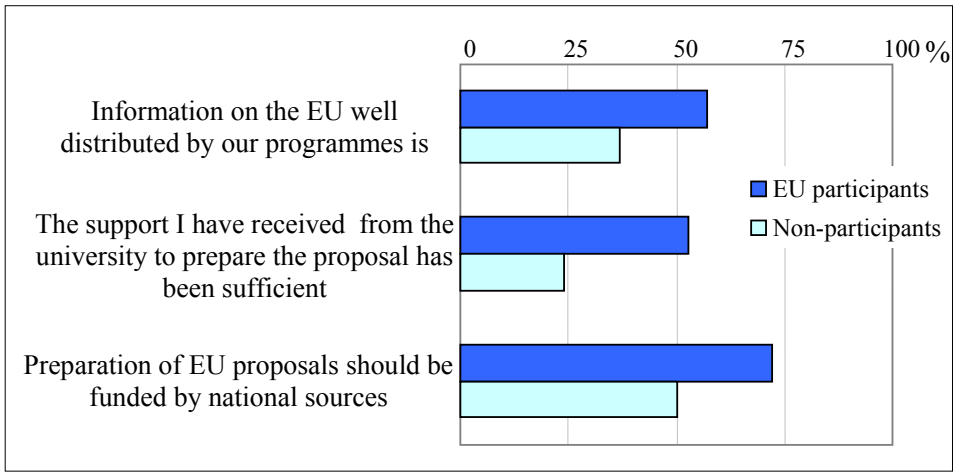

Figure 20. Opinions of Finnish academics on information services concerning EU framework programmes. Share of respondents who fully or partly agreed with the statement (%).

However, participants more often than non-participants thought that the preparation of an EU proposal should be funded by national sources. Based on interview data, it seems that there are enough different kinds of courses and seminars on EU programmes, but most often researchers have no time to participate in them. Instead of organising large seminars, national organisations could further provide efficient and more targeted information dissemination at the grassroots level. If the accumulated knowledge remains the property of a small group of university officials or researchers without ever finding its way to wider circles, the investment will fall short of its purposes.

Especially those interviewees who had not participated in EU projects said that they would need personal assistance to help them in preparing EU proposals, as evident in the following citation:

> *If it would be possible to receive funding for such a purpose, from national sources for instance. The funding could be applied for by this kind of larger unit, and the funding could be used for employing a qualified person to do the job. But the person should operate on the grass-root level in order for the system to work properly. It's of no use if I have to take leave from my work for two months to be able to write an application. The time would then be taken from writing publications. It would be a gift for us if we received a person with language skills who'd be familiar with the bureaucracy. We would give the contents and write the research plan. (Social sciences, non-participant)*

Drawing conclusions for the future, the participation of universities is highly related to the development of the new framework programme. In order to increase university participation in EU collaboration, the EU has to be able to improve its reliability and credibility as a funding source that supports high-quality, curiosity-oriented and exciting research. It should also pay more attention to the promotion of fundamental research instead of targeted projects. Also, more efforts should be put into simplifying the procedures for managing the EU research programmes and making them more flexible. Alongside reducing the administrative burden involved in preparing and submitting proposals, more qualified personnel with technical competence in international project management at the national level would be a positive contribution to university participation in EU research programmes.

Conclusions

European framework programmes have played an important role in adding to the efforts of Finnish universities and contributing to the international visibility of Finnish research. Recent statistics indicate that EU funding for Finnish universities is no longer increasing rapidly but has maintained a steady level. This raises a question, whether the saturation point in the volume of Finnish-EU research collaboration has been reached.

To answer these questions and further better understanding of the benefits and significance of EU collaboration for Finnish university research, this study has focused on the views of university researchers and heads of departments and research units concerning such research issues as: the quality and relevance of EU projects; the impact of EU collaboration on other international collaboration; commercial exploitation of research and collaboration with companies; and the future attractiveness of EU-funded research. Futhermore, the study has highlighted the characteristics in the research environment that may facilitate or hinder university units' participation in EU collaboration.

Previous international experience as well as flexible and discerning management encourage participation in EU programmes

Different capabilities to join in EU collaboration and university-industry collaboration are present in the various universities and even in the departments. Previous international experience is one of the most important factors that facilitate joining EU framework programmes. Furthermore, larger units seem to have better management and organisational capabilities to cope with international co-operation than smaller units. Good co-ordination of research tasks, strong leadership and continuity of expertise at the unit level are factors that help to build up these capabilities. These are also factors that may help Finnish academics to participate in EU programmes and to utilise them successfully. In order to improve the capabilities of less internationalised units,

new research activities that enable the building up and further development of university-industry collaboration capabilities should thus be encouraged.

EU-funded research is considered to be application-oriented and heterogeneous concerning the level of scientific quality

One of the major findings from this study is that Finnish academics' views on the quality and relevance of EU research collaboration vary a lot, from positive to critical. Despite the fact that EU research projects are considered application-oriented rather than basic research-oriented, half of the respondents considered them to be demanding, useful and of an internationally high-standard. Perceptions among EU participants and non-participants are rather similar, even though participants have somewhat more positive views concerning the quality of EU-funded research than non-participants do. On the one hand, these results indicate that the scientific quality of EU projects is heterogeneous – varying from high to low quality within the various programmes. On the other hand, they reflect the fact that the Finnish researchers in general have a realistic view of EU collaboration and its significance. Researchers' views regarding the objectivity of evaluation procedures also varied a lot. Regardless of the criticism towards the evaluation process among university participants, many of the interviewed persons believed that the severe competition and the evaluation procedures will ensure the high quality of EU projects and that the weakest projects will be dismantled.

Along with a growing criticism towards the applied research orientation and short-term nature of the EU projects among university participants, their expectations of and demands for EU collaboration have increased. Especially those with long experience of EU collaboration argued that EU programmes should be targeted towards more bottom-up approach projects if it is the goal of such programmes to promote global competitiveness and the creation of innovations. Instead of promoting the creation of new networks, university researchers wished that EU research programmes would promote scientifically demanding and genuinely innovative research in promising research fields.

Advantages of EU collaboration outweigh its weaknesses

Another major finding of this study is that the significance and benefits of the EU collaboration for university departments vary not only by discipline but also by the stage of internationalisation of the unit or research group. For the less internationalised units, EU projects seem to function as a preparatory stage for more substantive and long-term collaboration. New scientific knowledge is still quite rarely the most important benefit from the projects, while learning from international collaboration, obtaining new contacts and new collaboration possibilities are more important. On the other hand, for more internationalised units, EU projects have provided complementary knowledge and know-how which they might have found difficult to acquire solely in Finland.

The study shows that the advantages of EU collaboration mostly outweigh its weaknesses. Money is important, but is not the most significant reason for participating in EU collaboration. The distinguishing features that make EU framework programmes popular among academics can be summarised in six points:

1) It provides additional research funding for on-going and new projects. EU money is important but not a substitute for national research funding. In addition, the scientifically most significant and demanding research is carried out by national or other international funding.

2) It creates an international reputation and visibility, which in turn facilitate raising national or other international funds, as participation in EU programmes is seen as a criterion of merit.

3) It opens up possibilities for new exchanges and contacts in all fields. The evidence shows that EU collaboration has catalysed new communication channels for European research laboratories, and has not decreased other international collaboration, but rather reinforced and diversified it. New opportunities for collaboration and research training are particularly important to the younger researchers whose own research contacts are still few in number.

4) It provides complementary know-how for research units that might have been difficult to acquire solely in Finland.

5) It provides opportunities to disseminate research results and expertise among companies and in the society at large. Consequently, participation in the commercial utilisation of research results has increased the visibility and acceptability of university research in society.

6) It encourages an entrepreneurial culture in universities. EU programmes have not only played an important role in enhancing collaboration with end-users but they have enabled academics to take part in the commercialisation of research (even though to a lesser extent). EU collaboration has built up knowledge on patenting agreements and intellectual property rights (IPR) among academics. Nevertheless, the level of participation of Finnish academics in the commercial exploitation of EU research projects is still minor and most academics lack the social and technical competency to patent and exploit their research commercially.

The results also revealed, contrary to previous concerns, that the rapid increase in EU collaboration since 1995 has not reduced other international research collaboration or has done so only temporarily. In many fields experiences in EU collaboration have encouraged researchers to seek new international contacts and further expanded other international collaboration.

The reasons that are seen as weaknesses in and barriers to EU collaboration can be summarised in five points:

1) The application process is time-consuming and laborious. In many fields, it is much easier to apply for and receive funding from national or other international sources than from EU research programmes.

2) Carrying out an EU project is time-consuming and laborious compared to the acquired benefits.

3) Funding is insufficient. EU funding does not always cover the total expenses incurred in carrying out the research project and scientific analyses cannot be completed within EU funding limits.

4) Among university researchers, EU programmes are considered to be too practically oriented. Also, technological objectives seem to outweigh scientific ones. Several respondents also suspected that the most innovative and novel projects are not necessarily carried out within EU funding schemes– partly due to the fear of knowledge leakage, partly due to the fact that there may be ”free-riders” whose contribution to the projects is small, likely leading to mediocre research.

5) There is a lack of flexibility in project implementation.

The influence of EU participation on the allocation of national research funding seems to be moderate

The study dealt with the relationship between EU participation and the allocation of national funding by exploring researchers' perceptions whether EU collaboration is taken as a criterion of research quality and is likely to reinforce the concentration of research funding for the top groups. University researchers believe that participation in EU collaboration facilitates raising national funds but they do not consider it as a desirable development for university research. Using EU collaboration as a criterion for allocating national funding is considered unfair because not all fields or research groups are in a parallel position to apply for EU funding. Furthermore, based on the interviews, EU collaboration does not necessarily indicate a high scientific quality of research, but rather that the unit (or group) is active and their research is relevant to the targets of EU framework programmes.

The study supports the view that there is a tendency towards an increasing concentration of research funding and that opportunities to carry out basic research in Finland are increasingly few. Based on the views of the interviewees, research programmes funded by the EU tend to support the same fields and research areas as the national funding agencies and vice versa. One of the outcomes of the competitive approach to university research funding and concentration of research funding may be the stratification of the university system. This means division into two strata. On the one hand, successful and lucky researchers or groups may succeed in raising funds from several sources, putting them on a high productivity path. On the other hand, unlucky but possibly talented researchers or groups may lack the proper research resources

and facilities, leading to decreased means for further research and pushing them into a path of low productivity in scientific research. To ensure the fertile development of university research in the future, more attention should be paid to diverse competitive funding sources creating different incentives (or constraints) for university research at the national and European levels.

More targeted information dissemination is needed at the grassroot level

The study indicates that most university researchers are satisfied with information dissemination regarding the EU framework programme provided by their university or national authorities. However, several interviewed respondents wished that information dissemination about the EU programmes (e.g., when the specific programmes are launched) would be more targeted and focused on certain groups and fields. Evidently, most Finnish academics are currently well aware of the general principles underlying EU programmes and of the administrative demands inherent in the application and research procedures, but they need further assistance in filling out the application forms.

One of the problems is also that there is too much information available and that it is overly general and obscure. Very often researchers are too busy to take part in seminars and they find it difficult to obtain relevant and essential details and facts from the information flood that is sent via email or other information channels. Thus, national organisations and authorities should consider how they could improve information channels so that the right information reaches the right persons and groups. Alongside developing the existing practices concerning information dissemination, the accumulated knowledge in the groups and units with experience in EU research could be a useful means of contributing to information dissemination regarding EU research collaboration.

Towards a new phase in EU collaboration

The EU Framework Programme has by now attained a stable role in the Finnish research system. The results above show, among others, that most Finnish academics with EU experience regard EU collaboration as useful and that their interest towards EU collaboration continues to be at a high level. The positive attitudes among the interviewed heads of university units towards EU collaboration suggest that a saturation point in the volume of Finnish university

participation has perhaps not yet been reached. Competition for marginal research resources and pressure towards tighter collaboration between university and industry as well as the pressure to engage in international collaboration are mentioned as notable incentives encouraging joining EU collaboration. Participation in EU projects is, however, discouraged by excessive EU bureaucracy, inflexibility in the implementation of programmes and problems due to the insufficient basic resources of the unit. Another important finding from the study is that the demands of those who have been active in EU projects regarding scientific quality and accountability have increased. This reflects the fact that EU collaboration is moving from a preparatory stage, in which partners are learning from collaboration with European colleagues, towards a more challenging stage. In this stage partners are more demanding, seek the best partners available and demand that projects be directly related to their own research interests. The collaboration is often influenced by existing or former collaboration as well as by criteria of academic quality.

