

**FCT** Fundação para a Ciência e a Tecnologia

MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR

**EVALUATION OF RESEARCH UNITS 2002-2004**

# **Overall Report**

**December, 2005**

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# EVALUATION OF RESEARCH UNITS 2002-2004

## OVERALL REPORT

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***There is a tide in the affairs of men,  
Which, taken at the flood, leads on to fortune;  
Omitted, all the voyage of their lives  
Is bound in shallows and in miseries.  
On such a sea are we now afloat,  
And we must take the current when it serves,  
Or lose our ventures.***

*Shakespeare, Julius Caesar, Act IV, Scene III  
.... as cited in the "Evaluation of Physics Research Units" Report*

## 1. Introduction

*The present Report is structured in two main parts; the first part describes the concept, history, the procedure and results of the 2002 - 2004 Evaluation of the Research Units financed by the Foundation for Science and Technology. The main indicators, characteristic of the Research Units' situation at the time of the evaluation, are discussed and a synthesis of the conclusions of the Evaluation Panels' reports for each scientific area is presented. The classifications of the different Units and the amounts of funding awarded are analysed globally and per scientific area and compared with those of the preceding evaluations. This first part ends with recommendations for future evaluations, essentially abstracted from the reports and experience of the Evaluation Panels. The second part includes copies of all Evaluation Panels' reports organized thematically.*

## 2. The process of Evaluation of the Portuguese Research Units

### 2.1 The framework

The Introduction of the Global Report of the Coordinator of the 1996 Research Units' Evaluation states:

*“The main goal of the Research Units' evaluation process is to promote a critical reflection of their on-going activities, based on recommendations from external specialists, stimulating a strategic reorientation and the reorganization of the units themselves.”*

Hence, besides implementing a stable financing model, the evaluation processes put into practice assessment and monitoring procedures that fostered a culture of rigour and quality, in a context of increasing and demanding internationalisation. The financing, which is established according to the evaluation results, is independent and supplements the funding received from projects and research grants. It thus plays a structural role in the strengthening of the institutions.

The implementation of a regular evaluation process has been a major stimulating factor in the development of a dynamic scientific community, increasingly competitive in the international arena. In fact, as will be demonstrated in the next sections, the process has led to a sustainable increase in the number of PhDs (a researcher holding a doctor's

degree) and in scientific output, as well as to better-organized and internationally visible Research Units.

## 2.2 The previous evaluations

### 2.2.1 The 1996 evaluation

In 1996, the Ministry of Science and Technology requested a full evaluation of all the 270 Research Units that were funded at the time, which included about 3 700 PhDs. Twenty one Evaluation Panels, each one coordinated by a Portuguese researcher and involving more than one hundred foreign scientists, performed this evaluation in the different research fields. The evaluation comprised the assessment of activity reports and plans, and site visits to all Units during the period June - October 1996. Besides recommendations concerning the Units' activities, the evaluation led to major changes in Basic Funding levels per PhD, to the award of Programmatic Funding to some of the Research Units, and to the complete cessation of funding in the worst performing cases. The Programmatic Funding, whose objectives are described in detail in Annex 3, responds to specific needs detected by the evaluators, aiming at increases in performance that would not be attained with other funds available to the Units.

The Evaluation Panel reports were published in the beginning of 1997, together with the comments of each Research Unit to the corresponding evaluation report.

The Research Units were ranked in five levels (*Excellent, Very Good, Good, Fair, Poor*), according to overall quality standards defined by international terms of reference. The proportion of units rated *Excellent, Very Good, Good, Fair* and *Poor* was, respectively, 16%, 29%, 30%, 19% and 7%. About 20% of the overall number of PhDs was involved in Units rated *Excellent*, while 36% of them were involved in Units rated *Very Good*.

As a result of the evaluation and the policies that ensued from it, the overall funding, that was about 1 500 billion PTE (Portuguese Escudos) in 1996, increased to more than 4 000 billion PTE in 1997. This corresponded to an average annual Basic Funding per eligible PhD of 820 thousand PTE for Units rated *Excellent* or *Very Good*, 683 thousand PTE for Units rated *Good*, and 547 thousand PTE for Units rated *Fair*.

### 2.2.2. The Evaluation of new Research Units in 1997

In 1997 there was a call for proposals for new Research Units. The application procedure involved two steps: a pre-application for verification of general eligibility criteria and cross-reference of the research teams against those of Units already funded, and an application



that took into account the results of that preliminary screening. Of the 135 pre-applications only 89, involving about 600 PhDs, were formalized as applications. About 15% of the accepted proposals resulted from divisions or mergers of previous Research Units, mainly as a consequence of recommendations of the Evaluation Panels of 1996. Some of the other applications were from Units that applied and were not approved in 1994.

The evaluation engaged 17 Evaluation Panels, including *circa* 50 foreign scientists, and was based on the analysis of the proposals submitted and on interviews with the Research Units' leaders and representative researchers. The share of Units rated *Excellent*, *Very Good*, *Good*, *Fair* and *Poor* was, respectively, 15%, 30%, 36%, 13% and 6%, leading to the funding of 79 new Research Units. The Units rated as *Poor* were not selected for financing. As a consequence, the FCT's Pluriannual Programme in 1998 encompassed a total 335 Research Units, involving about 4 700 PhDs and a total funding of about 5 000 billion PTE.

### 2.2.3 The Evaluation of 1999

The evaluation exercise of 1999 covered the totality of the 263 Research Units evaluated in 1996 and funded through the FCT's Pluriannual Funding Programme. This included the Units that resulted from the partition of those evaluated in 1996, but not the new Units evaluated in 1997-1998. The reviewers assessed the value of the activities performed from 1996 to 1998, as well as those proposed for next tri-annual period 1999-2001.

The evaluation lasted from July 1999 to September 2000 and engaged 21 Evaluation Panels, involving *circa* 160 foreign scientists. It was based on the analysis of the reports and tri-annual activity plans submitted by the Research Units and on site visits and interviews with their leaders and representative researchers. The share of Units rated *Excellent*, *Very Good*, *Good*, *Fair* and *Poor* was, respectively, 19%, 38%, 25%, 13% and 5%, a clear improvement relatively to the 1996 evaluation. In December 1999 the FCT's Pluriannual Funding Programme encompassed a total of 337 Research Units, involving about 4 700 PhDs and a total funding (for that year, including that from the Programmatic Funding) of about 5 100 billion PTE.

Again, a consequence of the evaluation and the policies that ensued from it, namely the yearly updating of the number of PhDs eligible for financing, this figure reached *circa* 95 million Euros in the period 2000 - 2002 (equivalent to about 19 billion PTE). At the end of 2002, 346 Research Units involving *circa* 7 000 PhDs were in existence.

### 3. Evaluation of the Research Units 2002-2004

#### 3.1 Description of the evaluation exercise

The evaluation exercise under analysis will be referred to in the present text as the “2002-2004 evaluation”. It was organized by the Foundation for Science and Technology (FCT) through a team coordinated by Maria José Camecelha Abreu. Annex 1 presents the composition of that team, as well as the names of the FCT technical staff who accompanied the site visits to the Research Units.

The evaluation involved the Units financed through the Pluriannual Financing Programme, including those resulting from the partition or merger of Units evaluated in 1998 or 1999. It focussed on the worth of the activities carried out in the period 1999 - 2001, as well as on the activity plans for 2003-2005. It also assessed the applications submitted to the 2001-2002 call for proposals for new Research Units. Communication Sciences and Law and Political Sciences were included for the first time as independent areas. Contrarily, Education Policies, which encompassed only one Centre, although evaluated by a distinct panel, was considered a sub-area of Education Sciences and, thus, was not the object of a specific area report. It should be noted that not all the existing Units were evaluated, as it was decided to exclude those that had been integrated in Associated Laboratories since the last evaluation<sup>1</sup>.

One hundred and eighty international and Portuguese experts, belonging almost entirely to foreign institutions, made up the Panels responsible for the evaluation. The composition of these Evaluation Panels (EP), as well as the corresponding evaluation periods, is presented in Annex 2. Because of the multidisciplinary nature of some of the Units, Panels from more than one scientific area were chosen to evaluate them. On the other hand, due to the scope and diversity of some of the areas, the corresponding Evaluation Panels were divided in sub-panels. This was the case of the Biological Sciences, Health Sciences and Electrical and Computer Engineering Panels, with 2, 3 and 2 sub-panels, respectively.

As a result of the exercise, 444 Research Units, integrated in 24 scientific areas, were assessed and most selected for financing. The names of these areas are presented in Table 1.

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<sup>1</sup> The Associated Laboratories were created in 1999, under a legal framework defined by “Decreto-Lei” 125/99, which granted to institutions of high merit, recognized by external evaluations, a special statute, and special forms of financing. This statute was based on the assessment of their capacity to cooperate, in a sustainable, competent, and efficient way in the implementation of specific objectives of the national scientific and technological policy. At the end of 2004, 21 Associated Laboratories were in existence, involving 38 Research Units and integrating *circa* 1520 PhDs.

**Table 1.** Major Scientific Areas corresponding to the 24 Evaluation Panels

Mathematics
Physics
Chemistry
Biological Sciences
Earth and Space Sciences
Marine Sciences
Agricultural Sciences
Health Sciences
Civil Engineering
Mechanical Engineering
Materials Science and Engineering
Chemical Engineering and Biotechnology
Electrical and Computer Engineering
Economics and Management
Law and Political Sciences
Sociology, Anthropology, Demography and Geography
Education Sciences, including Education Policies
Psychology
Linguistics
Communication Sciences
Literary Studies
Art and Architecture
Philosophy
History

The 2002-2004 Evaluation comprised 468 public sessions, involving site visits or presentations, which were held all over the country, from mainland Portugal, to Azores and Madeira. The Reports and Activity Plans of the Research Units, as well as the EP's reports were submitted electronically for the first time. The exercise was, thus, extremely demanding in terms of data treatment, namely due to the required coordination between the different scientific areas and to the various programmes that had to be developed. It also demanded a quick response to the various queries that were formulated, either by the Units or by the EP themselves.

Similarly to the previous evaluations, the process comprised, for each Scientific Area and for each Research Unit, the following stages:

- 1. Preliminary evaluation** by the members of the corresponding Evaluation Panel of the Reports and tri-annual Plans submitted in March-April 2002.

**2. Site visit** to the Unit, including its presentation by the Director and other researchers representative of the on-going activities. In the case of the applications for new Units, it was the Panel's option to carry out a site visit or not. In the latter case, the Units were called to FCT headquarters to present their Activity Plans to the EP.

**3. Final individual and panel reports** for each Unit or for each application evaluated.

**4. Global area report**, mostly written by the Panel coordinator.

The evaluation procedure, which abided by the Guidelines described in Annex 3, was based in the following criteria:

- Merit of the results of the scientific activity;
- Relevance of the current and planned activities;
- Internationalisation of the scientific activities;
- Management and working environment;
- Resources available for the research activity;
- Diffusion of the activity results and other actions to promote a scientific culture within society.

The application of these criteria took into consideration, amongst other, the following aspects:

- Publications of the members of the research team in relevant scientific journals, number of prototypes developed and patents registered, knowledge or technology transfer activities;
- Supervision of post-graduate students, involvement of post-docs in the Units' activities, training of young researchers.

The technical staff that accompanied the evaluation prepared all the support materials, namely detailed synoptic tables, containing, for example, the results of previous exercises, composition of the research teams, and analysis of the internationalisation of the Units, including international projects.

Furthermore, the organization of the process included: 1) supporting the coordinators in the organization of the Evaluation Panels, 2) articulating the respective agendas with the overall evaluation schedule; 3) preparing the evaluation programmes in close articulation with the coordinators; 4) keeping the Research Units informed about the evaluation dates and places; 5) organizing and implementing the logistics necessary for the accomplishment of the programmes; 6) helping the EP in the submission of the corresponding reports.

The “2002-2004 evaluation” began in July 2002. Four scientific areas, Mathematics, Physics, Earth and Space Sciences and most of History, corresponding to a total of 92 Research Units, were assessed in that year. The remaining 20 scientific areas, involving 315 Research Units, were evaluated in 2003. However, the site visits to 36 Units from two of these areas, Health Sciences and the Electrical and Computer Engineering, were postponed to January 2004. One single Unit, which had been transferred to the History area, was reviewed in early 2005. This last evaluation is clearly an outlier in the distribution and, hence, does not compromise the designation given above to the overall exercise.

The evaluation schedule is diagrammatically represented in Figure 1.

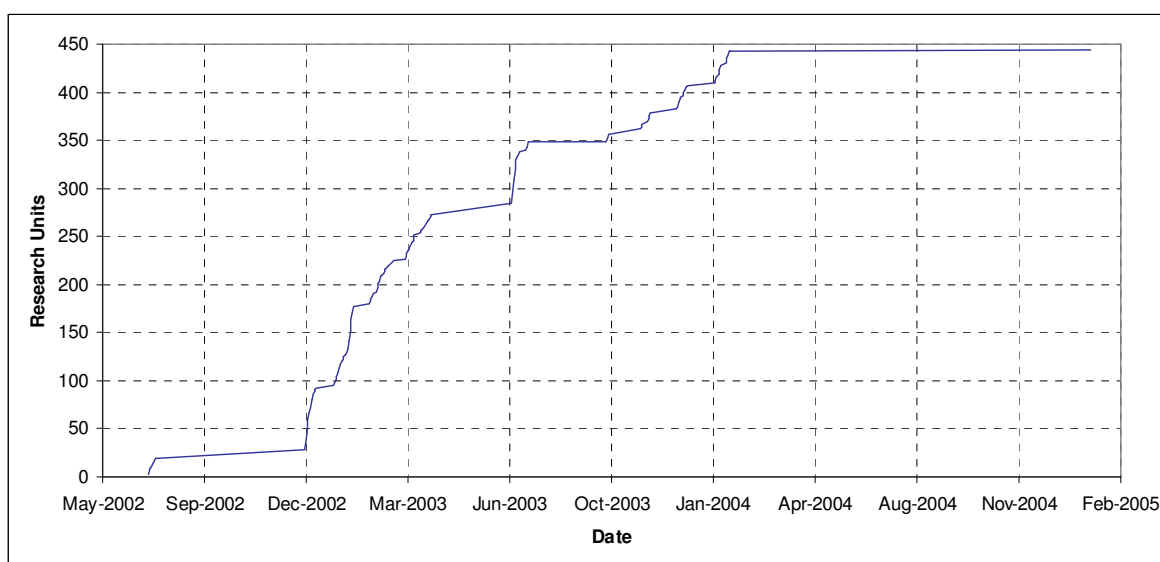


Figure 1. Accumulated number of Research Units evaluated as a function of time

At the end of the exercise the EPs final reports were transmitted to the Research Units, which were asked to send in their comments, or self-evaluation reports, that, if they so wished, were published together with the Panels' reports.

In this evaluation the share of Units rated *Excellent*, *Very Good*, *Good*, *Fair* and *Poor* was, respectively, 18%, 32%, 28%, 14% and 8%, leading to the funding of 122 new Research Units. As in the previous evaluations, the Units rated as *Poor* were not selected for financing. As a consequence, the FCT's Pluriannual Funding Programme in 2003-2005 encompassed 437 Research Units (29 of which integrated in Associated Laboratories) and involving about 8 000 PhDs (with *circa* 1 200 integrated in Associated Laboratories).

A more detailed analysis of the evaluation data, as well as a comparison with those of the 1996 and 1999 evaluations, is presented in section 3.3 of this Report.

## 3.2 Analysis of the Evaluation exercise

### 3.2.1 *The situation of the Portuguese Research Units at the time of the exercise*

The first difficulty in characterising the Portuguese Research Units at a time relevant to the evaluation exercise is exactly the definition of that time. In fact, the national R&D system is still going through a phase of dynamic expansion, and hence, a matter of a few months will necessarily make a difference in the values of the main indicators. In a process that lasted for more than three years, the variation of these indicators was certainly very significant. In this context, two alternative moments were considered for the analysis, December 2001, and December 2003. The former was the moment to which corresponded the data included in the Units reports or in the applications that the evaluators reviewed prior to the site visits. At the end of 2003, 92% of the Units, in all scientific areas, had been visited. This means that the indicators generated during that year were those apprehended locally by the evaluators as reflecting the overall situation of the Units. As explained in section 3.3.2, FCT calculated the global amount of the Pluriannual financing to be awarded to each Unit in the period 2003-2005 based on the number of PhDs in December 31, 2003. This was, thus, the time selected for the analysis, as it allows comparison between the financing amounts awarded globally to the Units in the different evaluation cycles.

However, to make a general comparative analysis of the situation of the Portuguese Research Units in the 1996, 1999 and 2002-2004 evaluation cycles some other considerations are necessary. The former and latter included both old and new Units, but the second only evaluated already existing ones. Hence, the data corresponding to the new Units that applied for financing and were reviewed in 1997-1998 were added to those of the 1999 evaluation. For comparability reasons again, the number of researchers integrated in Associated Laboratories, which were exempted from the 2002-2004 evaluation, were also added to those of the other Units. This was necessary, as the Units to which they were affiliated had been included in the previous evaluation cycle. Taking all these caveats into consideration, Table 2 synthesises the main indicators of the Portuguese Research Units in 1996, 1999 and 2003.

**Table 2.** Situation of the Portuguese Research Units in 1996, 1999 and 2003

Indicators	1996	1999*	2003
Number of PhDs	3 575	5 823	8 324
Number of Units	270	354	473
Average number PhD/Unit	13.2	16.4	17.6

\* consolidated in December 2000

The steady increase of the number of PhDs and Units from one evaluation cycle to the other is clearly evident in the Table, reflecting the impact of a stable financing model on the R&D system that became progressively more mature. The number of PhDs increased at an average rate of 19.0%/year in the period 1996 - 2003, which is a very high rate indeed. The average size of the Units increased too, but the growth seems to be stabilising from 1999 to 2003.

To fully characterize the human dimension of the Portuguese R&D system in 2003 further data are necessary, not only the number of PhDs, but also the overall number of researchers and other personnel in the system, as well as its institutional and professional distribution. These data, abstracted from PCTN.03<sup>2</sup>, are presented in Table 3.

**Table 3.** Researchers and other personnel in the R&D system in 2001 and 2003

Personnel		Firms		State		Higher Education		nPPI*		Total	
		2001	2003	2001	2003	2001	2003	2001	2003	2001	2003
Researchers	Number	4 625	6 102	5 211	5 027	17 276	19 906	4 034	4 280	31 146	35 855
	FTE	2 722	3 794	3 646	3 440	8 941	10 062	2 415	2 964	17 724	20 242
	%	15	19	21	17	50	50	14	15	100	100
Total Personnel	Number	6 821	9 882	8 478	7 273	19 112	21 488	4 752	5 393	39 163	44 036
	FTE	3 875	6 124	5 971	4 917	10 173	11 147	2 951	3 342	22 970	25 530
	%	17	24	26	19	44	44	13	13	100	100

\* non-Profit making Private Institutions

Analysis of Table 3 warrants a number of interesting conclusions, namely on the evolution and relative proportion of researchers and total personnel between the public and private sectors. It is especially noteworthy that in 2003 private firms were employing 19% of the total number of researchers (FTE) and 24% of the total personnel working in the R&D system. The increase from 2001 to 2003 of *circa* 1 500 researchers and 1 500 technical and administrative personnel (obtained by the difference between the two set of figures in the Table) is also significant. On the other hand, the decrease in all categories of personnel employed by the state is also relevant, a 31.3% drop in the number of technical and administrative personnel and a more modest 3.5% drop in the number of researchers. These data confirm a progressive increase of the participation of the Portuguese firms in the overall national R&D effort. More relevant to the objectives of the present report, however, is to cross the absolute figures in the Table with those of the overall population.

<sup>2</sup> *Inquiry to the Scientific and Technological National Potential*, PCTN.03, "Main Indicators of the National Effort in R&D", OCTES, the Observatory for Science, Technology and Higher Education, Lisbon, 2005

The Portuguese active population reached 5 118 000 in 2003<sup>3</sup>. Using this figure, ratios per 1 000 active population of 3.97‰ FTE researchers, 1.03 ‰ FTE personnel (technical and administrative), and 1.63 ‰ PhDs are obtained. Comparison with the 2002 EUR-25 ratios relative to the active population, 5.8‰ FTE researchers and 4.4 ‰ FTE personnel<sup>2</sup>, shows that the Portuguese R&D system still lags behind its European counterparts, specially so in what concerns technical and administrative personnel.

#### *Thematic heterogeneity*

As the Arts, Social and Human Sciences areas have often been considered as trailing behind the remainder areas in the dimension of the human resources, it is interesting to assess how the main indicators differ for these areas. This analysis is shown in Table 4.

**Table 4.** Situation of the Research Units in the Arts, Social and Human Sciences areas

Areas:	Arts, Social and Human Sciences			Other areas		
	1996	1999*	2003	1996	1999*	2003
Number of PhDs	759	1 440	2 459	2 816	4 383	5 865
Number of Units	73	118	186	197	236	287
Average n. PhD/Unit	10.4	12.2	13.2	14.3	18.6	20.4

\* consolidated in December 2000

The numbers in Table 4 confirm the *a priori* notion that Research Units have a significantly smaller dimension in the Arts, Social and Human Sciences areas than in the remaining part of the Portuguese R&D system. The numbers, however, also show that those areas are growing at a faster rate, increasing their share of the overall system from 27.0% to 39.3% and 21.2% to 29.5%, in number of Units and PhDs, respectively, from 1996 to 2003. In spite of these increases, the average dimension is still small, probably below a critical threshold value. It would be interesting to study further the influence of this dimension (and, by extension, that of the Portuguese Research Units as a whole) in their relative performance. In the absence of this study, the general impression obtained is that the system is still too fragmented, which, besides other problems, complicates significantly the logistics of the evaluation exercises.

#### *Detailed Analysis per scientific area*

The next set of figures compares the main indicators of the Research Units in 1996, 1999 and 2003 evaluations per Scientific Area, excluding and including in the latter the data corresponding to the Associate Laboratories (pink and light blue bars). The data of 1997-

<sup>3</sup> Data from "Employed Population According to main Profession", *Inquiry to Employment*, Portuguese Statistics Yearbook, National Institute of Statistics, Lisbon, 2004



98 were combined with those of the 1999 evaluation. These different cycles are designated in the figures as E96, E98+99, E03 and E03ALs, respectively.

Figure 2 shows the evolution of the number of Full Time Equivalent (FTE) PhDs<sup>4</sup> in the Research Units, per scientific area, from 1996 to 2003.

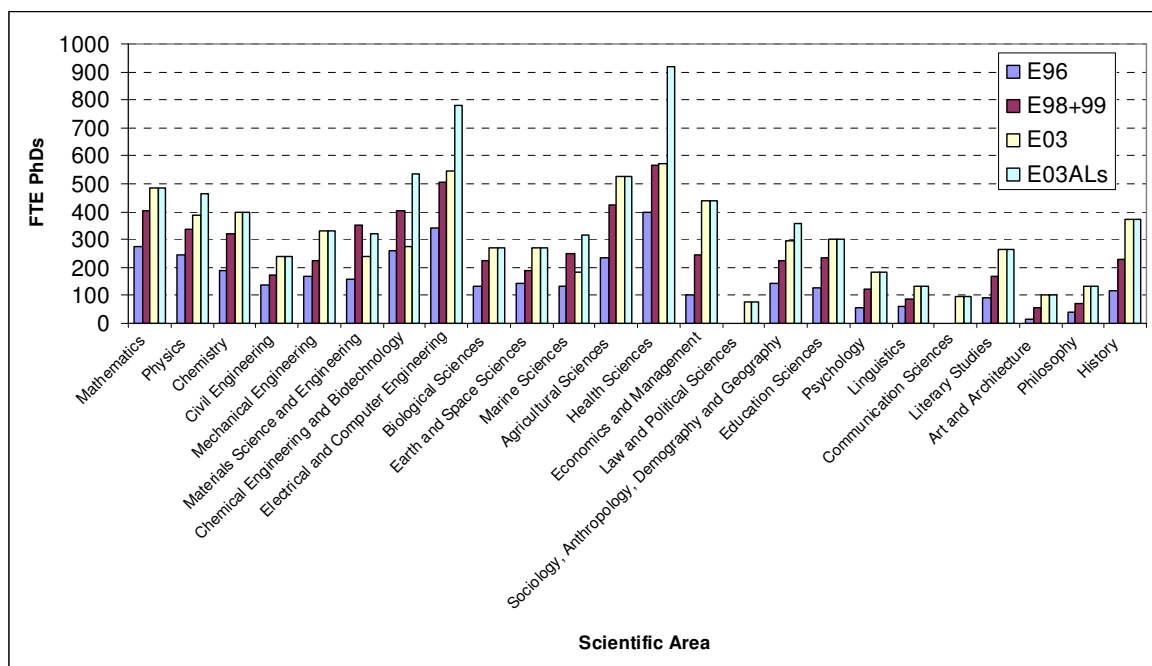


Figure 2. Evolution of the number of FTE PhDs in the Research Units from 1996 to 2003

Considering the 2003 data inclusive of the Associated Laboratories, it can be observed that the number of PhDs increases steadily, for almost all areas, from one evaluation to the other. Between 1999 and 2003, this general increase is particularly noteworthy for areas such as Philosophy, Art and Architecture, Economics and Management, Health Sciences, History, Sociology, Anthropology, Demography and Geography, Literature and Electrical and Computer Engineering, which grew 88.7%, 88.0%, 79.6%, 62.3%, 61.6%, 57.9%, 54.7% and 54.6%, respectively.

