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Europe's top research universities in FP6: scope and drivers of participation

Luisa Henriques, Antoine Schoen, Dimitrios Pontikakis

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European Commission
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Contact information
Address: Edificio Expo. c/ Inca Garcilaso, 3. E-41092 Seville (Spain)
E-mail: jrc-ipts-secretariat@ec.europa.eu
Tel.: +34 954488318
Fax: +34 954488300

IPTS website: http://ipts.jrc.ec.europa.eu
JRC website: http://www.jrc.ec.europa.eu
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Europe's top research universities in FP6. Scope and drivers of participation

Executive Summary

The present note characterises the participation of universities in the European Framework Programmes for Research and Technological Development (FP) with a substantive focus on the profile of participation of the top research universities on FP6.

Many argue that top research universities prefer not to participate to the FP. Purported 'cumbersome' administrative procedures, 'low content of basic research' and availability of other, 'more attractive' sources of funding have been put forward as possible explanations. Another stereotype is that the principle of symmetric representation of member states' interests, often leads to charitable participations to organisations from less well-off countries. The present policy note takes a step back and puts such commonly held beliefs to the test.

Collectively our findings lend support to the view that FP 6 has managed to involve excellent universities regardless of where they come from, maintaining overall neutrality despite political pressure for either "*cohesion*" or "*juste retour*".

Europe's top research universities account for the lion's share of higher education participations to the FP6 and act as leading coordinators and key partners. Top research universities participate more in thematic priorities that are close to the knowledge frontier. NoE was the main instrument used by top research universities, in accordance with policy expectations.

These findings need to be seen under the light of the study's limitations. First, the quantitative bibliometric criteria employed in the construction of our sample of top research universities may underestimate important research activities that do not usually register on standard bibliometric indicators. Second, the narrow definition of universities chosen may not be representative of the full range of academic research in Europe. Nevertheless, the fact that our sample compares favourably with well-known university rankings makes it likely that our results hold more broadly. We conclude identifying a number of areas worthy of further investigation.

Acknowledgements

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1. Introduction

The turn of the century saw the launch of two major European research policy initiatives: the construction of an internationally competitive knowledge-based society (outlined in the *Lisbon Strategy*[1]) and of a common space for European research, the *European Research Area* (*ERA*) (CEC, 2000). The twin political aims exerted a considerable influence on all European research actors, placing particular demands on universities and higher education organisations (hereafter collectively referred to as higher education institutions (HEI), both in terms of supplying the required human capital and of producing economically useful knowledge. At the time some questioned whether Europe's universities would be able to respond to the challenge[2].

In the years following the launch of the twin aims, the relative importance of HEI has been steadily increasing in most member states. Over the last decade, universities have increased their weight in national research systems. Higher education in the EU-27 accounted for 22 per cent of the total R&D expenditures in 2007, with more than one third of researchers working in the sector (up from 20,6 per cent and less than a third respectively in 2000)[3]. It comes as little surprise then that university-based R&D now commands greater policy attention.

Universities feature prominently on the research policy agendas of both national and European policy makers. Governments are fostering reorganisations and mergers of universities, and reforming their governance laws, to provide them with higher degree of strategic autonomy[4]. For its part, the European Commission has singled out universities as a priority policy area for action, considering them an essential pole of the knowledge triangle and part of the backbone of the European Research Area[5]. The Green Paper on the ERA (CEC, 2007) as well as the reports of expert groups advising the Commission have supported the choices taken and highlighted the need for world class European centres of excellence (ULLENIUS et al. 2008).

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[1] Lisbon European Council, March 2000

[2] The Europe of Knowledge 2020: A Vision for University-Based Research and Innovation, Conference Proceedings, EC- DG RTD, Liège, Belgium, 25-28 April 2004

[3] If ERA countries are considered (the EU-27 and the six associated countries), these shares in 2007 accounted for 27 and to 40 per cent of the total in 2007, while in 2000 represented 24,6 and 32 per cent of the total (figures drawn from DG-RTD's Regional Key Figures (RKF) database, 2008).

[4] Technopolis, Policy note 1 2008, ERAWATCH, "Key recent reforms concerning Universities" and "Key Recent Reforms in Public Research Centres". CHEPs study "The extent and impact of higher education governance reform across Europe', DG Education and Culture, 2006

[5] Examples that illustrate this priority are the recently issued communications inviting member states to modernise and give strategic autonomy to their universities, suggesting at the same time the implementation of a new model of universities to replace the Humboldtian one. The informal meeting at Hampton Court in October 2005 was also indicative of the importance attributed to universities in the policy agenda. As well as the three EC communications on the universities with the aim to launch the debate and to define strategies and EU agenda for the universities: "The role of universities in the Europe of Knowledge" Com (2003) 58 Final, and the second one delineating the strategy - Mobilising the brainpower of Europe: enabling universities to make their full contribution to the Lisbon Strategy COM (2005) 152 and “Delivering on the modernisation agenda for universities: education, research and innovation, COM (2006) 208 final, 10.05.2006

The European Framework Programme for Research and Technology Development (FP), as the main instrument of European research policy, has been called to address the above challenges. The FP has been conceived as an instrument for transnational collaborative research and technology development aimed at improving the international competitiveness of European industry while at the same time strengthening (or at least not obstructing) EU cohesion[6]. A key feature of FP-funded research is that it is supposed to be *pre-competitive*[7]. In such a setting universities are expected to play a key role as providers of basic science capabilities and source of scientific novelty with companies often positioned as partners in knowledge creation or as interlocutors of industrial demand and exploiters of the knowledge produced and public research organisations complementing both roles (GIBBONS et al.,1994; ETZKOWITZ, 2003). Therefore, internationally competitive industrial applications are difficult to conceive in the absence of a leading, frontier-shifting scientific base and strong public-private partnerships[8]. However, and despite its relevance to the success of the FP objectives, very little is known about the role of top research universities in the FP.

The present policy note attempts to gauge the role and place of top research universities in FP-funded research in the backdrop of contemporary policy developments. Key questions of concern to current policy are:

- To what extent do Europe's top research universities participate in the European Framework Programmes?
- What is the nature of their participation? Are they more likely to be project co-ordinators than non-top universities? How does their participation vary across instruments, priorities and across countries?
- Is their participation driven by fair competition or by national policy concerns with "*juste retour*[9]" and/or "*cohesion*"?

It is assumed by many that top European research universities have a low interest in participating to the FP. The argument is built on their preferential access to national sources of funding, which have lighter procedures without imposing cross-country collaboration requirements. Several additional reasons have been put forward to justify their perceived lack of interest in participating in the FP: namely the strong applied and detailed nature of FP projects that is considered more suited to technical and engineering schools and their heavy burden in managerial and administrative terms, which would favour the participation of companies and research institutes more familiar with this type of project development. Concerns over these issues were not only voiced in evaluation reports (MARIMON, 2004, ORMALA, 2005, AHO et al., 2008,); but also included in a

[6] Cf. Relevant articles in Single European Act 1986; Maastricht Treaty on the European Union 1992; see also GUZZETTI (1995), SHARP & PEREIRA (2001) .

[7] i.e. research the results of which have potential economic applications but are not directly marketable. The pre-competitive character of FP research has been meant to avoid (or at least minimise the potential for) market distortions associated with direct industrial subsidies.

[8] This is an argument made by both BONACCORSI et al. (2009) and ORMALA (2005).

[9] "According to RIETSCHEL et al. (2009: 18): " *'Juste retour' is the idea that the share of the financial returns a Member State obtains from the Community budget (in the form of grants) should be the same as its share of the overall contribution*. [...] *is central to some types of non-EU research and technology cooperation such as the European Space Agency*".

recent communication of the European Commission as part of the six recommendations on the management of European investment in research (CEC, 2008).

Many knowledge gaps hinder a good understanding of the participation of the higher education sector in the FP. Relevant work has mainly centred on the evaluation and impact of specific sub-programmes, taking as unit of analysis the networks formed by each of them (BACH et al. 1995, LARÉDO (1998), BRESCHI & CUSMANO (2004), MALERBA (2006) and BARBER et al. 2009). A notable exception is the work done by GEUNA (1998) on the determinants of university participation in the EU funded cooperative projects which is however set in a policy backdrop that is appreciably different from the present.