It is not surprising that EU programmes – as they now are focused – are more appropriate for those fields that are application-oriented than basic research-oriented. On the other hand, the agenda of EU research has been widened to increasingly include questions and research issues relevant in the social sciences and humanities and even in fields that are more basic research-oriented. This development has been greeted with satisfaction by many academic researchers.

The recent guidelines for future European research activities (e.g., Communication …, 2000; Proposal for a Decision of the European Parliament …, 2001) imply that EU research policy is taking a qualitative step forward and changing its orientation towards a more open and flexible direction. One of the suggestions concerns the strengthening of the European knowledge base, in particular through the networking and co-ordinated implementation of national programmes, and has been taken as one of the targets of EU research policy. Another important suggestion concerns the implementation of the Framework Programme; steps will be taken to simplify the procedures and increase significantly the size of projects by raising the financial threshold. Given the objectives of the European Research Area project, the Commission considers the European framework programme to be the most significant instrument used in creating it. While it is a useful instrument for promoting international co-operation and stimulating research collaboration across sectors, can EU

framework programmes alone enable the achievement of Europe-wide collaboration and high-quality academic research which meets the needs of academia?

Many university researchers have been reasonably satisfied with the EU framework programme. It has helped them to obtain new research contacts in Europe and strengthened their skills and know-how. Nevertheless, EU framework programmes have been criticised for being too practically oriented and leaving too little space for curiosity-oriented research and professional autonomy. To ensure the attractiveness of EU framework programmes among university researchers in the future, these programmes should be more cost-effective, give more space to curiosity-oriented research and become more flexible. Alternatively, other policy instruments and organisational forms should be developed to support Europe-wide high-quality academic research.

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Appendix 1: Result of the reliability analyses

Name of the summary variable	Summarised variables	Alpha
High research quality	internationally high-standard, innovative, provide new knowledge, high quality, ambitious goals, cover interesting topics, useful, technically complex	.90
Industrial funding important	TEKES, EU R&D Framework programme, EU structural funds, private enterprises	.70
EU participation influences on national research funding allocation	- EU participation facilitates funding from national sources, - EU participation is considered positive by the university management, - EU participation is generally valued, - EU participation has a positive effect on receiving university funding, - EU projects are valued more than other international projects	.71

Appendix 2: Results of factor analyses. Results based on rotated component matrices

1. The internationality of the unit and the importance of international research collaboration in the field of study.

Factor 1: Internationally acknowledged	
Our unit is internationally renowned	.875
Our studies are published in high-standard international series	.794
Many foreign researchers visit our unit	.522
Our unit has joined international research collaboration for a long time	.651
Factor 2: Importance of international collaboation	
International collaboration has improved the visibility of our own research	.806
International collaboration is necessary for the development of our field of study	.732
All our researchers join in international collaboration	.658

Total variance explained 61 %

2. Benefits of the EU R&D Framework Programmes for the research.

Factor 1 : Internation collaboration	
Strengthened international collaboration	.801
Increased foreign researchers' visits to the unit	.793
Increased collaboration with universities	.791
Led to new international projects	.695
Provided new training opportunities for young researchers	.687
Promoted young researchers' careers	.675
Increased collaboration with research institutes	.558
Produced publications	.639
Increased positive competition between the research groups of the unit	.522
Factor 2: Strengthening the knowledge base	
Promoted objectives related to basic research	.652
Produced publications	.618
Provided possibilities to use research equipment	.614
Provided research samples and materials	.523
Helped in keeping the equipment up-to-date	.484
Factor 3: Redirection of research	
Has directed our research towards socially topically issues	.781
Directed the unit's research towards new research fields	.695
Broadened the research field	.653
Provided a new funding channel for research	.588
Brought new dynamism to the unit's research	.564
Broadened unit's knowledge base	.550

Factor 4: Collaboration with end-users	
Increased collaboration with private enterprises	.835
Increased collaboration with the end-users of the research	.771
Enabled the utilisation of research results in practice	.588
Lead to national projects	.563
Factor 5: Commercial exploitation of research	
Brought patents or licences	.853
Enabled participation in commercialisation of research	.697

Total variance explained 73 %

3. Application process and evaluation procedure.

Factor 1: Application process	
Application process is slow	.881
Application process is complex	.869
Factor 2: Evaluation procedure	
Evaluation procedure is incompetent	.859
Selection is based on other criteria than quality of research	.852

Total variance explained 75 %

Appendix 3

Questionnaire for university staff

Group for Technology Studies

Impacts of EU framework programmes for universities

I BACKGROUND INFORMATION

1 Name of respondent:

_____

2 University and department/unit where you work _____

3 Unit or research group where you principally work (By unit we refer to the group, unit or department the activities with which you are best familiar with and in which you work)

Name _____

4 Do you work as a research group leader?

❑ Yes

❑ No, I work in a research group under : _____ (the name of the project leader)

❑ No, I work alone

5 Sex

Woman ❑

Man ❑

6 Year of birth

_____

7 Education

PhD ❑

Licentiate ❑

Licentiate in Medicine ❑

University degree (higher) ❑

Other, which?_____ ❑

8 Professional position

Professor ❑

Docent ❑

Researcher ❑

Senior assistant ❑

Assistant ❑

Lecturer ❑

Other, which? ❑

9 Discipline and field of study (eg medicine/immunology)

_____

10 How would you describe your own research?

Please tick the appropriate point on the scale to best describe your research

Low costs						High costs
Routine						Innovative
Short-term						Long-term
Technically simple						Technically complex
Basic research-oriented						Application-oriented
Curiosity-oriented						Aimed at fixed goals
Interdisciplinary						Represents one discipline
Theory-oriented						Practically oriented
Possible to carry out without partners						Not possible to carry out without partners
Internationally acknowledged						Not internationally acknowledged

11 How important are the following sources of funding with respect to your own research?
Please use the four-point scale, where 1= not at all important and 4=very important

	Not at all important			**Very important**
University funding	1	2	3	4
Academy of Finland	1	2	3	4
Tekes	1	2	3	4
EU R&D Framework programme	1	2	3	4
EU Structural Funds	1	2	3	4
Funding provided by private enterprises	1	2	3	4
Other private funding	1	2	3	4
Other, please specify_____	1	2	3	4

II RESEARCH ENVIRONMENT AND RESOURCES

Questions **12–14** refer to the unit you specified at the beginning of this questionnaire (Q3). It is very important that your answers relate to the unit where you principally work.

12 Which of the following characteristics describe your unit?
Please tick the appropriate point on the scale to best describe your unit.

The unit employs researchers from various disciplines						The unit employs researchers from one discipline
Interdisciplinary						Represents one discipline
Various theoretical approaches						One theoretical approach
The unit has a strong leader						The unit does not have a strong leader
Basic research-oriented						Applied research-oriented
Many teaching duties						No teaching duties
Hierarchical						Not hierarchical
Application-oriented						Theory-oriented
Research is conducted in groups						Research is conducted in single-handed
Many conflicts						No conflicts
Decisions made collaboratively						Decisions made at managerial level
Plenty of collaboration with the researchers of your department						No co-operation with the researchers of your department
Plenty of collaboration with national research groups						No co-operation with national research groups
Research projects are co-ordinated at unit level						Research projects are not co-ordinated at unit level
The unit applies for research funding						Each researcher applies for research funding alone
The unit co-operates with private enterprises						The unit does not co-operate with private enterprises
The researchers are encouraged to join in international collaboration						The researchers are not encouraged to join in international collaboration
The researchers are encouraged to join in international collaboration						The researchers are not encouraged to join in international collaboration

13 How would you describe the research resources and the development of research funding in your own field of study?

Please describe your opinion on the following five-point scale where 1=fully disagree, 2=somewhat disagree, 3=neutral, 4=somewhat agree, 5= fully agree.

	Fully disagree	Somewhat disagree	Neutral	Somewhat agree	Fully agree
Research funding is currently insufficient	1	2	3	4	5
Equipment is up-to-date	1	2	3	4	5
The group/unit works in many projects with (partial or full) external funding	1	2	3	4	5
There is a lack of teaching posts	1	2	3	4	5
There is a lack of permanent research posts	1	2	3	4	5
There are too few young researchers in our unit	1	2	3	4	5
There are too few experienced researchers in our unit	1	2	3	4	5
Budgetary funding has decreased	1	2	3	4	5
External funding has increased	1	2	3	4	5
It is easy for the young researchers to obtain funding for travel expenses	1	2	3	4	5
It is difficult to conduct long-term research	1	2	3	4	5
The Centre of Excellence policy creates inequality between research groups	1	2	3	4	5
It is difficult to obtain funding if the research lacks practical relevance	1	2	3	4	5
The role of Tekes as source of funding has increased	1	2	3	4	5

14 How would you describe the internationality of your own unit and the importance of international research collaboration in your field of study?

Please tick the appropriate point on the scale which best describes your opinion on the statement.

Our unit is internationally recognised	☐☐☐☐☐	Our unit is not internationally recognised
Our studies are published in high-standard international series	☐☐☐☐☐	Our studies are not published in high-standard international series
Many foreign researchers visit our unit	☐☐☐☐☐	No foreign researchers visit our unit
All our researchers join in international collaboration	☐☐☐☐☐	None of the researchers join in international collaboration
Our unit has joined in international research collaboration for a long time	☐☐☐☐☐	Our unit has started to join in international research collaboration recently
International collaboration is necessary for the development of our field of study	☐☐☐☐☐	International collaboration is not necessary for the development of our field of study
International collaboration has improved the visibility of our own research	☐☐☐☐☐	International collaboration has not improved the visibility of our own research

III EU R&D PROGRAMMES

Questions **15–27** focus on your participation in the EU R&D programmes and your opinions of the importance of the EU projects for your own unit. By unit we refer to the group, unit or department the activities of which you are best familiar with and where you principally work.

15 Have you received research funding from the following sources?

EU 1st - 3rd R&D Framework Programme (before the 1994)	❑
EU 4th R&D Framework Programme (1994-1998)	❑
EU 5th R&D Framework Programme (1998-2002)	❑
COST collaboration	❑
EU Structural Funds	❑
Other international research funding, please specify.	❑

_____

_____

I have received no international funding ❑

16 How many EU projects have you participated in? _____ projects

17 Was your role in the EU project(s)

	Yes	No
Co-ordinator?	❑	❑
Contractor?	❑	❑
Associate partner?	❑	❑
Subcontractor?	❑	❑

18 Have you worked as an evaluator of EU projects?

Yes ❑ No ❑

If yes, in which years? _____

19 Are you going to participate in the ongoing EU Fifth R&D Framework Programme?

I have received funding from the EU 5th R&D Framework Programme	❑
I have applied for funding from the EU 5th R&D Framework Programme, but the decision for funding has not been made yet	❑
I have planned to apply for EU funding	❑
I am not sure yet, possibly	❑
No, I am not going to apply for EU funding	❑

NB: Questions 20–27 are addressed to all respondents, also to those researchers who have not participated in any projects themselves. The objective of these questions is to define researchers' views on EU projects and on the effects of the EU projects on the research conducted in one's own department.

20 What is your own opinion of the nature of the projects under EU R&D Framework Programmes?

Please tick the appropriate point on the scale which best describes your own view.