Figure 2 also reflects the heterogeneous distribution of the number of PhDs integrated in the 15 Associated Laboratories (AL) existing in December 2003 across the different scientific areas. This situation is further detailed in Table 5 that additionally presents the distribution of the number of Research Units (RUs) in which these researchers were integrated.

<sup>4</sup> The individuals whose percentage of time dedicated to a Research Unit was lower than 20%, contributed only partially to the number of its FTE PhDs; the contribution was calculated in the following manner: 15%, 10%, 5% and 0% of dedicated time corresponded to 3/4, 1/2, 1/4 and 0 FTE PhDs, respectively. Individuals connected to other institutions, such as State Laboratories or hospitals, were not considered.

**Table 5.** Percentage of Research Units and FTE PhDs involved in ALs in December 2003

Scientific Area	FTE PhDs	RUs
Physics	17%	15%
Marine Sciences	43%	18%
Health Sciences	38%	16%
Materials Science and Engineering	25%	8%
Chemical Engineering and Biotechnology	49%	19%
Electrical and Computer Engineering	30%	22%
Sociology, Anthropology, Demography and Geography	17%	8%

It is particularly striking to observe in Table 5 the proportion of AL researchers in the Chemical Engineering and Biotechnology, Marine Sciences and Health Sciences areas. However, it should be noted that some of these ALs resulted from the merger of Units that were previously classified in different scientific areas and, hence, these figures should be interpreted with caution.

The analysis can be taken a step further, by considering the data in Figure 3, which represents the evolution of the number of Research Units from 1996 to 2003.

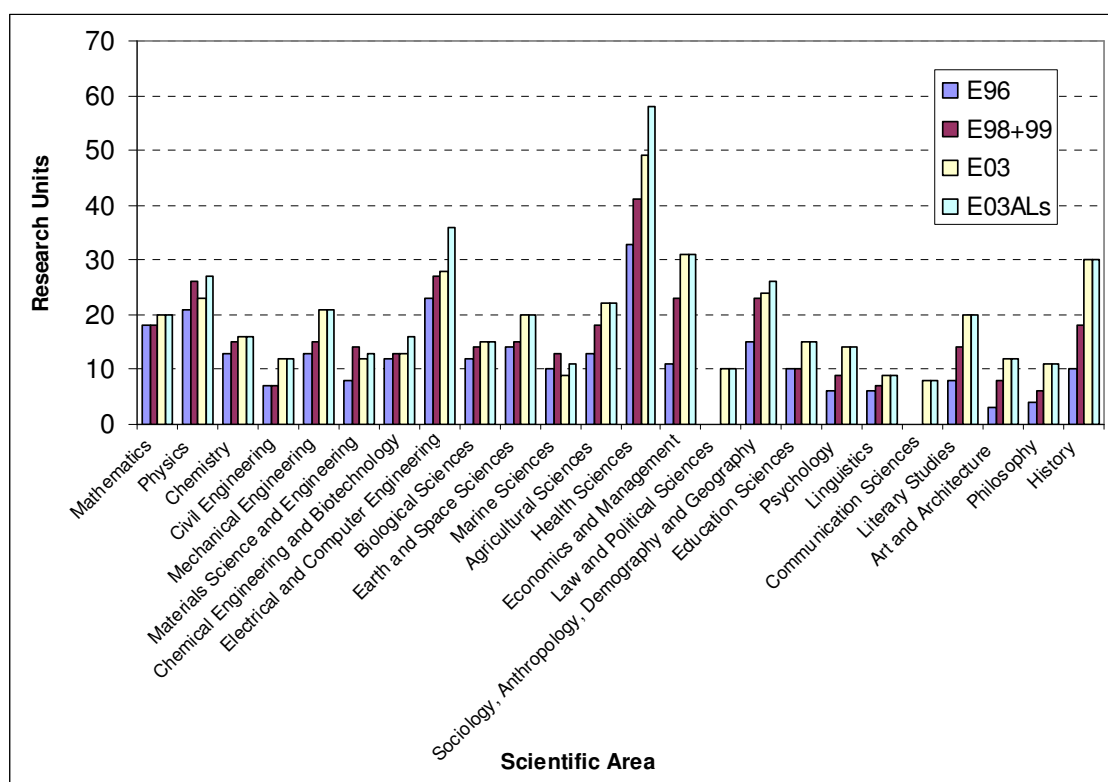


Figure 3. Evolution of the Research Units' number per scientific area from 1996 to 2003

Again, the growth in the number of Units in the Arts, Social and Human Sciences areas from 1996 to 2003 is evident, being particularly important in Art and Architecture, History and Economy and Management (300%; 200%; 182%). The distribution of the number of

Units integrated in Associated Laboratories is also not homogeneous, although the differences are smaller than in that case of the PhDs.

Crossing the data in Figures 2 and 3, it is possible to obtain the average dimension of the Research Units in the different areas, as shown in Figure 4.

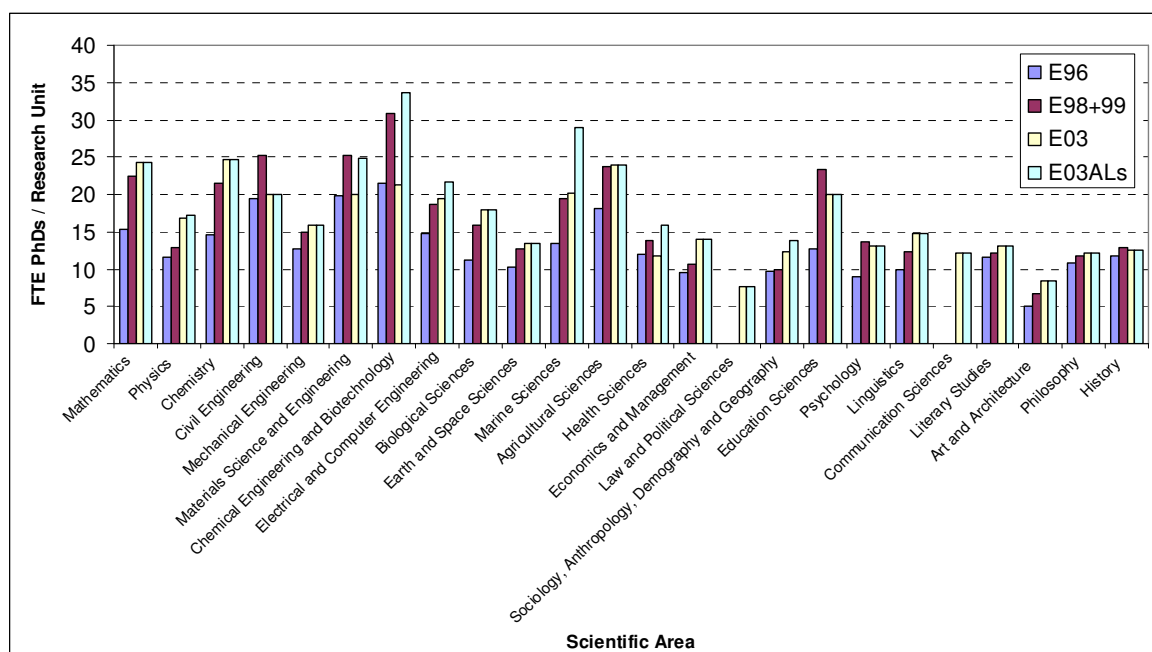


Figure 4. Evolution of the PhDs/Research Unit ratio per scientific area from 1996 to 2003

The steady increase in the PhDs/Research Unit ratio shown in Table 2 from 1996 to 2003 is also obvious in Figure 4. The areas with higher average ratios are, by decreasing order, Chemical Engineering and Biotechnology (34), Marine Sciences (29), Chemistry (25) and Materials Science and Engineering (25). Conversely, the areas with lower average ratios are Art and Architecture (8), Law and Political Sciences (8), Philosophy (12) and Communication Sciences (12), all Arts, Social and Human Sciences areas. It should be noted that two of these areas were evaluated and financed in 2003 for the first time.

#### *Regional distribution*

The territorial distribution of the Portuguese R&D system is not a well-studied subject, certainly not to a level commensurate with its importance as a driver of regional development and national cohesion. Thus, in the present text, an attempt will be made to give an idea of the distribution of PhDs and Research Units across the various regions (NUTS II). The former is shown in Figure 5, in absolute values and in percentage of the total number.

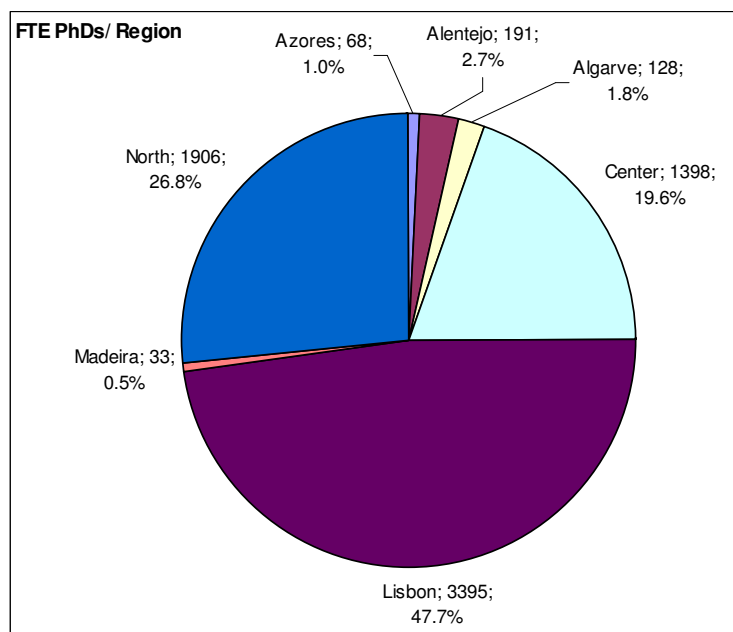


Figure 5. Distribution of FTE PhDs in the various NUTS II in absolute numbers and %

The correct interpretation of the data in Figure 5 needs additional information on the demographic and professional profiles across the various Portuguese regions<sup>3</sup>. That information is shown in Table 6.

**Table 6.** Distribution of the active population according to main profession

NUTS	Active population	High level civil servants, corporations' managers and upper technical staff	Scientists and other intellectual professionals
Portugal	5 118 000	427 600	371 500
North	35.0%	37.3%	26.4%
Centre	24.9%	16.8%	19.1%
Lisbon	25.3%	31.5%	42.6%
Alentejo	6.7%	7.1%	5.2%
Algarve	3.8%	5.4%	3.7%
Azores	2.0%	0.9%	1.1%
Madeira	2.2%	1.0%	1.9%

It is clear that the distribution of PhDs does not follow the distribution of the active population, but rather that of the scientific and intellectual professions across the different NUTS II. Close to 50% of the researchers holding a doctor's degree are concentrated in the Lisbon region, and there are significant unbalances relatively to the active population in all the other regions. There are also significant unbalances relatively to the regional distribution of PhDs in the different scientific areas, as can be concluded by inspecting Figure 6.

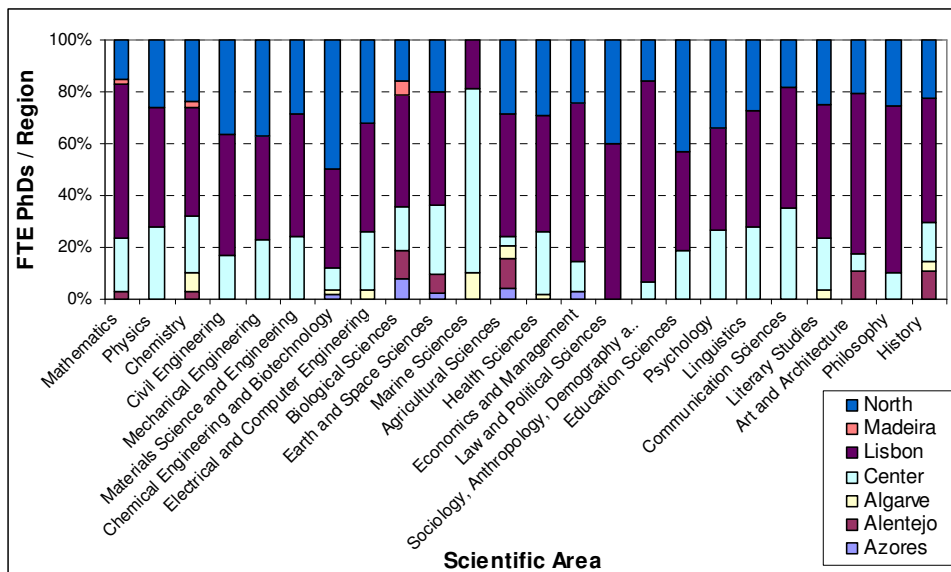


Figure 6. Regional distribution of PhDs in the different scientific areas

Again, it is clear the concentration of PhDs in a number of areas in the Lisbon Region. The unbalance is particularly serious (60% or more) in Mathematics, Economics and Management, Art and Architecture, Philosophy, and Law and Political Sciences, reaching a maximum of 77.4% in the Sociology, Anthropology, Demography and Geography area.

As shown in Figure 7, the distribution of Research Units by the different NUTS II follows the same pattern.

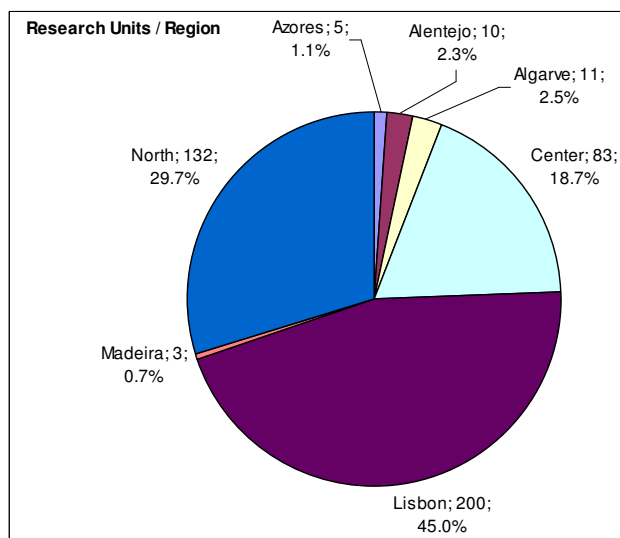


Figure 7. Distribution of the Research Units in the various NUTS II in absolute numbers and %

Again, the majority of the Units are concentrated in the Lisbon region, although the situation in this case is slightly more mitigated. Similarly to the regional distribution of PhDs, there are also significant unbalances in the distribution of the Research Units in the different scientific areas (see Figure 8).

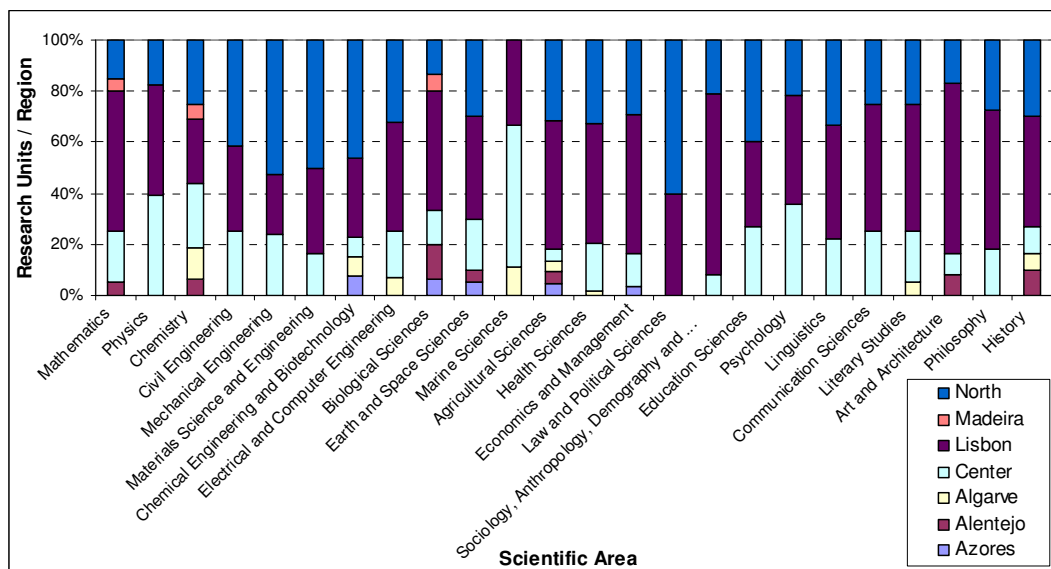


Figure 8. Regional distribution of the Research Units in the different scientific areas

Once more, there is a patent concentration of Units in a number of areas in the Lisbon Region. The unbalance is again particularly serious (50% or more) in Mathematics, Agricultural Sciences, Economics and Management, Art and Architecture, Literary Studies, Philosophy, and Communication Sciences, reaching a maximum of 70.8% in the area of Sociology, Anthropology, Demography and Geography.

#### *The overall performance of the Portuguese R&D system*

To finalise the analysis of the situation of the Portuguese Research Units at the time of the evaluation exercise, it is relevant to give an idea of their global performance and how it compares with that of their international counterparts.

Figure 9, taken from the OCTES (Observatory for Science, Technology and Higher Education) website<sup>5</sup>, shows the evolution of the number of publications authored or co-authored by Portuguese scientists from 1981 to 2004 (Sources: National Citation Report for Portugal / Institute for Scientific Information (ISI) – in dark blue - and ISI Web of Knowledge Platform – in red). From the data in the Figure, at the end of 2003, the 8 324 Portuguese PhD researchers were responsible for 5 484 publications, corresponding to a productivity ratio of 0.66 *publications/PhD/year*. Although the calculation did not take into consideration other PhD researchers not included in FCT Units, this value is already reasonably good<sup>6</sup>.

<sup>5</sup> OCTES website ([www.oces.mctes.pt/?id\\_categoria=11&id\\_item=81915](http://www.oces.mctes.pt/?id_categoria=11&id_item=81915))

<sup>6</sup> The EU-15 average for the period 1997-2001, as quoted in the Expert Report for the Trendchart Policy Workshop of June 2005, *Evaluating and Comparing the Innovation Performance of the United States and the EU*, by Giovanni Dosi, Patrick Llerenna, Mauro Sylos Labini, is 0.86 *publications/researcher/year*

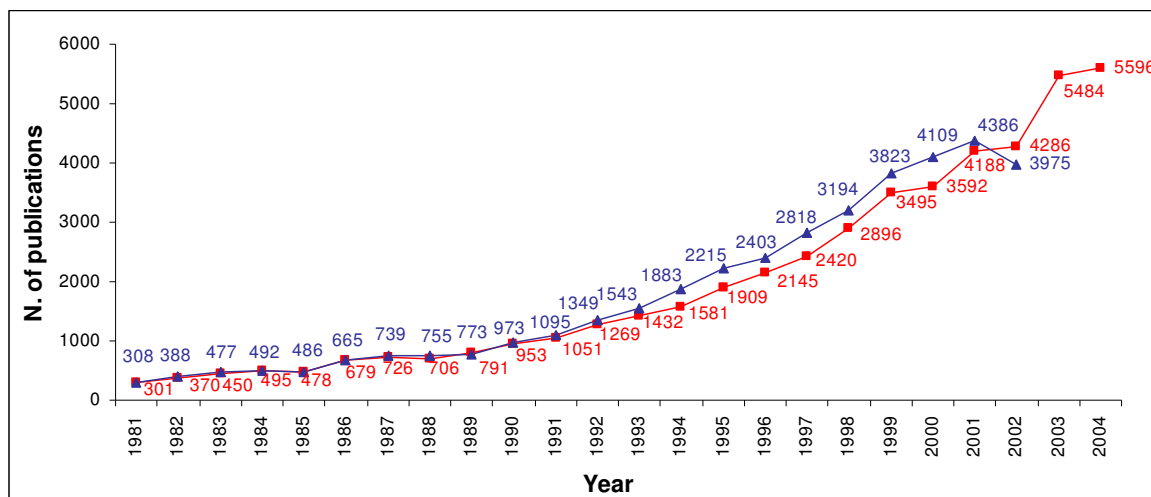


Figure 9. Evolution of the number of Portuguese authored publications from 1981 to 2004

### Conclusions

In summary, in the 2002 – 2004 evaluation the situation that the 24 Evaluation Panels encountered during the site visits to the Research Units could be characterised as follows:

- A global increase in the number of Units, as well as in their average dimension;
- A significant enhancement in the numbers of researchers and PhDs, leading to ratios at the national scale that were near the European ratios per 1 000 inhabitants;
- A serious deficiency in technical and administrative personnel, as well as equipment, which was approaching the limit of its useful life (or was already obsolete);
- A relative smaller dimension and maturity of the Arts, Social and Human Sciences areas that integrated fewer researchers, in fewer Units than the remaining areas;
- A clear territorial heterogeneity in the numbers of Units and PhDs, which were heavily concentrated in the Lisbon region, in almost all scientific areas, and specially so in Arts, Social and Human Sciences;
- A science productivity ratio – *publications per PhD, per year* – accounted by international databases, which was approaching the average of the EU-15 countries.

#### 3.2.2 Analysis of the reports of the Evaluation Panels

The Global Reports written by the Panels' coordinators of the 24 scientific Areas included in 2002 – 2004 Evaluation are presented in Part 2 of this volume. A synthesis of their main conclusions will be presented herein. Possibly the stronger impression that can be obtained by reading them is the belief that the evaluation process played a major role in the institutional consolidation of a culture of scientific rigour and quality in the Portuguese

Research Units. Also, and perhaps not surprisingly, there is a general agreement between the comments of the evaluators and the general conclusions of the previous section. Another general impression, common to various Panels, is the recognition of the **upward status of science in Portugal** in general, and particularly in some Arts, Social and Human Sciences areas. For example, the Philosophy Panel noted, *“Philosophy stopped being a purely individual activity limited to the reading and writing of author essays. Furthermore, philosophical research shows a healthy diversity in schools of thought and methodologies, its internationalisation continues at a pace no one could predict a few years ago”*. This is surely a quite positive result.

The Panels also noted that the Research Units have grown in dimension and maturity, reaching in some cases a true international level. However, multiple problems, of various natures, remain to be solved. One is the problem of **inefficient management**, referred by many reports. For example Education Sciences noted that *“on the basis of the deliverables provided for the Evaluation, the centres reached in the last three years a high degree of management ability, growth and scientific identity, showed by the teams' work; however, the growth, in terms of PhDs, projects, financing and publications, does not correspond to an equal growth of research maturity, resources management and research potential”*. This stems from a lack of professionalism of the persons that manage the Units, which, in addition, do not have adequate financial and administrative support. As the Materials Science and Engineering Panel states: *“The financial management of some Units is, at best, poorly professional and difficult to understand”*, a position with which other Panels concur. Another problem that amplifies this one results from the fact the Directors of most Units are senior staff members of Universities, which do not have the capacity, or are just too busy, to be adequate leaders. As a consequence, many Units do not have inner coherence, clear objectives or a sense of mission. A significant number of Panel reports address this subject, some of them quite drastically. An abridged sample follows. Health Sciences: *“Science in Portugal is dominated by a few key figures, which frequently run large programs and participate in many governmental advisory committees; efforts should be made to include a broader spectrum of young scientists in centre management”*; Electrical and Computing Engineering: *“With some very good exceptions, the management of the Units is weak and lacks strategic vision .... FCT should consider ways to strengthen the management of the research Units”*; Economics and Management: *“Several Units include a relatively large number of senior researchers who do not have much recent research productivity and who, in practice, are important decision-makers in terms of the allocation of resources”*; Psychology: *“Centres' directors often cumulate simultaneous charges. FCT might consider recommending limitation of this and years in*



*charge*". The Health Science coordinator adds to this list the American view in these matters: *"Tenured professors should be reviewed periodically and encouraged to pursue their own research or at least to stimulate research within their departments: tenure should apply to professorships and not to chairmanships"*.

One of the most interesting statements, again from the Health Sciences Panel, explicits the reason for the existence of a Unit: *"one reason to form a Unit is to provide improved means of communication among researchers, if this does not happen the Director must implement measures to solve the problem"*. Adds the Biological Sciences Panel: *"(In some cases) there is no co-authorship or collaboration among members of same Research Units; directors must build in measures to solve this problem"*.

The obvious overall conclusion is that, in the evaluators' view, a substantial change in management practices is called for. The Foundation for Science and Technology should thus **define a clear set of management rules** at the earliest opportunity and make the Research Units abide by it.