In this policy note, we focus on a sample of top research universities and show that these universities are heavily involved in the FP6, and are in the core of European networks. The analysis is centred on three main FP instruments with relevance to the development of the ERA: Integrated projects (IP), networks of excellence (NoE) and Specific Targeted Research Projects (STREP)[10]. These three instruments are the dominant instruments in this programme, representing 75 per cent of the total funding awarded.

The present policy note makes use of quantitative data from FP 6 and scientometric data drawn from Thomson Scientific. It focuses on a sample of 171 European universities (hereafter referred to as "top research universities") defined as those having published more than 5,000 publications[11] the period 2000 to 2006.

The policy note is divided as follows:

- The first part defines the data set and the methodology used for this note;
- The second part puts in perspective the top research European universities in relation to their national context and the ERA;
- The third part compares our sample of top research universities against well-known university rankings.
- The fourth part characterises the participation of the top research universities in FP6.
- The fifth part investigates the relationship between research excellence (proxied by the volume of scientific publications produced and citations received) and the FP participation profiles (number of participations,

[10] According to description provided by the European Commission the three instruments are described as follows: Integrated Projects (IP) are a new instrument in FP6 devoted to basic as well as applied objective-driven research with a “programme approach.” IP are expected to assemble the necessary critical mass of activities, expertise and resources to achieve ambitious objectives. In practice, organisations with skills in management, dissemination and knowledge transfer, as well as potential users and other stakeholders, are recommended, as well as a project size of 10-20 participants; Specific Targeted Research Projects (STREP) represent the former Shared-Cost Actions and comprise objective driven research of limited scope, focused on a single issue. Projects are to be smaller than IP (6-15 participants; mono-disciplinary). SMEs usually state a clear preference for this instrument; Networks of Excellence (NoE) are also a new instrument in FP6 and are designed to strengthen scientific and technological excellence on a focused research topic. NoE are therefore an instrument aimed at tackling fragmentation of existing research capacities and aim at gathering research centres, universities, research and technology organisations, and to a lesser extent enterprises. 6-12 participants are recommended.

[11] Publications considered were articles, reviews and letters published in peer-reviewed journals included in Thomson Scientific 'Web of Science'.

centrality in collaborative networks, amount of overall funding received and funding received per project) of the top research universities in our sample.

- A concluding sixth part is mainly devoted to drawing policy implications.

2. Data and Methodology

Data Sources

The data used in this policy note have three main sources. The first source is the JRC-IPTS database of HEI FP6 participations. The underlying data come from the Commission's internal administrative records of FP6 (provided by DG RTD), homogenised for the HEI names. The second source is a set of scientometric data produced by CWTS (Centre for Science and Technology Studies) for the European Commission in the framework of the ASSIST Project[12]. The third source of data is an indicator of centrality of university participation to FP6, developed by ARC Systems in the context of an ETEPS[13] project commissioned by JRC-IPTS. Finally, the study uses Eurostat data drawn from the DG RTD's Regional Key Figures (RKF) Database.

HEI participation in the FP6

The FP6 database contains information on the participation of organisations in the sub-programmes. Information is provided by project or action with the identification of the participants and the funding awarded, classified by type of organisation, country of origin, thematic priority and funding instrument. Table 1 compares by type of organisation (higher education, business, and other as a residual category) the number of times organisations participate in projects funded by FP 6 (number of participations) and the funding received by them. The table considers first the overall FP6, then focuses on the participation of organisations from ERA countries[14], and then is restricted to the three main instruments from FP6: Integrated projects (IP), Networks of excellence (NoE), the specific targeted research projects (STREP). Specifically IP instrument targets exploration of knowledge that requires concentration of resources (competences and financial) and flexibility in management; while the NoE envisages concentration of resources to structure excellent European thematic research. STREP funds collaborative research and technology development projects that address European competitiveness and societal needs.

[12] CWTS, Contract PP-CT-M2-2004-0001: "Analyses and Studies and Statistics and Indicators on Science and Technology"

[13] European Techno-Economic Policy Support Network (ETEPS) Contract 150083-2005-02-BE: "Network Analysis Study on Participations in Framework Programmes". ARC Systems use a database with homogenised HEI names whose underlying data was collected from CORDIS (BARBER et al., 2009).

[14] ERA countries are considered here as the EU-27 member states and the 6 associated countries which participate in almost equal terms in the FP 6 as the member states, with a seat in the main advisory board on research issues of the European Union Scientific and Technical Research Committee (CREST)

Table 1 - Overview of participation of institutional sectors in number of participations and funding awarded by FP6

	Higher Education Institutions	%	Research organisations	%	Business organisations	%	Other organisations	%	Total FP 6
The FP 6 (all instruments, priorities and countries),									
Total no. participations in projects	24.743	36	19.068	28	12.917	19	12.434	18	69.162
Total funding (10^6 Euros)	5.857	37	4.990	32	2.904	18	2.058	13	15.810
Only participations in projects from ERA countries									
Total no. participations in projects	23.304	36	17.516	27	12.677	20	11.453	18	64.950
Total funding (10^6 Euros)	4.269	37	3.532	30	2.595	22	1,265	0	11.661
Only participations in projects from ERA countries (STREPS, IP and NoE)									
Total no. participations in projects	14.784	37	10.857	27	8.995	22	5.499	14	40.135
Total funding (10^6 Euros)	4.258	37	3.497	30	2.591	22	1.229	11	11.576

Source: our own calculations from JRC-IPTS database of FP6 (date of extraction 07.05.08).

The table shows that universities and other HEI have taken a leading role in FP 6, with the highest percentage of funding received (37%) and also have the highest percentage of project participation (36%). It also shows that in higher education most of the participation in FP6 was done by HEI from ERA countries and mainly through the STREP, IP and NoE instruments.

Methodological Framework

The methodology adopted in the present policy note combines data on participation and funding in FP 6 with the results of two projects carried out for the European Commission (see section Data Sources) that have respectively developed a network-based analysis on the participation of universities in FP and produced a scientometric characterisation of top European research universities. A top research university is defined as a university that places an emphasis in the production of new knowledge, as indicated by the high number of articles published in referenced journals[15]. The top research universities in Europe were identified through a scientometric analysis taking the volume and visibility of scientific production over a nine year period (1997-2006) as the main criteria for selection.

[15] For details on the methodology used to assign articles to universities, including a discussion of measurement issues relating to capturing the research activity of specialised universities, see: http://www.cwts.nl/hm/bibl_rnk_wrld_univ_full.pdf.

A dedicated database has been created combining information related to the participation of higher education institutions in FP 6 with scientometrics and network analysis data. The development of the database required a homogenisation process to reduce variations in the name of universities that might vary from project to project because of language, abbreviations, misspelling, acronyms used, etc. Moreover sub-units of universities (departments or institutes with whom projects were contracted) have been assigned to the universities they are part of in order to be able to perform the analysis at the university level[16].

The analysis is centred on a subset of FP6 database comprising the participation of HEI from ERA countries in three instruments IP, NoE and STREP and on the seven thematic priorities[17]. Several reasons justify this double focus, country-wise and instrument-wise.

First, as shown in Table 1, the focus on ERA countries is justified by the share of HEI participation in FP6 from organisations belonging to ERA countries. For the three selected instruments this share is similar to the whole participation of higher education institutions in FP6 – around 37%.

Second, these three instruments were considered the most relevant to universities as research performers, because they target specifically the creation or coordination of knowledge or its application in technological development[18]. The remaining funding instruments[19] target either the researchers as recipients, as do Marie Curie fellowships, or have other aims such as promotion of infrastructures, coordination of research funding, or international cooperation.

Third, the selection of the particular instruments makes sense from a policy perspective. IP and NoE were introduced in FP6 with the aim to foster the development of the ERA by promoting the integration and structuring of the European R&D landscape. Examining the take up of these instruments by universities (and comparing it against the traditional FP instrument, whose continuation is now STREP) allows an understanding of the contribution of universities to the realisation of the ERA.