High costs						Low costs
High-quality						Low quality
Provide new knowledge						Focus on transferring already existing information
Minor risks						Major risks
Technically simple						Technically complex
Routine						Innovative
Useful						Useless
Short-term						Long-term
Focus on basic research						Focus on applied research
Ambitious goals						Low goals
Curiosity-oriented						Aims at fixed goals
Cover interesting topics						Cover uninteresting topics
Internationally high-standard						Internationally low-standard
Possible to carry out without partners						Not possible to carry out without partners

21 What is your view on the benefits of the EU R&D Framework Programmes for the research conducted in your unit? Please evaluate on the following scale where 1=not at all, 2=somewhat, 3=moderate, 4=a lot, 5=very much, 6=unable to say

	Not at all			**Very Much**	**Unable to say**	
Knowledge-related benefits						
Broadened the unit's knowledge base	1	2	3	4	5	6
Brought new methodological skills	1	2	3	4	5	6
Directed the unit's research towards new research fields	1	2	3	4	5	6
Broadened the research field	1	2	3	4	5	6
Brought new dynamism to the unit's research	1	2	3	4	5	6
Produced publications	1	2	3	4	5	6
Promoted objectives related to basic research	1	2	3	4	5	6
Collaboration-related benefits						
Increased collaboration with universities	1	2	3	4	5	6
Increased collaboration with research institutes	1	2	3	4	5	6
Increased collaboration with private enterprises	1	2	3	4	5	6
Increased collaboration with the end-users of the research	1	2	3	4	5	6
Strengthened international collaboration	1	2	3	4	5	6
Increased foreign researchers' visits to the unit	1	2	3	4	5	6
Promoted young researchers' careers	1	2	3	4	5	6
Provided new training opportunities for young researchers	1	2	3	4	5	6
Other benefits						
Provided a new funding channel for research	1	2	3	4	5	6
Enabled the utilisation of research results in practice	1	2	3	4	5	6
Helped in keeping the equipment up-to-date	1	2	3	4	5	6
Provided research samples and materials	1	2	3	4	5	6
Provided possibilities to use research equipment	1	2	3	4	5	6
Brought about patents or licences	1	2	3	4	5	6
Enabled participation in commercialisation of research	1	2	3	4	5	6
Led to new international projects	1	2	3	4	5	6
Led to national projects	1	2	3	4	5	6
Increased positive competition between the research groups of the unit	1	2	3	4	5	6
Has directed our research towards socially topical issues	1	2	3	4	5	6

22 Has the EU collaboration caused any negative impacts on the research conducted in your unit? Please choose the alternative that best corresponds to your own opinion. 1=fully disagree, 5=fully agree

	Fully disagree				**Fully agree**
Has decreased collaboration with non-EU countries	1	2	3	4	5
Has focused attention away from national importance	1	2	3	4	5
Does not correspond to our unit's own objectives	1	2	3	4	5
Other negative impact, please specify	1	2	3	4	5

_____
_____
_____
_____
_____

23 What is your opinion on the suitability of EU framework programmes for university research? *Please choose the alternative that best corresponds to your own opinion.*

	Fully disagree				Fully agree	Unable to say
EU programmes are well suited to my own field of study	1	2	3	4	5	6
The volume of EU funding is inadequate	1	2	3	4	5	6
Programmes based on concerted action are useful	1	2	3	4	5	6
Programmes based on concerted action are inefficient	1	2	3	4	5	6
The emphasis on the EU programmes is on applied research	1	2	3	4	5	6
Basic research needs an EU programme of its own	1	2	3	4	5	6
EU programme do not promote theory-oriented research	1	2	3	4	5	6
The duration of the EU projects is sufficient	1	2	3	4	5	6
It is difficult to find suitable collaboration partners	1	2	3	4	5	6
The fact that the EU projects have fixed goals restricts research	1	2	3	4	5	6

24 What is your opinion of the implementation of the EU framework programmes with respect to your own field of study? Please tick the appropriate box on the scale.

Application process is slow	❑ ❑ ❑ ❑ ❑	Application process is fast
Application process is complex	❑ ❑ ❑ ❑ ❑	Application process is simple
Evaluation procedure is competent	❑ ❑ ❑ ❑ ❑	Evaluation procedure lacks competence
Selection is based on other criteria than quality of research	❑ ❑ ❑ ❑ ❑	Selection is based on quality of research

25 In your opinion, is participation in EU framework programmes used as a criterion when the quality of other research activities is assessed or when decisions on funding other research activities are made? Please choose the alternative that best corresponds to your own opinion of the statement. 1=fully disagree, 5=fully agree

	Fully disagree				**Fully agree**
EU participation is generally valued	1	2	3	4	5
EU participation facilitates funding from national sources	1	2	3	4	5
EU participation is considered positive by the university management	1	2	3	4	5
EU projects are valued more than other international projects	1	2	3	4	5
EU participation has a positive effect on receiving university funding	1	2	3	4	5
EU participation should not have any effect on how national research funding is appropriated	1	2	3	4	5

26 What is your opinion of the national information services related to EU framework programmes? Please choose the alternative that corresponds to your own opinion of the statement.

	Fully disagree				**Fully agree**
Information on the EU programmes is well distributed by our university	1	2	3	4	5
The support I have received from the university to prepare the proposal has been sufficient	1	2	3	4	5
Preparation of EU proposals should be funded by national sources	1	2	3	4	5

27 How should the services related to EU programmes be developed in your own university?

Questions 28-29 are addressed to those respondents who have participated in EU projects.

28 Are/were there any private enterprises involved in your EU projects?
Please tick the appropriate box .

Finnish enterprises	❑ please answer question 29
Foreign enterprises	❑ please answer question 29
There are no enterprises involved in the EU projects	❑ please answer question 31

29 What is your view on the collaboration with private enterprises?

Please choose the alternative that corresponds to your own view on the statement.

	Fully disagree				**Fully agree**
EU projects have increased my own interest in collaborating with private enterprises	1	2	3	4	5
The EU project has increased knowledge on matters related to commercialisation of the research	1	2	3	4	5
In Europe, it is easier to find private enterprises able to utilise my research	1	2	3	4	5
European private enterprises have more know-how than the Finnish ones	1	2	3	4	5

Questions 30 is addressed to those respondents who have not participated in any EU R&D projects.

30 To what extent have the following matters influenced the fact that you have not participated in any EU R&D projects?

Please describe your own situation on the following five-point scale where not participated in any EU R&D projects. 1=does not correspond to my situation at all and 5=fully corresponds to my situation.

	Does not correspond to my situation at all				**Fully corresponds to my situation**
Participation has not been relevant for me	1	2	3	4	5
EU projects demand a lot of work and time	1	2	3	4	5
A large share of my work time is committed to teaching	1	2	3	4	5
My own research is not suitable for the EU programmes	1	2	3	4	5
I am not interested in international collaboration	1	2	3	4	5
The received amount of funding is too small considering the work load involved	1	2	3	4	5
I have had sufficient funding and thus there has been no need for me to apply for EU funding	1	2	3	4	5
The fact that the application process is so complex is a hindrance to my applying	1	2	3	4	5
If there was national funding available for preparing the application, I would apply for EU funding	1	2	3	4	5
I have applied for EU funding but the project did not receive funding	1	2	3	4	5

Other, please specify

_____

_____

_____

_____

_____

IV COLLABORATION

Questions **31–38** deal with collaboration with private enterprises or organisations such as towns, municipalities etc.

31 Have you collaborated with the following organisations?
Please choose the alternative that corresponds to your own situation. 1=no collaboration, 5= a lot of collaboration

	No collaboration				**A lot of collaboration**
Finnish enterprise	1	2	3	4	5
Foreign enterprise	1	2	3	4	5
Local authority (e.g. town, municipality, federation of municipalities)	1	2	3	4	5
Sectoral authority (e.g. ministries, regional environment centres)	1	2	3	4	5
Non-profit organisation of association	1	2	3	4	5
Other, please specify	1	2	3	4	5

_____

If you have had no collaboration at all with any of the above mentioned, please answer **question 39** next.

32 What kind of collaboration have you had with private enterprises or non-profit organisations such as towns, municipalities and associations?
Please tick the appropriate box.

	Collaboration with private enterprises	**Collaboration with non-profit organisations**
Tekes project	❑	❑
EU project	❑	❑
Project funded by a private enterprise	❑	❑
Project funded by a non-profit organisation	❑	❑
Joint project with partial funding from ourselves	❑	❑
Other, please specify_____	❑	❑

_____

33 What made you enter collaboration with private enterprises or non-profit organisations?
Please tick the appropriate box.

	Collaboration with private enterprises	Collaboration with non-profit organisations
Funding	❑	❑
Opportunity to take part in commercialising the results	❑	❑
Opportunity to use advanced research equipment	❑	❑
Opportunity to learn about developments in the field of study	❑	❑
Opportunity to obtain research material	❑	❑
Opportunity to apply one's own theoretical knowledge to solving practical problems	❑	❑
Partners were involved in the same project, there was no particular reason	❑	❑
Other, please specify _____ _____		

34 Have you been satisfied in your collaboration with private enterprises or non-profit organisations?
Please tick the appropriate box.

	Collaboration with private enterprises	Collaboration with non-profit organisations
Satisfied with all projects	❑	❑
Fairly satisfied	❑	❑
Satisfied with some of the projects only	❑	❑
Dissatisfied with all projects	❑	❑

35 In what aspects has the collaboration with private enterprises or non-profit organisations?

Please use the five-point scale (A) when considering your collaboration with private enterprises and (B) when considering your collaboration with non-profit organisations. 1=collaboration has not been useful to me at all, 5=collaboration has been very useful

	(A) Collaboration with private enterprises					**(B) Collaboration with non-profit organisations**				
	has not been useful to me at all				has been very useful	has not been useful to me at all				has been very useful
* Provided new viewpoints on the subject matter and research material	1	2	3	4	5	1	2	3	4	5
* Broadened my views on the needs of industry/public organisations	1	2	3	4	5	1	2	3	4	5
* Brought about new contacts	1	2	3	4	5	1	2	3	4	5
* Brought about funding for research work and for employing researchers	1	2	3	4	5	1	2	3	4	5
* Helped in understanding the possibilities to utilise my own research	1	2	3	4	5	1	2	3	4	5
* Provided access to research data an material(s)	1	2	3	4	5	1	2	3	4	5
* Provided access to advanced research equipment	1	2	3	4	5	1	2	3	4	5
* Enabled faster acquisition of information from commercial data banks to which university has no access	1	2	3	4	5	1	2	3	4	5
* Helped combine practical know-how and theoretical knowledge	1	2	3	4	5	1	2	3	4	5
* Other, please specify	1	2	3	4	5	1	2	3	4	5

_____
_____
_____
_____

36 What kind of disadvantages or problems have you encountered when collaborating with private enterprises or non-profit organisations?

Please choose the alternative that corresponds to your opinion of the statement.

	Collaboration with enterprises	Collaboration with non-profit organisations
Collaboration is time-consuming	❑	❑
The customer has been dissatisfied with the outcome		
A partner tried to obtain the possession of the research results	❑	❑
Publishing of the results was postponed	❑	❑
A partner tried to direct the research according to one's own interests	❑	❑
There was confusion concerning the ownership of the results	❑	❑
Other problems, please specify	❑	❑

_____

_____

_____

37 Has your collaboration with private enterprises or non-profit organisations increased in the past few years? Please tick the appropriate box.

	Collaboration with enterprises	Collaboration with non-profit organisations
Increased considerably	❑	❑
Increased somewhat	❑	❑
Remained unchanged	❑	❑
Decreased	❑	❑
There has been no collaboration	❑	❑

38 If your collaboration with private enterprises has increased in the past few years, which of thefollowing factors have influenced the increase? Please choose the alternative that corresponds to your own opinion of the statement.

	Fully disagree				**Fully agree**
Funding provided by Tekes has increased collaboration with private enterprises	1	2	3	4	5
EU collaboration has increased collaboration with private enterprises	1	2	3	4	5
The number of research commissions from private enterprises has increased	1	2	3	4	5
Researchers have become more interested in commercialising their results	1	2	3	4	5
Environmental issues have increased private enterprises' interest in university research	1	2	3	4	5
Other, please specify_____	1	2	3	4	5

_____
_____
_____
_____

V COMMERCIALISATION

Question **39-41** deal with your views on researchers participating in the commercialisation of research results.

39 Do you participate or are your going to participate in commercialising the research results yourself?

Yes, I participate	❑
No, I do not participate	❑
Yes, I am going to participate	❑

40 What is your opinion on the commercialisation of research results in your own field of study?

Please choose the alternative that corresponds to your own opinion of the statement. 1=fully disagree, 2=somewhat disagree, 3=neutral opinion, 4=somewhat agree, 5=fully agree and 6=unable to say.