Another significant constrain to the proper management of many of the Portuguese Research Units is the fact that their researchers are mostly staff of their host institutions, the Universities. This brings two kinds of problems. On the one hand, a significant part of the time of the Units' members is occupied with University affairs, namely teaching. Junior members, often the more scientifically productive ones, normally have **heavy teaching loads**. On the other hand, there is a tendency for some Centres' to **duplicate the structure of specific Departments**. This carries to these Centres most of the Departments' problems, such as few or none personal mobility, inbreeding and few reasons to struggle for higher achievement. The Panels' reports pinpoint these problems accurately. For instance, for the Mathematics' Panel *"all Research Units in mathematics are strongly associated with universities, and salaries of researchers depend exclusively on their teaching duties; universities should introduce rotating teaching positions to be occupied based solely on research merit"*. Also for the Physics Panel: *"The prevailing system of management, recruitment and policy development in the universities needs to be reformed to provide (inter alia) a better environment for research."* The evaluators in Economics and Management consider that Units members suffer from *"heavy teaching and exam loads, high numbers of administrative responsibilities, lack of flexibility in compensation, inadequate academic promotion policies, and inbreeding"*, and hence *"university departments may use smaller teaching loads to provide incentives"*. It is, thus, not surprising the somewhat understated conclusion of the Literary Studies Panel that

*“clearer distinctions between Research Units and hosting institution might worked more positively for some Units”.*

However, other panels, such as that of Sociology, also regret that Universities do not take a closer look on the performance of the Units to which they are connected: *“the diversity in the quality of Research Units, sometimes hosted by the same University, is difficult to comprehend ... universities should monitor and evaluate the performance of their own centres, as the bad performing ones negatively affect their reputation”.* One efficient way to promote the institutional monitoring, linking it with the present FCT evaluation system, was suggested by the Law and Political Sciences Panel: *“Research Units should be integrated in the evaluation of the University they are associated with, to optimize the capacities of teaching, investigation and research coordination, with the consequent definition of responsibilities”.* The Mathematics Panel adds further arguments: **“Evaluation of universities and research centres should not be dissociated.** *An articulation of the two exercises is crucial so as to guarantee that the criteria, standards and guidelines are compatible”.* The evident merit of this suggestion warrants an articulation between FCT and the entity responsible for the Universities’ evaluation (up to the moment the Foundation of Portuguese Universities).

On top of that, the Research Units also suffer from structural deficiencies, in spite of the fact that some infrastructures, namely the facilities, buildings and laboratories, have improved substantially since the last evaluation. The worst deficiency is by far the **scarcity of support personnel**, administrative and, above all, technical. Almost all Panels, one way or another, mentioned that lack of technical support was a huge problem. However, as stated in the Chemical Engineering and Biotechnology Panel, *“laboratory leaders no longer believe that this can be solved via FCT”.* Indeed, due to the permanent and structural nature of this problem, it is evident that FCT cannot solve it alone. A sustainable solution could be found in a partnership between the Units and the host institutions. However, FTC may also play a role by launching a specific national programme to hire this kind of personnel, as pointed out in the Physics Panel report.

The second major deficiency, as mentioned by a number of Panels, Materials Science and Engineering, Physics, Sociology, Linguistics, Biological Sciences, Earth and Space Sciences and Marine Sciences, is the **relatively bad conditions of the equipment**, namely the most sophisticated one, which was nearing, or had already surpassed, the limit of its useful life. There was a clear need for equipment upgrading at national level, a problem that FCT had already begun to tackle at the time of the evaluation, by launching the National Programme for the Renewal of Scientific Equipment.

Extensive **thematic dispersion** was observed in a significant number of the Units visited, and in some cases there were at least as many subjects as permanent staff. This may satisfy individual ambitions but is not really compatible with a common focused goal for a Unit. As discussed before, part of this lack of focus stems from the confusion between Departments and Units. However, Units' leaders are also responsible for it. In some Units there is a significant **internal heterogeneity in scientific productivity** too. A number of Panels issued comments cogent to this issue, among them, the Civil Engineering and the Chemical Engineering and Biotechnology Panels. States the former: *“Yet another cause for insufficient levels of performance is the tendency to address a too large number of research topics at group level. Only one or two researchers per topic are found frequently. This questions the strength and the suitability of the research topic. It is difficult to perform well at international research level without continued attention and effort focused on few and adequately selected topics....This degree of heterogeneity is indeed stronger at unit level. Units can produce excellent work in some aspects and be completely inactive in other”*. To achieve international recognition, the Units should clearly focus on fewer and adequately selected topics and for that the Unit's director should address the fundamental questions of mission, organisation and strategic long-term planning. There is clearly here a need of leadership.

Indeed visionary leadership is necessary to overcome still important obstacles, across all areas that hinder the way to scientific excellence. It is possibly useful to recollect what the expression really entails and in what context it should be considered. Quoting one of the Panel Coordinators: *“The objective of R&D activities is the advancement of knowledge, that is, research that adds to the stock of knowledge, is well-published, and can be verified and reproduced by the best researchers in the world in that field”*. Often *“this translates almost entirely into publications in a well-defined and well-established hierarchy of international journals. Publications in these journals provide an assurance that the result is a true advance of knowledge because it is evaluated by well-reputed referees”*.

With this frame of mind, it is now possible to discuss the barriers to scientific excellence. One of them is **low scientific productivity**. In this case, the opinions of different Panels are clearly revealing. The Civil Engineering, Materials Science and Engineering and Agricultural Sciences Panels concluded that in near all Units a few researchers still publish almost nothing, and propose that, to remain members, they should publish at least one paper per year in international journals. The Mathematics Panel, concurring, insisted that: *“members who have not published a paper in an international refereed journal within the last three years be (temporarily) removed from the membership list; doing otherwise*

*will bring discredit to the Centre and it will necessarily hurt its ranking*". This situation is not specific to the Engineering and Exact and Natural Sciences areas, as reflected in the opinion of the Psychology coordinator: *"With a few praiseworthy exceptions, the level of publications does not match what one would expect; the number of papers published in international journals with peer review is low and sometimes nil"*. As the evaluators commented that many of these remarks had already been done in the reports of the 1999 Evaluation, FCT should consider this issue carefully.

The second major barrier to scientific excellence, that exacerbates the first, is the **deficit of internationalisation**. Although also general, this problem seems to be more significant in the Arts, Human and Social Sciences areas. It even seems to be critical in some cases, as for example, in the new Units that applied for FCT recognition in Communication Sciences: *"if the expectation that applicants should have a record of publication in international peer refereed journal was taken inflexibly, it would rule out most of them immediately"*. This led to several recommendations from a number of Panels. For instance, the Literary Studies Panel proposed that *"FCT should make mandatory the selection of a truly international editorial board for Centres journals and external refereeing of contributions of its publications; furthermore, the international publication of Portuguese scholarship (including competent translations) should be financially supported"*. The Linguistics Panel, recognizing that the *"Linguistic community's overwhelming scientific production is in Portuguese with very limited impact outside the Portuguese or Spanish speaking scientific community"*, specifically recommends the creation of a temporary program of rewards for publications in international peer-reviewed journals to increase the international visibility of the Portuguese research in Linguistics. It also suggested that *"an important issue might be the creation of an International Journal of Portuguese Linguistics, with international peer-reviewers and published in English"*.

However, the importance of studies focusing specifically in the Portuguese situation was also often recognized. The Sociology Panel reflected that: *"although important, the international dimension, should not exclude the study of the Portuguese social and cultural context; Portugal has a lot to offer to sociological knowledge, namely due to its links to Africa and Latin America"*. The Biological Sciences Panel was also of the opinion that *"due to the unique Ecology of the Iberian situation, Portuguese ecologists ought to be in a prime position to contribute to major international trends on biodiversity and evolutionary processes"*. Obviously, this does not preclude the publication of the resulting studies in international journals.

Giving the importance of these recommendations, particularly in specific scientific areas, the Foundation for Science and Technology might well consider taking action at the national level. It might also consider sending to specific Units the pertinent ones, together with that of a minimum publication threshold, referred to above.

Another topic that is treated transversely in most of the reports is the balance between **R&D activities and their social and economic impact**. In this regard, the view of the Chemical Engineering and Biotechnology Panel is surely provocative: *“In general, throughout Europe the laboratories which ensure a healthy financial situation are those which have attained high levels of scientific excellence and only rarely has contract-based research led to the emergence of scientific excellence. .... Usefulness should not be confused with scientific excellence. In a similar manner, some of the applied research programmes presented were not realistic within an industrial context and it is difficult to see what motivation exists for this applied but not applicable research effort”*. The notion that Units should first attain an internationally recognized level of scientific activity and then apply the knowledge acquired to the promotion of societal development is certainly challenging, in special in the Engineering and Exact and Natural Sciences areas. One thing does not preclude the other, as the coordinator of the Physics Panel ironically remarks: *“It is not an easy path to tread, and so will always remain the pursuit of a few enterprising and dauntless individuals. Therefore it should not be seen as subverting the overall academic ethos; if the Cavendish Professor in Cambridge can do this, why not the others?”*

The immense benefits in maintaining contacts with industry are recognized by many Panels, but many also consider that they should be strictly controlled. The equilibrium between the two activities is not always easy to achieve, and it sometimes seems to shift to one side, like in Civil Engineering and Agricultural Sciences, and sometimes to the other, like in Materials Science and Engineering where *“the researchers expressed the view that companies do not pay attention to this issue”*, the usual argument of scientific autism. In other areas, like Electrical and Computing Engineering, the Panels concluded that *“collaboration with industry is still not very relevant, but starting to emerge”*. No reference to this topic appeared in the reports of the Arts, Human and Social Sciences areas. This is somewhat surprising, as some coordinators, such as that of Literary Studies, consider that *“it is simply not true that the literary studies field doesn’t require a lot of money to thrive”*, and then expounds a number of cogent arguments in defence of more financial support. One would think that services to the society could provide at least part of the needed funds.

In summary, the idea of a rather restricted interaction of the Research Units with the economic fabric that ultimately supports them emerges from many Panels reports. This could indeed represent a structural characteristic of the Portuguese R&D system. However, it may also partially result from the minimization of existing activities by the Units' directors, believing that they would not enhance their ratings. As discussed ahead, a deeper understanding of this situation should carefully be considered by FCT in future evaluation exercises.

Another issue addressed by some Panels in the Arts, Human and Social Sciences is the territorial heterogeneity in the Research Units distribution and in their scientific development. Namely the Sociology Panel claims that there is a “*need for a national policy to create and reinforce peripheral Research Units which have a catalytic role in regional development*”. For the Philosophy Panel “it is not accidental that the four Centres considered excellent belonged to Universities in Lisbon, Porto and Coimbra”, however there is also “*research done by small teams outside Lisbon and Porto; the panel valued this tendency for decentralization*”. Although the statements on this topic are not very extensive, they are strongly highlighted by the information presented in section **3.2.1**.

All the above considerations call for a **decisive leadership** by FCT, to put into practice, at national level, the proposals of the Panels, in all scientific areas. To that effect, a series of recommendations of a more strategic nature abstracted from the area reports will be presented herein in an adapted form, listed by topic:

*National policies:*

- To guide further scientific development a *national research council*, including distinguished research leaders and members from the corporate world and other countries, would be valuable (Physics)
- The erratic nature of the funding available to FCT creates problems not only for the Portuguese scientists but also for the evaluators; this subject should be addressed by the appropriate entities of the government of Portugal (Health Sciences)
- It is necessary a better and regular articulation between FCT, GRICES and the OCTES (History).

*Continuous monitoring:*

- Several of the measures recommended by the reviewers in 1999 were not yet implemented by FCT at the time of the next evaluation (History)

- Several Units necessitate monitoring and even, in certain cases, a site visit, before the completion of the period in-between evaluations (History, Health Sciences)

#### *National Facilities:*

- Some centres are responsible for valuable collections (herbaria, botanical gardens, fungi archives), and it is recommended that FCT find a sustainable solution for the maintenance of these facilities (Biological Sciences)
- It is necessary to establish a national policy for ocean data and information, supported by data centre/ databanks (Marine Sciences)

#### *Conclusions*

As remarked in one of the Panels' reports, bad news are always more interesting than positive ones. Similarly, the points discussed above deal mainly with problems, difficulties and flaws. This is only a partial picture that does not tell the whole story about evaluation procedures and the status of scientific research in Portugal captured by reading all the reports.

Whatever their imperfections, FCT assessment procedures have the merit to exist and are now generally accepted by the scientific community. Portuguese research has undoubtedly progressed in recent years, to an important extent as a consequence of FCT incentives. Globally, Portuguese researchers were able to adapt to the increasing quality standards of the international scientific community. Overall, the research centres are doing well, although important differences still exist between a few truly excellent ones, some very good and good ones, and some really poor. Also, major deficiencies are still found in scientific equipment and technical personnel. Hence, to boost research in Portugal beyond the excellence threshold, a general effort should be made to improve a number of critical issues, namely the publication policy and the international dimension of the research. The structure of the centres and the funding rules should also be revised, to avoid rewarding unproductive members. If FCT gives due consideration to the recommendations present in the Panels' reports, implements rules to improve the centres' leaderships, and does the required investments to overcome the infrastructural deficiencies still found nationally, the Portuguese research centres as a whole will surely reach and maintain a truly international scientific status. Last but not least, proper attention should be given to an important recommendation of the Physics Panel:

*"We believe that it would be desirable for the Evaluation process to be informed by a sense of national strategy, e.g. from some Research Council of FCT, or other government*

*body. Such a council could also advise and coordinate the various institutions, in guiding their research and recruitment strategies, without compromising their independence. It might include distinguished leaders in research in Portugal, together with some others from other countries and from the corporate world.*

*By this means guidance could be given, as to which activities having reached a reasonable limit, which are missing or serious sub-critical, and what strategic objectives are being set for the future. This might find expression in targeted funding. This is sometimes seen as a threat to independent basic science, and it can be so if pursued to excess, but a modicum of justified targeting belongs within any rational strategy.”*

### 3.3 Analysis of the Evaluation results: global and per scientific area

In this section the results of the evaluation exercise 2002-2004, will be presented and analysed, globally and per scientific area. The analysis will compare the results with those of the previous evaluations. As described in Section **3.2.1**, these are the 1996 Evaluation, the combination of the 1997-98 and 1999 evaluations and the 2002-2004 evaluation (the focus of the present report), designated as E96, E98+99 and E03, respectively. Since Law and Political Sciences and Communication Sciences were assessed for the first time in this exercise, it will not be possible to view the chronological evolution of these two scientific areas.

As referred to in Section **3.1**, the Research Units integrated in Associated Laboratories (ALs) before 2002 were not included in the 2002-2004 evaluation. This fact would inevitably affect the results of the areas listed in Table 5, all of which had some percentage of Units and FTE PhDs involved in Associated Laboratories. Since only Units rated *Very Good*, or better, were allowed to integrate ALs, their exclusion would have a negative impact on the evaluation results, especially in the areas where that percentage was higher. For that reason, the data corresponding to the Units integrated in Associated Laboratories were also considered in the analysis performed in this section. In any case, due to the distinct nature of the areas studied and to possible variations in the criteria used by the different evaluation Panels, the comparison of the three evaluation cycles should be done carefully.

#### 3.3.1 Analysis of the Classifications

Figure 10 depicts diagrammatically the distribution of the overall classification of the Research Units in the three evaluation cycles.



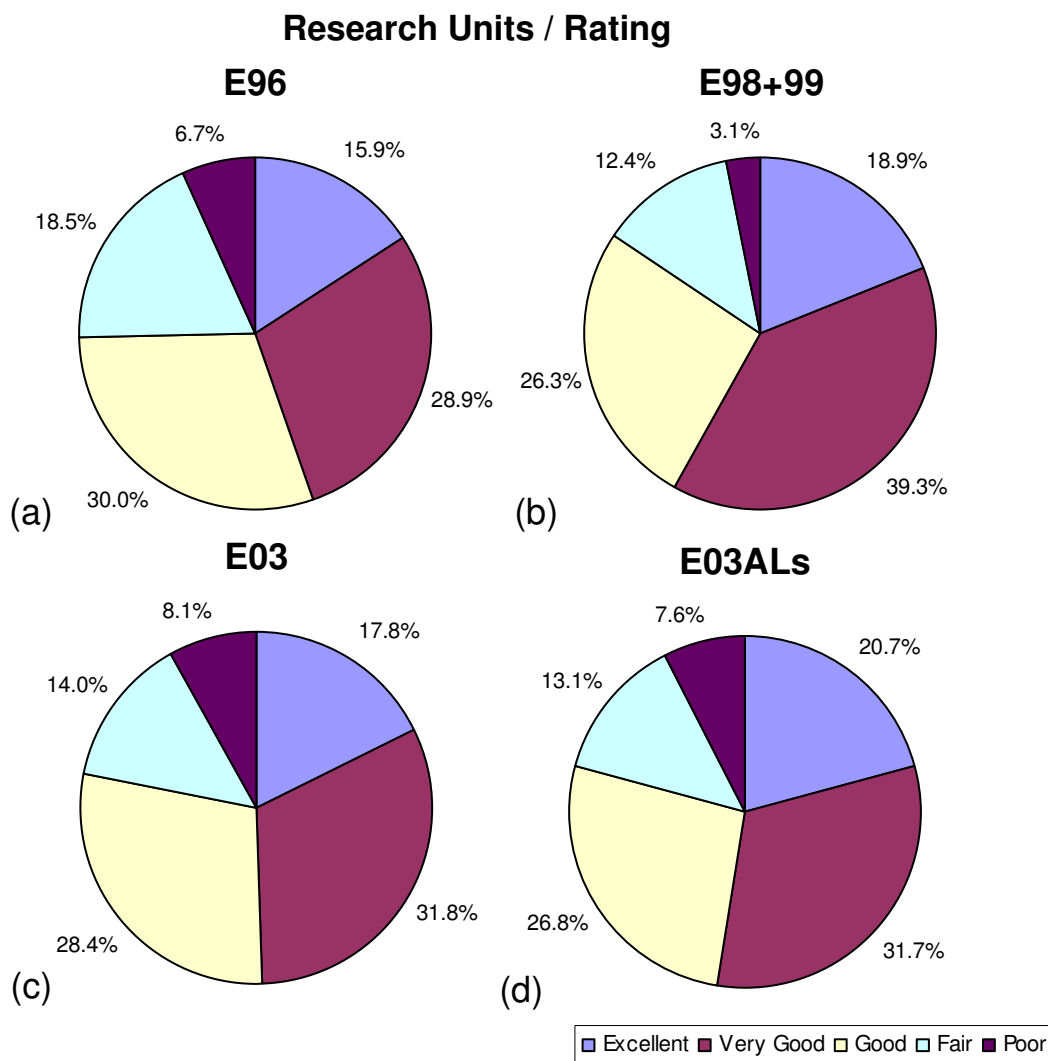


Figure 10. Distribution of Research Units per ratings in the three evaluation exercises. (a) 1996; (b) 1998+1999; (c) 2003; (d) 2003 + PhDs integrated in ALs

It can be concluded that, after a significant increase of the number of Units in the two upper groups of the ratings between 1996 (Figure 10-a) and 1999 (Figure 10-b), with 44.8% and 58.2%, respectively, in 2003 there was a decrease in the proportion of Units in those groups to 49.6% (Figure 10-c). Figure 10-d includes the Units integrated in Associated Laboratories, assuming a classification equal to that obtained in the previous evaluation exercise. It is evident that there is an attenuation of the differences between E98+99 and E03, confirming that this decrease was partially a consequence of the migration of some Research Units to Associated Laboratories. However, probably the more remarkable aspect of the data presented in the figure is the proportion of the Units rated as *Excellent* or *Very Good*. It was close to, or even above, 50% in all evaluations. This is certainly not the norm in other European countries and may reflect an overall attitude of benign complacency of the Evaluation Panels. This situation is not really necessary and should be carefully looked upon by FCT in future evaluations.

The impact of the migration of some Research Units to Associated Laboratories is still higher when the distribution of FTE PhDs per rating is analysed (see Figure 11). In this case, considering the PhDs integrated in Associated Laboratories, the situation in 2003 is even slightly better than in 1999.

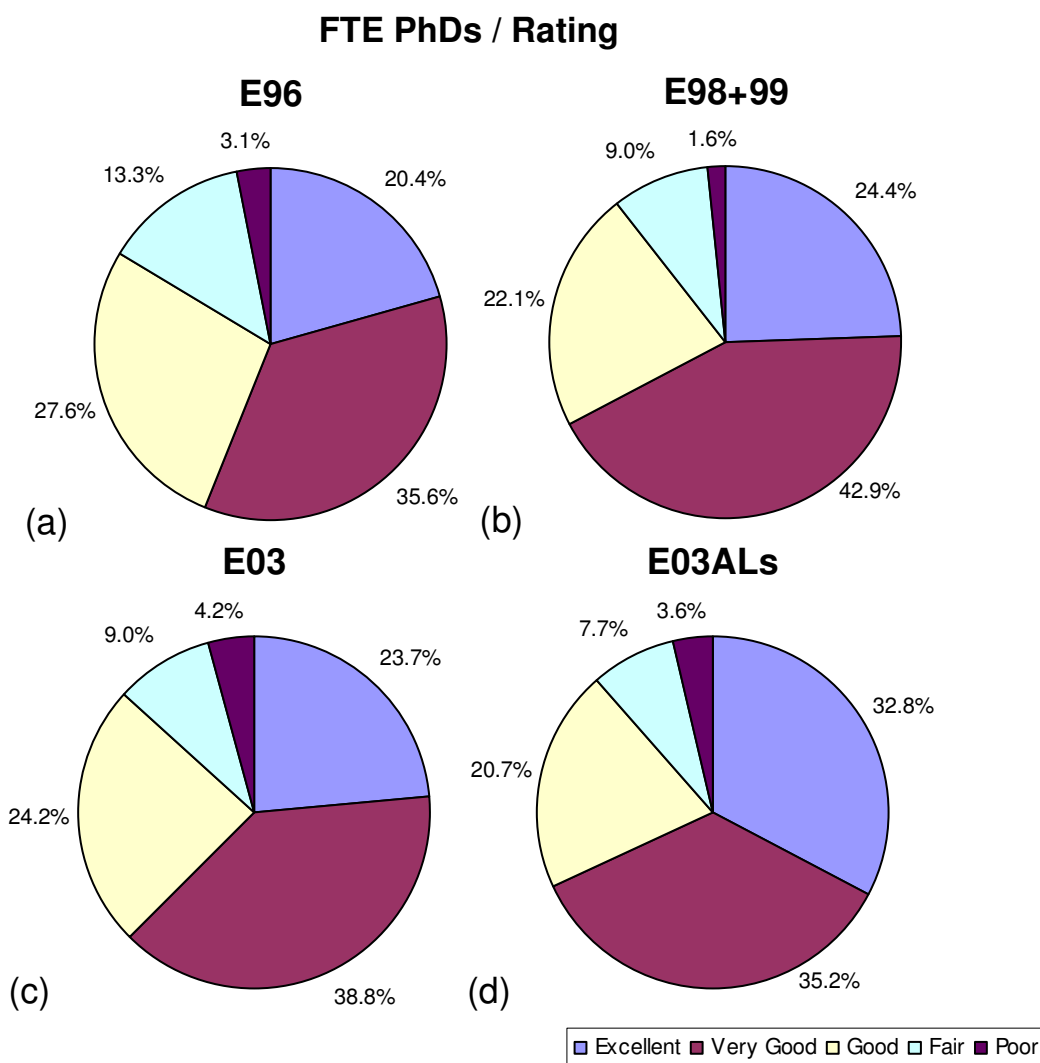


Figure 11. Distribution of FTE PhDs per ratings in the three evaluation exercises. (a) 1996, (b) 1998+1999; (c) 2003; (d) 2003 + PhDs integrated in ALs

In Figure 12, the 2003 ratings' distribution is depicted separately for old (already existing) and new Units. In this case, it makes no sense to include in the Figure information corresponding to the Units integrated in Associated Laboratories. From the data portrayed in the Figure, it can be concluded that the performance of the old Units is significantly better than that of the new ones. In fact, 58.6% of the former were classified as *Excellent* or *Very Good*, whereas only 25.5% of the latter obtained those ratings. Besides demonstrating the existence of a learning curve, this might also reflect the positive impact of the current model of evaluation and funding on the Centres' performance.