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[16] An approach also taken in the Aquameth project, a comprehensive study on 488 European universities (documented in BONACCORSI & DARAIO, 2007)

[17] The seven thematic priorities in FP 6 are: 1. Life sciences, genomics and biotechnology for health; 2. Information society technologies; 3. Nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices; 4. Aeronautics and space; 5. Food quality and safety; 6. Sustainable development, global change and ecosystems; 7. Citizens and governance in a knowledge-based society. The other priorities in FP 6 are: Policy support and anticipating scientific and technological needs; Horizontal research activities involving SMEs; Specific measures in support of international cooperation; Support for the coordination of activities; Support for the coherent development of research & innovation policies; Research and innovation; Human resources and mobility; Research infrastructures; Science and Society; EURATOM; Undefined.

[18] On a study by POLT et al. (2008), IP and NoE funding instruments were important for universities and mobilised FP participants because of their explorative nature.

[19] FP 6 comprised the following instruments: Integrated projects (IP), Networks of Excellence (NoE), Specific Target Research Projects (STREP), Coordination Actions (CA), Specific Support Actions (SSA), Marie Curie Actions (MCA), Co-operative research projects (CRAFT), Collective research projects (CLR), and Specific Actions to promote research infrastructures.

Identification of top research universities

The top research universities in Europe were selected from a list compiled by CWTS in the ASSIST project, applying the following criteria: have published above the threshold of 5000 articles with an average impact in the fields above 0.50. The resulting list has a total of 171 universities from 21 countries, 17 of them are member states and 4 are from associated countries (see table in Annex).

The level of scientific production was measured by the number of articles published in journals referenced in the Web of Knowledge[20]. The visibility of publications at world level was measured applying the CPP/FCSm indicator, the so-called "crown" indicator of the CWTS ranking[21] to position a research organisation at world level in terms of its average impact in the field in which it is engaged.

There are two main limitations with this selection. First universities have been defined in a narrow sense. As a consequence a few large HEI have been excluded due to their non university label: e.g. Politecnico di Milano or French “Grandes Écoles”. Therefore, the total sample of HEI that have produced more than 5000 papers within the 1997-2006 period should be slightly larger. The second limitation is related to the non-consideration of specialised universities which are in general smaller or active in scientific domains that have a lower publication pace, as is the case of social sciences and humanities, mathematics or engineering sciences e.g. London School of Economics.

Comparison with other university rankings

The sample of 171 top research universities according to their volume of scientific production overlaps largely with the institutions that have been ranked as 'top' in other well-known rankings of universities excellence:

- More than 40% of these top 171 research universities are among the top 200 world universities according to the 2008 Times Higher Education (THE) ranking.
- 112 of these top 171 research universities are among the top 123 European Universities according to the 2007 Academic Ranking of World Universities (ARWU) ranking (also known as the 'Shanghai' ranking).

The high presence of the top 171 research universities in these well-known rankings provides some reassurance that, despite the rigid scientometric criteria used, our sample is a good representation of excellent European universities.

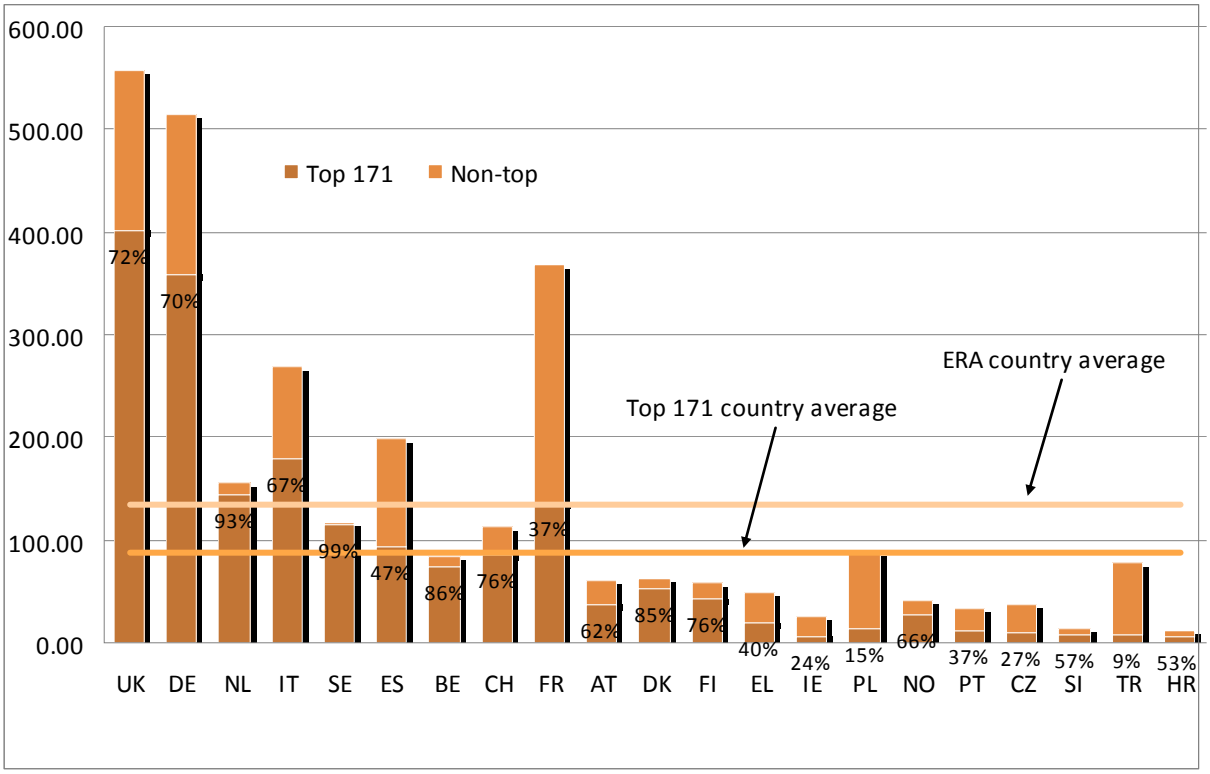
[20] It is known from the scientometrics studies that the number of publications and type of publications vary by scientific domain. However in this study, scientific production of disciplines was not taken into consideration. This line of research is worthwhile to pursuit in the future.

[21] CPP/FCSm represents the standardised impact of the publications of a given organisation corrected for field distortion.

Top research universities in their national settings and in the ERA

The top 171 European universities account for a large share of ERA total scientific output (60%). This holds true for most countries. The universities included in the Top 171 from smaller research systems represent more than 60 per cent of publications from their country. The same pattern applies for large and developed research systems such as those of the United Kingdom, Germany and Italy. However the situation is different in Spain and particularly in France where the national universities belonging to the top 171 account for a share of around 40% of total national scientific production. With regards to developing research systems, the top 171 do not account for a major share in general (in some cases accounting for less than 50 per cent) with the exception of Slovenia and Croatia.

Figure 1 - Number of publications (in thousands) and top universities' national share of publications



3. Europe's top research universities in FP 6

Top research universities receive a large share of funding awarded to HEI

The top 171 universities represent the kernel of higher education participation in the FP, measured either in terms of the number of participations or the total amount of funding awarded[22]. Top research universities from ERA countries represent 62 per cent of the

[22] In the interest of brevity, the following discussion only refers to funding awarded as no significant differences in participation patterns exist using either measure (see the last two columns in Table 3).

funds awarded in the three instruments selected (IP, NoE, STREP) to the HEI sector as whole (table 2). Even when all types of organisations are considered for the same three instruments, the top 171 universities still account for a substantial part of FP 6. They account for more than 20 per cent of the total number of participations and funding. In short, table 2 reveals a high level of participation of HEI in FP 6, which holds even more true for the most active and visible in terms of research.

Table 2 -Top 171 top research universities' participation in FP6 (3 instruments, ERA Countries)

	Top 171	Total HEI	Total FP6	Top 171 as a % of HEI	Top 171 as a % FP6
Number of participations	8.496	14.784	40.135	57	21
Funding received (10^6 €)	2.647	4.258	11.576	62	23
Funding per participation (€)	311.558	288.014	288.427	/	/

The high participation of top universities in the FP might simply be a reflection of the willingness of other participants to have them as project partners. If this is so, then top research universities may participate as regular members of the consortium but not take the lead role as coordinators. This hypothesis is explored in the next section.