	Fully disagree			**Fully agree**	**Unable to say**	
Participation in commercialising research results causes problems in one's teaching work	1	2	3	4	5	6
The prejudices of the university researchers towards the commercialisation of research results have decreased	1	2	3	4	5	6
The fact that university researchers participate in commercialisation decreases the reliability of university research	1	2	3	4	5	6
Researcher's participation in the commercialisation of research is considered positive by the university management	1	2	3	4	5	6
Researchers lack the special skills needed in commercialisation	1	2	3	4	5	6
University should give more support to researchers participating in the commercialisation	1	2	3	4	5	6
University should create explicit rules regarding the commercialisation of results	1	2	3	4	5	6
EU collaboration increases the commercialisation of research results	1	2	3	4	5	6

41 How does your university support the commercialisation of research?

Please choose the alternative that corresponds to your own opinion of the statement. 1=fully disagree, 2=somewhat disagree, 3=neutral opinion, 4=somewhat agree, 5=fully agree and 6=unable to say

	Fully disagree			**Fully agree**	**Unable to say**	
There is a unit providing assistance in issues related to commercialisation at our university	1	2	3	4	5	6
The services related to commercialisation provided by our university are sufficient	1	2	3	4	5	6
The services provided by our university are competent	1	2	3	4	5	6
The services related to commercialisation should be located in a certain few universities	1	2	3	4	5	6

Please return the questionnaire in the enclosed envelope.
Thank you for your contribution!

Appendix Tables

SURVEY RESULTS

1 Respondents by university

	N	%
University of Helsinki	77	41
University of Joensuu	13	7
University of Jyväskylä	9	5
University of Kuopio	17	9
University of Oulu	12	6
Tampere University of Technology	11	6
University of Tampere	13	7
Helsinki University of Technology	28	15
University of Turku	9	5
Total	189	100

2 Type of organisation

	Units			Department		Research units		Total	
	N	%		N	%	N	%	N	%
Departments	28	78	EU participants	84	82	19	22	103	54
Research units	8	22	Non-participants	73	71	13	15	86	46
Total	36	100	Total	157	83	32	17	189	100

3.a University departments

Helsinki university of Technology
Transportation Engineering
Ship Laboratory
Chemical Technology
Space Laboratory
Systems Analysis Laboratory

University of Helsinki
Department of Applied Chemistry and Microbiology
Department of Geography
Department of Chemistry
Department of Physics
Department of Food Technology
Department of Forest Economics and Marketing
Department of Sociology
Department of Psychology
Department of Information Sciences

Tampere university of technology
Occupational Safety Engineering
Institute of Material Science

University of Tampere
Department of Regional Studies and Environmental Policy
Department of Nursing Science

University of Oulu
Department of Biology

University of Turku
Department of Biochemistry and Food Chemistry
Turku Centre for Biotechnology
Research Unit for the Sociology of Education

University of Joensuu
Department of Physics
Faculty of Forestry

University of Kuopio
Department of Ecology and Environmental Science

University of Jyväskylä
Department of Mathematics
Department of English
Department of Social Sciences and Philosophy

3.b Research units

Low Temperature Laboratory
TAI Research Centre
Haartman Institute
Institute of Biotechnology
Digital Media Institute
Infotech
A.I.Virtanen Institute

4 Role in the research group

	N	%
Leader	126	67
Working in a research group	36	19
Working alone	20	11
Working alone and in a group	5	3
Missing	2	1
Total	189	100

5 Age

Age group	N	%
25-37	55	29
38-44	70	37
45-68	54	29
Missing	10	5
	189	100

Age	
Mean	44
Median	44
Min	25
Max	68

6 Sex

	N	%
Women	49	26
Men	140	74
Total	189	100

	Age		
Sex	Mean	Min	Max
Women	42	26	63
Men	45	25	68

7 Education

	N	%
PhD	149	79
Licentiate	12	6
University degree (higher)	26	14
Other	1	1
Missing	1	1
Total	189	100

8 Professional position

	Women		**Men**		**Total**	
	N	%	N	%	N	%
Professor	18	37	75	54	93	49
Docent	9	18	22	16	31	16
Researcher	17	35	24	17	41	22
Senior assistant	1	2	8	6	9	5
Assistant	3	6	2	1	5	3
Lecturer	0	0	2	1	2	1
Other	1	2	6	4	7	4
Total	49	100	139	100	188	100

9 Discipline

	N	%
Natural sciences	90	48
Technology	38	20
Medicine	17	9
Agriculture and forestry	18	10
Social sciences	23	12
Humanities	3	2
Total	189	100

	N	%
Technology, mathematics, physics	68	36
Life sciences	85	45
Humanities and social sciences	36	19
Total	189	100

10 Characteristics of respondent's own research

	Agree		Neutral		Disagree		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
High costs										
EU participants	37	36	28	27	38	37	0	0	103	100
Non-participants	29	33	17	20	40	47	0	0	86	100
ALL	66	41	45	24	78	35	0	0	189	100
p=.333										
Innovative										
EU participants	88	85	14	14	1	1	0	0	103	100
Non-participants	70	81	12	14	4	5	0	0	86	100
ALL	158	84	26	14	5	3	0	0	189	100
p=.287										
Long-term										
EU participants	78	76	16	16	9	9	0	0	103	100
Non-participants	64	74	15	17	7	8	0	0	86	100
ALL	142	75	31	16	16	8	0	0	189	100
p=.935										
Technically complex										
EU participants	62	60	25	24	15	15	1	1	103	100
Non-participants	51	59	21	24	13	15	1	1	86	100
ALL	113	60	46	24	28	15	2	1	189	100
p=.992										
Basic research-oriented										
EU participants	32	31	37	36	34	33	0	0	103	100
Non-participants	34	40	26	30	26	30	0	0	86	100
ALL	66	35	63	33	60	32	0	0	189	100
p=.465										
Curiosity-oriented										
EU participants	39	38	22	21	41	40	1	1	103	100
Non-participants	35	41	20	23	30	35	1	1	86	100
ALL	74	39	42	22	71	38	2	1	189	100
p=.789										
Interdisciplinary										
EU participants	64	62	23	22	16	16	0	0	103	100
Non-participants	49	57	23	27	14	16	0	0	86	100
ALL	113	60	46	24	30	16	0	0	189	100
p=.741										
Possible to carry out without partners										
EU participants	18	17	8	8	77	75	0	0	103	100
Non-participants	23	27	13	15	50	58	0	0	86	100
ALL	41	22	21	11	127	67	0	0	189	100
p=.586										
Internationally acknowledged										
EU participants	77	75	12	12	13	13	1	1	103	100
Non-participants	56	65	19	22	11	13	0	0	86	100
ALL	133	70	31	16	24	13	1	1	189	100
p=.048										

11 How important are the following sources of funding with respect to your own research?

	Important		Not very important		Not very important		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
University funding										
EU participants	43	42	36	35	23	22	1	1	103	100
Non-participants	52	60	26	30	8	9	0	0	86	100
ALL	95	50	62	33	31	16	1	1	189	100
p=.032										
Academy of Finland										
EU participants	72	70	16	16	13	13	2	2	103	100
Non-participants	63	73	12	14	9	10	2	2	86	100
ALL	135	71	28	15	22	12	4	2	189	100
p=.951										
Tekes										
EU participants	58	56	16	16	25	24	4	4	103	100
Non-participants	39	45	13	15	30	35	4	5	86	100
ALL	97	51	29	15	55	29	8	4	189	100
p=.344										
EU R&D Framework Programmes										
EU participants	56	54	26	25	16	16	5	5	103	100
Non-participants	13	15	24	28	43	50	6	7	86	100
ALL	69	37	50	26	59	31	11	6	189	100
p=.000										
EU Structural Funds										
EU participants	13	13	24	23	52	50	14	14	103	100
Non-participants	10	12	19	22	51	59	6	7	86	100
ALL	23	12	43	23	103	54	20	11	189	100
p=.917										
Private enterprises										
EU participants	42	41	20	19	32	31	9	9	103	100
Non-participants	33	38	15	17	33	38	5	6	86	100
ALL	75	40	35	19	65	34	14	7	189	100
p=.779										
Other private funding										
EU participants	39	38	22	21	26	25	16	16	103	100
Non-participants	34	40	27	31	20	23	5	6	86	100
ALL	73	39	49	26	46	24	21	11	189	100
p=.779										

12 a) Characteristics of the unit by experience in EU project

	Agree		Neutral		Disagree		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
The unit employs researchers from various disciplines										
EU participants	51	50	9	9	42	41	1	1	103	100
Non-participants	38	44	7	8	41	48	0	0	86	100
ALL	89	47	16	8	83	44	1	1	189	100
p=.669										
Interdisciplinary										
EU participants	49	48	21	20	32	31	1	1	103	100
Non-participants	40	47	16	19	30	35	0	0	86	100
ALL	89	47	37	20	62	33	1	1	189	100
p=.865										
Various theoretical approaches										
EU participants	62	60	26	25	13	13	2	2	103	100
Non-participants	49	57	27	31	7	8	3	3	86	100
ALL	111	59	53	28	20	11	5	3	189	100
p=.450										
The unit has as a strong leader										
EU participants	39	38	32	31	28	27	4	4	103	100
Non-participants	40	47	27	31	18	21	1	1	86	100
ALL	79	42	59	31	46	24	5	3	189	100
p=.460										

Basic research-oriented										
EU participants	30	29	35	34	36	35	2	2	103	100
Non-participants	36	42	20	23	30	35	0	0	86	100
ALL	66	35	55	29	66	35	2	1	189	100
p=.135										
Many teaching duties										
EU participants	66	64	18	17	17	17	2	2	103	100
Non-participants	56	65	12	14	18	21	0	0	86	100
ALL	122	65	30	16	35	19	2	1	189	100
p=.654										
Hierarchical										
EU participants	24	23	26	25	51	50	2	2	103	100
Non-participants	17	20	27	31	42	49	0	0	86	100
ALL	41	22	53	28	93	49	2	1	189	100
p=.642										
Applied research-oriented										
EU participants	44	43	31	30	26	25	2	2	103	100
Non-participants	34	40	36	42	16	19	0	0	86	100
ALL	78	41	67	35	42	22	2	1	189	100
p=.240										
Research is conducted in groups										
EU participants	75	73	19	18	8	8	1	1	103	100
Non-participants	56	65	17	20	13	15	0	0	86	100
ALL	131	69	36	19	21	11	1	1	189	100
p=.257										
Many conflicts										
EU participants	17	17	31	30	53	51	2	2	103	100
Non-participants	14	16	28	33	44	51	0	0	86	100
ALL	31	16	59	31	97	51	2	1	189	100
p=.963										
Decisions made collaboratively										
EU participants	41	40	23	22	37	36	2	2	103	100
Non-participants	34	40	15	17	37	43	0	0	86	100
ALL	75	40	38	20	74	39	2	1	189	100
p=.565										
Plenty of collaboration with the researchers in own department										
EU participants	48	47	35	34	17	17	3	3	103	100
Non-participants	41	48	31	36	14	16	0	0	86	100
ALL	89	47	66	35	31	16	3	2	189	100
p=.985										
Plenty of collaboration with national research groups										
EU participants	59	57	26	25	16	16	2	2	103	100
Non-participants	42	49	25	29	18	21	1	1	86	100
ALL	101	53	51	27	34	18	3	2	189	100
p=.442										
Research projects are co-ordinated at unit level										
EU participants	36	35	24	23	40	39	3	3	103	100
Non-participants	35	41	12	14	37	43	2	2	86	100
ALL	71	38	36	19	77	41	5	3	189	100
p=.252										
The unit applies for research funding										
EU participants	41	40	14	14	46	45	2	2	103	100
Non-participants	29	34	17	20	39	45	1	1	86	100
ALL	70	37	31	16	85	45	3	2	189	100
p=.459										
The unit co-operates with private enterprises										
EU participants	50	49	17	17	35	34	1	1	103	100
Non-participants	30	35	28	33	28	33	0	0	86	100
ALL	80	42	45	24	63	33	1	1	189	100
p=.028										
The researchers are encouraged to join in international collaboration										
EU participants	86	83	12	12	4	4	1	1	103	100
Non-participants	67	78	12	14	7	8	0	0	86	100
ALL	153	81	24	13	11	6	1	1	189	100
p=.401										