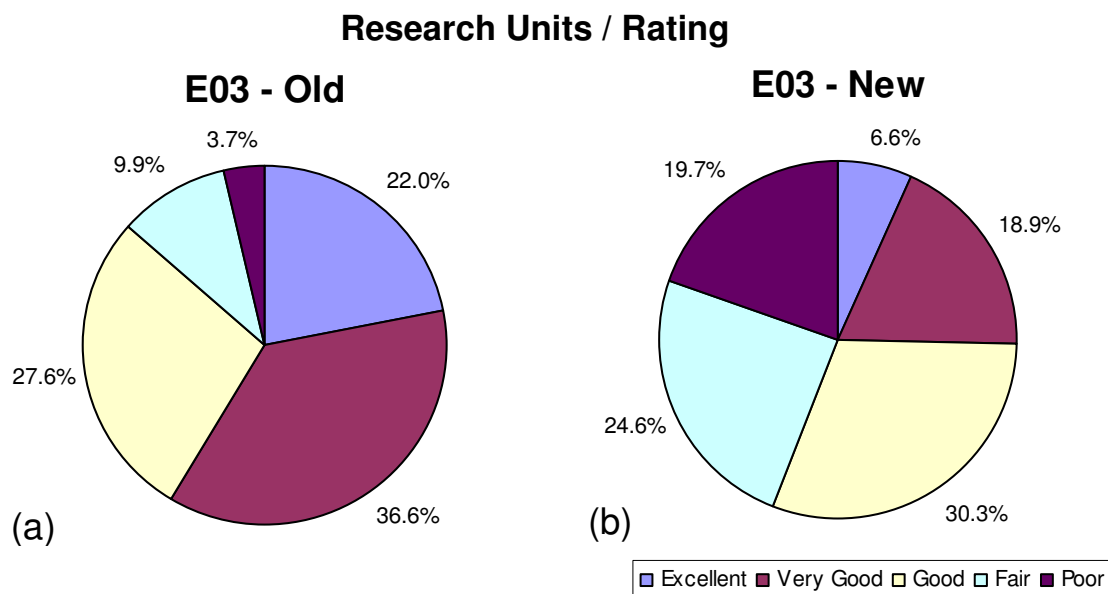
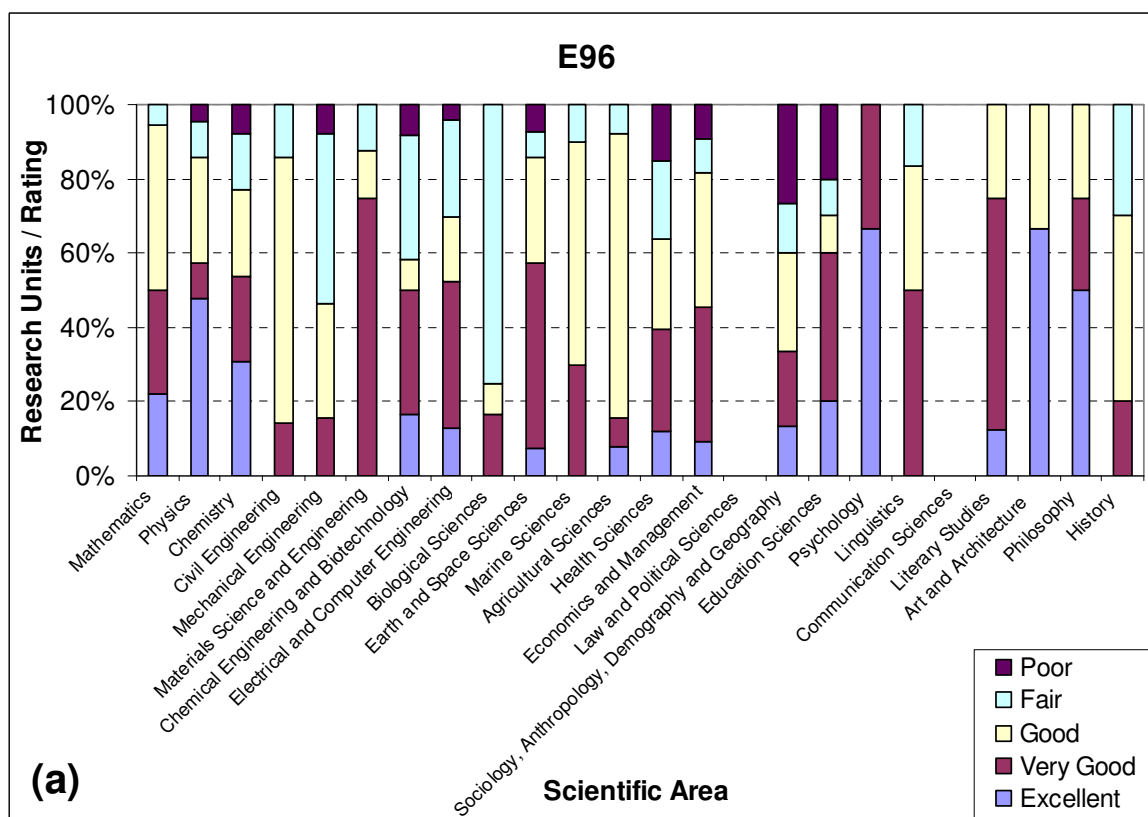


Figure 12. Distribution of Research Units per ratings for old and new Research Units.

The distribution of the Research Units per ratings and scientific area is shown in Figures 13 (a) to (c). For obvious reasons again, the figures corresponding to the Associated Laboratories are not included in this analysis.



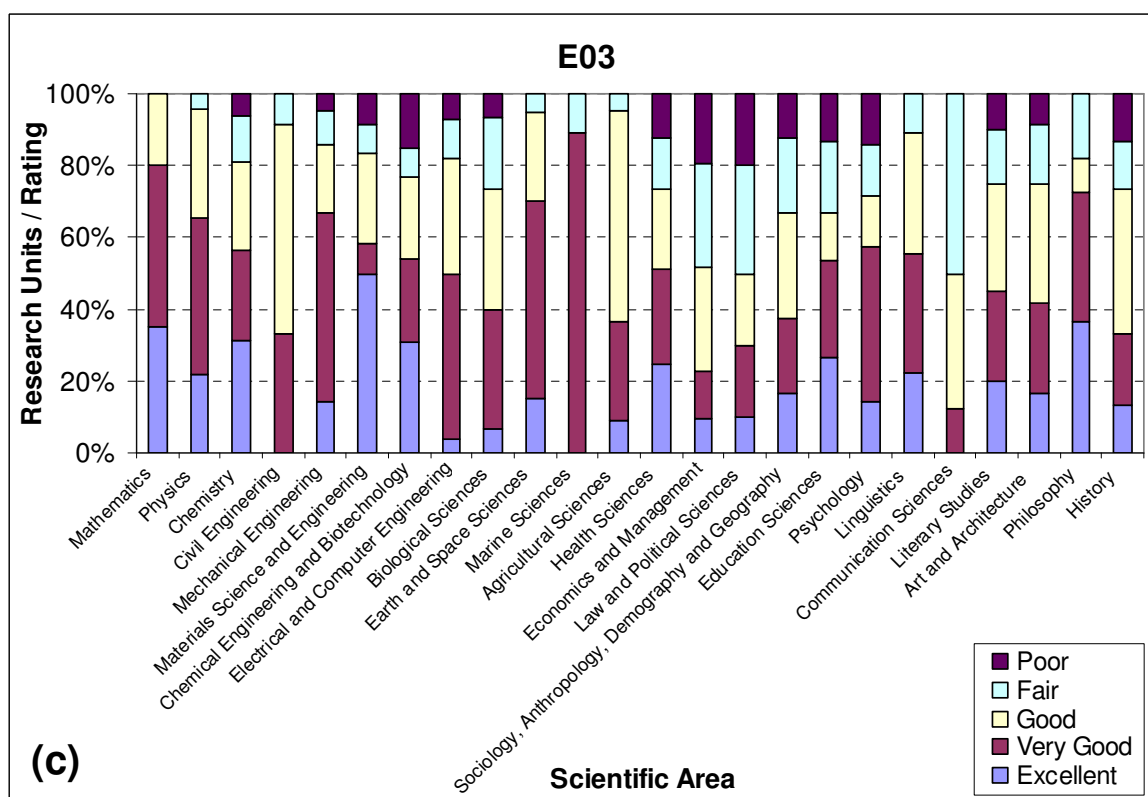
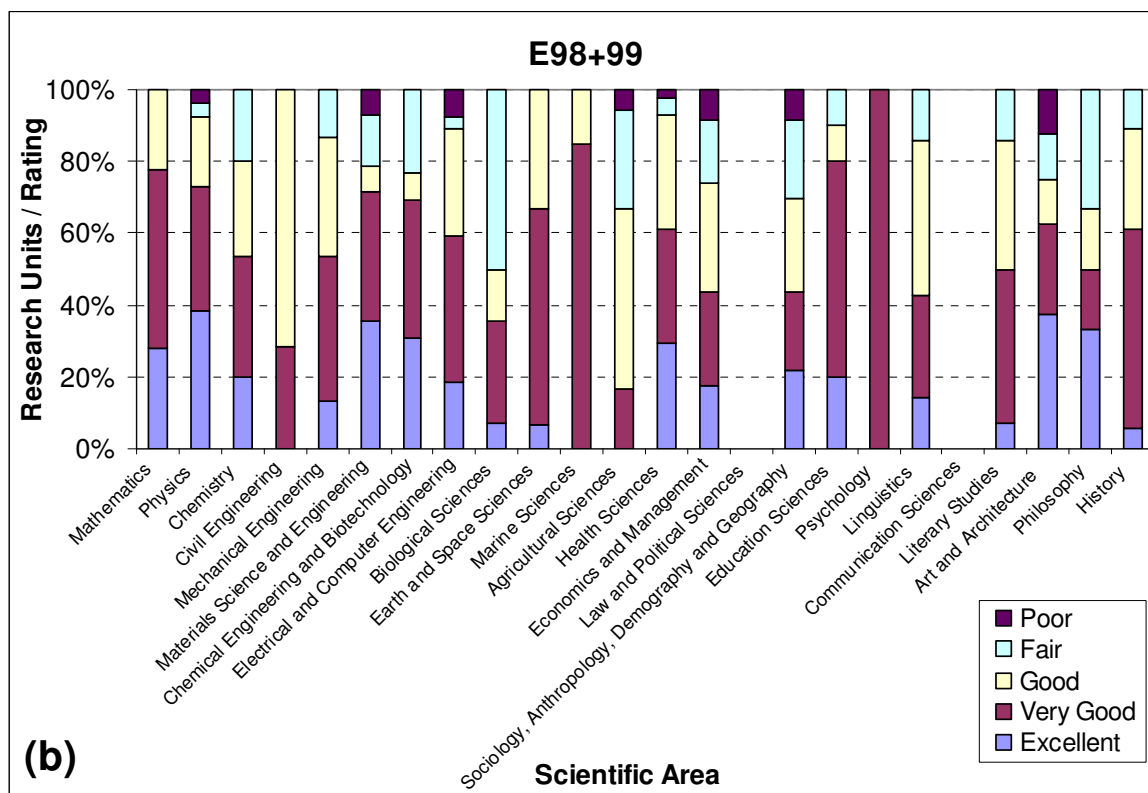


Figure 13. Distribution of Research Units per ratings and scientific area in the three evaluation exercises. (a) 1996, (b) 1998+1999; (c) 2003

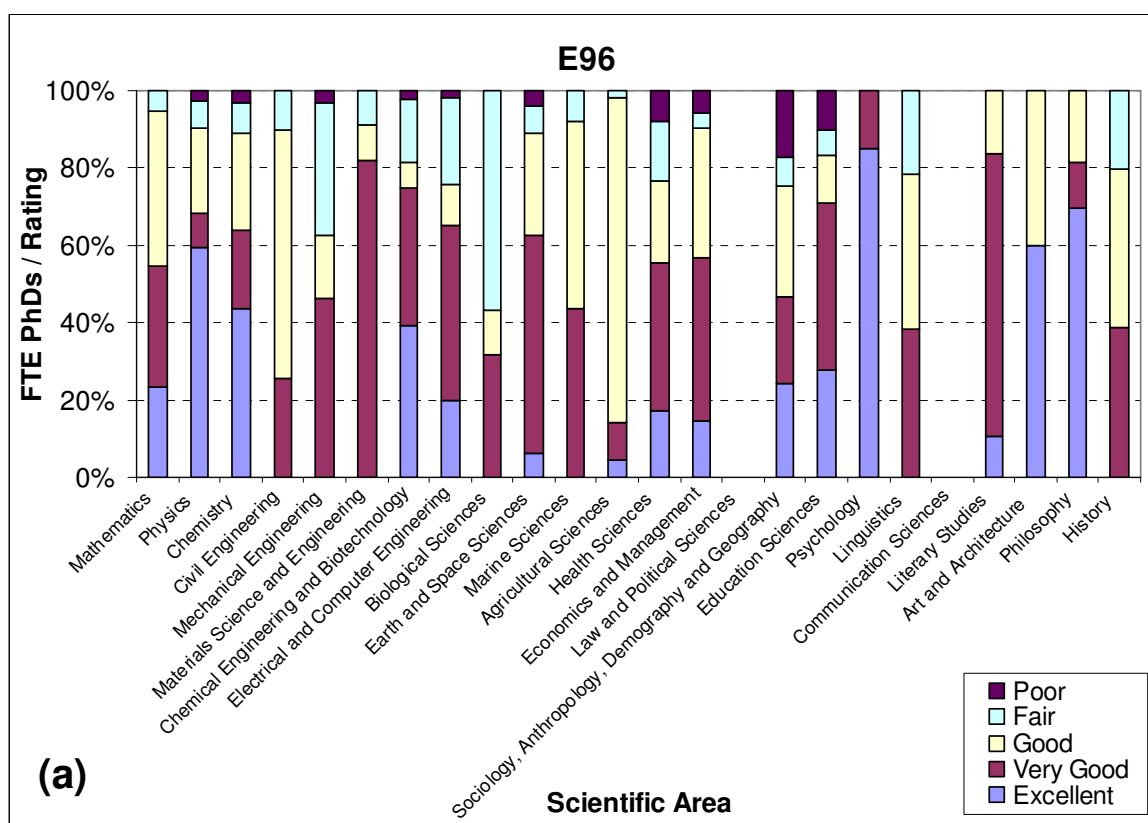
A careful observation of the evolution of the distribution of the Research Units' ratings, shown in Figure 13, allows the identification of four different types of situations:

- Areas that after an effective overall improvement in ratings between 1996 and 1999, seem to have stabilised between 1999 and 2003; these comprise Mathematics, Biological Sciences, Earth and Space Sciences, Marine Sciences, Mechanical Engineering and Civil Engineering. From this group it is worth mentioning the positive performance of the Marine Sciences area, which, in spite of having a significant migration of Research Units to Associated Laboratories (as shown in Table 5), was able to preserve the previous evaluations' ratings. Indeed, the overall rates in this area in the last evaluation are somewhat puzzling with near 90% of the Units classified as *Very Good* (see Figure 13 c). In the Biological Sciences and Mechanical Engineering areas there was an effective and constant reduction of the Units classified in the lower end of the ratings, whereas in the remaining areas the increase in the Units classified as *Excellent* or *Very Good* was followed by a reduction in the number of those classified as *Good*.
- Areas that after an effective overall improvement between 1996 and 1999, had a major drop in the top ratings between the 1999 and 2003 evaluations, namely Physics, Health Sciences, Chemical Engineering and Biotechnology, Electrical and Computer Engineering, Sociology, Anthropology, Demography and Geography, History and Education Sciences. This group comprises five of the seven scientific areas with Units integrated in Associated Laboratories, an additional confirmation of the negative effect, in terms of ratings, of the migration of Units to Associated Laboratories. In relative terms, the Chemical Engineering and Biotechnology and Electrical and Computer Engineering areas had a slightly better performance as the number of Units classified as *Good* increased.
- Areas that had a negative evolution in both periods, namely Materials Science and Engineering, Economics and Management, Literary Studies and Art and Architecture. In this group, only the Materials Science and Engineering area had a reasonable increase in the number of Units rated as *Good*.
- Areas, such as Chemistry, Linguistics and Philosophy, that had a negative evolution between 1996 and 1999 but improved their performance in the last period, resulting in a small global variation between 1996 and 2003. From this group it is worth mentioning Linguistics and Philosophy, which had a quite appreciable evolution between 1999 and 2003.

Some areas showed a performance that could not be aggregated to that of the remaining ones. For instance, Agricultural Sciences had significant improvements between 1999 and 2003, whereas Psychology had a huge drop in the same period. In the latter case this is probably just a natural adjustment, as the 1999 ratings were again out of the norm (100% of the Units rated as *Very Good*).

The areas assessed for the first time in the evaluation exercise object of this report, Law and Political Sciences and Communication Sciences, obtained overall ratings considerably lower than the total average. This fact, as referred to before, may be explained by the significant percentage of new Units included in these areas, 80% and 63%, respectively.

The distribution of the FTE PhDs 'per ratings and scientific area is portrayed in Figure 14 (a) to (c).



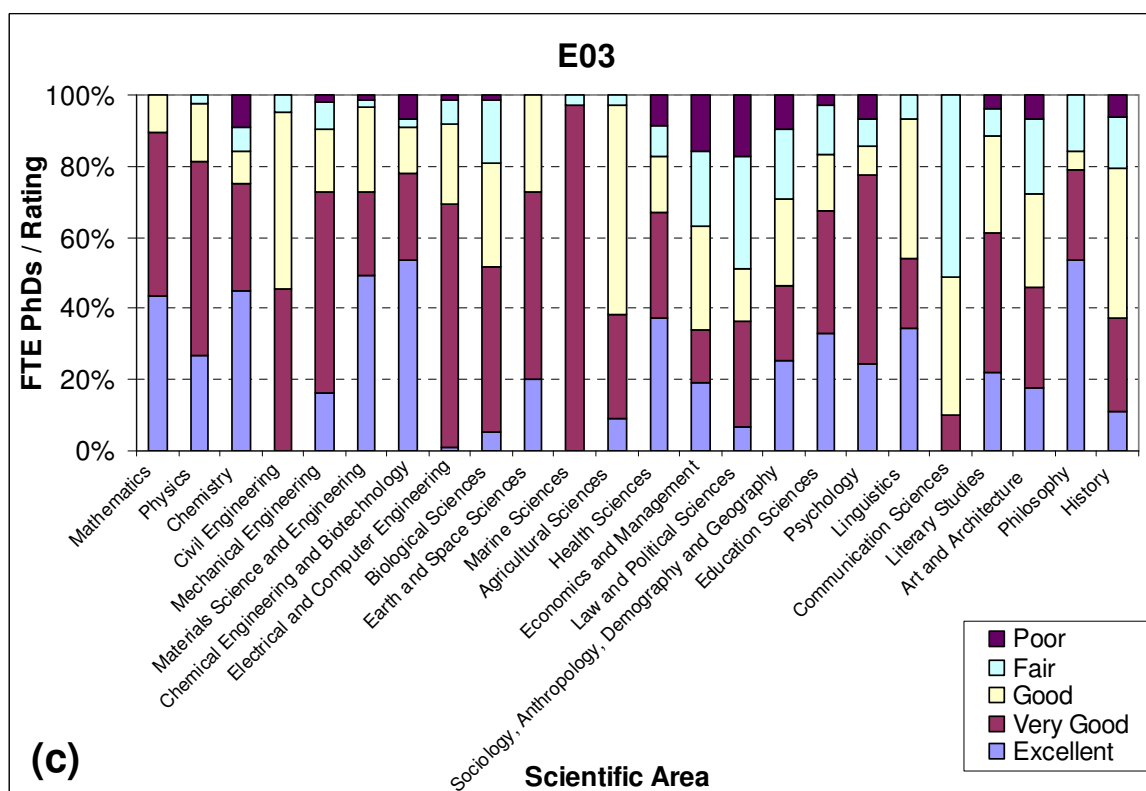
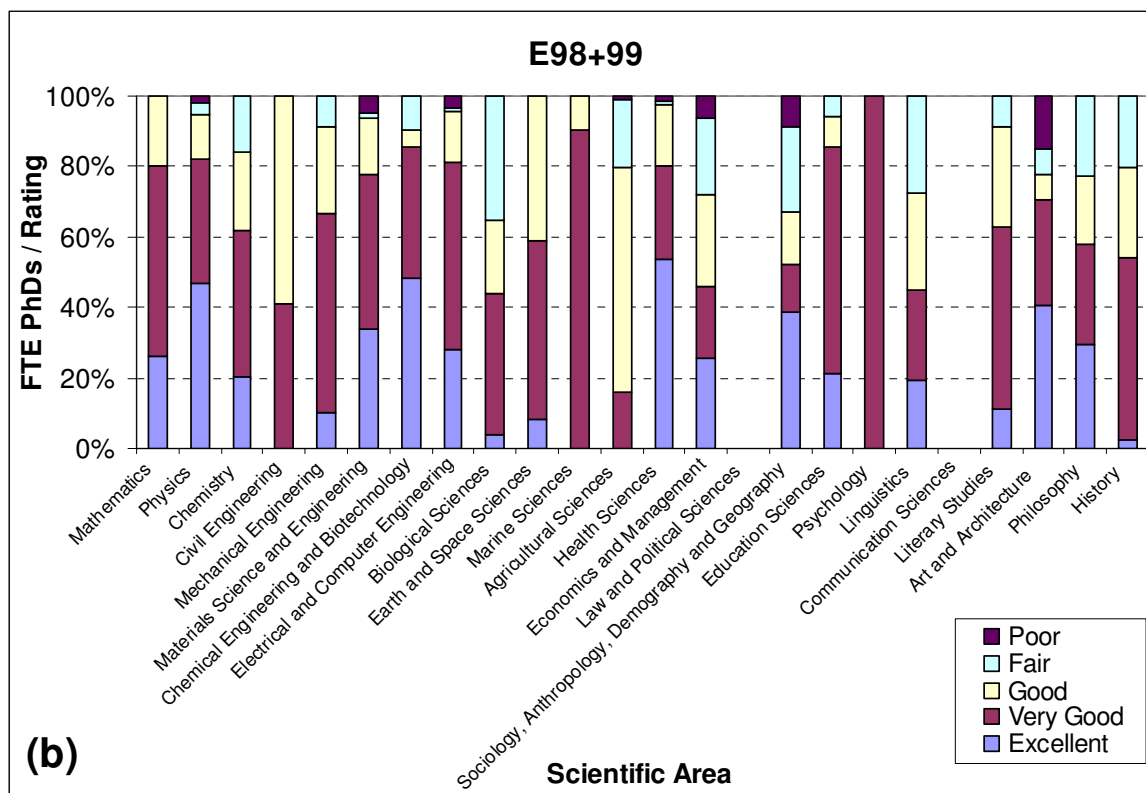


Figure 14. Distribution of FTE PhDs per ratings and scientific area in the three evaluation exercises. (a) 1996, (b) 1998+1999; (c) 2003

The analysis of the data shown in Figure 14 leads to conclusions similar to those of the preceding Figure, with the following differences:

- The asymmetry in the distribution of the ratings in the Marine Sciences area is even more pronounced than that observed for the Research Units, with 97.3% of the FTE PhDs rated as *Very Good* (Figure 14-c).
- The Art and Architecture and Linguistics areas had a positive evolution between 1996 and 1999; this was a consequence of 2 factors: a higher growth rate of researchers comparatively to that of the Units (see Figures 2 and 3) and a concentration of these new researchers in the higher rated ones.

A complementary perspective of the evaluation results might be obtained by analysing the distribution of FTE PhDs per ratings on a territorial basis.

Figure 15 depicts the regions' distribution per rating and Figure 16 shows this data in terms of the ratings' distribution per region. Confirming the conclusions of the analysis in Section 3.2.1, the Figures provide additional proof of the asymmetries that exist in the R&D national system. Figure 15 shows that Lisbon, Centre and North regions have obtained the better ratings, with respectively, 69%, 66% and 58% of its FTE PhDs classified in the two upper groups.

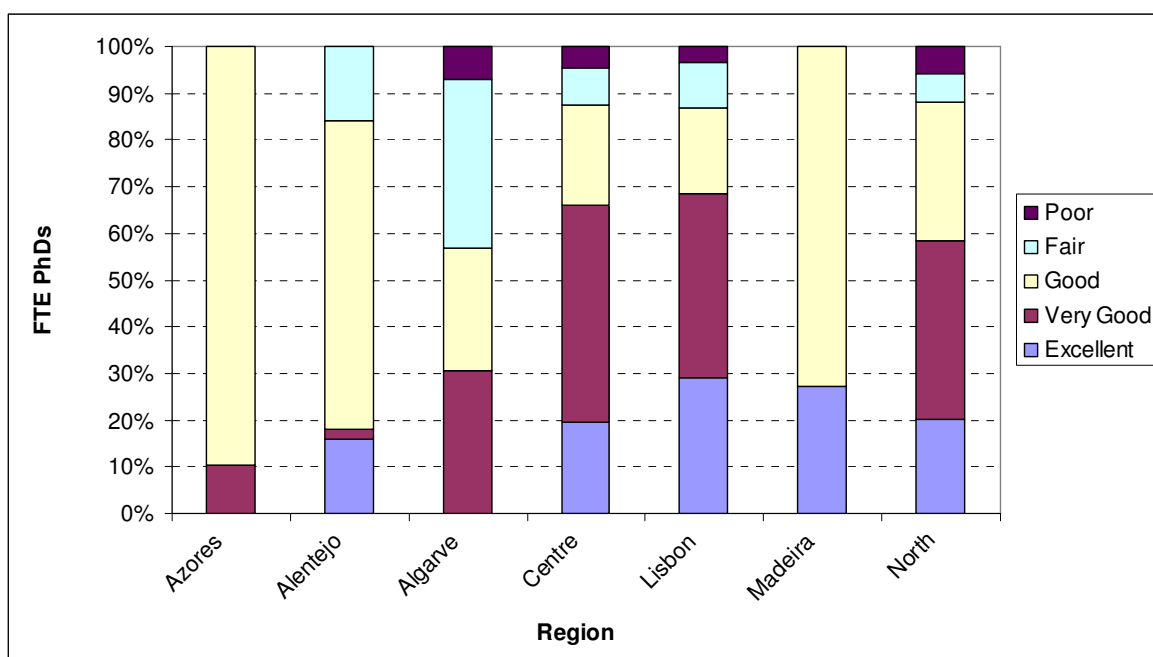


Figure 15. Distribution of FTE PhDs per region for each rating in the 2002 - 2004 evaluation exercise

Additionally, Figure 16 evidences a significant concentration of FTE PhDs in Units classified as *Excellent* or *Very Good* in the Lisbon region, followed by the North and Centre regions, respectively with 52%, 25% and 21% of the total. The top rated Units in the remaining four regions only included 2% of the total FTE PhDs number.