Top research universities are likely project coordinators

The FP was designed to promote collaborative research involving consortia of organisations. Each consortium is led by one of the partners – the so-called coordinator. The coordinator assumes the lead role in drafting the project proposal, negotiating with the Commission and administering the project's delivery.

Contrary to the earlier hypothesis, our calculations indicate that the top 171 universities have taken a leading role by coordinating 23% of all FP6 projects. They played a dominant part in the HEI sector, being in charge of almost two thirds (62%) of the coordination within this sector.

The coordination of FP6 projects by HEI varies widely by thematic priority and also by type of instrument. Table 3 presents an exploratory analysis of the degree of coordination of projects by topics. There is a pattern of HEI participation as coordinator according to objectives of the selected instruments combined with the phase of development of a scientific field. Life sciences and citizens and governance are the thematic priorities that have the highest percentage of coordination by HEI organisations, specifically from the top 171 universities in the three instruments considered. On the contrary, IP or NoE in the information society, nanotechnologies, aeronautics and sustainable development are almost never coordinated by the HEI. But, whenever this is the case, coordination is taken up by one of the top 171 universities.

Universities, in general, are not involved in the coordination of NoE or IP in aeronautics, nano-sciences and technologies, and sustainable development domains. In the case of STREP, independent of the theme, HEI-coordinated projects are often taken by top research universities.

Table 3 - Degree of participation as coordinator in three instruments in FP 6 by thematic priority (HEI and top universities)

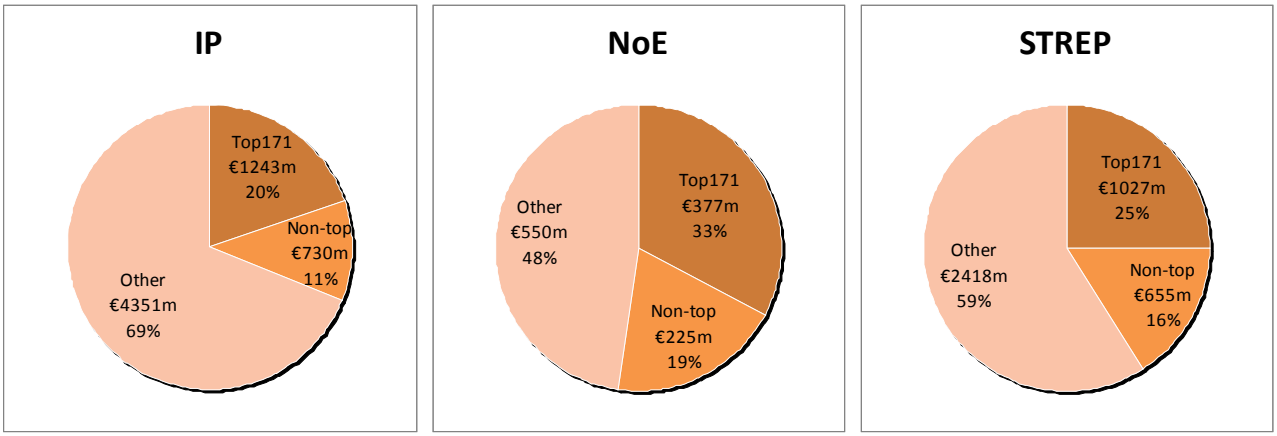
Instrument	Measured by	High share in projects' coordination (above 50%) in FP6 thematic priorities	Medium share in projects' coordination (between 50-20%) in FP6 thematic priorities	Low share in projects' coordination (below 20%) in FP6 thematic priorities
IP	**Coord. HEI in in total IP projects**	Life sciences, Citizens	Information society, Food	Nano. Aeronautics, Sustainable Devo
	Coord. top 171 out of total coord HEI	Life sciences, Information Society, Food, Sustainable Devo, Citizens & Governance		Aeronautics
NOE	**Coord. HEI in total NoE projects**	Life sciences, Information Society, Citizens and Governance	Food	Nano, Aeronautics, Sustainable Devo
	Coord. top 171 out of total coord HEI	Life sciences, Nano, Food, sustainable devo, Citizens	Information society	Aeronautics
STREP	**Coord. HEI in total STREP projects**	Life sciences, Citizens and governance	information society, Nano Food, Sustainable devo	Aeronautics
	Coord. top 171 out of total coord HEI	Life sciences, information society, Nano, Aeronautics, Food, Sustainable devo, Citizens		

Participation of the top universities varies across instruments, priorities and countries

Participation of top research universities varies across instruments. The highest share is achieved in NoE, and the lowest one in IP (Figure 2). Top research universities received almost two thirds of funding awarded to HEI in NoEs. The top group received more than half of HEI funding in IP, an instrument with high take-up by non-university participants. As these new instruments were designed for the realisation of the ERA, the above could indicate that top research universities were preferred or took the lead in coordinating the research fabric of ERA and cooperate with others in structuring technology oriented research.

The relatively high involvement in STREP shows that top research universities are important nodes in FP networks of collaboration, maintaining their involvement in traditional collaborative projects. Moreover, this take-up can also be explained by the adequacy of STREP to more exploratory research therefore suiting better the needs of these universities, because of its limited size and scope when compared with the other two instruments.

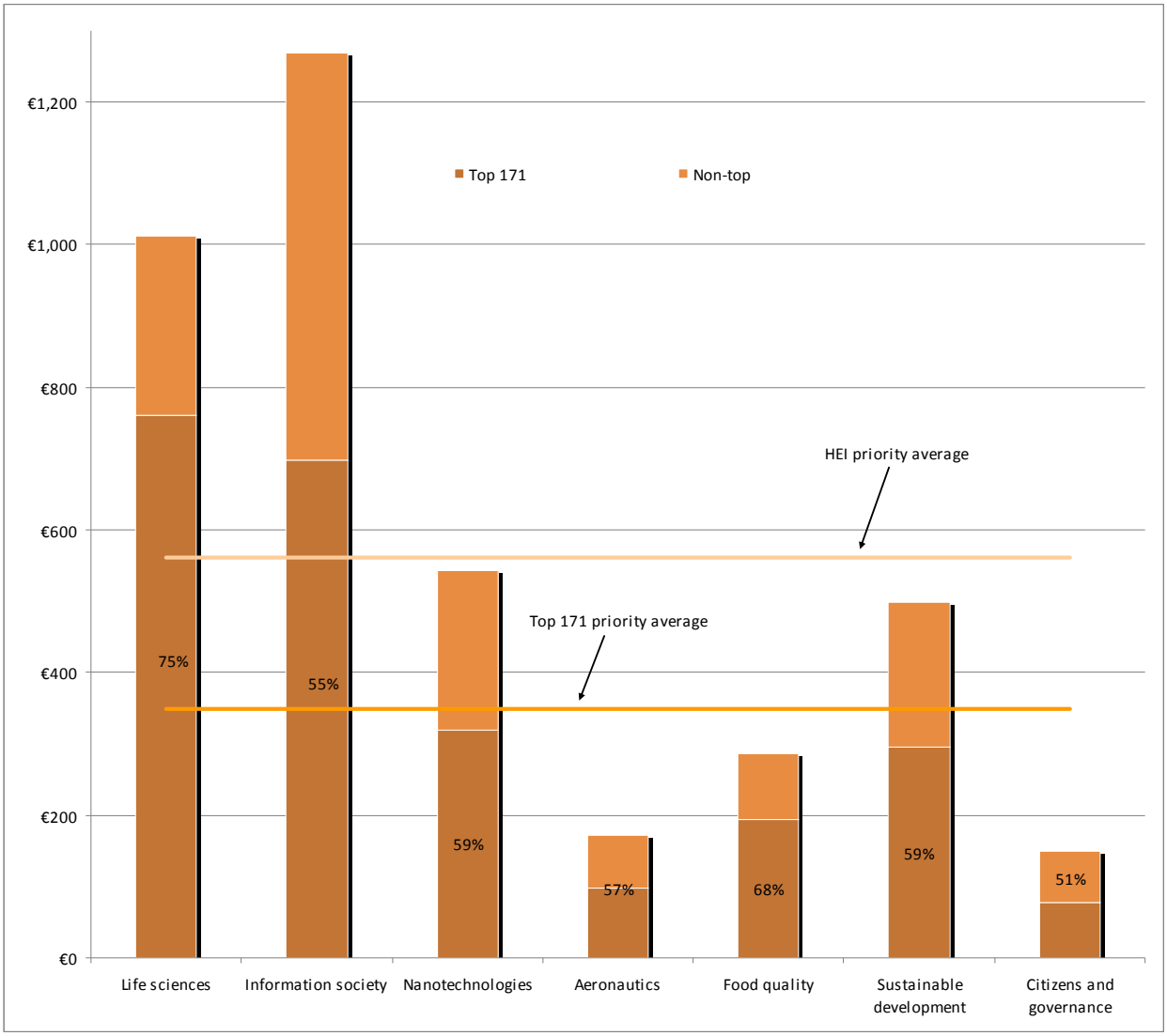
Figure 2 - Top research universities' share in the total funding of IP, NoE and STREP