12 b) Characteristics of units by unit type unit

	Agree		Neutral		Disagree		Disagree		Total	
	N	%	N	%	N	%	N	%	N	%
Research is high costs										
EU active units	38	41	25	27	29	32	0	0	92	100
Less active units	28	29	20	21	49	51	0	0	97	100
Total	66	35	45	24	78	41	0	0	189	100
p = .029										
Research is technically complex										
EU active units	68	74	16	17	8	9	0	0	92	100
Less active units	45	46	30	31	20	21	2	2	97	100
Total	113	60	46	24	28	15	2	1	189	100
p = .001										
Various theoretical approaches										
EU active units	47	51	34	37	10	11	1	1	92	100
Less active units	64	66	19	20	10	10	4	4	97	100
Total	111	59	53	28	20	11	5	3	189	100
p = .033										
Unit has a strong leader										
EU active units	46	50	21	23	22	24	3	3	92	100
Less active units	33	34	38	39	24	25	2	2	97	100
Total	79	42	59	31	46	24	5	3	189	100
p = .031										
Many teaching duties										
EU active units	45	49	23	25	23	25	1	1	92	100
Less active units	77	79	7	7	12	12	1	1	97	100
Total	122	65	30	16	35	19	2	1	189	100
p = .000										
The unit co-operates with private enterprises										
EU active units	49	53	24	26	19	21	0	0	92	100
Less active units	31	32	21	22	44	45	1	1	97	100
Total	80	42	45	24	63	33	1	1	189	100
p = .001										
Research funding is currently insufficient										
EU active units	35	38	22	24	34	37	1	1	92	100
Less active units	56	58	18	19	20	21	3	3	97	100
Total	91	48	40	21	54	29	4	2	189	100
p = .012										
There is a lack of research posts										
EU active units	74	80	12	13	5	5	1	1	92	100
Less active units	88	91	3	3	2	2	4	4	97	100
Total	162	86	15	8	7	4	5	3	189	100
p = .019										
The Centre of Excellence policy creates inequality between research groups										
EU active units	53	58	18	20	19	21	2	2	92	100
Less active units	59	61	27	28	7	7	4	4	97	100
Total	112	59	45	24	26	14	6	3	189	100
p = .022										
Our unit is internationally renowned										
EU active units	84	91	4	4	3	3	1	1	92	100
Less active units	62	64	20	21	14	14	1	1	97	100
Total	146	77	24	13	17	9	2	1	189	100
p = .000										
Our unit has joined international research collaboration for a long										
EU active units	80	87	8	9	3	3	1	1	92	100
Less active units	67	69	19	20	10	10	1	1	97	100
Total	147	78	27	14	13	7	2	1	189	100
p = .010										

13 Research resources and the development of research funding by experience in EU project

	Agree		Neutral		Disagree		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
Research funding is currently insufficient										
EU participants	47	46	20	19	33	32	3	3	103	100
Non-participants	44	51	20	23	21	24	1	1	86	100
ALL	91	48	40	21	54	29	4	2	189	100
p=.458										
Equipment is up-to-date										
EU participants	51	50	29	28	21	20	2	2	103	100
Non-participants	51	59	12	14	23	27	0	0	86	100
ALL	102	54	41	22	44	23	2	1	189	100
p=.050										
The group/unit works in many projects with (partial or full) external funding										
EU participants	84	82	12	12	5	5	2	2	103	100
Non-participants	62	72	10	12	14	16	0	0	86	100
ALL	146	77	22	12	19	10	2	1	189	100
p=.037										
There is a lack of teaching posts										
EU participants	57	55	25	24	17	17	4	4	103	100
Non-participants	48	56	13	15	23	27	2	2	86	100
ALL	105	56	38	20	40	21	6	3	189	100
p=.119										
There is a lack of permanent research posts										
EU participants	89	86	7	7	3	3	4	4	103	100
Non-participants	73	85	8	9	4	5	1	1	86	100
ALL	162	86	15	8	7	4	5	3	189	100
p=.695										
There are too few young researchers in our unit										
EU participants	57	55	22	21	21	20	3	3	103	100
Non-participants	45	52	16	19	25	29	0	0	86	100
ALL	102	54	38	20	46	24	3	2	189	100
p=.916										
There are too few experienced researchers in our unit										
EU participants	57	55	22	21	21	20	3	3	103	100
Non-participants	45	52	16	19	25	29	0	0	86	100
ALL	102	54	38	20	46	24	3	2	189	100
p=.435										
Budgetary funding has decreased										
EU participants	74	72	17	17	9	9	3	3	103	100
Non-participants	63	73	14	16	8	9	1	1	86	100
ALL	137	72	31	16	17	9	4	2	189	100
p=.992										
External funding has increased										
EU participants	80	78	17	17	4	4	2	2	103	100
Non-participants	58	67	19	22	9	10	0	0	86	100
ALL	138	73	36	19	13	7	2	1	189	100
p=.113										
It is easy for the young researchers to obtain funding for travel expenses										
EU participants	52	50	25	24	22	21	4	4	103	100
Non-participants	38	44	27	31	21	24	0	0	86	100
ALL	90	48	52	28	43	23	4	2	189	100
p=.504										
It is difficult to conduct long-term research										
EU participants	56	54	21	20	23	22	3	3	103	100
Non-participants	51	59	22	26	13	15	0	0	86	100
ALL	107	57	43	23	36	19	3	2	189	100
p=.369										
The Centre of Excellence policy creates inequality between research groups										
EU participants	60	58	24	23	14	14	5	5	103	100
Non-participants	52	60	21	24	12	14	1	1	86	100
ALL	112	59	45	24	26	14	6	3	189	100
p=.999										

It is difficult to obtain funding if the research lacks practical relevance										
EU participants	62	60	20	19	17	17	4	4	103	100
Non-participants	50	58	24	28	11	13	1	1	86	100
ALL	112	59	44	23	28	15	5	3	189	100
p=.390										
The role of Tekes as a source of funding has increased										
EU participants	64	62	24	23	9	9	6	6	103	100
Non-participants	43	50	24	28	17	20	2	2	86	100
ALL	107	57	48	25	26	14	8	4	189	100
p=.058										

14 Internationality of the unit and importance of international collaboration

	Agree		Neutral		Disagree		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
Our unit is internationally recognised										
EU participants	82	80	10	10	9	9	2	2	103	100
Non-participants	64	74	14	16	8	9	0	0	86	100
ALL	146	77	24	13	17	9	2	1	189	100
p=.416										
Our studies are published in high-standard international series										
EU participants	88	85	8	8	5	5	2	2	103	100
Non-participants	66	77	17	20	3	3	0	0	86	100
ALL	154	81	25	13	8	4	2	1	189	100
p=.057										
Many foreign researchers visit our unit										
EU participants	56	54	33	32	12	12	2	2	103	100
Non-participants	55	64	18	21	13	15	0	0	86	100
ALL	111	59	51	27	25	13	2	1	189	100
p=.194										
All our researchers join in international collaboration										
EU participants	59	57	36	35	6	6	2	2	103	100
Non-participants	52	60	28	33	6	7	0	0	86	100
ALL	111	59	64	34	12	6	2	1	189	100
p=.887										
Our unit has joined in international research collaboration for a long time										
EU participants	87	84	7	7	7	7	2	2	103	100
Non-participants	60	70	20	23	6	7	0	0	86	100
ALL	147	78	27	14	13	7	2	1	189	100
p=.006										
International collaboration is necessary for the development of our field of study										
EU participants	90	87	8	8	3	3	2	2	103	100
Non-participants	79	92	5	6	2	2	0	0	86	100
ALL	169	89	13	7	5	3	2	1	189	100
p=.816										
International collaboration has improved the visibility of our own research										
EU participants	87	84	9	9	5	5	2	2	103	100
Non-participants	63	73	18	21	5	6	0	0	86	100
ALL	150	79	27	14	10	5	2	1	189	100
p=.059										

15 Have you received research funding from the following sources?

	N	%
EU 1st - 3rd R&D Framework Programme (before the 1994)	12	6
EU 4th R&D Framework Programme (1994-1998)	66	35
EU 5th R&D Framework Programme (1998-2002)	49	26
COST collaboration	29	15
EU Structural Funds	17	9
Other international research funding	34	18

16 Number of EU projects that respondents have participated

Number of EU projects	N	%
1	42	41
2	22	21
3	15	15
4-9	21	20
10 or more	3	3

17 Role in the EU project(s)

	N	%
Co-ordinator	28	27
Contractor	73	71
Associate partner	28	27
Subcontractor	20	19

18 Number of respondents who have been as an evaluator of EU projects

	N	%	
Yes	31	16	(n=189)

19 Respondents' intentions to participate in the EU's 5th R&D Framework Programme

	N	%
I have received funding from the EU 5th R&D Framework Programme	28	15
I have applied for funding from the EU 5th R&D Framework Programme, but the decision for funding has been not made yet	21	11
I have planned to apply for EU funding	27	14
I am not sure yet, possibly	45	24
No, I am not going to apply for EU funding	54	29
Do not know	14	7
	189	100

20 Views of the characteristics of the EU projects

	Agree		Neutral		Disagree		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
High costs										
EU participants	59	57	38	37	1	1	5	5	103	100
Non-participants	50	58	30	35	1	1	5	6	86	100
ALL	109	58	68	36	2	1	10	5	189	100
p=.965										
High quality										
EU participants	39	38	31	30	30	29	3	3	103	100
Non-participants	31	36	33	38	18	21	4	5	86	100
ALL	70	37	64	34	48	25	7	4	189	100
p=.330										
Provide new knowledge										
EU participants	40	39	23	22	37	36	3	3	103	100
Non-participants	28	33	26	30	28	33	4	5	86	100
ALL	68	36	49	26	65	34	7	4	189	100
p=.410										
Minor risks										
EU participants	36	35	43	42	20	19	4	4	103	100
Non-participants	29	34	38	44	15	17	4	5	86	100
ALL	65	34	81	43	35	19	8	4	189	100
p=.913										
Technically complex										
EU participants	34	33	48	47	16	16	5	5	103	100
Non-participants	24	28	43	50	15	17	4	5	86	100
ALL	58	31	91	48	31	16	9	5	189	100
p=.736										

Innovative										
EU participants	36	35	32	31	30	29	5	5	103	100
Non-participants	25	29	33	38	24	28	4	5	86	100
ALL	61	32	65	34	54	29	9	5	189	100
p=.534										
Useful										
EU participants	51	50	35	34	13	13	4	4	103	100
Non-participants	32	37	33	38	17	20	4	5	86	100
ALL	83	44	68	36	30	16	8	4	189	100
p=.185										
Long-term										
EU participants	38	37	32	31	29	28	4	4	103	100
Non-participants	33	38	37	43	12	14	4	5	86	100
ALL	71	38	69	37	41	22	8	4	189	100
p=.045										
Focus on basic research										
EU participants	9	9	24	23	67	65	3	3	103	100
Non-participants	6	7	32	37	43	50	5	6	86	100
ALL	15	8	56	30	110	58	8	4	189	100
p=.080										
Ambitious goals										
EU participants	51	50	24	23	24	23	4	4	103	100
Non-participants	34	40	25	29	22	26	5	6	86	100
ALL	85	45	49	26	46	24	9	5	189	100
p=.422										
Curiosity-oriented										
EU participants	6	6	19	18	73	71	5	5	103	100
Non-participants	4	5	23	27	55	64	4	5	86	100
ALL	10	5	42	22	128	68	9	5	189	100
p=.386										
Cover interesting topics										
EU participants	46	45	37	36	15	15	5	5	103	100
Non-participants	27	31	36	42	19	22	4	5	86	100
ALL	73	39	73	39	34	18	9	5	189	100
p=.133										
International high-quality										
EU participants	50	49	29	28	21	20	3	3	103	100
Non-participants	29	34	42	49	11	13	4	5	86	100
ALL	79	42	71	38	32	17	7	4	189	100
p=.009										
Not possible to carry out without partners										
EU participants	74	72	15	15	8	8	6	6	103	100
Non-participants	60	70	14	16	8	9	4	5	86	100
ALL	134	71	29	15	16	8	10	5	189	100
p=.886										

21 Benefits of the EU participation for the unit

	Agree		**Neutral**		**Disagree**		**Missing**		**Total**	
	N	%	N	%	N	%	N	%	N	%
Broadened the unit's knowledge base										
EU participants	54	52	27	26	15	15	7	7	103	100
Non-participants	19	22	11	13	24	28	32	37	86	100
ALL	73	39	38	20	39	21	39	21	189	100
p=.000										
Brought new methodological skills										
EU participants	35	34	36	35	25	24	7	7	103	100
Non-participants	16	19	15	17	27	31	28	33	86	100
ALL	51	27	51	27	52	28	35	19	189	100
p=.000										