Comparison of these results with the corresponding aggregated ones in the regional distribution of the active population and intellectual professionals, portrayed in Table 6, 14.7 and 11.9%, respectively, reveals, once again, severe distortions in the national development pattern.

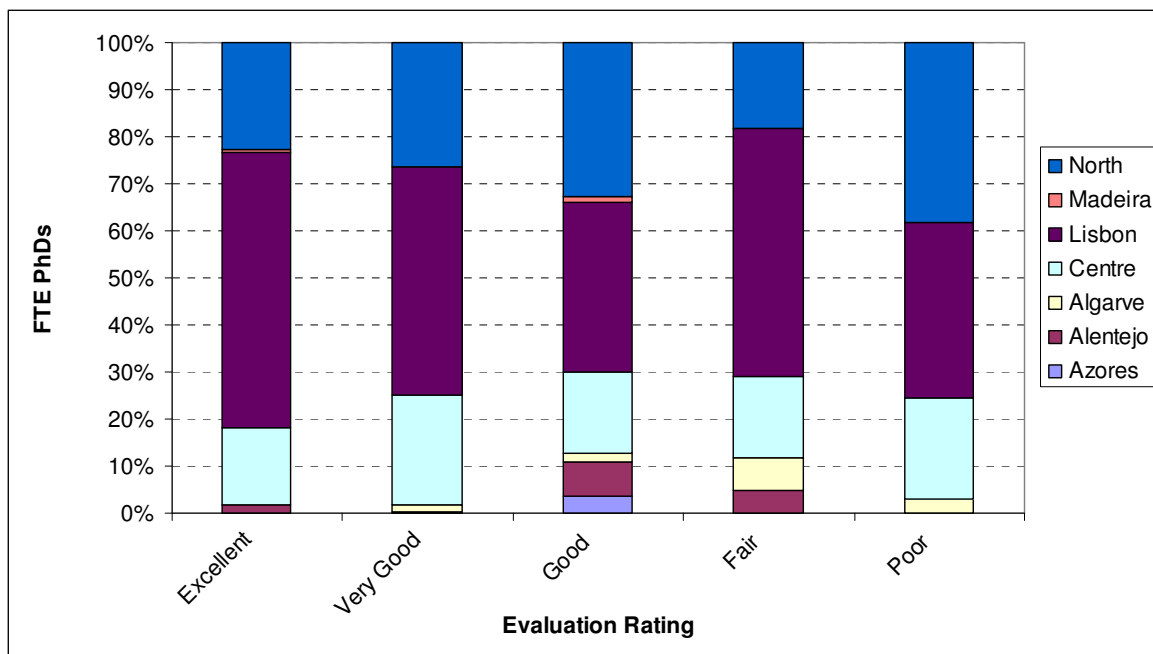


Figure 16. Distribution of FTE PhDs per ratings and region in the 2002 - 2004 evaluation exercise

### 3.3.2 Analysis of the Pluriannual Funding

As stated in the report of the 1999 Evaluation Exercise the funding provided by the Pluriannual Programme was “*designed to enable the units to function in such a way as to take advantage of the funds available from national and European sources of funding for R&D projects, research grants and science and technology-related equipment and infrastructure. The intention is not to replace them, but rather to provide supplementary funding for specific R&D activities so as to guarantee the viability and quality of the research carried out.*”

The Pluriannual Programme finances Research Units via the Basic and the Programmatic Funding. The classification assigned by the Evaluation Panels determines the level of Basic Funding. For the present evaluation exercise, this Funding was 4 500 €, 4 050 €, 2 700 € and 1 125 €, per year and FTE PhD for the Research Units classified as *Excellent*, *Very Good*, *Good* and *Fair*, respectively. The Units rated as *Poor* were not financed. Additionally, the Basic Funding for 2003-2005 was calculated considering the number of FTE PhDs in each Unit in December 31, 2003. In the preceding evaluation,

Units classified as *Excellent* and *Very Good* received 820 000 PTE (ca. 4 100 Euros) per year and FTE PhD, and those classified as *Good* and *Fair* got 5/6 and 2/3 of that amount, respectively. It can be concluded that, from one evaluation to the other, reflecting the progressive maturity and quality of the system, the funding of the Units became more selective, since the better classified received relatively more and the worst rated got relatively less.

Since the Research Units classified as *Poor* were discontinued, in the following analysis these Units and the respective FTE PhDs will not be considered. Figure 17 depicts the Basic Funding allocated per PhD for each area, as a consequence of the classifications obtained by the Units in the three evaluation exercises.

As portrayed in the Figure, the average values of the Basic Funding (per year and FTE PhD) allocated to all scientific areas in the 1996, 1999 and 2003 evaluations were 3 700 €, 3 800 € and 3 550 €, respectively. That means that, in absolute, non-inflation adjusted terms, they remained almost constant from 1996 to 2003. In fact, there was even a reduction in the last evaluation. This reduction results from the decrease in average ratings described in section 3.3.1, combined with the enhanced selectivity of the funding referred to above.

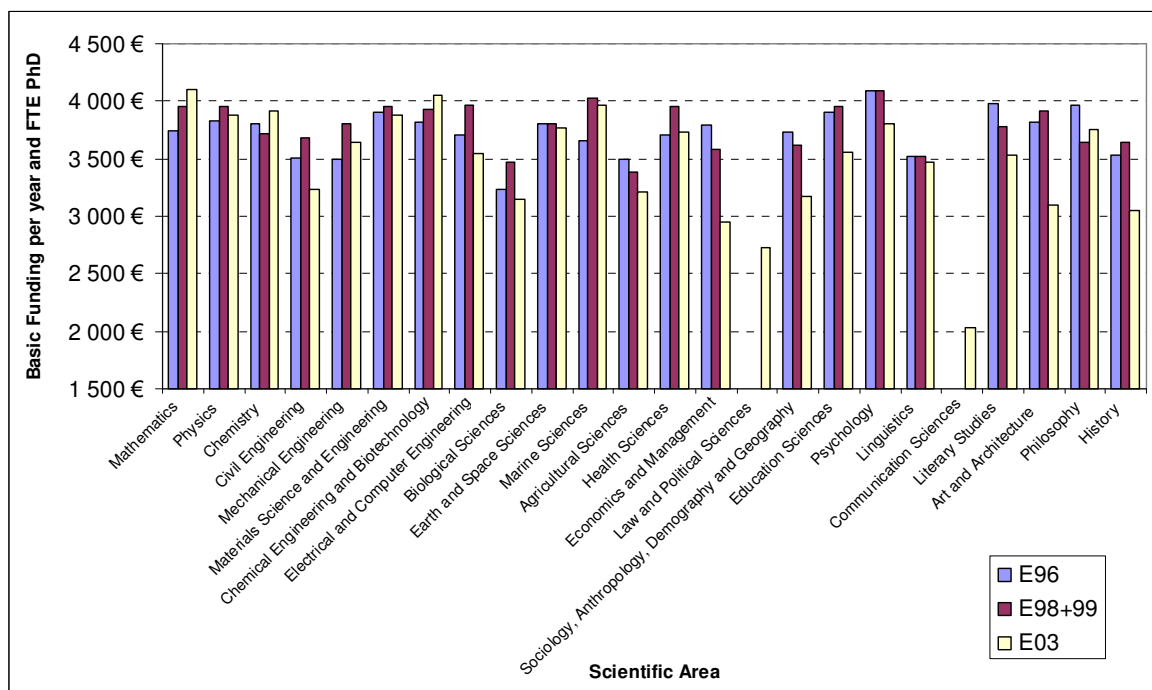


Figure 17. Basic Funding per year and FTE PhD for the various scientific areas.

In spite of the decrease in the *average* Basic Funding, the total amount assigned per year to the Units increased significantly, from 12.9 million to 21.8 million, to 24.0 million Euros,

respectively, in the 1996, 1998+99 and 2003 evaluations: This enhancement reflects the increase of the number of FTE PhDs integrated in the Research Units.

As can be concluded from the data shown in Figure 17, in terms of the scientific areas distribution, the changes verified were a direct consequence of the Units' classifications and the number of PhDs involved. For example, the major decreases in the Basic Funding per FTE PhD between E98+99 and E03 were in the Art and Architecture, Economics and Management and History areas, respectively, -21%, -18% and -16%. As portrayed in Figure 14, in the same period, these areas had also noteworthy reductions in the number of FTE PhDs rated as *Excellent* or *Very Good*. On the opposite side, the Mathematics and Chemistry areas had the highest increases in Basic Financing per FTE PhD, respectively, +4% and +5%, being also the areas that had significant improvements in both the number of FTE PhDs and in overall ratings (see Figure 14).

The regional distribution of the Basic Funding is shown in Figure 18. The Figure evidentiates a regional unbalance similar to that of previous analyses, with 49.2% of the total amount of funding allocated to the Lisbon region, followed by the North and Centre regions, with 26.2% and 19.8%, respectively. Together, these regions received *circa* 95 % of the total Basic Funding awarded.

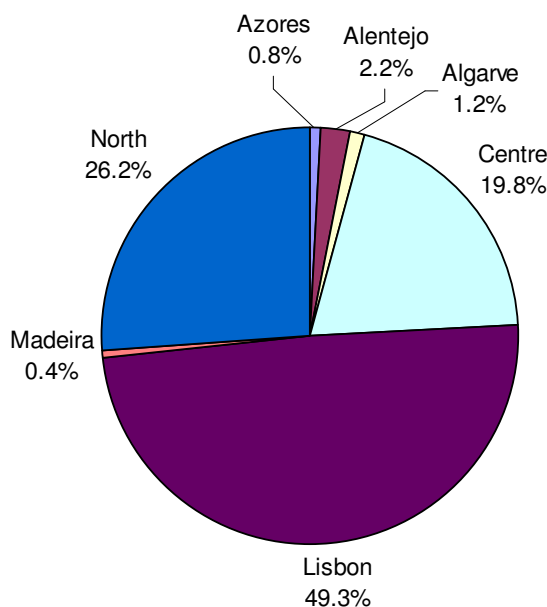


Figure 18. Regional distribution of the Basic Funding in the 2002 - 2004 Evaluation

### 3.3.3 Analysis of the Programmatic Funding

As stated in the report of the 1999 Evaluation Exercise, the Programmatic Funding allocated by the FCT had the purpose of making “*specific funds available in accordance*

with the actual needs of units, in order to promote high quality research within groups and/or units that show a high potential. This type of funding is thus not intended to cover the costs of infrastructures or maintenance of buildings, nor reward quality, but rather to support activities that will improve quality of research". The allocation of Programmatic Funding was thus defined considering the overall budget available, the ratings of the Units and the recommendations made by the evaluators. The procedure utilised to calculate the amount allocated to each individual Unit is presented in Annex 5.

The global amount of Programmatic Funding allocated as a result of the 2002 - 2004 evaluation was 15.6 million Euros. Figure 19 portrays the ratio between the Programmatic Funding (for the whole 2003-2005 period) and the Basic Funding (per year) for each scientific area. The values recommended by the Evaluation Panels and those effectively allocated are presented together in the Figure. It can be observed that the average value of the former was approximately 1.0, although with huge deviations from area to area. Due to budgetary constraints that determined the Programmatic Funding effectively allocated, the average ratio diminished to *circa* 0.65. On the other hand, the deviations relatively to the average also diminished, particularly in the Engineering, and Exact and Natural Sciences areas. This may reflect the equilibrium of the procedure utilised to allocate this Funding.

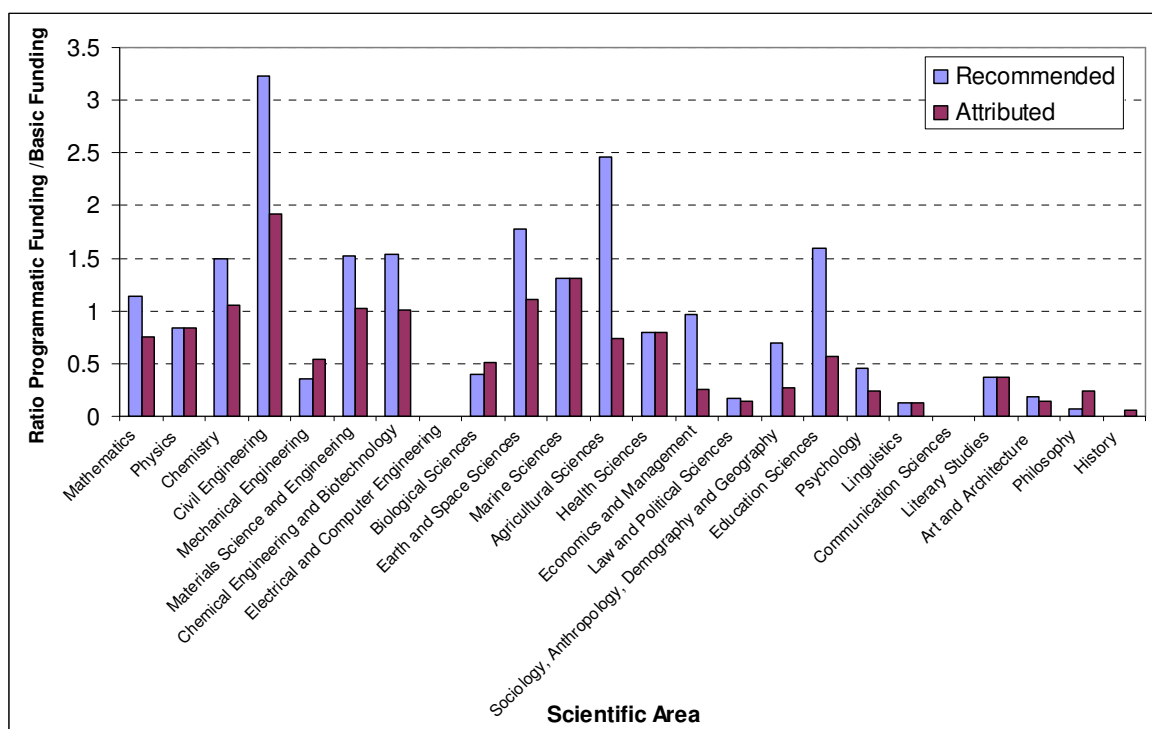


Figure 19. Ratio between the Programmatic and Basic Funding recommended and effectively allocated as a result of the evaluation

As can also be observed in Figure, the Programmatic Funding proposed by the Evaluation Panel for the different scientific areas had a major reduction for Economics and Management, Agricultural Sciences, Education Sciences, Sociology, Anthropology, Demography and Geography, -72.9%, -70.0%, -64.3%, and -62.0%, respectively. On the other hand, the amounts recommended by the Philosophy, Mechanical Engineering, Biological Sciences Panels were increased by 250.0%, 51.9% and 30.3%, respectively.

Figure 20 depicts the distribution of the Programmatic Funding per ratings for all the Units involved in the last evaluation. Note that, according to the procedure adopted, it was only awarded to Units rated *Excellent*, *Very Good* and *Good* (in this case, only new Units).

As mentioned before, the Programmatic Funding is not intended to reward quality. However, as shown in the Figure, *circa* 90% of the total funding amount was allocated to Units rated as *Excellent* or *Very Good*. This was to be expected, since the perspectives of high-quality research and the potential of the Units are obviously directly related to their quality.

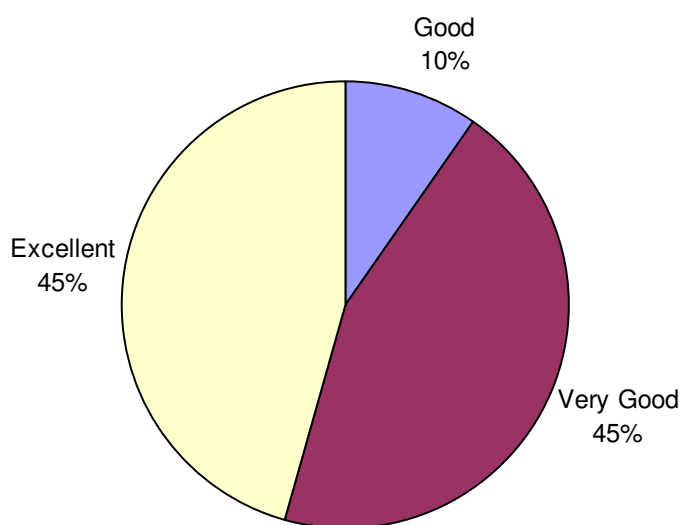


Figure 20. Distribution of the Programmatic Funding per ratings

The regional distribution of the Programmatic Funding, portrayed in Figure 21, is similar to that of the Basic Funding, with 96.4 % of the total amount assigned to the Lisbon, North and Centre regions, respectively 47.4%, 31.6% and 17.4 %.

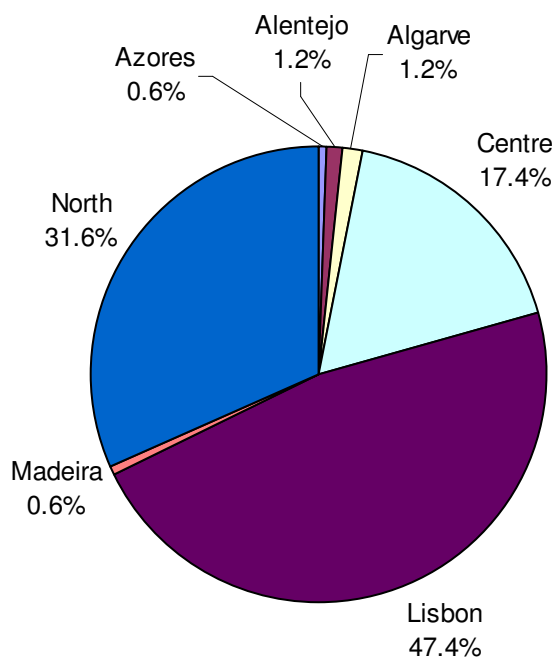


Figure 21. Regional distribution of the Programmatic Funding in the 2002-2004 Evaluation

### 3.4 Final and recommendations and a comment

Probably the more striking conclusion that emerges by comparing the analysis of the Panels' reports of the present evaluation (section 3.2.2) with the *Final Observations* of the General Report of the 1999 Evaluation is the similarity between the main recommendations in both texts. For instance, the 1999 Report recommendations:

- Develop scientific co-operation networks at the national level to promote the quality of research in the country as a whole;
- Promote the national and international mobility of researchers and attract foreign investigators, especially at post-doctoral level;
- Induce the internationalisation of the Research Units, especially in the Arts, Social and Human Sciences areas;
- Adapt the university system, that hosts the majority of the researchers, in order to respond to the requirements of a high-quality scientific and technological system;
- Implement a portfolio of structural measures, such as *national research infrastructures*, sharing large-scale equipment by the scientific community, and *thematic programmes* related to the main public priorities for investment,

were also all suggested and/or recommended by the reviewers in the 2002-2004 evaluation. This means that the same problems and deficiencies appear in successive

evaluation cycles, in spite of the measures suggested for their correction, implying that the regulation and monitoring of the Research Units' system still needs to be improved.

It should be mentioned, however, that some of the suggested measures were already implemented by FCT, such as the National Programme for Equipment Renewal and the resulting National Networks of Scientific Equipment, namely the *Nuclear Magnetic Resonance*, the *Mass Spectrometry*, the *Electron Microscopy*, and the *Advanced Computing Networks*.

However, some particularly worrying situations, also noted in both evaluations, still remain. One is the insufficient interaction of the Research Units with industry that limits the amount of external funding received. More importantly, due to this, a large proportion of R&D projects are carried out without the active participation of companies, leading often to “non-applicable” applied research. The measures suggested to solve this problem in the 1999 evaluation are clearly not working, or are not working fast enough. Most probably, due to behavioural inertia, time is the limiting factor. In any case, those measures, aiming at fostering collaboration between universities and the business community, were all directed to the “supply side” of the R&D system: i) accompanying committees with the participation of business people; ii) co-operation networks, established with public funding; iii) exchange mechanisms for teachers, researchers and students. It seems important to change, or rather expand, these policies, and energise the interaction between the R&D system and the economic tissue from the “demand side”, that is, the companies themselves. Measures such as those implemented recently, e.g. funding the constitution of R&D units *within* companies, certainly seem to be a step in the right direction.

Another important and worrying situation mentioned in both evaluations is the inadequate compliance of many research Units with the previous cycle's recommendations. One measure suggested to correct this is a mid-term evaluation, to check whether the Units adequately implemented those recommendations. This exercise, which could be carried out essentially by Portuguese teams, including a scientific coordinator, other members and a technical staff, will necessary be area and Unit specific. Obviously, to guarantee consistency and continuity, the scope of coordinator should encompass a scientific area and its mandate the full period in-between evaluations. The lack of one such policy possibly justifies the permanence of many of the detected Units' deficiencies. Henceforth, and irrespective of cost, staff shortages and logistic difficulties, this policy should be seriously considered by FCT and supported by the Ministry of Science and Technology and Higher Education.

*A final comment*

Many Evaluation Panel reports contained detailed lists of suggestions to improve future evaluation exercises. These will be synthesised in a different volume and presented to the Foundation for Science and Technology as a Guideline for those exercises. Most recommendations of a more structural and strategic nature were already discussed in the previous sections and will not be repeated here.

Nevertheless, it is cogent to make a final comment, again with the help of the report of the Coordinator of the Physics Panel, which has been quoted often throughout this text:

*“In Portugal, physics (and by extension all of science) stands at a crucial point in time. ... Changes need to be made to take advantage of the present opportunities. Bold policy is needed. Shakespeare’s advice [the poem in the beginning of this text] should appeal to a maritime nation.”*

So be it!