When the overall participation in the thematic priorities is considered, top research universities account for more than 50% of the funding awarded in all thematic priorities (Figure 3). The highest shares of funding awarded to top research universities are in life sciences, food quality and sustainable development priorities. The lowest share of funds received by top universities is in citizens and governance, a social sciences-related theme. In more technology-driven thematic priorities as information society and nanotechnologies or aeronautics top research universities remain important players in the context of the HEI.

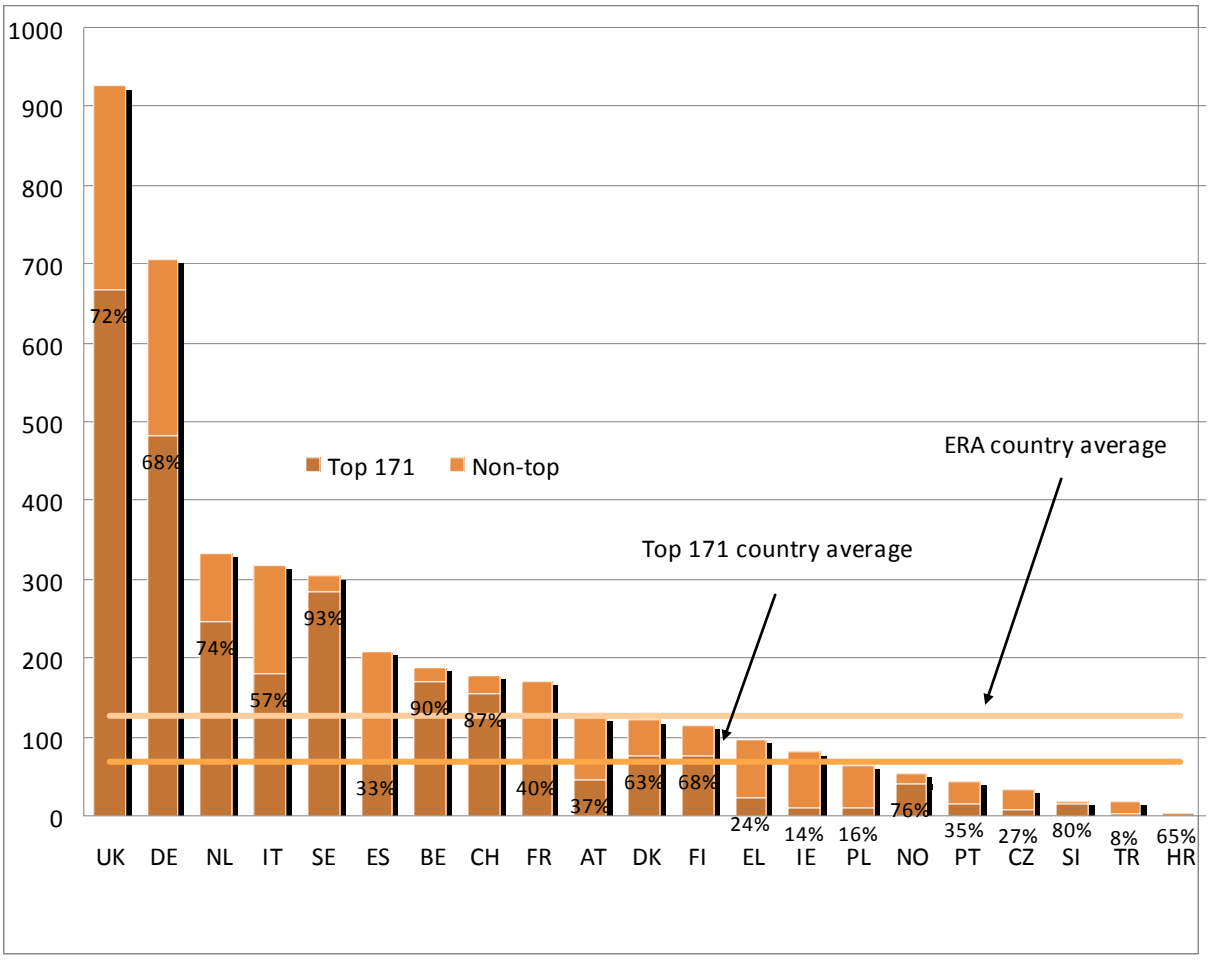
Figure 3 also indicates that the funding received by top research universities varies by thematic priority. Top research universities exceeded the HEI average in the life sciences and information society thematic priorities. By contrast, the lowest amount of funds awarded to HEI in general and to the top research universities are to be found in the thematic priorities aeronautics, citizens and governance, and food quality.

Figure 3 - Top universities' share in the FP funding by priorities



The share of top research universities in the funding received by each country from FP6 varies with the structural specificities of national research systems - for instance (as shown in Figure 1), according to the weight of universities in the system and share in national total of publications. Countries with small and developed research systems tend to have their participation centred on their most visible research universities. In the large developed systems no clear patterns appear.

Figure 4 - FP6 HEI funding by countries (millions of euros)



Likewise, Figure 4 presents a comparison, at the national level, of FP6 funding received by top research universities and HEI in general. The afore-identified pattern still seems valid: with regards to smaller developed research systems, the most visible universities in terms of size in publications are receiving most of the funding, seemingly acting as key nodes for their national systems in the FPs. Austria appears to be the exception in this group. With respect to less developed research systems, top research universities are not the leading players, with the exception of Croatia and Slovenia.

Finally, concerning large and developed research systems such as the United Kingdom and Germany, top research universities are central players for the HEI. Spain and France are again exceptions in this group below the average share of top research funding.

4. Participation in FP 6 projects was driven by excellence

In this section we attempt to shed some light on the determinants of participation to FP6 for the top universities in our sample. In that respect we attempt to answer our third question: is the participation of top universities, driven primarily by excellence (thus implying fair competition) or is it on the contrary determined by economic and/or political criteria (*juste retour* / cohesion)?

An analysis of the determinants of participation to FP6 must inevitably begin with a few innocuous generalisations about how FP networks are formed and how proposals are evaluated and eventually granted.

We know from the analysis in the preceding sections that the top 171 universities examined here account for the lion's share of HEI participation in FP6. It is therefore plausible to expect an association between a university's scientific standing and its degree of participation (i.e. number of participations, amount of funding). Using regression analysis, we can examine the statistical influence of proxies for excellence (number of publications and citations per university) on FP participation. Our expectations would then be verified by a positive statistically significant relationship.

Given that individual proposals are evaluated on the basis of scientific merit and technological soundness, scientifically excellent universities should be highly sought partners. Networks formed during the application stage favour universities with distinguished research records as these should maximise the probability of a grant. It is therefore reasonable to expect that the number of FP partners each university attracts is linked to its overall scientific standing. It follows that universities with high research output and high visibility scientific research (i.e. number of scientific publications and number of citations their work receives respectively, taken together as a signal of 'excellence') might become central FP actors, in terms of linking to a greater number of organisations. Centrality in those networks is both an important outcome of FP participation in itself (as can signal willingness to lead) and a determinant[23] of further FP participation.