Directed the unit's research towards new research fields										
EU participants	31	30	40	39	26	25	6	6	103	100
Non-participants	16	19	16	19	25	29	29	34	86	100
ALL	47	25	56	30	51	27	35	19	189	100
p=.000										
Broadened the research field										
EU participants	53	51	21	20	23	22	6	6	103	100
Non-participants	22	26	15	17	20	23	29	34	86	100
ALL	75	40	36	19	43	23	35	19	189	100
p=.000										
Brought new dynamism to the unit's research										
EU participants	37	36	32	31	25	24	9	9	103	100
Non-participants	20	23	13	15	25	29	28	33	86	100
ALL	57	30	45	24	50	26	37	20	189	100
p=.000										
Produced publications										
EU participants	49	48	28	27	17	17	9	9	103	100
Non-participants	24	28	9	10	25	29	28	33	86	100
ALL	73	39	37	20	42	22	37	20	189	100
p=.000										
Promoted objectives related to basic research										
EU participants	23	22	28	27	42	41	10	10	103	100
Non-participants	13	15	14	16	31	36	28	33	86	100
ALL	36	19	42	22	73	39	38	20	189	100
p=.000										
Increased collaboration with universities										
EU participants	57	55	17	17	21	20	8	8	103	100
Non-participants	26	30	12	14	18	21	30	35	86	100
ALL	83	44	29	15	39	21	38	20	189	100
p=.000										
Increased collaboration with research institutes										
EU participants	48	47	22	21	24	23	9	9	103	100
Non-participants	27	31	12	14	17	20	30	35	86	100
ALL	75	40	34	18	41	22	39	21	189	100
p=.000										
Increased collaboration with private enterprises										
EU participants	23	22	30	29	41	40	9	9	103	100
Non-participants	19	22	11	13	24	28	32	37	86	100
ALL	42	22	41	22	65	34	41	22	189	100
p=.000										
Increased collaboration with the end-users of the research										
EU participants	18	17	27	26	48	47	10	10	103	100
Non-participants	12	14	12	14	25	29	37	43	86	100
ALL	30	16	39	21	73	39	47	25	189	100
p=.000										
Strengthened international collaboration										
EU participants	69	67	21	20	6	6	7	7	103	100
Non-participants	30	35	15	17	13	15	28	33	86	100
ALL	99	52	36	19	19	10	35	19	189	100
p=.000										
Increased foreign researchers' visits to the unit										
EU participants	46	45	20	19	31	30	6	6	103	100
Non-participants	23	27	14	16	22	26	27	31	86	100
ALL	69	37	34	18	53	28	33	17	189	100
p=.000										
Promoted young researchers' careers										
EU participants	39	38	33	32	23	22	8	8	103	100
Non-participants	19	22	14	16	23	27	30	35	86	100
ALL	58	31	47	25	46	24	38	20	189	100
p=.000										
Provided new training opportunities for young researchers										
EU participants	36	35	22	21	33	32	12	12	103	100
Non-participants	17	20	18	21	22	26	29	34	86	100
ALL	53	28	40	21	55	29	41	22	189	100
p=.001										

Provided a new funding channel for research										
EU participants	51	50	29	28	13	13	10	10	103	100
Non-participants	24	28	18	21	17	20	27	31	86	100
ALL	75	40	47	25	30	16	37	20	189	100
p=.000										
Enabled the utilisation of research results in practice										
EU participants	19	18	32	31	39	38	13	13	103	100
Non-participants	10	12	18	21	23	27	35	41	86	100
ALL	29	15	50	26	62	33	48	25	189	100
p=.000										
Helped in keeping the equipment up-to-date										
EU participants	9	9	19	18	62	60	13	13	103	100
Non-participants	12	14	14	16	32	37	28	33	86	100
ALL	21	11	33	17	94	50	41	22	189	100
p=.000										
Provided research samples and materials										
EU participants	39	38	26	25	30	29	8	8	103	100
Non-participants	15	17	16	19	24	28	31	36	86	100
ALL	54	29	42	22	54	29	39	21	189	100
p=.000										
Provided possibilities to use research equipment										
EU participants	14	14	26	25	48	47	15	15	103	100
Non-participants	10	12	15	17	30	35	31	36	86	100
ALL	24	13	41	22	78	41	46	24	189	100
p=.000										
Brought about patents or licences										
EU participants	3	3	2	2	80	78	18	17	103	100
Non-participants	7	8	4	5	42	49	33	38	86	100
ALL	10	5	6	3	122	65	51	27	189	100
p=.000										
Enabled participation in commercialisation of research										
EU participants	6	6	14	14	66	64	17	17	103	100
Non-participants	5	6	7	8	42	49	32	37	86	100
ALL	11	6	21	11	108	57	49	26	189	100
p=.002										
Lead to new international projects										
EU participants	33	32	31	30	26	25	13	13	103	100
Non-participants	19	22	9	10	30	35	28	33	86	100
ALL	52	28	40	21	56	30	41	22	189	100
p=.000										
Lead to new national projects										
EU participants	16	16	28	27	45	44	14	14	103	100
Non-participants	17	20	15	17	27	31	27	31	86	100
ALL	33	17	43	23	72	38	41	22	189	100
p=.001										
Increased positive competition between the research groups of the unit										
EU participants	11	11	18	17	52	50	22	21	103	100
Non-participants	10	12	7	8	35	41	34	40	86	100
ALL	21	11	25	13	87	46	56	30	189	100
p=.009										
Has directed our research towards socially topical issues										
EU participants	17	17	26	25	46	45	14	14	103	100
Non-participants	9	10	15	17	30	35	32	37	86	100
ALL	26	14	41	22	76	40	46	24	189	100
p=.000										

22 Negative impacts of EU participation on the research conducted in your unit

	Agree		Neutral		Disagree		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
EU participation has decreased collaboration with non-EU countries										
EU participants	15	15	19	18	62	60	7	7	103	100
Non-participants	3	3	26	30	47	55	10	12	86	100
ALL	18	10	45	24	109	58	17	9	189	100
p=.011										
EU participation has focused attention away issues from national importance										
EU participants	6	5	20	18	70	63	16	14	112	100
Non-participants	6	7	28	33	43	50	9	10	86	100
ALL	12	6	48	24	113	57	25	13	198	100
p=.056										
Does not correspond to our unit's own objectives										
EU participants	11	11	24	23	61	59	7	7	103	100
Non-participants	12	14	34	40	31	36	9	10	86	100
ALL	23	12	58	31	92	49	16	8	189	100
p=.008										

23 Suitability of EU R&D Framework programmes for university

	Agree		Neutral		Disagree		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
EU programmes are well suited to my own field of study										
EU participants	58	56	25	24	13	13	7	7	103	100
Non-participants	28	33	20	23	23	27	15	17	86	100
ALL	86	46	45	24	36	19	22	12	189	100
p=.000										
The volume of EU funding is inadequate										
EU participants	36	35	29	28	25	24	13	13	103	100
Non-participants	21	24	23	27	17	20	25	29	86	100
ALL	57	30	52	28	42	22	38	20	189	100
p=.006										
Programmes based on concerted action are useful										
EU participants	35	34	27	26	13	13	28	27	103	100
Non-participants	25	29	19	22	12	14	30	35	86	100
ALL	60	32	46	24	25	13	58	31	189	100
p=.597										
Programmes based on concerted action are efficient										
EU participants	27	26	23	22	22	21	31	30	103	100
Non-participants	9	10	16	19	21	24	40	47	86	100
ALL	36	19	39	21	43	23	71	38	189	100
p=.009										
The emphasis on the EU programmes is too much on applied research										
EU participants	47	46	20	19	24	23	12	12	103	100
Non-participants	36	42	16	19	16	19	18	21	86	100
ALL	83	44	36	19	40	21	30	16	189	100
p=.112										
Basic research needs an EU programme of its own										
EU participants	63	61	10	10	17	17	13	13	103	100
Non-participants	46	53	11	13	7	8	22	26	86	100
ALL	109	58	21	11	24	13	35	19	189	100
p=.020										
EU programmes do not promote theory-oriented research										
EU participants	50	49	26	25	12	12	15	15	103	100
Non-participants	34	40	16	19	8	9	28	33	86	100
ALL	84	44	42	22	20	11	43	23	189	100
p=.006										
The duration of the EU projects is sufficient										
EU participants	40	39	21	20	33	32	9	9	103	100
Non-participants	25	29	27	31	9	10	25	29	86	100
ALL	65	34	48	25	42	22	34	18	189	100
p=.000										

It is difficult to find suitable collaboration partners										
EU participants	27	26	17	17	48	47	11	11	103	100
Non-participants	28	33	20	23	22	26	16	19	86	100
ALL	55	29	37	20	70	37	27	14	189	100
p=.006										
The fact that the EU projects have fixed goals restricts research										
EU participants	38	37	28	27	23	22	14	14	103	100
Non-participants	34	40	24	28	7	8	21	24	86	100
ALL	72	38	52	28	30	16	35	19	189	100
p=.005										

24 Opinions of the implementation of the EU framework programmes

	Agree		**Neutral**		**Disagree**		**Missing**		**Total**	
	N	%	N	%	N	%	N	%	N	%
Application process is slow										
EU participants	72	70	21	20	7	7	3	3	103	100
Non-participants	70	81	12	14	2	2	2	2	86	100
ALL	142	75	33	17	9	5	5	3	189	100
p=.142										
Application process is complex										
EU participants	91	88	7	7	2	2	3	3	103	100
Non-participants	73	85	8	9	3	3	2	2	86	100
ALL	164	87	15	8	5	3	5	3	189	100
p=.651										
Evaluation procedure is competent										
EU participants	35	34	33	32	31	30	4	4	103	100
Non-participants	24	28	41	48	18	21	3	3	86	100
ALL	59	31	74	39	49	26	7	4	189	100
p=.082										
Selection is based on other criteria than quality of research										
EU participants	40	39	40	39	20	19	3	3	103	100
Non-participants	34	40	35	41	15	17	2	2	86	100
ALL	74	39	75	40	35	19	5	3	189	100
p=.931										

25 EU participation as a criterion of national research funding allocation

	Agree		**Neutral**		**Disagree**		**Missing**		**Total**	
	N	%	N	%	N	%	N	%	N	%
EU participation is generally valued										
EU participants	72	70	19	18	7	7	5	5	103	100
Non-participants	65	76	14	16	5	6	2	2	86	100
ALL	137	72	33	17	12	6	7	4	189	100
p=.830										
EU participation facilitates funding from national sources										
EU participants	58	56	25	24	15	15	5	5	103	100
Non-participants	57	66	23	27	3	3	3	3	86	100
ALL	115	61	48	25	18	10	8	4	189	100
p=.032										
EU participation is considered positive by the university management										
EU participants	84	82	13	13	1	1	5	5	103	100
Non-participants	69	80	12	14	2	2	3	3	86	100
ALL	153	81	25	13	3	2	8	4	189	100
p=.739										
EU projects are valued more than other international projects										
EU participants	39	38	30	29	20	19	14	14	103	100
Non-participants	33	38	37	43	13	15	3	3	86	100
ALL	72	38	67	35	33	17	17	9	189	100
p=.633										

EU participation has a positive effect on receiving university funding										
EU participants	32	31	32	31	28	27	11	11	103	100
Non-participants	33	38	45	52	5	6	3	3	86	100
ALL	65	34	77	41	33	17	14	7	189	100
p=.633										
EU participation should not have any effect on how national research funding is appropriated										
EU participants	51	50	28	27	18	17	6	6	103	100
Non-participants	51	59	26	30	7	8	2	2	86	100
ALL	102	54	54	29	25	13	8	4	189	100
p=.135										

26 Opinions of the national information services related to EU framework programmes

	Agree		**Neutral**		**Disagree**		**Missing**		**Total**	
	N	%	N	%	N	%	N	%	N	%
Information on the EU programmes is well distributed by our university										
EU participants	56	54	19	18	23	22	5	5	103	100
Non-participants	31	36	33	38	20	23	2	2	86	100
ALL	87	46	52	28	43	23	7	4	189	100
p=.006										
The support I have received from the university to prepare the proposals has been sufficient										
EU participants	49	48	20	19	24	23	10	10	103	100
Non-participants	17	20	36	42	17	20	16	19	86	100
ALL	66	35	56	30	41	22	26	14	189	100
p=.000										
Preparation of EU proposals should be funded by national sources										
EU participants	68	66	15	15	12	12	8	8	103	100
Non-participants	40	47	32	37	8	9	6	7	86	100
ALL	108	57	47	25	20	11	14	7	189	100
p=.001										

28 The number of private enterprises involved in EU projects

	EU-participants	
	N	%
Finnish enterprises	32	31
Foreign enterprises	38	37
There are no enterprises involved in the EU projects	40	39
		(n=103)