Guimarães, December 2005



(Carlos A. A. Bernardo)

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## ANNEX 1. TECHNICAL STAFF THAT COORDINATED AND ACCOMPANIED THE EVALUATION EXERCISE

### Project Team

Maria José Camecelha de Abreu (Coordinator)

### Executive Secretariat

Sandra Carrapiço

Ana Amorim

Miguel Oliveira (Informatics Coordination)

Ana Paula Trindade Rodrigues (until June 2003)

Conceição Tavares (since October 2003)

### Support to the Project Team

Isabel Santa-Bárbara (administrative support to the implementation of the informatics network for the Evaluation Panels' site visits)

Jorge Sousa (conceptualization and implementation of the platform for the electronic submission of the Research Units tri-annual reports and the Evaluation Panel reports)

SCIENTIFIC AREA	COMPOSITION OF THE TEAMS THAT ACCOMPANIED THE SITE VISITS
01 Mathematics	Ellen Barends (Project team - coordination); Amadeu Garcia (Informatics)
02 Physics	Paula Almeida (SPP); Germana Santos (SPP); Júlia Pacheco (SPP)
03 Chemistry	Patrícia Ramos (SFRH)
04 Biological Sciences	Cristiana Matos (SPP); Conceição Tavares (FCT - Azores/ Project team - coordination)
05 Earth and Space Sciences	Alexandra Salvador (SFRH); Patrícia Ramos (SFRH)
06 Marine Sciences	Ana Amorim (Project team - coordination); Miguel Oliveira (Project team - coordination)
07 Agricultural Sciences	Ana Amorim (Project team - coordination); Conceição Tavares (Project team - coordination)
08 Health Sciences	Conceição Tavares (Project team - coordination) ; José M. Furtado de Mendonça (FCT-Porto)
09 Civil Engineering	Marco Mota (SAICT); José M. Furtado de Mendonça (FCT-Porto); Ana Cristina Serrano (FCT - Porto)
10 Mechanical Engineering	Miguel Oliveira (Project team - coordination); Pedro Sousa e Silva (SPP); José M. Furtado de Mendonça and Ana Cristina Serrano (FCT-Porto)
11 Materials Science and Engineering	Sandra Carrapiço (Project team - coordination); Alexandra Salvador (SFRH)
12 Chemical Engineering and Biotechnology	Marco Mota (SAICT)
13 Electrical and Computer Engineering	Miguel Oliveira (Project team - coordination); Pedro Sousa e Silva (SPP); Sónia Santos (SPP)
14 Economics and Management	Ana Amorim (Project team – coordination)
15 Law and Political Sciences	Sandra Carrapiço (Project team - coordination); José M. Furtado de Mendonça (FCT-Porto)
16 Sociology, Anthropology, Demography and Geography	Ana Paula Rodrigues (Project team – coordination)
17 Education Sciences, including Education Policies	Susana Sousa (SFRH); Sofia Medeiros (SFRH); José M. Furtado de Mendonça (FCT-Porto); Ana Cristina Serrano (FCT-Porto)
18 Psychology	Ana Paula Rodrigues (Project team – coordination); Eduardo Inês (SPP); Claudia Cardoso (SPP)
19 Linguistics	Conceição Tavares (Project team – coordination)
20 Communication Sciences	Conceição Tavares (Project team – coordination)
21 Literary Studies	Susana Sousa (SFRH); Isabel Carvalho (SPP); Cristiana Matos (SPP); José M. Furtado de Mendonça (FCT-Porto)
22 Art and Architecture	Ana Amorim (Project team – coordination); Teresa Amaro (SID)
23 Philosophy	Pedro Sousa e Silva (SPP)
24 History	Ana Paula Rodrigues (Project team – coordination); Miguel Oliveira (Project team – coordination); Susana Sousa (SFRH); Antonieta Vigário (SID)

## ANNEX 2.

### DESCRIPTION OF THE EVALUATION PANELS AND THE CORRESPONDING EVALUATION PERIODS

#### **Mathematics / Evaluation Panel**

Site Visit: 08-07-2002 to 19-07-2002

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Oxford, United Kingdom  
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*Gerard Huet*  
Institut National de Recherches en Informatiques et en Automatique (INRIA)  
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*Jalal Shatah*  
Courant Institute  
New York, USA  
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<http://www.ihes.fr/IHES-A/Presentation/cvjpbA.html>

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**Physics / Evaluation Panel**

Site Visit: 08-12-2002 to 21-12-2002

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*George Walmsley*  
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Belfast, United Kingdom  
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*Herwig Schopper*  
PPE Division - CERN  
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*Martial Ducloy*  
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*Martin C. E. Huber*  
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**Chemistry / Evaluation Panel**

Site Visit: 16-03-2003 to 25-03-2003

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*Peter Maitlis*  
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Sheffield, United Kingdom  
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*Terry McMahon*  
University of Waterloo  
Waterloo, Canada  
<http://sciborg.uwaterloo.ca/~mcmahon/>

*Víctor Cerdà Martín*  
Universitat de les Illes Balears  
Palma de Mallorca, Spain  
[http://www.uib.es/depart/dqu/dquiweb/curvcm\\_e.html](http://www.uib.es/depart/dqu/dquiweb/curvcm_e.html)

**Biological Sciences / Evaluation Panel 1**

Site Visit: 16-02-2003 to 22-02-2003

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**Biological Sciences / Evaluation Panel 2**

Site Visit: 02-03-2003 to 09-03-2003

*Arsélio Pato de Carvalho*, Coordinator  
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*Jeremy Roberts*  
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 Nottingham, United Kingdom  
<http://plantsci.nottingham.ac.uk/jerry/>

*William J. Brammar*  
 University of Leicester  
 Leicester, United Kingdom

**Earth and Space Sciences / Evaluation Panel**

Site Visit: 09-12-2002 to 17-12-2002

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*Emilio Galan*  
 Facultad de Química-Universidad de Sevilla  
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*Fulvio Zezza*  
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*Jean Bonnin*  
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*Manuel Bustillo*  
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 Orléans France

**Marine Sciences / Evaluation Panel**

Site Visit: 30-03-2003 to 05-04-2003

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*Gunnar Kullenberg*  
International Ocean Institute - University of Malta  
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*John Stuart Gray* (Advisor)  
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Marseille, France

*Michael Collins*  
University of Southampton  
Southampton, United Kingdom

*Ulf Lie*  
University of Bergen  
Bergen, Norway

**Agricultural Sciences / Evaluation Panel**

Site Visit: 30-06-2003 to 08-07-2003

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Paris, France

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*Jean-Louis Multon*  
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*Louis Aimé Aumaitre*  
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*Robert Dumas de Vault*  
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**Health Sciences / Evaluation Panel 1**

Site Visit: 09-11-2003 to 16-11-2003

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*Faramarz Ismail Beigi*  
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**Health Sciences / Evaluation Panel 2**

Site Visit: 08-12-2003 to 14-12-2003

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*Edward Dwyre*  
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*Murray D. Altose*  
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*Neil Cherniack*  
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**Health Sciences / Evaluation Panel 3**

Site Visit: 14-01-2004 to 24-01-2004

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*Joseph Germino*  
Cancer Institute of New Jersey  
New Brunswick, USA

*Marvin Schwalb*  
UMDNJ - Medical School  
Newark, USA

*Peter Gascon*  
University of Barcelona  
Barcelona, Spain

*Sara Torres*  
UMDNJ - School of Nursing  
Newark, USA

*Steven Schleifer*  
UMDNJ - Medical School  
Newark, USA  
<http://njms.umdj.edu/psychiatry/StevenSchleifer.html>

*Thomas Forsthuber*  
Case Western Reserve University  
Cleveland, USA  
<http://www.cwru.edu/med/pathology/fac/forsthuber.htm>

### **Civil Engineering / Evaluation Panel**

Site Visit: 09-02-2003 to 16-02-2003

*J. Teixeira de Freitas*, Coordinator  
Instituto Superior Técnico  
Lisboa, Portugal  
<http://www.civil.ist.utl.pt/~freitas/freitas.html>

*Alan D. Pearman*  
University of Leeds  
Leeds, United Kingdom  
[http://www.leeds.ac.uk/about/senior\\_officers/learning.htm](http://www.leeds.ac.uk/about/senior_officers/learning.htm)

*Eduardo Alonso*  
Universitat Politècnica de Catalunya  
Barcelona, Spain

*Enrique Calderon*  
Universidad Politécnica de Madrid  
Madrid, Spain  
<http://www.caminos.upm.es/ordeter/enrique.htm>

*Guido de Roeck*  
Katholieke Universiteit Leuven  
Heverlee, Belgium

*R. N. Swamy*  
The University of Sheffield  
Sheffield, United Kingdom  
<http://www.shef.ac.uk/mecheng/staff/rns/>

*Yves Zech*  
Université Catholique de Louvain  
Louvain-la-Neuve, Belgium  
<http://www.gce.ucl.ac.be/hydr/staff/yz-fr.html>

**Mechanical Engineering / Evaluation Panel**

Site Visit: 19-01-2003 to 27-01-2003

*Cristina Amon*, Coordinator  
Carnegie Mellon University  
Pittsburgh, USA  
<http://www.cs.cmu.edu/~camon>

*Aleksandar Ostrogorsky*  
Rensselaer Polytechnic Institute  
Troy, USA

*André Preumont*  
Université Libre de Bruxelles  
BRUsels, Belgium  
<http://www.ulb.ac.be/scmero/team.html>

*Bora Mikic*  
MIT  
Cambridge, USA  
<http://www-me.mit.edu/people/personal/mikic.htm>

*Cesar Dopazo*  
Madrid, Spain  
<http://www.ciemat.es/sisinfo/ic1.datos?mat=4797>

*Fabio Gori*  
Università degli Studi di Roma "Tor Vergata"  
Roma, Italy  
[http://www.mec.uniroma2.it/personale/Prof\\_ordinari.htm](http://www.mec.uniroma2.it/personale/Prof_ordinari.htm)

*Fritz B. Prinz*  
Stanford University  
Stanford, USA

*Glenn Sinclair*  
Louisiana State University  
Baton Rouge, USA  
[http://me.lsu.edu/ME\\_WebPage/Faculty/Sinclair.htm](http://me.lsu.edu/ME_WebPage/Faculty/Sinclair.htm)

*Joseph A. C. Humphrey*  
University of Virginia  
Charlottesville, USA  
[http://www.mae.virginia.edu/faculty/jach\\_cv.html](http://www.mae.virginia.edu/faculty/jach_cv.html)

*Thomas Kurfess*  
Georgia Institute of Technology  
Atlanta, USA  
<http://precision.me.gatech.edu/members/professors.html>

**Materials Science and Engineering / Evaluation Panel**

Site Visit: 11-01-2003 to 19-01-2003

*João Rocha*, Coordinator  
Universidade de Aveiro  
Aveiro, Portugal  
[http://www.dq.ua.pt/fichas/docentes/joao\\_rocha.htm](http://www.dq.ua.pt/fichas/docentes/joao_rocha.htm)

*Brian Ralph*  
Brunel University  
Cardiff, United Kingdom

*Jacques Lucas*  
Université de Rennes 1  
Rennes, France

*James Hay*  
University of Birmingham  
Birmingham, United Kingdom

*Michael Coey*  
Trinity College  
Dublin, Republic of Ireland



<http://www.tcd.ie/Physics/Magnetism/mike.html>

*Paul O'Brien*  
University of Manchester  
Manchester, United Kingdom  
<http://www.ch.man.ac.uk/people/academic/pob.html>

*Relva Buchanan*  
University of Cincinnati  
Cincinnati, USA  
<http://homepages.uc.edu/~buchanrc>

### **Chemical Engineering & Biotechnology / Evaluation Panel**

Site Visit: 29-06-2003 to 06-07-2003

*Gerard Goma*, Coordinator  
INSA Toulouse - DGBA  
Toulouse, France

*Eric G. Derouane*  
Universidade do Algarve  
Faro, Portugal

*Jean-Claude Charpentier*  
Villeurbanne, France

*Nic D. Lindley*  
Centre de Bioingénierie Gilbert Durand  
Toulouse, France

### **Electrical and Computer Engineering / Panel 1**

Site Visit: 14-12-2003 to 21-12-2003

*José Manuel Fonseca de Moura*, Coordinator  
Carnegie Mellon University  
Pittsburgh, USA  
<http://www.ece.cmu.edu/~moura/>

*Christopher Rose*  
Rutgers Winlab - Electrical and Computer Engineering  
Piscataway, USA  
<http://www.winlab.rutgers.edu/~crose/>

*David Padua*  
University of Illinois at Urbana-Champaign  
Urbana, USA  
<http://hpc.cs.uiuc.edu/~padua/>

*Franco Malsoberti*  
The University of Texas at Dallas  
Richardson, USA  
<http://www.utdallas.edu/~fxm018200/>

*Janak H. Patel*  
University of Illinois at Urbana-Champaign  
Urbana, USA  
<http://www.crhc.uiuc.edu/Faculty/patel.html>

*Luigia Carlucci Aiello*  
Università di Roma "La Sapienza"  
Roma, Italy  
<http://www.dis.uniroma1.it/~aiello/>

*Moira C. Norrie*  
Institut für Informationssysteme  
Zurich, Switzerland

*Tariq Durrani*  
University of Strathclyde  
Glasgow, UK  
<http://www.eee.strath.ac.uk/staff-profile.asp?id=55>

**Electrical and Computer Engineering / Panel 2**

Site Visit: 25-01-2004 to 01-02-2004

*José Manuel Fonseca de Moura*, Coordinator  
Carnegie Mellon University  
Pittsburgh, USA  
<http://www.ece.cmu.edu/~moura/>

*Adel Razek*  
Laboratoire de Génie Électrique de Paris  
Gif-sur-Yvette , France  
<http://www.lgep.supelec.fr/mse/Welcome.html>

*Bruce MacDowell Maggs*  
Carnegie Mellon University  
Pittsburgh, USA  
<http://www-2.cs.cmu.edu/People/bmm/>

*Hans-Dieter Burkhard*  
Humboldt Universitat Berlin  
Berlin, Alemanha  
<http://www.informatik.hu-berlin.de/~hdb/>

*Hyong Kim*  
Carnegie Mellon University  
Pittsburgh, USA

*Marwan A. Simaan*  
University of Pittsburgh  
Pittsburgh, USA  
<http://www.engr.pitt.edu/simaan/biosketch.html>

*Yale Patt*  
The University of Texas Austin  
Austin, USA  
<http://www.ece.utexas.edu/~patt/>

**Economics and Management / Evaluation Panel**

Site Visit: 29-06-2003 to 06-07-2003

*João Miguel Villas-Boas*, Coordinator  
Haas School of Business - University of California  
Berkeley, USA

*Denis Gromb*  
London Business School  
London , United Kingdom  
<http://faculty.london.edu/dgromb/index.html>

*Finn Kydland*  
Carnegie-Mellon University  
Pittsburgh, USA

*Leonardo Felli*  
London School of Economics  
London, United Kingdom  
[http://econ.lse.ac.uk/staff/lfelli/index\\_own.html](http://econ.lse.ac.uk/staff/lfelli/index_own.html)

*Thomas M. Stoker*  
MIT Sloan School of Management  
Cambridge, USA

**Law and Political Sciencess / Evaluation Panel**

Site Visit: 14-07-2003 to 16-07-2003

*Adriano Moreira*, Coordinator  
Lisboa, Portugal  
<http://www.bragancanet.pt/filustres/amoreira.html>

*André Thomashausen*  
Institute of Foreign and Comparative Law  
South Africa  
*Gianfranco Pasquino*

Università de Bologna  
Bologna, Italy  
<http://www.unibo.edu.ar/img/pdf/cvpasquino.pdf>

*Julían Santamaría Ossorio*  
Universidad Complutense de Madrid  
Pozuelo de Alarcón (Madrid), Spain

### **Sociology, Anthropology, Demography and Geography / Evaluation Panel**

Site Visit: 05-01-2003 to 16-01-2003

*Liliane Voyé*, Coordinator  
Université Catholique de Louvain  
Louvain-la-Neuve, Belgium

*Alessandro Cavalli*  
University of Pavia  
Pavia, Italy

*Daniel Mercure*  
Université Laval  
Sainte-Foy, Canada  
<http://www.soc.ulaval.ca/corps/mercure/mercure.htm>

*Jean-Bernard Racine*  
Université de Lausanne  
Lausanne, Switzerland  
<http://www.hec.unil.ch/hec/enseignement/professeurs/39>

*Karel Dobbelaere*  
Catholic University of Leuven  
Leuven, Belgium

*Michael Singleton*  
Université Catholique de Louvain  
Louvain-la-Neuve, Belgium

*Robert Hettlage*  
University of Regensburg  
Regensburg, Germany

### **Education Sciences / Evaluation Panel**

Site Visit: 19-01-2003 to 25-01-2003

*Teresa Ambrósio*, Coordinator  
Universidade Nova de Lisboa  
Lisboa, Portugal  
<http://www.cursoverao.pt/teresa.htm>

*Antonio Cachapuz*  
Universidade de Aveiro  
Aveiro, Portugal  
<http://www.dte.ua.pt/PaginasPessoais/Cachapuz/>

*Daniel Gil-Perez*  
Universidad de Valencia  
Valencia, Spain  
<http://www.uv.es/~diciex/gil-cata.htm>

*Gaston Pineau*  
Université François-Rabelais  
Tours, France

*Jesus de Alvarenga Bastos*  
Universidade Federal Fluminense  
Rio de Janeiro, Brasil

*Paul Taylor*  
Université Rennes 2  
Rennes, France

**Educational Policies / Evaluation Sub-Panel**

Site Visit:

*Peter Maassen* (Advisor)  
Senior Fellow  
Centre for Higher Education Policy Studies (CHEPS)  
University of Twente, The Netherlands

*V. Lynn Meek* (Advisor)  
Director, Centre for Higher Education, Management and Policy  
University of New England  
Armidale, USA

**Psychology / Evaluation Panel**

Site Visit: 20-01-2003 to 25-01-2003

*Marc Richelle*, Coordinator  
Université de Liège  
Goesnes, Belgium

*Amparo Belloch*  
University of Valencia  
Valencia, Spain  
<http://www.ucm.es/info/Psyap/hispania/belloch.htm>

*John Michon*  
Leiden University  
Leiden, The Netherlands

*José Morais*  
Université Libre de Bruxelles  
BRUsels, Belgium

*Michèle Carlier*  
Université de Provence  
Aix-en-Provence, France

**Linguistics / Evaluation Panel**

Site Visit: 03-11-2003 to 07-11-2003

*Francisco Lacerda*, Coordinator  
Stockholm University  
Stockholm, Sweden  
<http://www.ling.su.se/staff/frasse/frasse.html>

*Carol Stoel-Gammon*  
University of Washington  
Seattle, USA

*Isabel Trancoso*  
INESC - Lisboa  
Lisboa, Portugal  
[http://www.l2f.inesc-id.pt/~imt/imt\\_en.html](http://www.l2f.inesc-id.pt/~imt/imt_en.html)

*Jan Terje Faarlund*  
Universitetet i Oslo  
Oslo, Norway

*Jens Allwood*  
University of Goeteborg  
Goeteborg, Sweden  
<http://www.ling.gu.se/~jens/>

*Lars-Erik Edlund*  
Kansliet for Humaniora  
UMEA, Sweden  
<http://www.umu.se/littnord/personal/leedlund.html>

*Santiago Alcoba*  
Universidade Autònoma Barcelona  
Bellaterra, Spain

**Communication Sciences / Evaluation Panel**

Site Visit: 30-09-2003 to 04-10-2003

*Peter Golding*, Coordinator  
Loughborough University  
Leicestershire, United Kingdom  
<http://www.meccsa.org.uk/committee/golding.html>

*Els De Bens*  
Universiteit Gent  
Gent, Belgium  
<http://www.lboro.ac.uk/research/changing.media>

**Literary Studies / Evaluation Panel**

Site Visit: 18-02-2003 to 01-03-2003

*Maria Irene Ramalho*, Coordinator  
Faculdade de Letras  
Universidade de Coimbra  
Coimbra, Portugal

*Helder Macedo*  
King's College London  
London, United Kingdom

*Hugh Ridley*  
University College Dublin  
Dublin, Republic of Ireland  
<http://www.ucd.ie/~dei/ridley.htm>

*Nancy Armstrong*  
Brown University  
Providence, USA

*Page duBois*  
University of California at San Diego  
La Jolla, USA  
<http://literature.ucsd.edu/faculty/pdubois.cfm>

*Ziva Ben-Porat*  
Tel Aviv University  
Tel Aviv, Israel  
[http://www.tau.ac.il/humanities/porter/ziva\\_benporat.htm](http://www.tau.ac.il/humanities/porter/ziva_benporat.htm)

**Art and Architecture / Evaluation Panel**

Site Visit: 08-04-2003 to 12-04-2003

*José Ressano Garcia Lamas*, Coordinator  
Faculdade de Arquitectura  
Universidade Técnica de Lisboa  
Lisboa, Portugal

*Antonio Pizzo*  
Università degli Studi di Torino  
Torino, Italy

*Delfín Rodríguez Ruiz*  
Universidad Complutense de Madrid  
Madrid, Spain

*Francesco Zurlo*  
Politecnico di Milano  
Milan, Italy

*Luis Moya Gonzalez*  
Escuela Técnica Superior de Arquitectura de Madrid  
Madrid, Spain

**Philosophy / Evaluation Panel**

Site Visit: 23-03-2003 to 28-03-2003

*Fernando Gil*, Coordinator  
École des Hautes Études en Sciences Sociales  
Paris, France

*Jean-Pierre Cometti*  
Université d'Aix-Marseille  
Marseille, France

*Quintín Racionero*  
Universidad Nacional de Educación a Distancia  
Madrid, Spain

*Renato Lessa*  
Instituto Universitário de Pesquisas do Rio de Janeiro  
22260-100 Rio de Janeiro, Brasil  
rlessa@iuperj.br

**History / Evaluation Panel**

Site Visit: 09-12-2002 to 16-12-2002

*Luís Adão da Fonseca*, Coordinator  
Porto, Portugal

*Adeline Rucquoi*  
CNRS  
Paris, France

*Franco Angiolini*  
Università di Pisa  
Pisa, Italy

*José Jobson de Andrade Arruda*  
Universidade de São Paulo  
São Paulo, Brazil

*Josep Maria Fullola Pericot*  
Faculty of Geography and History, University of Barcelona  
Barcelona, Spain

*Salvador Claramunt*  
University of Barcelona  
Barcelona, Spain

## ANNEX 3.

### ABRIDGED GUIDELINES FOR THE PANELS OF THE 2002 EVALUATION OF THE PORTUGUESE RESEARCH UNITS

The evaluation exercise of 2002 considers all the Research Units evaluated in 1997/1998, 1999 and also the new Research Units submitted to the call for proposals in March/April 2002. It also includes a few new Units that have split from those evaluated in 1999.

#### 1. Evaluation Panels

Each Evaluation Panel relates to a major scientific domain, corresponding to one of the 24 subdivisions of areas of Science and Technology shown in Table 1. Research Units with a considerable multidisciplinary character are to be evaluated by more than one Panel.

Each Panel works under the guidance of an *Evaluation Panel Coordinator* and is composed of foreign evaluators. The Evaluation Panel Coordinator is supposed to assure comparability and coherence of the evaluation criteria across the Research Units that must be considered by that particular Panel, and the appropriateness of the planning and time span of the site visits.

#### 2. Evaluation Process

The evaluation of each Research Unit, under the coordination of the corresponding Evaluation Panel Coordinator, involves **three stages**:

- 1) Preliminary **evaluation of the reports and plans** submitted in 2002 by the Research Units assigned to each Panel, individually by each evaluator;
- 2) Research Unit **public session**, including presentations by the Research Unit leader and other members of the research team, considered by the Unit as more representative of its activities;
- 3) Preparation of the **final evaluation report** by the Evaluation Panel.

The site visits are accompanied by FCT staff members, and, when desirable, by staff members of other agencies of the Ministry for Science and Higher Education, whose mission is to assist the evaluators and to carry on assignments regarding technical evaluation aspects.

Each evaluator should complete a **preliminary report** based on the analysis of the activity reports submitted by the Units, and a **visit report**, to be filled during the site visits. Then, the full evaluation panel should complete a **final evaluation report** for each Unit. The reports should include precise and detailed comments to assess the performance of the Units and to guide their future development.

In addition, the Evaluation Panel is expected to prepare an overall report about the state of R&D in each scientific domain, under the coordination of the Evaluation Panel Coordinator.

#### 3. Guidelines for the Evaluations

As the panel Evaluation Reports are to be communicated to the Research Units and will be made public, they must contain extensive substantive remarks on the proposed research activities and the track record of the research team, as well as recommendations for the proposed activities and the Units organization. The reasons supporting the evaluation results must be made explicit and understandable. Besides, the Panel Report has to be useful for the orientation of the Research Unit future activities.

(A brief description of the funding model containing the evaluation criteria can be found at [www.fct.mctes.pt/apoios/unidades/sumaria/](http://www.fct.mctes.pt/apoios/unidades/sumaria/))

#### 4. Site Visits

The visits are to take place only after a preliminary report evaluation of the Units assigned to each Panel. Independently of special arrangements made at the discretion of the Evaluation Panel, each visit must involve the following stages, in the order indicated:

- 1) *Introductory overview* of the Research Unit activities and achievements of its team members in the period 1999-2001 and the proposed activities, by the Unit leader and/or other investigator(s), not exceeding 1 hour.

(Proposed contents: *Summary of the Unit's mission, projects, organisation and management, results obtained by research team members, training and mentoring of young researchers and students, organisation of workshops, colloquia, periodic seminars, etc., interdisciplinary ventures, interactions with other Research Units in Portugal and abroad, outreach activities, technology transfer, equipment resources and needs, funds and financial needs*)

- 2) *Visit to the facilities and laboratories*, if appropriate.
- 3) *Informal discussion* between the Evaluation Panel and researchers, including some of the younger team members.

The time limits and other organisational specifications for each stage are to be defined by the Coordinator of the Evaluation Panel.

#### 5. Results of the Evaluation

The results of the evaluation of each Unit are to be expressed in terms of a final report, which should include the overall assessment and recommendations for the Unit, besides an overall rating of the Units for purposes of Basic Funding Level, and a possible recommendation for Programmatic Funding.

##### 5.1 Basic Funding

The evaluators are supposed to classify the absolute level of each Research Unit in a scale of 5 levels (*Excellent, Very Good, Good, Fair, and Poor*), which will be used to define the level of Basic Funding per PhD. Funding of Units rated *Poor* will be discontinued.

##### 5.2 Programmatic Funding

In addition, the evaluators are supposed to assess the adequacy of additional Programmatic Funding for a restricted number of Units, as a result of specific needs detected by the evaluators. The adequacy of this funding is to be considered independently of the Research Unit size, research area or form of organization. The main criteria to be used in selecting Units to be proposed for this funding are:

- Clear needs of operation, maintenance or small equipment funds for carrying out high quality research activity;
- Potential for increased high quality research results and internationalisation;
- Opportunities for increased research performance that could be enhanced by hiring researchers or technicians.

In evaluating eligibility for such funding, it is essential to observe that the additional funding must correspond to increases in performance that could not be attained with the funds that the Unit has had available in the past or is likely to have in the future. It is not appropriate to consider Programmatic Funding to replace or shift financial allocations faced by the Unit in the past or likely to be faced in the future without this funding.



The evaluators' recommendations for Programmatic Funding must include the proposal of the appropriate amounts of additional funding, their uses, time span, associated performance expectations, and requirements to be included in the corresponding contract.

#### **6. Conflicts of Interest and Confidentiality**

The interpretation of "conflicts of interest" in the present evaluation is that an individual directly involved as a member or paid consultant of a Research Unit may not participate in the evaluation of that Research Unit.

The confidentiality of Research Units activities results must be protected. The evaluators are asked not to copy, quote, or otherwise use material from them. Upon completion of the evaluation they are expected to return their working copies of proposal to the FCT staff or to destroy them.