Moreover, it is often alleged that the allocation of FP projects does not always follow strict scientific and technological criteria. The stereotype is that the principle of symmetric representation of member states' interests, often leads to charitable participations to organisations from less well-off countries[24]. A contradictory stereotype expects that better-

[23] Though the inclusion of the specific centrality proxy we have here (betweenness centrality in FP6) as an explanatory variable of FP6 participation is challenging. As the observed networks are determined *simultaneously* with the FP allocation/funding decisions, we are faced with the problem of statistical endogeneity. We therefore opt for separate equations, treating centrality only as an outcome. In the future, data drawn from FP5 could be used to examine its possible role as a determinant too.

[24] The following quote from the British Parliamentary Office of Science and Technology is telling: "*Some FP projects have specific requirements to include participants from a number of member states. Applicants have claimed there is also a hidden requirement to include "research-poor" member states (despite strong denial by the European Commission and use of anonymised peer review in FP5). Some believe that fewer restraints on the make up of research teams would better enable them to build optimal teams.*" (POST, 2004: 3)

off countries are awarded more funds, following the *juste retour* principle (RIETSCHEL et al., 2009). If these perceptions are true they raise serious questions about the ability of the FP to hold-on to its original mission. Even if they are not true, the mere fact that they are believed is potentially important, as it could influence the composition of project partners and effectively become self-fulfilling. In either case they are worth investigating.

Here an opportunity arises to test these beliefs: in a framework that statistically controls for the influence of excellence, we can test for the possible influence of the level of wealth of the university's home country (proxied by GDP per capita). A statistically significant influence would imply a deviation from fair allocation. More specifically, a statistically significant *positive* influence would indicate that project/fund allocation followed the principle of *juste retour* with wealthier countries (typically countries that contribute more to the EU budget) obtaining more participations and funds. By contrast, a statistically significant *negative* influence would suggest that less wealthy countries obtained more participations and funds, supporting the view that allocation was influenced by a concern for cohesion.

In order to test[25] the above hypotheses, we use data on the participation profiles of the 171 top universities (list in the Annex) from 21 countries to FP6 (number of participations, total amount of funding, betweenness centrality[26] in networks of organisations) and indicators on the total numbers ('output') and citations of their scientific publications ('visibility') for the period 1997-2006[27]. Our sample only covers the upper tail of the excellence distribution and is not representative of the whole range of university participation to the FP. While this limits the potential of our analysis for generalised inferences, it is probably safe to assume that there is enough variation (in terms of scientific standing, national characteristics and FP participation) to capture any underlying relationships.

Pairwise correlations appear to support the hypothesised relationships (see table 7 in Annex) in that all the variables have the expected sign. Overall, universities from wealthier countries appear to be participating in more projects and obtaining more funds. Such a setting however is unable to gauge the influence of each determinant as distinct from those of others. Is, for instance, the relatively greater success of universities from wealthier countries due to some kind of bias or is it simply because universities in such countries tend to also publish more and perform more visible research? Using regression analysis we can statistically control for multiple determinants of key participation features and disentangle their individual effects. Table 4 presents a selection of results.

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[25] The empirical equation is specified as: $Y_i = \alpha + \beta_1 PUBLICATIONS_i + \beta_2 CITATIONS_i + \beta_3 GDP_j + u_i$ where Y is a variable on FP participation (e.g. centrality, number of FP participations, funds), PUBLICATIONS, CITATIONS and GDP are explanatory variables, α, β_1, β_2, β_3 are parameters to be estimated and the subscripts *i* and *j* refer to individual universities and countries respectively.

[26] This indicator was produced by ARC systems and is drawn from their EUPRO database of FP participations. It is defined as: "*The betweenness centrality of a vertex can be defined as the fraction of geodesic paths between any pair of vertices on which this vertex lies. It is measured by the frequency of one actor positioned on the shortest path between other groups of actors arranged in pairs. If an actor is located at many links between other actors, he/she can more easily access information within the network, manipulate this information and distribute it. Those actors who are located on the shortest paths between many actors therefore hold key position for controlling the information flow within the network (gate keeper function)*" (BARBER et al., 2009: 47).

[27] The period in question begins before FP6 (duration 2002-2006) and thus lessens the potential for endogeneity. Taking into account a relatively long period was necessary in order to limit reliability problems with small number counts for individual universities. Stocks of publications and citations also capture the cumulative character of knowledge producing capabilities and reputation dynamics respectively.

Table 4 - Regression estimates

	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5
Dependent variable	Number of FP6 participations	Betweeness centrality in FP6 networks	Total amount of FP funding awarded	Number of FP6 participations	Average value of FP6 participations (=Total amount of FP funding/Number of FP6 participations)
Constant	-35.6843*** (12.2824) *-2.4352*** (0.8106)*	-0.0006685 (0.001) *-14.45906*** (1.5752)*	--2.04e+07*** (4217600) *6.83174* (3.657738)*	-31.3958* (16.233) *1.1837 (3.2687)*	34137.86 (34394.38) *5.648*** (1.4353)*
Fractional number of publications 1997-2006 (CWTS drawn from WoK)	0.0034*** (0.0005) *0.6676*** (0.0907)*	2.30e-07*** (4.76e-08) *0.9043705*** (0.1463)*	1294.814*** (185.9687) *0.8322*** (0.1082)*	0.0034*** (0 .0005) *0.6735*** (0.0918)*	3.8062*** (1.3054) *0.1587*** (0.0438)*
Total number of citations 1997-2006 (CWTS' "crown" indicator)	48.8006*** (13.17395) *1.0804*** (0.2928)*	0.0015258 (0.001) *0.9045336* (0.5067)*	2.00e+07*** (4576600) *1.4960*** (0.3532)*	50.3199*** (14.6306) *1.1623*** (0.3139)*	72697.04* (41818.89) *0.3337** (0.1407)*
GDP per capita (average 1997-2006) expressed in 2000 purchasing power standard[28]			85.2989 (207.5932) *0.1777 (0.3379)*	-0.0002 (0.0007) *-0.3669 (0.3018)*	6.5625*** (2.057) *0.5446*** (0.137)*
Variance explained in the data (Adjusted R-square)	40% *35.38%*	17.7% *20.4%*	48.06% *42.21%*	39.79% *34.28%*	19.59% *28.42%*
Number of observations[29]	167	167	166	166	166

Estimates are from OLS regressions (White's heteroskedasticity-robust standard errors in parentheses). ***, ** and * denote statistical significance at the 99, 95 and 90 per cent levels respectively. Italicised numbers denote statistics obtained with both the dependent and independent variables expressed (natural) logarithms and can be interpreted as elasticities.

Equations 1 and 2 show that our proxies for output and visibility have a positive, statistically significant and quantitatively distinct effect on the number of FP partners attracted by universities and the centrality of their FP participation. Equations 3 and 4 show that our proxies for output and visibility have a positive, statistically significant and quantitatively distinct effect on FP participation (in terms of both the numbers of participations and the total amount of funding awarded) but, *ceteris paribus*, a country's overall wealth level is not statistically significant.

In addition to the wealth variable, two country group dummies (one for southern European member states (EL, ES, IT, PT) and one for new member states and ERA associates (CZ, PL, SI, TR, HR) were attempted. The results obtained with the group dummies (not reported here) corroborate those obtained with levels of wealth with one exception: Ceteris paribus new member states and ERA associates obtain a greater number of projects but,

[28] Due to lack of data, shorter periods were considered for the following countries: BE, DK, IE, AT: 1997-2005; FR: 1999-2005; MT: 2000-2006; RO: 1999-2006; UK: 1997-1999 and 2002-2003.

[29] Fractional publication counts (i.e. ones avoiding duplication) were not available for some universities (n=4). GDP per capita for Turkey is also not available from Eurostat for this period (n=1).

as with the wealth-derived results, no more funds - perhaps an indication of a political (if not an economic) criterion.

Differences in the amount of funding received per project can be attributed to output and visibility as well as different wealth levels (equation 5). As wealth is not a determinant of either the total number of participations or the total funding awarded (i.e. taking joint consideration of the results of equations 3, 4 and 5), then its statistically significant influence in equation 5 could be interpreted as a reflection of differences in the cost of living (and by extension researcher salaries). It is of course possible that another latent variable (e.g. national R&D expenditures) may be behind this result, which may be the subject of further study.