29 The opinions of the Finnish EU participants on the collaboration with private enterprises in EU projects

	Agree		**Neutral**		**Disagree**		**Total**	
	N	%	N	%	N	%	N	%
EU collaboration has increased interest in collaboration with private enterprises	15	31	15	31	19	39	49	100
Has increased knowledge on matters related to commercialisation of research	13	27	12	24	24	49	49	100
In Europe, it is easier to find private enterprises able to utilise my research	15	31	15	31	19	39	49	100
European private enterprises have more know-how than the Finnish ones	10	20	17	35	22	45	49	100

30 Opinions of the non-participants on the reasons for non-participation in EU programmes

	Agree		Neutral		Disagree		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
Participation has not been topical for me	42	49	14	16	13	15	17	20	86	100
EU projects demand a lot of work and time	49	57	15	17	6	7	16	19	86	100
Teaching duties	24	28	9	10	36	42	17	20	86	100
Unsuitability of EU programmes	31	36	18	21	21	24	16	19	86	100
Low interest	2	2	8	9	60	70	16	19	86	100
Funding is too small considering the work load	21	24	31	36	17	20	17	20	86	100

31 Collaboration with end-users of research (those who had a lot or somewhat collaboration)

	EU participants		Non-participants		Total	
	N	%	N	%	N	%
Finnish enterprises	48	47	32	37	80	42
Foreign enterprises	8	8	11	13	19	10
Local authority (e.g. town, municipality, federation of munipalities)	20	19	10	12	30	16
Sectoral authority (e.g. ministries, regional environment centres)	37	36	16	19	53	28
Non-profit organisation (e.g. association)	14	14	8	9	22	12
		(n=103)		(n=86)		(n=189)

32 Funding source of collaboration with private enterprises

	EU participants		Non-participants		Total	
	N	%	N	%	N	%
Tekes	47	57	27	47	74	53
Private enterprises	43	52	29	50	72	51
The university unit itself	18	22	23	40	41	29
EU	37	45	0	0	37	26
Non-profit organisation	14	17	18	31	32	23
		(n=82)		(n=58)		(n=140)

33 Funding source of collaboration with non-profit organisations

	EU participants		Non-participants		Total	
	N	%	N	%	N	%
The university unit itself	26	35	19	38	45	36
Non-profit organisation	23	31	15	30	38	31
EU	20	27	0	0	20	16
Tekes	14	19	5	10	19	15
Private enterprises	10	14	4	8	14	11
		(n=74)		(n=50)		(n=124)

34 Motives for collaboration with private enterprises

	EU participants		Non-participants		Total	
	N	%	N	%	N	%
Funding	53	65	33	57	86	61
Opportunity to apply one's own theoretical knowledge to solving practical problems	40	49	27	47	67	48
Opportunity to obtain research material	27	33	18	31	45	32
Opportunity to take part in commercialising the results	23	28	15	26	38	27
Opportunity to learn about developments in the field of study	21	26	14	24	35	25
Partners were involved in the same project, there was no particular reason	16	20	11	19	27	19
Opportunity to use advanced research equipment	7	9	6	10	13	9
		(n=82)		(n=58)		(n=140)

34 Motivations for collaboration with non-profit organisations

	EU participants		Non-participants		Total	
	N	%	N	%	N	%
Funding	29	39	17	34	46	37
Possibility to apply one's own theoretical knowledge to solving practical problems	26	35	14	28	40	32
Possibility to obtain research material	22	30	17	34	39	31
Possibility to take part in commercialising the results	12	16	8	16	20	16
Possibility to learn about developments in the field of study	7	9	6	12	13	10
Partners were involved in the same project, there was no particular reason	3	4	2	4	5	4
Possibility to use advanced research equipment	2	3	1	2		0
		(n=74)		(n=50)		(n=124)

35 Satisfaction with collaboration with private enterprises

	Satisfied with almost all projects		Satisfied with some of the projects		Dissatisfied with all projects		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
EU participants	57	70	16	20	0	0	9	11	82	100
Non-participants	48	83	5	9	0	0	5	9	58	100
Total	105	75	21	15	0	0	14	10	140	100

36 Satisfaction with collaboration with non-profit organisations

	Satisfied with almost all projects		Satisfied with some of the projects		Dissatisfied with all projects		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
EU participants	42	57	6	8	2	3	24	32	74	100
Non-participants	20	40	7	14	1	2	22	44	50	100
Total	62	50	13	10	3	2	46	37	124	100

37 Utility of collaboration with private enterprises

	Very or somewhat useful		Neutral		Not at all useful		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
Provided new viewpoints on the subject matter and research material										
EU participants	43	52	16	20	12	15	11	13	82	100
Non-participants	31	53	15	26	5	9	7	12	58	100
Total	74	53	31	22	17	12	18	13	140	100

Broadened views on the needs of industry										
EU participants	51	62	14	17	7	9	10	12	82	100
Non-participants	35	60	10	17	6	10	7	12	58	100
Total	86	61	24	17	13	9	17	12	140	100
Brought about new contacts										
EU participants	42	51	20	24	9	11	11	13	82	100
Non-participants	33	57	16	28	2	3	7	12	58	100
Total	75	54	36	26	11	8	18	13	140	100
Brought about funding for research and for employing researchers										
EU participants	47	57	14	17	11	13	10	12	82	100
Non-participants	31	53	10	17	10	17	7	12	58	100
Total	78	56	24	17	21	15	17	12	140	100
Helped in understanding the possibilities to utilise own research										
EU participants	41	50	17	21	13	16	11	13	82	100
Non-participants	34	59	13	22	4	7	7	12	58	100
Total	75	54	30	21	17	12	18	13	140	100
Provided access to research data										
EU participants	26	32	15	18	27	33	14	17	82	100
Non-participants	20	34	11	19	20	34	7	12	58	100
Total	46	33	26	19	47	34	21	15	140	100
Provided access to advanced research equipment										
EU participants	6	7	7	9	54	66	15	18	82	100
Non-participants	5	9	11	19	34	59	8	14	58	100
Total	11	8	18	13	88	63	23	16	140	100
Helped combine practical know-how and theoretical knowledge										
EU participants	34	41	22	27	13	16	13	16	82	100
Non-participants	23	40	18	31	9	16	8	14	58	100
Total	57	41	40	29	22	16	21	15	140	100

38 Utility of collaboration with non-profit organisations

	Very or somewhat useful		Neutral		Not at all useful		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
Provided new viewpoints on the subject matter and research material										
EU participants	29	39	15	20	27	36	3	4	74	100
Non-participants	17	34	9	18	6	12	18	36	50	100
Total	46	37	24	19	33	27	21	17	124	100
Broadened views on the needs of industry										
EU participants	26	35	20	27	9	12	19	26	74	100
Non-participants	16	32	10	20	6	12	18	36	50	100
Total	42	34	30	24	15	12	37	30	124	100
Brought about new contacts										
EU participants	30	41	16	22	7	9	21	28	74	100
Non-participants	19	38	10	20	4	8	17	34	50	100
Total	49	40	26	21	11	9	38	31	124	100
Brought about funding for research and for employing researchers										
EU participants	25	34	14	19	17	23	18	24	74	100
Non-participants	12	24	10	20	12	24	16	32	50	100
Total	37	30	24	19	29	23	34	27	124	100
Helped in understanding the possibilities to utilise own research										
EU participants	31	42	12	16	12	16	19	26	74	100
Non-participants	20	40	6	12	6	12	18	36	50	100
Total	51	41	18	15	18	15	37	30	124	100
Provided access to research data										
EU participants	23	31	8	11	21	28	22	30	74	100
Non-participants	16	32	6	12	9	18	19	38	50	100
Total	39	31	14	11	30	24	41	33	124	100
Helped combine practical know-how and theorical knowledge										
EU participants	21	28	19	26	14	19	20	27	74	100
Non-participants	15	30	9	18	7	14	19	38	50	100
Total	36	29	28	23	21	17	39	31	124	100

39 Disadvantages and problems in collaboration with private enterprises

	EU participants		Non-participants		Total	
	N	%	N	%	N	%
Collaboration is time-consuming	17	21	12	21	29	21
A partner tried to direct the research according to its own interests	20	24	10	17	30	21
A partner tried to obtain the possession of the research results	17	21	8	14	25	18
Publishing of the results was postponed	14	17	8	14	22	16
There was confusion concerning the ownership of the results	14	17	8	14	22	16
The customer has been dissatisfied with the outcome	6	7	1	2	7	5
		(n=82)		(n=58)		(n=140)

40 Disadvantages and problems in collaboration with non-profit organisations

	EU participants		Non-participants		Total	
	N	%	N	%	N	%
Collaboration is time-consuming	19	26	16	32	35	28
A partner tried to direct the research according to its own interests	6	8	5	10	11	9
A partner tried to obtain the possession of the research results	5	7	1	2	6	5
The customer has been dissatisfied with the outcome	1	1	1	2	2	2
There was confusion concerning the ownership of the results	2	3	2	4	4	3
Publishing of the results was postponed	2	3	1	2	3	2
		(n=74)		(n=50)		(n=124)

41 Increase in the collaboration with private enterprises

	EU participants		Non-participants		Total	
	N	%	N	%	N	%
Increased considerably	10	10	12	14	22	12
Increased somewhat	40	39	20	23	60	32
Remained unchanged	17	17	14	16	31	16
Decreased	5	5	7	8	12	6
Missing	31	30	33	38	64	34
	103	100	86	100	189	100

42 Increase in the collaboration with non-profit organisations

	EU participants		Non-participants		Total	
	N	%	N	%	N	%
Increased considerably	6	6	3	3	9	5
Increased somewhat	19	18	11	13	30	16
Remained unchanged	21	20	15	17	36	19
Decreased	10	10	4	5	14	7
Missing	47	46	53	62	100	53
	103	100	86	100	189	100

43 Reasons for the increase in collaboration with private enterprises

	Agree		Neutral		Disagree		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
Funding provided by Tekes has increased collaboration with private enterprises										
EU participants	37	36	10	10	7	7	49	48	103	100
Non-participants	20	23	2	2	10	12	54	63	86	100
ALL	57	30	12	6	17	9	103	54	189	100
p=.098										
EU collaboration has increased collaboration with private enterprises										
EU participants	21	20	16	16	16	16	50	49	103	100
Non-participants	2	2	5	6	21	24	58	67	86	100
ALL	23	12	21	11	37	20	108	57	189	100
p=.000										
The number of research commissions from private enterprises has increased										
EU participants	21	20	15	15	15	15	52	50	103	100
Non-participants	12	14	12	14	7	8	55	64	86	100
ALL	33	17	27	14	22	12	107	57	189	100
p=.687										

Researchers have become more interested in commercialising their results

EU participants	15	15	21	20	16	16	51	50	103	100
Non-participants	8	9	10	12	12	14	56	65	86	100
ALL	23	12	31	16	28	15	107	57	189	100

p=.685

Environmental issues have increased private enterprises' interest in university research

EU participants	18	17	5	5	26	25	54	52	103	100
Non-participants	6	7	10	12	16	19	54	63	86	100
ALL	24	13	15	8	42	22	108	57	189	100

p=.034

44 Interest in participation in commercialising the research results

	EU participants		Non-participants		Total	
	N	%	N	%	N	%
Yes, I participate	21	20	16	19	37	20
No, I do not participate	60	58	45	52	105	56
I am going to participate	20	19	19	22	39	21
Missing	2	2	6	7	8	4
	103	100	86	100	189	100