## ANNEX 4.

**MAIN DATA ON THE RESEARCH UNITS REVIEWED IN THE 2002 - 2004  
EVALUATION** (after the evaluation of some Units' appeals)

## Exact Sciences

### Mathematics

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs 31.12.2003</b>	<b>Evaluation Rating</b>
Centro de Álgebra da Universidade de Lisboa / Fundação da Universidade de Lisboa	Gracinda Maria dos Santos Gomes Moreira da Cunha	17	Very Good
Centro de Análise Matemática, Geometria e Sistemas Dinâmicos / Instituto Superior Técnico da Universidade Técnica de Lisboa	Carlos Alberto Varelas da Rocha	58	Excellent
Centro de Ciências Matemáticas - CCM / Universidade da Madeira	Ludwig Paul Ary Evert Streit	9	Excellent
Centro de Estatística e Aplicações da Universidade de Lisboa / Fundação da Faculdade de Ciências da Universidade de Lisboa	Maria Ivette Leal de Carvalho Gomes	30	Very Good
Centro de Estruturas Lineares e Combinatórias / Fundação da Universidade de Lisboa	Fernando Abel Conceição Silva	16	Excellent
Centro de Estudos em Optimização e Controlo (CEOC) / Universidade de Aveiro	Domingos Moreira Cardoso	12	Very Good
Centro de Investigação Operacional / Fundação da Faculdade de Ciências da Universidade de Lisboa	José Manuel Pinto Paixão	22	Excellent
Centro de Matemática - CMAT / Universidade do Minho	Rui Manuel Silva Ralha	23.75	Very Good
Centro de Matemática da Universidade de Coimbra / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	Maria Paula Serra Martins de Oliveira	49.5	Excellent
Centro de Matemática da Universidade do Porto / Associação para o Desenvolvimento da Faculdade de Ciências da Universidade do Porto	João Nuno Domingues Tavares	43.5	Excellent
Centro de Matemática e Aplicações - CEMAT / Instituto Superior Técnico da Universidade Técnica de Lisboa	Adélia da Costa Sequeira dos Ramos Silva	48	Very Good

Centro de Matemática e Aplicações / Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa	João Tiago Mexia	19	Good
Centro de Matemática e Aplicações Fundamentais da Universidade de Lisboa / Fundação da Universidade de Lisboa	Manuel Duque Pereira Monteiro Marques	39	Very Good
Centro de Matemática, Universidade da Beira Interior / Universidade da Beira Interior	Anvarbek Meirmanov	12	Good
CIMA-UE - Centro de Investigação em Matemática e Aplicações da Universidade de Évora / Universidade de Évora	António Costa de Ornelas Gonçalves	14	Good
CLC - Centro de Lógica e Computação / Instituto Superior Técnico da Universidade Técnica de Lisboa	Amílcar dos Santos Costa Sernadas	14	Very Good
Grupo de Física-Matemática da Universidade de Lisboa / Fundação da Universidade de Lisboa	Jean-Claude Zambrini	12.5	Excellent
Matemática Aplicada - IISA / Instituto Superior de Agronomia da Universidade Técnica de Lisboa	Carlos Manuel Agra Coelho	10	Very Good
Officina Mathematica / Universidade do Minho	Estelita Vaz	7	Good
UI&D Matemática e Aplicações (UIMA) / Universidade de Aveiro	Maria Paula Macedo Rocha Malonek	28	Very Good

## Physics

Research Unit / Home Institution	Scientific Coordinator	FTE PhDs 31.12.2003	Evaluation Rating
Centro de Astrofísica / Centro de Astrofísica da Universidade do Porto	Maria Teresa Vaz Torrão Lago	19.5	Excellent
Centro de Astronomia e Astrofísica da Universidade de Lisboa / Fundação da Faculdade de Ciências da Universidade de Lisboa	Rui Jorge L. Santos Agostinho	14	Good
Centro de Electrónica e Instrumentação / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	Carlos Manuel Bolota Alexandre Correia	6	Very Good
Centro de Estudos de Materiais por Difracção de Raios-X / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	Maria Margarida Ramalho Ribeiro da Costa	13	Excellent
Centro de Física Atómica da Universidade de Lisboa / Fundação da Universidade de Lisboa	Fernando António de Freitas Costa Parente	17	Very Good

Centro de Física Computacional / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	Carlos Manuel Baptista Fiolhais	18	Very Good
Centro de Física da Matéria Condensada / Fundação da Universidade de Lisboa	Maria Margarida da Fonseca Beja Godinho	34	Very Good
Centro de Física da Universidade do Minho / Universidade do Minho	Maria Isabel P. L. Calado Ferreira	48	Very Good
Centro de Física das Interações Fundamentais / Instituto Superior Técnico da Universidade Técnica de Lisboa	Luís Manuel Balio Lavoura	10.5	Excellent
Centro de Física do Porto / Associação para o Desenvolvimento da Faculdade de Ciências da Universidade do Porto	Maria Augusta Oliveira Pereira dos Santos	15.5	Good
Centro de Física e Investigação Tecnológica - CEFITEC / Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa	Augusto Manuel Celorico Moutinho	23	Very Good
Centro de Física Molecular / Instituto Superior Técnico da Universidade Técnica de Lisboa	José Manuel Pereira Serão	9	Fair
Centro de Física Nuclear da Universidade de Lisboa / Fundação da Universidade de Lisboa	Ana Maria Eiró	33	Excellent
Centro de Física Teórica da Universidade de Coimbra / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	João da Providência Santarém e Costa	11	Good
Centro de Física Teórica e Computacional / Fundação da Universidade de Lisboa	Margarida Maria Telo da Gama	15	Very Good
Centro de Instrumentação (Unidade 217/94)/Instrumentation Center (Unit 217/94) / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	Carlos Alberto Nabais Conde	12	Very Good
Centro Multidisciplinar de Astrofísica - CENTRA / Instituto Superior Técnico da Universidade Técnica de Lisboa	Jorge Venceslau Comprido Dias de Deus	20	Very Good
Física de Semicondutores em Camadas Optoelectrónica e Sistemas Desordenados / Universidade de Aveiro	Sushil Kumar Mendiratta	28	Excellent
Grupo de Astrofísica da Universidade de Coimbra (GAUC) / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	João Manuel de Moraes Barros Fernandes	4	Good
Grupo de Dinâmica Não-Linear / Instituto Superior Técnico da Universidade Técnica de Lisboa	Rui Manuel Agostinho Dilão	3	Good

Grupo de Física Nuclear da Matéria Condensada / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	João Manuel de Sá Campos Gil	5.25	Good
Núcleo IFIMUP -Pólo IMAT Porto / Universidade do Porto	José Manuel Machado da Silva	17	Very Good
Unidade de Detecção Remota / Universidade da Beira Interior	José Alberto Ribeiro Pacheco de Carvalho	10	Good

## Chemistry

Research Unit / Home Institution	Scientific Coordinator	FTE PhDs 31.12.2003	Evaluation Rating
Centro de Electroquímica e Cinética da Universidade de Lisboa - CECUL / Fundação da Faculdade de Ciências da Universidade de Lisboa	João Carlos Reis	36	Poor
Centro de Investigação em Química da Universidade do Porto / Associação para o Desenvolvimento da Faculdade de Ciências da Universidade do Porto	Manuel Aníbal Varejão Ribeiro da Silva	38	Excellent
Centro de Química - Vila Real / Universidade de Trás-os-Montes e Alto Douro	Luis Herculano Melo de Carvalho	11	Very Good
Centro de Química / Universidade do Minho	Maria Irene Magalhães Assunção Montenegro	39	Very Good
Centro de Química da Madeira / Universidade da Madeira	José Carlos Antunes Marques	8	Good
Centro de Química de Coimbra / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	Sebastião José Formosinho Sanches Simões	40	Very Good
Centro de Química de Évora / Universidade de Évora	Peter Joseph Michael Carrott	13	Good
Centro de Química e Bioquímica / Fundação da Faculdade de Ciências da Universidade de Lisboa	José Artur de Sousa Martinho Simões	44	Excellent
Centro de Química Estrutural / Instituto Superior Técnico da Universidade Técnica de Lisboa	Sílvia Marília de Brito Costa	66	Excellent
Centro de Química-Física Molecular / Instituto Superior Técnico da Universidade Técnica de Lisboa	José Manuel Gaspar Martinho	21	Excellent
Centro Multidisciplinar de Química do Ambiente / Faculdade de Ciências e Tecnologia da Universidade do Algarve	João Carlos Pereira Peres Brandão	13	Fair
Espectroscopia RMN / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	Carlos Frederico de Gusmão Campos Geraldes	9	Excellent

LAQUIPAI - Laboratório de Química Inorgânica Pura e de Aplicação Interdisciplinar / Associação para o Desenvolvimento da Faculdade de Ciências da Universidade do Porto	Adélio Alcino Sampaio Castro Machado	6	Good
Química Biológica / Universidade do Algarve	Eric G. Derouane	14	Fair
Química Orgânica, Produtos Naturais e Agroalimentares / Universidade de Aveiro	José Abrunheiro da Silva Cavaleiro	30	Very Good
Química-Física Molecular / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	António Marinho Amorim da Costa	8	Good

## Engineering Sciences

### Civil Engineering

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs</b> <i>31.12.2003</i>	<b>Evaluation Rating</b>
Centro de Engenharia Civil da Universidade da Beira Interior / Universidade da Beira Interior	Luiz António Pereira de Oliveira	11	Fair
Centro de Engenharia Civil da Universidade do Minho / Universidade do Minho	Paulo José Brandão Barbosa Lourenço	19	Good
Centro de Estudos da Construção / Faculdade de Engenharia da Universidade do Porto	António Manuel Adão da Fonseca	39	Good
Centro de Estudos de Hidrossistemas - CEHIDRO / Instituto Superior Técnico da Universidade Técnica de Lisboa	António Heleno Cardoso	20	Very Good
Centro de Hidráulica, Recursos Hídricos e Ambiente da FEUP - CEHRA / Faculdade de Engenharia da Universidade do Porto	Fernando Francisco Machado Veloso Gomes	13	Good
Centro de Investigação em Engenharia Civil / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	Luís Joaquim Leal Lemos	12	Good
Centro de Investigação em Estruturas e Construção da UNL - UNIC / Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa	Válter José da Guia Lúcio	12	Good
CESUR - Centro de Sistemas Urbanos e Regionais / Instituto Superior Técnico da Universidade Técnica de Lisboa	Luís António de Castro de Valadares Tavares	17	Very Good

CITTA - Centro de Investigação do Território, Transportes e Ambiente / Faculdade de Engenharia da Universidade do Porto	Paulo Manuel Neto da Costa Pinho	8	Good
ICIST - Instituto de Engenharia de Estruturas, Território e Construção / Instituto Superior Técnico da Universidade Técnica de Lisboa	Carlos Alberto Ferreira de Sousa Oliveira	63	Very Good
Instituto de Tecnologias de Produção na Construção - Polo de Coimbra / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	Luis Miguel Cruz Simões	17.5	Good
LABEST - Laboratório da Tecnologia do Betão e do Comportamento Estrutural / Faculdade de Engenharia da Universidade do Porto	Joaquim Azevedo Figueiras	9	Very Good

## Mechanical Engineering

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs</b> <i>31.12.2003</i>	<b>Evaluation Rating</b>
Associação para o Desenvolvimento da Aerodinâmica Industrial (ADAI) / Associação para o Desenvolvimento da Aerodinâmica Industrial (ADAI)	Domingos Xavier Filomeno Carlos Viegas	18	Very Good
CCTAE - Centro de Ciências e Tecnologias Aeronáuticas e Espaciais / Instituto Superior Técnico da Universidade Técnica de Lisboa	Luis Manuel Braga da Costa Campos	8	Very Good
Centro de Ciência e Tecnologias Aeroespaciais / Universidade da Beira Interior	Jorge Manuel Martins Barata	20	Fair
Centro de Engenharia Mecânica / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	José Valdemar Bidarra Fernandes	12	Excellent
Centro de Estudos de Energia Eólica e Escoamentos Atmosféricos / Faculdade de Engenharia da Universidade do Porto	José Manuel Laginha Mestre da Palma	7	Very Good
Centro de Estudos de Fenómenos de Transporte / Faculdade de Engenharia da Universidade do Porto	João Bernardo Lares Moreira de Campos	8	Very Good
Centro de Inovação e Desenvolvimento em Engenharia Mecânica / Universidade da Beira Interior	Luis Carlos Carrilho Gonçalves	6	Poor
Centro de Tecnologia Mecânica e Automação / Center for Mechanical Technology and Automation / Universidade de Aveiro	José Joaquim de Almeida Grácio	21	Excellent

Centro Interdisciplinar em Tecnologias da Produção e Energia / Universidade do Minho	José Carlos Fernandes Teixeira	30	Good
CIDEM - Centro de Investigação e Desenvolvimento em Engenharia Mecânica / Instituto Superior de Engenharia do Instituto Politécnico do Porto (ISEP/IPP)	José Abel Ferreira de Andrade	6	Fair
IDMEC - Instituto de Engenharia Mecânica / Instituto Superior Técnico da Universidade Técnica de Lisboa	Carlos Alberto Mota Soares	93	Very Good
Mecânica Experimental e Novos Materiais / Experimental Mechanics and New Materials / Instituto de Engenharia Mecânica e Gestão Industrial - INEGI	Joaquim Francisco da Silva Gomes	22	Excellent
Novas Tecnologias e Processos Avançados de Produção / Instituto de Engenharia Mecânica e Gestão Industrial - INEGI	António Pinto Barbedo de Magalhães	6	Very Good
Unidade de Conceção e Validação Experimental / Instituto de Engenharia Mecânica - IDMEC - Pólo FEUP	António Augusto Fernandes	8	Very Good
Unidade de Engenharia e Tecnologia Naval / Instituto Superior Técnico da Universidade Técnica de Lisboa	Carlos Guedes Soares	14	Very Good
Unidade de Estudos Avançados de Energia no Ambiente Construído / Instituto de Engenharia Mecânica - IDMEC - Pólo FEUP	Eduardo Guimarães de Oliveira Fernandes	6	Very Good
Unidade de I&D em análise de ciclo de vida de produtos e componentes industriais soldados / Instituto de Soldadura e Qualidade	José Oliveira Santos	10	Very Good
Unidade de Integração de Sistemas e Processos Automatizados / Instituto de Engenharia Mecânica - IDMEC - Pólo FEUP	Fernando Gomes de Almeida	10	Very Good
Unidade de Investigação e Desenvolvimento em Engenharia Mecânica e Industrial - UNIDEMI / Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa	Jorge Joaquim Pamies Teixeira	9	Good
Unidade de Métodos Numéricos em Mecânica e Engenharia Estrutural / Instituto de Engenharia Mecânica - IDMEC - Pólo FEUP	Rogério Augusto Fernandes Martins	16	Good
Unidade de Novas Tecnologias Energéticas / Instituto de Engenharia Mecânica - IDMEC - Pólo FEUP	Armando Carlos Figueiredo Coelho de Oliveira	4	Good



## Materials Science and Engineering

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs 31.12.2003</b>	<b>Evaluation Rating</b>
3B's Research Group - Biomaterials, Biodegradables and Biomimetics / Universidade do Minho	Rui Luis Gonçalves dos Reis	12	Excellent
Centro de Ciência e Tecnologia Têxtil / Escola de Engenharia da Universidade do Minho	Mário Duarte de Araújo	21	Excellent
Centro de Ciências Moleculares e Materiais / Fundação da Faculdade de Ciências da Universidade de Lisboa	Fernanda Madalena de Abreu da Costa	22.5	Good
Centro de Desenvolvimento de Metais Não-Ferrosos / Universidade do Minho	Fernando António Portela de Sousa Castro	3	Poor
Centro de Investigação de Materiais - CENIMAT / Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa	Elvira Maria Correia Fortunato	25	Excellent
Centro de Investigação em Interfaces e Comportamento de Superfícies / Universidade do Minho	António Augusto Sousa Miranda	5	Fair
GMM/IMAT Grupo de Materiais Metálicos do Instituto de Materiais Núcleo FEUP / Faculdade de Engenharia da Universidade do Porto	Carlos Alberto Silva Ribeiro	6	Good
ICEMS - Instituto de Ciência e Engenharia de Materiais e Superfícies / Instituto Superior Técnico da Universidade Técnica de Lisboa	Rui M. Almeida	57	Very Good
INESC Solid State Technology Group / Instituto de Engenharia de Sistemas e Computadores - INESC	Paulo Jorge Peixeiro de Freitas	10	Excellent
Instituto de Ciência Engenharia de Materiais e Superfícies - ICEMS -polo Coimbra / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	Maria Teresa Freire Vieira	29	Excellent
IPC - Instituto de Polímeros e Compósitos / Universidade do Minho	Carlos António Alves Bernardo	21	Excellent
Materiais Têxteis e Papeleiros / Universidade da Beira Interior	Manuel José dos Santos Silva	29	Good

## Chemical Engineering and Biotechnology

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs 31.12.2003</b>	<b>Evaluation Rating</b>
Centro de Biotecnologia dos Açores / Universidade dos Açores	Artur da Câmara Machado	5	Good

Centro de Biotecnologia e Química Fina / Escola Superior de Biotecnologia da Universidade Católica Portuguesa	António Osmaro Santos Silva Rangel	35	Very Good
Centro de Ciência e Tecnologia de Alimentos / Escola Superior de Tecnologia da Universidade do Algarve	Maria Nelma Pinto Gaspar	5	Poor
Centro de Engenharia Biológica da Universidade do Minho / Universidade do Minho	Manuel José Magalhães Gomes Mota	34	Excellent
Centro de Investigação de Engenharia Aplicada - CIEA / Instituto Superior de Engenharia do Instituto Politécnico do Porto (ISEP/IPP)	Rui Alberto Gonçalves da Silva	14	Poor
Centro de Investigação de Engenharia Biotecnológica / Instituto Superior de Engenharia do Instituto Politécnico de Lisboa	Amin Karmali	6	Fair
Centro de Investigação em Engenharia dos Processos Químicos e dos Produtos da Floresta / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	Maria Margarida Lopes Figueiredo	23	Very Good
Centro de Processos Químicos da Universidade Técnica de Lisboa / Instituto Superior Técnico da Universidade Técnica de Lisboa	Jorge Manuel Rodrigues de Carvalho	15	Good
Instituto de Biotecnologia e Química Fina - Polo Lisboa / Instituto Superior Técnico da Universidade Técnica de Lisboa	Júlio Maggiolly Novais	69	Excellent
Laboratório de Catálise e Materiais / Faculdade de Engenharia da Universidade do Porto	José Luís Cabral da Conceição Figueiredo	9	Very Good
Laboratório de Processos de Separação e Reacção - LSRE / Faculdade de Engenharia da Universidade do Porto	Alírio Egídio Rodrigues	27	Excellent
LEPAE - Laboratório de Engenharia de Processos, Ambiente e Energia / Faculdade de Engenharia da Universidade do Porto	Luís Manuel Ferreira de Melo	19	Excellent
Unidade de Biotecnologia Ambiental / Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa	José Filipe dos Santos Oliveira	16	Good

## Electrical and Computer Engineering

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs 31.12.2003</b>	<b>Evaluation Rating</b>
ADETTI - Associação para o Desenvolvimento das Telecomunicações e Técnicas de Informática / ADETTI - Associação para o Desenvolvimento das telecomunicações e Técnicas de Informática	José Miguel de Oliveira Monteiro Sales Dias	15	Good
Centro Algoritmi / Universidade do Minho	João Luis Marques Pereira Monteiro	53.75	Very Good
Centro de Accionamentos e Sistemas Eléctricos / Universidade da Beira Interior	Carlos Manuel Pereira Cabrita	6	Good
Centro de Análise e Processamento de Sinais / Instituto Superior Técnico da Universidade Técnica de Lisboa	José Luis Bento Coelho	5	Good
Centro de Automática da Universidade Técnica de Lisboa (CAUTL) / Instituto Superior Técnico da Universidade Técnica de Lisboa	João José Esteves Santana	16	Good
Centro de Ciências e Tecnologias de Computação / Universidade do Minho	Alexandre Júlio Teixeira Santos	38	Good
Centro de Electrónica Optoelectrónica e Telecomunicações / Universidade do Algarve	Henrique Leonel Gomes	9	Very Good
Centro de Electrotecnia Teórica e Medidas Eléctricas do IST / Instituto Superior Técnico da Universidade Técnica de Lisboa	Vitor Manuel de Oliveira Maló Machado	7	Good
Centro de Energia Eléctrica - CEEL / Instituto Superior de Agronomia da Universidade Técnica de Lisboa	José Manuel Dias Ferreira Jesus	11	Fair
Centro de Estudos de Física, Acústica e Telecomunicações / Faculdade de Engenharia da Universidade do Porto	Francisco Correia Velez Grilo	4	Poor
Centro de Estudos e Recursos Multimédia / Universidade Fernando Pessoa	Feliz Alberto Ribeiro Gouveia	4	Poor
Centro de Informática e Sistemas da Universidade de Coimbra / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	António Dourado Pereira Correia	36.25	Very Good
Centro de Informática e Tecnologias da Informação / Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa	José Alberto Cardoso e Cunha	25	Very Good

Centro de Inteligência Artificial da Universidade Nova de Lisboa - CENTRIA / Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa	Luís Manuel Sancho Moniz Pereira	18.25	Very Good
Centro de Investigação em Sistemas Confiáveis e de Tempo Real - CISTER / Instituto Superior de Engenharia do Instituto Politécnico do Porto (ISEP/IPP)	Eduardo Manuel de Médicis Tovar	4	Excellent
Centro de Sistemas Inteligentes (CSI) / Universidade do Algarve	António Eduardo de Barros Ruano	11	Fair
Centro Robótica Inteligente - CRI / Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa - UNINOVA	Adolfo Sanchez Steiger Garção	16	Good
GECAD - Grupo de Investigação em Engenharia do Conhecimento e Apoio à Decisão / Instituto Superior de Engenharia do Instituto Politécnico do Porto (ISEP/IPP)	Carlos Fernando da Silva Ramos	13	Very Good
I.E.E.T.A.-Instituto de Engenharia Electrónica e Telemática e Aveiro / Universidade de Aveiro	António Manuel Melo Sousa Pereira	43	Very Good
INESC-ID - Instituto de Engenharia de Sistemas e Computadores - Investigação e Desenvolvimento em Lisboa / INESC - ID - Instituto de Engenharia de Sistemas e Computadores - Investigação e Desenvolvimento em Lisboa	Luis Henrique Martins Borges Almeida	69	Very Good
Instituto de Engenharia de Sistemas e Computadores de Coimbra (INESC Coimbra) / Instituto de Engenharia de Sistemas e Computadores - Coimbra	Carlos Henggeler Antunes	13	Very Good
Instituto de Sistemas e Robótica - Pólo de Coimbra / Instituto de Sistemas e Robótica	Aníbal Traça de Almeida	24	Very Good
Instituto de Sistemas e Robótica - Porto / Faculdade de Engenharia da Universidade do Porto	Sebastião José Cabral Feyo de Azevedo	23	Very Good
Laboratório de Inteligência Artificial e Ciência de Computadores - LIACC / Reitoria da Universidade do Porto	Pavel Brazdil	33.5	Very Good
Laboratório de Mecatrónica e Computação Científica (LMC2) / Instituto Superior Técnico da Universidade Técnica de Lisboa	Joaquim António Fraga Gonçalves Dente	15	Fair
Laboratório de Modelação de Agentes (LabMAG) / Fundação da Faculdade de Ciências da Universidade de Lisboa	Helder Manuel Ferreira Coelho	16	Good

Laboratório de Sinais e Sistemas / Faculdade de Engenharia da Universidade do Porto	Diamantino Rui da Silva Freitas	3	Good
Laboratório de Sistemas Informáticos de Grande Escala / Fundação da Faculdade de Ciências da Universidade de Lisboa	Nuno Manuel de Carvalho Ferreira Guimarães	12	Very Good

## Natural and Environmental Sciences

### Biological Sciences

Research Unit / Home Institution	Scientific Coordinator	FTE PhDs 31.12.2003	Evaluation Rating
Biologia do Desenvolvimento/Developmental Biology / Instituto Gulbenkian de Ciência	Moisés Mallo	14	Excellent
Centro de Biologia Ambiental / Fundação da Faculdade de Ciências da Universidade de Lisboa	Maria da Luz Mathias	43	Very Good
Centro de Biologia Celular / Universidade de Aveiro	Edgar F. da Cruz e Silva	19	Good
Centro de Biologia da Universidade do Minho (CB-UM) / Universidade do Minho	Maria Manuela Sansonetty Gonçalves Côrte-Real	22	Very Good
Centro de Ecologia e Ambiente / Centre of Ecology and Environment / Universidade de Évora	Jorge Quina Ribeiro de Araújo	8	Fair
Centro de Ecologia e Biologia Vegetal / Fundação da Faculdade de Ciências da Universidade de Lisboa	Maria Amélia Martins-Loução	12	Good
Centro de Engenharia Biológica / Fundação da Faculdade de Ciências da Universidade de Lisboa	João Daniel Correia Arrabaça	11	Good
Centro de Estudos da Macaronésia - Ciências da Vida e da Terra / Universidade da Madeira	Miguel Ângelo Almeida Pinheiro de Carvalho	16	Good
Centro de Estudos de Ecossistemas Mediterrânicos / Universidade de Évora	José Manuel Pereira Branco de Mascarenhas	22.25	Fair
Centro de Genética e Biologia Molecular da UL / Fundação da Universidade de Lisboa	Maria Helena do Quental Pereira Paveia Pinto Teixeira	17.75	Fair
Centro de Investigação de Recursos Naturais / Universidade dos Açores	Nelson José de Oliveira Simões	21	Good
Centro de Investigação em Biodiversidade e Recursos Genéticos - CIBIO / Instituto de Ciências e Tecnologias Agrárias e Agro- Alimentares - ICETA	Nuno Miguel dos Santos Ferrand de Almeida	20	Very Good