In conclusion research output and visibility have been the key determinants of FP6 participation. All other things being equal, the level of wealth of a university's home country has not affected its overall participation.

5. Conclusions

Implications for policy

This policy note has the intention of addressing two major questions regarding the role of FP in promoting excellence research at universities in Europe, and to establish which type of HEI have been the most active within the FP: Is it, as conventional wisdom has it, the engineering and more applied research universities, or is it, on the contrary the ones that are more active and visible in terms of scientific production and excellence?

Our analysis shows that the top research universities in Europe in terms of research excellence are at the core of higher education participation in the FP6. They have not only been awarded the lion's share of the funds (60% of HEI) and a large portion of participations in the collaborative projects (58% of HEI), but are also central actors in the resulting networks. Their high participation in the new FP instruments (NOE and IP) indicates that they are key players in structuring and coordinating the European Research Area.

Moreover, we have demonstrated that, at least for the top research universities we have focussed on, research output and research visibility are the key determinants of participation, regardless of the level of wealth of the country where the university is located.

Collectively our findings lend support to the view that FP 6 has managed to involve excellent organisations regardless of where they come from – maintaining overall neutrality despite the political debate about *juste retour*. This view is aligned with the conclusions of the Expert Group report on the evaluation of FP6 (RIETSCHEL et al., 2009) which also shows that *juste retour* is not verified. At the same time we find no evidence in support of the commonly held belief that some FP actors are granted charitable participations.

These findings are important given recent initiatives aimed at strengthening research excellence in Europe. For instance, the thematic priority-based approach of the FP is complementary to the one implemented by the recently founded European Research Council (ERC). Though the FP and ERC target different actors, they are complementary instruments. On the one hand, the ERC sponsors *basic* research among the best researchers across Europe, in all research fields, without imposing any collaborative requirements or thematic constraints. On the other hand, the thematic priorities in the FP strengthen *areas of importance for European competitiveness* by way of transnational collaborative research. Both instruments have an important role to play in the promotion of excellence.

Analytical Findings

Our study sought to explore a rich body of data that is still under investigation. Little is known about the participation profiles of universities to the FP. In this policy note we present an outlook of the participation of HEI in the FP6, with a focus on a sample of the top research universities. This sample compares favourably with well-known rankings of excellent universities.

The analysis showed some emerging patterns of collaboration on the degree of involvement of universities in terms of thematic priorities and funding instruments. The top research universities we have examined are more involved in thematic priorities that are closer to the frontier of knowledge such as life sciences, nanotechnologies and information society.

According to our findings, as well as some recent insights from other studies, we have good reason to expect that the level of intensity of participation of universities in thematic priorities, with continuity over several framework programmes, tends to reduce as the field or technology matures. We believe this to be an avenue of research that is worth exploring in the future.

Although there is variation in the take-up of instruments by universities in the seven thematic priorities of FP6, most of the funding awarded resulted from their participation in IP and STREP. Despite being the smallest instrument in terms of volume of funding, NoE was a significant instrument to top research universities that accounted for one third of both total funding awarded and number of participations. This dominant role is in accordance with the expectations placed on an instrument conceived to build collective research agendas towards integration and excellence.

The analysis of the participation of universities in FP6 when compared against the overall level of participation by countries and the share of top research universities shows that structural characteristics of the research system are important. Principally, when a research system has a large share of academic driven public research institutes, the part of the higher education organisations is relatively small in the scientific production of that country as well as in the participation of the FP (e.g. French case). This finding suggests that in order to have a good description of academic participation in FP, those institutes should be included in the analysis as well. Their inclusion would also have important ramifications for university ranking systems.

In parallel to the findings from the evaluation of FP 6, we conclude that countries with smaller but developed research systems in Europe centre their participation in leading actors, such as the top research universities examined here.

6. Annex.

Top European research universities by country and scientific production

Table 5- Share of top European research universities in national scientific production

Country	No. of universities	% of Top	SCIENTIFIC PRODUCTION 2000-2006	
			No. of publications	Share of national scientific production (%)
Germany	35	20	348469	54
United Kingdom	32	19	401967	58
Italy	18	11	180032	53
France	14	8	136921	30
Netherlands	11	6	144759	73
Spain	10	6	93493	37
Sweden	10	6	115579	78
Belgium	7	4	73883	67
Switzerland	7	4	85071	60
Finland	5	3	43804	60
Austria	4	2	37025	49
Denmark	4	2	52149	67
Norway	3	2	27023	50
Greece	2	1	19364	31
Poland	2	1	12877	11
Portugal	2	1	12100	27
Croatia	1	1	5806	43
Czech Republic	1	1	10148	21
Ireland	1	1	5914	19
Slovenia	1	1	9306	56
Turkey	1	1	7145	7
Bulgaria	0	0	0	0
Cyprus	0	0	0	0
Estonia	0	0	0	0
Hungary	0	0	0	0
Latvia	0	0	0	0
Lithuania	0	0	0	0
Luxembourg	0	0	0	0
Malta	0	0	0	0
Romania	0	0	0	0
Slovakia	0	0	0	0
Total	171	100	0	0

List of the top 171 top European research universities

Table 6- Sample of 171 top European research universities

Country Code	University
AT	KARL FRANZENS UNIVERSITAET GRAZ
AT	LEOPOLD FRANZENS UNIV INNSBRUCK
AT	TECH UNIV WIEN
AT	UNIV WIEN
BE	KATHOLIEKE UNIV LEUVEN
BE	UNIV ANTWERPEN
BE	UNIV CATHOLIQUE LOUVAIN
BE	UNIV GENT
BE	UNIV LIBRE BRUXELLES
BE	UNIV LIEGE
BE	VRIJE UNIV BRUSSEL
CH	ECOLE POLYTECN FEDERALE LAUSANNE
CH	ETH ZURICH
CH	UNIV BASEL
CH	UNIV BERN
CH	UNIV GENEVE
CH	UNIV LAUSANNE
CH	UNIV ZURICH
CZ	CHARLES UNIV PRAGUE
DE	ALBERT-LUDWIGS-UNIVERSITAET FREIBURG
DE	BAYERISCHE JULIUS-MAXIMILIANS-UNIVERSITAET WÜRZBURG
DE	CHRISTIAN ALBRECHTS UNIV KIEL
DE	EK UNIV TUBINGEN
DE	FREIE UNIV BERLIN
DE	FRIEDRICH ALEXANDER UNIV ERLANGEN
DE	FRIEDRICH SCHILLER UNIV JENA
DE	GA UNIV GOTTINGEN
DE	HEINRICH HEINE UNIV DUSSELDORF
DE	HUMBOLDT UNIV BERLIN
DE	JG UNIV MAINZ
DE	JOHANN WOLFGANG GOETHE UNIV FRANKFORT
DE	JUSTUS LIEBIG UNIV GIESSEN
DE	LMU UNIV MUNCHEN
DE	MARTIN-LUTHER-UNIVERSITAET HALLE-WITTENBERG
DE	MED HOCHSCHULE HANNOVER
DE	PHILIPPS-UNIVERSITAET MARBURG
DE	RFW UNIV BONN
DE	RUHR UNIV BOCHUM
DE	RUPRECHT-KARLS-UNIVERSITAET HEIDELBERG.
DE	TECH UNIV BERLIN
DE	TECH UNIV DARMSTADT
DE	TECH UNIV DRESDEN
DE	TECH UNIV MUNCHEN
DE	UNIV AACHEN (RWTH)
DE	UNIV DUISBURG ESSEN