45 Opinions on the commercialisation of research results in own field of study

	Agree		Neutral		Disagree		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
Participation in commercialising research results causes problems in one's teaching work										
EU participants	23	22	16	16	49	48	15	15	103	100
Non-participants	24	28	15	17	39	45	8	9	86	100
ALL	47	25	31	16	88	47	23	12	189	100
p=.612										
The prejudices of the university researchers towards the commercialisation of research results have decreased										
EU participants	46	45	30	29	21	20	6	6	103	100
Non-participants	42	49	19	22	13	15	12	14	86	100
ALL	88	47	49	26	34	18	18	10	189	100
p=.073										
The fact that university researchers participate in commercialisation decreases the reliability of university research										
EU participants	29	28	21	20	46	45	7	7	103	100
Non-participants	23	27	21	24	38	44	4	5	86	100
ALL	52	28	42	22	84	44	11	6	189	100
p=.756										
Researchers' participation in the commercialisation of research is considered positive by the university management										
EU participants	58	56	25	24	7	7	13	13	103	100
Non-participants	44	51	18	21	8	9	16	19	86	100
ALL	102	54	43	23	15	8	29	15	189	100
p=.585										
Researchers lack the special skills needed in commercialisation										
EU participants	66	64	18	17	13	13	6	6	103	100
Non-participants	50	58	15	17	15	17	6	7	86	100
ALL	116	61	33	17	28	15	12	6	189	100
p=.784										
University should give more support to researchers participating in the commercialisation										
EU participants	33	32	39	38	20	19	11	11	103	100
Non-participants	44	51	20	23	11	13	11	13	86	100
ALL	77	41	59	31	31	16	22	12	189	100
p=.025										
University should create explicit rules regarding the commercialisation of results										
EU participants	61	59	19	18	4	4	19	18	103	100
Non-participants	59	69	17	20	2	2	8	9	86	100
ALL	120	63	36	19	6	3	27	14	189	100
p=.262										

46 Support for the commercialisation of research

	Agree		Neutral		Disagree		Missing		Total	
	N	%	N	%	N	%	N	%	N	%
There is a unit providing assistance in issues related to commercialisation at our university										
EU participants	49	48	9	9	19	18	26	25	103	100
Non-participants	44	51	4	5	12	14	26	30	86	100
ALL	93	49	13	7	31	16	52	28	189	100
p=.449										
The services related to commercialisation provided by our university are sufficient										
EU participants	31	30	15	15	19	18	38	37	103	100
Non-participants	17	20	15	17	14	16	40	47	86	100
ALL	48	25	30	16	33	17	78	41	189	100
p=.341										
The services provided by our university are competent										
EU participants	27	26	12	12	27	26	37	36	103	100
Non-participants	18	21	18	21	20	23	30	35	86	100
ALL	45	24	30	16	47	25	67	35	189	100
p=.348										
The services related to commercialisation should be located in a certain few universities										
EU participants	6	6	8	8	60	58	29	28	103	100
Non-participants	7	8	10	12	39	45	30	35	86	100
ALL	13	7	18	10	99	52	59	31	189	100
p=.361										

Table 47. Characteristics of EU research

	High research quality			Applied research oriented			Collaboration intensive			Costly			Long-term		
	N	Cum %	Tot	N	Cum%	Tot	N	Cum%	Tot	N	Cum%	Tot	N	Cum%	Tot
Respondent's EU experience															
EU participants	64	66	97	67	67	98	74	76	97	59	60	98	38	38	99
Non-participants	48	59	81	43	53	81	60	73	82	50	55	91	33	40	82
p	*.355*			*.080*			*.886*			*.045*			*.045*		
Unit's EU experience															
EU active units	53	60	88	54	61	88	61	70	87	51	59	86	31	35	88
Less EU active units	59	66	90	56	60	91	73	79	92	58	62	93	40	43	93
p	*.462*			*.882*			*.200*			*.514*			*.138*		
Discipline group															
Technology, mathematics, physics	37	55	67	40	60	67	44	67	66	45	67	67	31	46	67
Life sciences	58	75	77	50	63	79	61	78	78	42	54	78	29	37	79
Humanities and social sciences	17	50	34	20	59	33	29	83	35	22	65	34	11	31	35
p	*.010*			*.871*			*.113*			*.480*			*.410*		
Organisation type															
Department	95	65	147	89	59	150	113	76	148	90	60	150	60	40	150
Research unit	17	55	31	21	68	31	21	68	31	19	66	29	11	36	31
p	*.305*			*.473*			*.565*			*.773*			*.646*		
Importance of industrial funding															
High importance	50	76	66	45	56	80	63	80	79	51	64	80	34	43	80
Low importance	46	52	88	50	66	76	54	72	75	43	57	75	28	37	76
p	*.003*			*.456*			*.527*			*.281*			*.745*		

Table 48. Characteristics of EU research. The share of respondents who fully agreed with the statement.

	Evaluators		Others	
	N	%	N	%
High quality	11	38	52	37
Internationally high-standard	11	38	61	44
		n=29		n=140

Table 49. Benefits of EU collaboration. (The share of respondents who fully or partly agreed that EU participation has influenced the unit's activities)

	International collaboration			Strengthening the knowledge-base			Redirection of research			Collaboration with end-users			Commercial exploitation of research		
	N	Cum%	Tot	N	Cum%	Tot	N	Cum%	Tot	N	Cum%	Tot	N	Cum%	Tot
Respondent's EU experience															
EU participants	57	79	72	53	59	90	68	76	90	42	48	87	4	5	84
Non-participants	29	60	48	24	52	46	29	58	50	22	42	52	9	17	52
p	*.026*			*.455*			*.031*			*.495*			*.016*		
Unit's EU experience															
EU active units	46	79	58	44	67	66	53	76	70	37	54	69	9	13	68
Less active units	40	65	62	33	47	70	44	63	70	27	39	70	4	6	68
p	*.072*			*.022*			*.099*			*.075*			*.145*		
Discipline group															
Technology, mathematics, physics	31	69	45	26	52	50	36	68	53	30	58	52	3	6	52
Life sciences and medicine	46	82	56	40	64	63	50	79	63	29	44	66	10	16	61
Humanities and social sciences	9	47	19	11	48	23	11	46	24	5	24	21	0	0	23
p	*.013*			*.306*			*.010*			*.028*			*.037*		
Organisation type															
Department	74	72	103	67	59	114	82	70	117	58	49	118	11	9	118
Research unit	12	71	17	10	46	22	15	65	23	6	29	21	2	11	18
p	*.915*			*.249*			*.644*			*.081*			*.810*		
Importance of industrial funding															
High importance	36	82	44	33	65	51	41	82	50	31	61	51	6	12	51
Low importance	38	62	61	32	47	68	40	56	71	20	29	69	5	7	70
p	*.030*			*.056*			*.003*			*.000*			*.383*		

Table 50. EU participation and its impact on national research allocation

	Influence			Justification		
	N	Cum%	Tot	N	Cum%	Tot
Respondent's EU experience						
EU participants	77	84	92	79	81	97
Non-participants	79	95	83	77	92	84
p	*.015*			*.047*		
Unit's EU experience						
EU active units	78	89	88	77	86	90
Less active units	78	90	87	79	87	91
p	*.829*			*.806*		
Discipline group						
Technology, mathematics, physics	59	91	65	58	87	67
Life sciences	71	89	80	69	84	82
Humanities and social sciences	26	89	30	29	91	32
p	*.827*			*.662*		
Organisation type						
Department	21	75	28	126	84	150
Research unit	125	92	147	30	97	31
p	*.009*			*.061*		
Importance of industrial funding						
High importance	57	89	64	58	87	67
Low importance	79	91	87	78	87	90
p	*.724*			*.986*		

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Finnish universities and the EU Framework Programme –
Towards a New Phase

Abstract

This report presents the results of a study on the impacts of EU framework programmes for Finnish universities as viewed by heads of units and other academics within 36 university departments and research units. The study is based on surveys and interviews conducted 1999–2001 and was carried out by the VTT Group for Technology Studies.

Participation by Finnish universities in EU framework programmes has contributed to increased international research collaboration and to the increased international visibility of Finnish research. In addition, collaboration with companies has increased awareness among academics of the commercial exploitation of research results.

The views of Finnish academics concerning the academic quality of EU projects vary from positive to critical. Half of Finnish EU participants considered EU projects to be of an internationally high-standard, while a third thought them to be of low quality. Perceptions among EU participants and non-participants are rather similar, even though participants have somewhat more positive views concerning the research quality and appropriateness of EU projects than non-participants do.

Regarding the use of EU participation as a criterion for allocating national research funding, the results indicate that it facilitates raising national funds, but only to a limited extent. Most academics thought that EU participation should not receive too much weight as a criterion of national research funding.

The interest among Finnish academics in participating in EU framework programmes continues to be at a high level. Competition for research funding, pressure towards tighter collaboration with end-users of research and pressure to internationalise are notable incentives encouraging academics to join EU programmes. Excessive bureaucracy, inflexibility in the implementation of programmes, the application orientation of the projects and a shortage of basic resources in the units are the major disincentives to EU participation among Finnish academics.

Keywords
research, universities, cooperation, European Union, EU framework programmes, impact, survey

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Suomalaisten yliopistojen osallistuminen EU:n tutkimuksen puiteohjelmiin

Tiivistelmä

EU:n tutkimusohjelmien vaikutuksia kartoittanut tutkimus vahvistaa aiempien tutkimusten kuvaa EU:n puiteohjelmien vaikutuksista Suomen tieteen kansainvälistymiseen. EU-osallistuminen on auttanut yliopistoja luomaan uusia kansainvälisiä kontakteja ja lisännyt laitosten tunnettuvuutta – ei vain Euroopassa vaan maailmanlaajuisesti. Päinvastoin kuin on oletettu, EU-osallistuminen ei ole vienyt resursseja muulta kansainväliseltä yhteistyöltä, vaan se on pikemmin monipuolistanut ja vahvistanut yhteistyötä.

Yliopistotutkijoiden näkemykset EU-hankkeiden laadusta ja tieteellisestä tasosta vaihtelevat suuresti. Noin puolet vastaajista pitää hankkeita kansainvälisesti korkeatasoisina, kun taas noin kolmannes arvio ne huonotasoisiksi. EU-hankkeisiin osallistuneiden ja osallistumattomien vastaajien näkemykset poikkeavat yllättävän vähän toisistaan. Osallistuneiden arviot ovat kuitenkin myönteisempiä kuin osallistumattomien. Biotieteiden edustajat suhtautuivat EU-hankkeisiin myönteisimmin. He pitivät EU-hankkeita muita tieteenaloja useammin korkealaatuisina ja hyödyllisinä.

Tutkimus osoittaa, että aikaisempi kokemus kansainvälisestä yhteistyöstä ja laitoksen tunnettuus edistävät puiteohjelmiin osallistumista. Sen sijaan sillä, onko laitos suuntautunut perus- tai soveltavaan tutkimukseen, näyttäisi olevan odotettua vähäisempi merkitys laitoksen osallistumisaktiivisuuden kannalta.

Yliopistotutkijoiden kiinnostus osallistua EU:n puiteohjelmiin on edelleenkin suurta. Osallistumista motivoivat erityisesti kilpailu niukoista tutkimusvaroista, kansainvälistymisen tarve sekä vaatimukset lisätä yhteistyötä yritysten ja tutkimuksen hyödyntäjien kanssa. Osallistumisen esteitä puolestaan ovat hakuprosessin monimutkaisuus, hankkeiden suuri työmäärä, rahoituksen helpompi saanti muista rahoituslähteistä ja ohjelmien soveltumattomuus omalle alalle. Yliopistotutkijoiden vaatimukset ja odotukset EU-osallistumisesta ovat selvästi suuremmat nyt kuin osallistumisen alkuaikoina.

Raportti perustuu vuosina 1999–2000 kerättyyn kysely- ja haastatteluaineistoon. Kyselyyn vastasi kaikkiaan 189 yliopistotutkijaa (vastausprosentti 60) 36 yliopistolaitoksesta. Näistä 103 vastaajalla oli omakohtaista kokemusta EU-osallistumisesta, 86 vastaajalta osallistumiskokemus puuttui. Lisäksi haastateltiin 34 yliopistolaitoksen johtajaa ja 44 tutkijaa. Tutkimus toteutettiin VTT Teknologian tutkimuksen ryhmässä.

Avainsanat
research, universities, cooperation, European Union, EU framework programmes, impact, survey

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This report examines the views of Finnish academics on the intended and unintended consequences of EU framework programmes for Finnish universities. It also addresses university-company collaboration and participation by academics in the commercial exploitation of research results.

The participation by Finnish universities in EU framework programmes has contributed to increased international research collaboration and international visibility of Finnish research. It has not reduced other international research collaboration, rather it has intensified and diversified it. Most Finnish university researchers regard EU collaboration as useful and internationally high-standard, and they are willing to join in EU collaboration in the future. Nevertheless, critical views towards the application orientation and short-term nature of EU projects were also expressed by respondents in the study. With experience in EU participation, demands and expectations concerning academic quality have increased among Finnish academics.

The study is based on a survey and interviews among heads of units and other academics within universities and was carried out by the VTT Group for Technology studies.

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