DE	UNIV HAMBURG
DE	UNIV KARLSRUHE (TH)
DE	UNIV KOLN
DE	UNIV LEIPZIG
DE	UNIV REGENSBURG
DE	UNIV SAARLANDES
DE	UNIV STUTTGART
DE	UNIV ULM
DE	WESTFAELISCHE WILHELMS - UNIVERSITAET MUENSTER
DK	AARHUS UNIV
DK	DANMARKS TEKNISKE UNIVERSITET
DK	KOBENHAVNS UNIV
DK	SUDDANSK UNIVERSITET
EL	ARISTOTLE UNIV THESSALONIKI
EL	NATIONAL AND CAPODESTRIAN UNIVERSITY OF ATHENS
ES	UNIV AUTONOMA BARCELONA
ES	UNIV AUTONOMA MADRID
ES	UNIV BARCELONA
ES	UNIV COMPLUTENSE MADRID
ES	UNIV GRANADA
ES	UNIV PAIS VASCO
ES	UNIV SANTIAGO COMPOSTELA
ES	UNIV SEVILLA
ES	UNIV VALENCIA
ES	UNIV ZARAGOZA
FI	HELSINGIN YLIOPISTO
FI	HELSINKI UNIV TECHNOLOGY
FI	OULUN YLIOPISTO
FI	UNIV KUOPIO
FI	UNIV TURKU
FR	UNI AIX MARSEILLE II MÉDITERANNÉE
FR	UNIV RENNES I
FR	UNIV BORDEAUX I
FR	UNIV GRENOBLE I JOSEPH FOURIER
FR	UNIV LYON 1 CLAUDE BERNARD
FR	UNIV MONTPELLIER II
FR	UNIV NANCY IHENRI POINCARE
FR	UNIV NANTES
FR	UNIV PARIS VI P&M CURIE
FR	UNIV PARIS VII DENIS DIDEROT
FR	UNIV PARIS XI SUD
FR	UNIV STRASBOURG I L PASTEUR
FR	UNIV TOULOUSE III
FR	UNIVERSITE RENE DESCARTES
HR	UNIV ZAGREB
IE	UNIV COLL DUBLIN, NATL UNIV IRELAND
IT	UNIV BARI
IT	UNIV BOLOGNA
IT	UNIV CATANIA
IT	UNIV CATTOLICA SACRO CUORE
IT	UNIV FERRARA
IT	UNIV FIRENZE
IT	UNIV GENOVA
IT	UNIV MILANO

IT	UNIV NAPOLI FEDERICO II
IT	UNIV PADOVA
IT	UNIV PARMA
IT	UNIV PAVIA
IT	UNIV PERUGIA
IT	UNIV PISA
IT	UNIV ROMA SAPIENZA
IT	UNIV ROMA TOR VERGATA
IT	UNIV TORINO
IT	UNIV TRIESTE
NL	DELFT UNIV TECHNOL
NL	EINDHOVEN TECHNOL UNIV
NL	ERASMUS MC ROTTERDAM
NL	LEIDEN UNIV
NL	RADBOUD UNIV NIJMEGEN
NL	RIJKS UNIV GRONINGEN
NL	UNIV AMSTERDAM
NL	UNIV MAASTRICHT
NL	UNIV UTRECHT
NL	VRIJE UNIV AMSTERDAM
NL	WAGENINGEN UNIV
NO	NORWEGIAN UNIV SCI&TECHNOL TRONDHEIM
NO	UNIV BERGEN
NO	UNIV OSLO
PL	JAGIELLONIAN UNIVERSITY
PL	WARSAW UNIV
PT	UNIV PORTO
PT	UNIV TECNICA LISBOA
SE	CHALMERS UNIV TECHNOL GOTEBORG
SE	GOTEBORG UNIV
SE	KAROLINSKA INSTITUTE
SE	KUNGLIGA TEKNISKA HOGSKOLAN
SE	LINKOEPINGS UNIV
SE	LUND UNIV
SE	STOCKHOLM UNIV
SE	SWEDISH UNIV AGRI UPSSALLA
SE	UMEA UNIV
SE	UPPSALA UNIV
SI	UNIV LJUBLJANA
TR	HACETTEPE UNIV ANKARA
UK	IMPERIAL COLL LONDON
UK	KINGS COLL UNIV LONDON
UK	LOUGHBOROUGH UNIV
UK	QUEEN MARY COLL UNIV LONDON
UK	QUEENS UNIV BELFAST
UK	UNIV ABERDEEN
UK	UNIV BIRMINGHAM
UK	UNIV BRISTOL
UK	UNIV CAMBRIDGE
UK	UNIV COLL LONDON
UK	UNIV DUNDEE
UK	UNIV DURHAM
UK	UNIV EDINBURGH
UK	UNIV EXETER

UK	UNIV GLASGOW
UK	UNIV LEEDS
UK	UNIV LEICESTER
UK	UNIV LIVERPOOL
UK	UNIV MANCHESTER
UK	UNIV NEWCASTLE UPON TYNE
UK	UNIV NOTTINGHAM
UK	UNIV OXFORD
UK	UNIV READING
UK	UNIV SHEFFIELD
UK	UNIV SOUTHAMPTON
UK	UNIV ST ANDREWS
UK	UNIV STRATHCLYDE GLASGOW
UK	UNIV SURREY
UK	UNIV SUSSEX
UK	UNIV WALES CARDIFF
UK	UNIV WARWICK
UK	UNIV YORK

Pairwise correlations matrix

Table 7- Pairwise correlations matrix

	Total amount of FP funding awarded	Number of FP6 participations	Average value of FP6 participations	Betweenness centrality in FP6 networks	Total number of citations 1997-2006	Fractional number of publications 1997-2006
Number of FP6 participations	0.9444					
Average value of FP6 participations	0.4974	0.2512				
Betweenness centrality rank in FP6 networks	0.772	0.8589	0.1346			
Total number of citations 1997-2006	0.5451	0.4802	0.3814	0.2557		
Fractional number of publications 1997-2006	0.6232	0.5811	0.304	0.4182	0.4083	
GDP per capita (average 1997-2006) expressed in 2000 purchasing power standard	0.2698	0.2046	0.3558	0.0568	0.5394	0.1385

List of acronyms

AIT – Austrian Institute of Technology

ARWU - Academic Ranking of World Universities

ASSIST – Analyses and Studies and Statistics and Indicators on Science and Technology

ARC systems – Austrian Research Centers GmbH

CA – Coordination Actions

CHEPs - Center for Higher Education Policy Studies

CLR - Collective research projects

CORDIS - Community Research and Development Information Service

CPP/FCSm – CWTS Internationally standardized impact indicator

CRAFT - Co-operative research projects

CWTS – Centre for Science and Technology Studies

DG RTD – Directorate General Research

ERA – European Research Area

ETEPS - European Techno-Economic Policy Support Network

EU – European Union

EUPRO – European Projects Database

FP – Framework Programme for Research and Technology Development

GDP –Gross Domestic Product

HERD – Higher education R&D

HEI - Higher Education Institutions

IP - Integrated Projects

IPTS - Institute for Prospective Technological Studies

JRC - Joint Research Centre

MCA - Marie Curie Actions

NoE - Networks of Excellence

OLS – Ordinary Least Squares

R&D – Research and Development

SSA - Specific Support Actions

STREP - Specific Target Research Projects

THE - Times Higher Education

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Abstract

The present note characterises the participation of universities in the European Framework Programmes for Research and Technological Development (FP) with a substantive focus on the profile of participation of the top research universities on FP6.

A commonly held belief is that top research universities prefer not to participate to the FP. Purported 'cumbersome' administrative procedures, 'low content of basic research' and availability of other, 'more attractive' sources of funding have been put forward as possible explanations. Another stereotype is that the principle of symmetric representation of member states' interests, often leads to charitable participations to organisations from less well-off countries. The present policy note takes a step back and puts such commonly held beliefs to the test.

Collectively our findings lend support to the view that FP 6 has managed to involve excellent universities regardless of where they come from, maintaining overall neutrality despite political pressure for either "cohesion" or "juste retour".

Europe's top research universities account for the lion's share of higher education participations to the FP6 and act as leading coordinators and key partners. Top research universities participate more in thematic priorities that are close to the knowledge frontier. NoE was the main instrument used by top research universities, in accordance with policy expectations.

These findings need to be seen under the light of the study's limitations. First, the quantitative bibliometric criteria employed in the construction of our sample of top research universities may underestimate important research activities that do not usually register on standard bibliometric indicators. Second, the narrow definition of universities chosen may not be representative of the full range of academic research in Europe. Nevertheless, the fact that our sample compares favourably with well-known university rankings makes it likely that our results hold more broadly. We conclude identifying a number of areas worthy of further investigation.

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