Centro de Micologia da Universidade de Lisboa / Fundação da Faculdade de Ciências da Universidade de Lisboa	João Luís de Carvalho Baptista Ferreira	4	Poor
Centro de Recursos Microbiológicos - CREM / Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa	Isabel Maria Spencer Vieira Martins	14	Very Good
Instituto do Ambiente e Vida / Instituto do Ambiente e Vida	Isabel Maria de Oliveira Abrantes	26	Very Good

## Earth and Space Sciences

Research Unit / Home Institution	Scientific Coordinator	FTE PhDs 31.12.2003	Evaluation Rating
Centro de Ciências da Terra / Universidade do Minho	Graciete Tavares Dias	8	Good
Centro de Estudos Geológicos / Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa	Miguel Carlos Ferreira Telles Antunes	10.25	Very Good
Centro de Geociências / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	Rui Paulo Bento Pena dos Reis	27	Good
Centro de Geofísica da Universidade de Coimbra / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	Eduardo Ivo Cruzes do Paço Ribeiro Alves	9	Very Good
Centro de Geofísica da Universidade de Lisboa / Fundação da Universidade de Lisboa	Jorge Miguel Alberto de Miranda	19	Excellent
Centro de Geofísica de Évora / Universidade de Évora	Rui Manuel Vassalo Namorado Rosa	19.5	Excellent
Centro de Geologia Aplicada e Ambiental, U.P. / Associação para o Desenvolvimento da Faculdade de Ciências da Universidade do Porto	Manuel João Lemos de Sousa	0	Fair
Centro de Geologia da Universidade de Lisboa / Fundação da Faculdade de Ciências da Universidade de Lisboa	José Manuel Urbano Munhá	20.75	Very Good
Centro de Geologia da Universidade do Porto / Associação para o Desenvolvimento da Faculdade de Ciências da Universidade do Porto	Manuel João Lemos de Sousa	22	Very Good
Centro de Geotecnia / Instituto Superior Técnico da Universidade Técnica de Lisboa	Carlos Dinis da Gama	12	Very Good
Centro de Investigação em Ciências Geo-Espaciais / Associação para o Desenvolvimento da Faculdade de Ciências da Universidade do Porto	José Joaquim de Sousa Pereira Osório	9	Very Good

Centro de Investigação em Geo-Ambiental e Recursos - CIGAR / Faculdade de Engenharia da Universidade do Porto	António Manuel Antunes Fiúza	9	Good
Centro de Investigação em Geociências Aplicadas / Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa	Rogério Eduardo Bordalo da Rocha	6	Very Good
Centro de Investigação Geológica, Ordenamento e Valorização de Recursos / Universidade do Minho	Maria Amália de Castro de Sequeira Braga	6	Good
Centro de Petrologia e Geoquímica / Instituto Superior Técnico da Universidade Técnica de Lisboa	Luís António Aires Barros	10	Very Good
Centro de Vulcanologia e Avaliação de Riscos Geológicos / Universidade dos Açores	João Luís Roque Baptista Gaspar	7	Very Good
CVRM - Centro de Geo-Sistemas / Instituto Superior Técnico da Universidade Técnica de Lisboa	Luís Filipe Tavares Ribeiro	24	Very Good
Evolução Litosférica e do Meio Ambiental de Superfície - ELMAS / Universidade de Aveiro	Britaldo Normando de Oliveira Rodrigues	24	Good
Laboratório de Tectonofísica e Tectónica Experimental - LATTEX / Fundação da Faculdade de Ciências da Universidade de Lisboa	António Augusto Ramos Ribeiro	16	Excellent
Minerais Industriais e Argilas / Universidade de Aveiro	Celso de Sousa Figueiredo Gomes	11	Very Good

## Marine Sciences

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs</b> <i>31.12.2003</i>	<b>Evaluation Rating</b>
Centro de Estudos do Ambiente e do Mar - CESAM / Universidade de Aveiro	Casimiro Adrião Pio	56.5	Very Good
Centro de Investigação Marinha e Ambiental (CIMA) / Universidade do Algarve	Tomasz Boski	19	Very Good
Centro de Modelação Ecológica - IMAR / Instituto do Mar - IMAR	João Pedro Salgueiro Gomes Ferreira	16.5	Very Good
Grupo de Biogeoquímica - IMAR / Instituto do Mar - IMAR	Alexandre Martins Moniz de Bettencourt	5	Fair
IMAR - Centro Interdisciplinar de Coimbra / Instituto do Mar - IMAR	João Carlos Sousa Marques	35	Very Good
Instituto de Oceanografia / Fundação da Faculdade de Ciências da Universidade de Lisboa	Maria José Rosado Costa	17	Very Good

Laboratório Marítimo da Guia/IMAR (LMG/IMAR) / Instituto do Mar - IMAR	Pedro Miguel Alfaia Barcia Ré	16	Very Good
MARETEC - Centro de Ambiente e Tecnologia Marítimos / Instituto Superior Técnico da Universidade Técnica de Lisboa	António José Nunes de Almeida Sarmento	5	Very Good
Unidade de Investigação em Ecologia / Instituto Superior de Psicologia Aplicada	Vítor Manuel Carvalho Almada	12	Very Good

## Agricultural Sciences

Research Unit / Home Institution	Scientific Coordinator	FTE PhDs 31.12.2003	Evaluation Rating
Centro de Botânica Aplicada à Agricultura / Instituto Superior de Agronomia da Universidade Técnica de Lisboa	Maria Manuela Coelho Cabral Ferreira Chaves	40	Very Good
Centro de Ciência Animal e Veterinária (CECAV) / Universidade de Trás-os-Montes e Alto Douro	Arnaldo Alves Dias da Silva	29	Good
Centro de Ciência e Engenharia Agrícola / Universidade de Trás-os-Montes e Alto Douro	Eduardo Augusto dos Santos Rosa	12	Very Good
Centro de Desenvolvimento de Ciências e Técnicas de Produção Vegetal (CDCTPV) / Universidade do Algarve	Gustavo Nuno Barbosa Nolasco	24	Good
Centro de Ecologia Aplicada Professor Baeta Neves / Instituto Superior de Agronomia da Universidade Técnica de Lisboa	Francisco Manuel Cardoso Castro Rego	7	Very Good
Centro de Economia Agrária e Sociologia Rural / Instituto Superior de Agronomia da Universidade Técnica de Lisboa	Francisco Xavier Miranda de Avillez	15	Fair
Centro de Estudos de Ciência Animal / Instituto de Ciências e Tecnologias Agrárias e Agro-Alimentares - ICETA	José Manuel Alves Correia da Costa	21	Good
Centro de Estudos de Engenharia Rural / Instituto Superior de Agronomia da Universidade Técnica de Lisboa	Luis Alberto Santos Pereira	14	Very Good
Centro de Estudos de Recursos Naturais, Ambiente e Sociedade - CERNAS / Escola Superior Agrária de Coimbra	Manuel Fernando de Miranda Páscoa	18	Good
Centro de Estudos em Gestão de Ecossistemas / Universidade de Trás-os-Montes e Alto Douro	Carlos António Coelho Pacheco Marques	15	Good



Centro de Estudos Florestais / Instituto Superior de Agronomia da Universidade Técnica de Lisboa	Helena Margarida Nunes Pereira	35	Excellent
Centro de Estudos Tecnológicos, do Ambiente e da Vida (CETAV) / Universidade de Trás-os-Montes e Alto Douro	José Manuel Gaspar Torres-Pereira	37	Good
Centro de Genética e Biotecnologia / Universidade de Trás-os-Montes e Alto Douro	Henrique Guedes-Pinto	12	Excellent
Centro de Investigação de Montanha / Escola Superior Agrária de Bragança	Dionísio Afonso Gonçalves	25	Good
Centro de Investigação em Tecnologias Agrárias dos Açores / Universidade dos Açores	João da Silva Madruga	23.25	Good
Centro de Investigação Interdisciplinar em Sanidade Animal - CIISA / Faculdade de Medicina Veterinária da Universidade Técnica de Lisboa	Luis Manuel Morgado Tavares	70	Very Good
Centro de Microbiologia e Indústrias Agrícolas / Instituto Superior de Agronomia da Universidade Técnica de Lisboa	Maria Luísa Duarte Beirão Martins da Costa	8	Good
Centro de Pedologia / Instituto Superior de Agronomia da Universidade Técnica de Lisboa	Manuel Armando Valeriano Madeira	11.75	Good
IISA - Sector de Produção Agrícola e Animal / Instituto Superior de Agronomia da Universidade Técnica de Lisboa	António José Saraiva de Almeida Monteiro	20	Good
Instituto de Ciências Agrárias Mediterrânicas - ICAM / Universidade de Évora	Mário José Gouveia Pinto Rodrigues Carvalho	61	Good
Química Ambiental/Environmental Chemistry / Instituto Superior de Agronomia da Universidade Técnica de Lisboa	Amarilis Paula Alberti de Varennes e Mendonça	11	Very Good
Unidade de Protecção das Plantas e dos Produtos Agrícolas Armazenados - IISA / Instituto Superior de Agronomia da Universidade Técnica de Lisboa	António Manuel Sebastião Silva Fernandes	16	Good

## Health Sciences

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs 31.12.2003</b>	<b>Evaluation Rating</b>
Centro de Biomedicina Molecular e Estrutural / Universidade do Algarve	Paulo José Garcia de Lemos Trigueiros de Martel	11	Very Good

Centro de Cardiologia da Universidade de Lisboa / Associação para a Investigação e Desenvolvimento da Faculdade de Medicina - AIDFM	Luciano Pinto Ravara	14	Very Good
Centro de Estudos Biocinéticos / Faculdade de Ciências do Desporto e Educação Física da Universidade de Coimbra	Francisco José dos Santos Sobral Leal	7	Very Good
Centro de Estudos de Ciências Farmacêuticas / Faculdade de Farmácia da Universidade de Lisboa	Rui Ferreira Alves Moreira	18.75	Very Good
Centro de Estudos de Doenças Pulmonares (CNL3) / Associação para Investigação e Desenvolvimento da Faculdade de Medicina	António A. Bugalho de Almeida	0	Good
Centro de Estudos de Farmacotecnia, Biofarmácia e Cosmética / Faculdade de Farmácia da Universidade do Porto	José Manuel Correia Neves de Sousa Lobo	6	Poor
Centro de Estudos de Patologia Respiratória / Faculdade de Ciências Médicas da Universidade Nova de Lisboa	Maria João Marques Gomes	5	Very Good
Centro de Estudos de Química Orgânica, Fitoquímica e Farmacologia da Universidade do Porto / Faculdade de Farmácia da Universidade do Porto	Madalena Maria de Magalhães Pinto	15	Very Good
Centro de Estudos Farmacêuticos / Faculdade de Farmácia da Universidade de Coimbra	Maria Luisa Campeão Fernandes Vaz de Sá e Melo	30	Excellent
Centro de Farmacologia e Biopatologia Química da Universidade do Porto / Faculdade de Medicina da Universidade do Porto	Maria Isabel Amorim de Azevedo	17.5	Excellent
Centro de Gastreenterologia da Universidade de Coimbra / Universidade de Coimbra	Diniz da Silva Freitas	6	Good
Centro de Hematologia e Imunologia da Universidade de Lisboa / Associação para a Investigação e Desenvolvimento da Faculdade de Medicina - AIDFM	Antero Manuel Guimarães Palma Carlos	4	Fair
Centro de Histofisiologia Patologia Experimental e Biologia do Desenvolvimento / Universidade de Coimbra	Vasco António Andrade Figueiredo de Bairos	14	Good
Centro de Investigação de Patobiologia Molecular / Faculdade de Ciências Médicas da Universidade Nova de Lisboa	Joana Maria Saraiva Diamond	0	Very Good

Centro de Investigação do Instituto Português de Oncologia do Porto (CI-IPOP) / Instituto Português de Oncologia de Francisco Gentil, Centro Regional de Oncologia do Porto, SA	Manuel António Rodrigues Teixeira	7	Good
Centro de Investigação em Actividade Física, Saúde e Lazer / Faculdade de Ciências do Desporto e de Educação Física da Universidade do Porto	Jorge Augusto Pinto da Silva Mota	4	Good
Centro de Investigação em Ciências da Saúde / Universidade da Beira Interior	João António de Sampaio Rodrigues Queirós	19	Good
Centro de Investigação em Genética Molecular Humana / Reitoria da Universidade Nova de Lisboa	José Alexandre de Gusmão Rueff Tavares	27	Very Good
Centro de Investigação em Psicologia Médica, Psicossomática e Psicofisiologia / Associação para a Investigação e Desenvolvimento da Faculdade de Medicina - AIDFM	José Luis Simões da Fonseca	4	Poor
Centro de Investigação Otorrinolaringológica da Universidade de Lisboa / Universidade de Lisboa - Faculdade de Medicina	Mário Eduardo Teixeira Bastos Andrea	3	Excellent
Centro de Malária e Outras Doenças Tropicais / Instituto de Higiene e Medicina Tropical	Virgílio Estólio do Rosário	15	Excellent
Centro de Metabolismo e Endocrinologia / Associação para a Investigação e Desenvolvimento da Faculdade de Medicina - AIDFM	Manuel Diamantino Pires Bicho	11.25	Fair
Centro de Morfologia Experimental / Faculdade de Medicina da Universidade do Porto	Manuel Maria Paula Barbosa	11	Very Good
Centro de Patogénese Molecular - Unidade de Biologia Molecular e Biopatologia Experimental / Faculdade de Farmácia da Universidade de Lisboa	Maria Celeste Bastos Cabrita de Sousa Lechner	16.75	Excellent
Centro de Patogénese Molecular - Unidade dos Retrovírus e Infecções Associadas / Faculdade de Farmácia da Universidade de Lisboa - ADEIM	José António Frazão Moniz Pereira	11	Excellent
Centro de Pneumologia da Universidade de Coimbra / Universidade de Coimbra	Luis Cardoso de Oliveira	19	Very Good
Centro de Polímeros Biomédicos / Centre of Biomedical Polymers (CPB) / Egas Moniz, CRL (Instituto Superior de Ciências da Saúde-Sul)	Ana Isabel Henriques Dias Fernandes	5	Fair

Centro Interdisciplinar de Estudo da Performance Humana / Faculdade de Motricidade Humana da Universidade Técnica de Lisboa	Kelo Marçal Correia da Silva	30	Very Good
CINTESIS - Centro de Investigação em Tecnologias e Sistemas de Informação em Saúde / Faculdade de Medicina da Universidade do Porto	Altamiro Manuel Rodrigues da Costa Pereira	7	Good
Gabinete de Investigação de Bioética / Universidade Católica Portuguesa - Centro Regional do Porto	Walter Friedrich Alfred Osswald	6	Good
GENÉTICA E DESENVOLVIMENTO DA TOLERÂNCIA NATURAL / Instituto Gulbenkian de Ciência	António Coutinho	31	Excellent
IBILI - Instituto Biomédico de Investigação da Luz e Imagem / Universidade de Coimbra	João José Pedroso de Lima	31.5	Excellent
INCIFES: INstituto de Ciências, do Intelecto e do Físico, para o bem-Estar e a Segurança / Maiêutica - Cooperativa de Ensino Superior, C.R.L.	Eduardo Lopes Nunes	24	Poor
Instituto de Biofísica e Engenharia Biomédica / Fundação da Faculdade de Ciências da Universidade de Lisboa	Eduardo Luís Bliebernicht Ducla Soares	4	Excellent
Instituto de Investigação em Ciências da Vida e Saúde / Universidade do Minho	Maria Cecília de Lemos Pinto Estrela Leão	15	Excellent
Instituto de Medicina Preventiva / Faculdade de Medicina da Universidade de Lisboa	José Manuel Domingos Pereira Miguel	9	Good
Instituto de Tecnologia Biomédica / Instituto do Coração	João Manuel Godinho de Queiróz e Melo	16	Excellent
Laboratório de Óptica Médica / CETO - Centro de Ciências e Tecnologias Ópticas	Manuel Antonio Caldeira Pais Clemente	5	Poor
Núcleo de Farmacovigilância do Centro / Faculdade de Medicina da Universidade de Coimbra	Francisco Jorge Batel Marques	4	Poor
Unidade de Ciências e Tecnologia Farmacêuticas / ADEIFAR / Faculdade de Farmácia da Universidade de Lisboa	José Augusto Guimarães Morais	12	Good
Unidade de Investigação e Desenvolvimento Cardiovascular / Faculdade de Medicina da Universidade do Porto	Mário José Cerqueira Gomes Braga	22.75	Excellent
Unidade de Investigação e Desenvolvimento de Nefrologia / Faculdade de Medicina da Universidade do Porto	Manuel Jesus Falcão Pestana Vasconcelos	4	Very Good

Unidade de Investigação e Desenvolvimento em Enfermagem (UI&DE) / Escola Superior de Enfermagem Maria Fernanda Resende	Marta Hansen Lima Basto Correia Frade	3	Fair
Unidade de Investigação e Formação sobre Adultos e Idosos - UnifAI / Instituto de Ciências Biomédicas de Abel Salazar	Maria Constança Leite de Freitas Paúl dos Reis Torgal	4.5	Fair
Unidade de Investigação em Ciências da Saúde: Domínio de Enfermagem / Escola Superior de Enfermagem Dr. Ângelo da Fonseca e Escola Superior de Enfermagem de Bissaya Barreto	Manuel Alves Rodrigues	9	Fair
Unidade de Investigação em Nutrição / Faculdade de Ciências da Nutrição e Alimentação da Universidade do Porto	Maria Daniel Barbedo Vaz Ferreira de Almeida	7	Poor
Unidade de Parasitologia e Microbiologia Médicas / Instituto de Higiene e Medicina Tropical	Maria Amélia Afonso Grácio	10.75	Fair
Unidade Multidisciplinar de Investigação Biomédica - UMIB / Instituto de Ciências Biomédicas de Abel Salazar	Nuno Lídio Pinto Rodrigues Grande	10	Very Good
Unit of Pharmacology and Pharmacotoxicology of University of Lisbon / Faculdade de Farmácia da Universidade de Lisboa	Maria Beatriz da Silva Lima	7	Good

## Social Sciences

## Economics and Management

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs 31.12.2003</b>	<b>Evaluation Rating</b>
CEDE - Centro de Estudos e Documentação Europeia / Instituto Superior de Economia e Gestão da Universidade Técnica de Lisboa	Maria Clara Peres de Sousa Cabrita dos Santos	5.25	Fair
CEDIN - Centro de Estudos de Economia Europeia e Internacional / CEDIN - Centro de Estudos de Economia Europeia e Internacional	António Francisco Espinho Romão	14	Fair
CEGI- Centro de Estatística e Gestão de Informação / Instituto Superior de Estatística e Gestão de Informação - ISEGI	Manuel José Vilares	5	Good
Centro de Estudos de Economia Aplicada do Atlântico (CEEApIA) / Universidade dos Açores	Pedro Telhado Pereira	12	Good

Centro de Estudos de Economia Industrial, do Trabalho e da Empresa / Faculdade de Economia da Universidade do Porto	Maria Margarida Fernandes Ruivo	14	Very Good
Centro de Estudos de Gestão do Instituto Superior Técnico / Center of Management Studies (CEG-IST) / Instituto Superior Técnico da Universidade Técnica de Lisboa	Carlos António Bana e Costa	19	Very Good
Centro de Estudos de Gestão e Economia / Universidade Católica Portuguesa - Centro Regional do Porto	Alberto João Coraceiro de Castro	18.25	Good
Centro de Estudos Macroeconómicos e Previsão - CEMPRE / Faculdade de Economia da Universidade do Porto	Álvaro Pinto Coelho de Aguiar	18	Very Good
Centro de Estudos sobre África e do Desenvolvimento - CESA / Instituto Superior de Economia e Gestão da Universidade Técnica de Lisboa	Jochen Oppenheimer	11	Fair
Centro de Estudos Transdisciplinares para o Desenvolvimento (CETRAD) / Universidade de Trás-os-Montes e Alto Douro	Artur Fernando Arêde Correia Cristóvão	13	Poor
Centro de Investigação da Academia Militar (CINAMIL) / Academia Militar	António José Barreiros Telo	11	Poor
Centro de Investigação de Ciências Empresariais (CICE) / Universidade Lusíada	José Alvaro de Assis Lopes	8	Poor
Centro de Investigação em Economia Aplicada / Universidade Lusófona de Humanidades e Tecnologias	Abel Luís da Costa Fernandes	7.75	Good
Centro de Investigação em Gestão (CIGEST) / Associação para o Desenvolvimento da Investigação no Instituto Superior de Gestão (ADI-ISG)	Ana Paula Nunes Amaro	4	Fair
Centro de Investigação Sobre Economia Portuguesa - CISEP / Instituto Superior de Economia e Gestão da Universidade Técnica de Lisboa	Manuel Victor Moreira Martins	17	Fair
Centro de Matemática Aplicada à Previsão e Decisão Económica - CEMAPRE / Instituto Superior de Economia e Gestão da Universidade Técnica de Lisboa	João Manuel Caravana Santos Silva	19.25	Excellent
CIEF - Centro de Investigação sobre Economia Financeira / CIEF - Centro de Investigação sobre Economia Financeira	José Martins Barata	15	Good

CIG - Centro de Investigação em Gestão / Faculdade de Economia da Universidade de Coimbra	Fernando Manuel Pereira de Oliveira Carvalho	8	Poor
CIRIUS - Centro de Investigações Regionais e Urbanas / Instituto Superior de Economia e Gestão da Universidade Técnica de Lisboa	António Simões Lopes	7	Fair
GEMF - Grupo de Estudos Monetários e Financeiros / Faculdade de Economia da Universidade de Coimbra	Paulino Maria de Freitas Teixeira	11	Fair
INOVA - Economia / Faculdade de Economia da Universidade Nova de Lisboa	Vasco Manuel Sousa Borges dos Santos	43.5	Excellent
NEEII - Núcleo de Investigação em Economia Europeia, Industrial e Internacional / Escola de Economia e Gestão da Universidade do Minho	Maria Helena Almeida Silva Guimaraes	8	Poor
Núcleo de Estudos em Ciências Empresariais / Universidade da Beira Interior	Ana Maria Ussman	12	Fair
Núcleo de Estudos em Gestão / Universidade do Minho	Maria do Céu Ribeiro Cortez	10	Good
Núcleo de Investigação em Microeconomia Aplicada / Universidade do Minho	Anabela Botelho Veloso	5	Good
Núcleo de Investigação em Políticas Económicas / Universidade do Minho	Francisco José Alves Coelho Veiga	9	Good
UNICEE - Unidade de Investigação em Ciências Económicas e Empresariais / Faculdade de Ciências Económicas e Empresariais da Universidade Católica Portuguesa	Maria Leonor Martins Ribeiro Modesto	20.5	Excellent
Unidade de Estudos sobre a Complexidade na Economia / Instituto Superior de Economia e Gestão da Universidade Técnica de Lisboa	Tanya Vianna de Araújo	13	Very Good
Unidade de Gestão e Engenharia Industrial / Instituto de Engenharia Mecânica - IDMEC - Pólo FEUP	Rui Manuel Campos Guimarães	10.25	Fair
Unidade de Investigação em Inovação e Competitividade do Território / Universidade de Aveiro	Henrique Manuel Morais Diz	21	Poor
UNIDE - Unidade de Investigação em Desenvolvimento Empresarial / Instituto Superior de Ciências do Trabalho e da Empresa - ISCTE	Elizabeth Azevedo Reis	46.75	Good

## Law and Political Sciences

Research Unit / Home Institution	Scientific Coordinator	FTE PhDs <i>31.12.2003</i>	Evaluation Rating
Centro de Administração e Políticas Públicas / Instituto Superior de Ciências Sociais e Políticas da Universidade Técnica de Lisboa	João Abreu de Faria Bilhim	13	Fair
Centro de Direito Comercial e Empresarial / Universidade Católica Portuguesa - Centro Regional do Porto	José Augusto Quelhas Lima Engrácia Antunes	3	Poor
Centro de Direito Privado Comparado / Universidade Católica Portuguesa - Centro Regional do Porto	Júlio Manuel Vieira Gomes	3.5	Fair
Centro de Estudos de Direito Canónico / Universidade Católica Portuguesa	Manuel Saturino da Costa Gomes	10	Poor
Centro de Investigação Jurídico-Económica / Faculdade de Direito da Universidade do Porto	Glória Maria Alves Teixeira	5	Very Good
Direito e Sociedade – Centro de Investigação & Desenvolvimento / Faculdade de Direito da Universidade Nova de Lisboa	Diogo Freitas do Amaral	18	Very Good
Instituto de Estudos Políticos da Universidade Católica Portuguesa / Universidade Católica Portuguesa	João Carlos Mosqueira Mendes Espada	5	Good
Núcleo de Estudos de Direito / Universidade do Minho	Nuno Manuel Pinto Oliveira	8	Fair
Núcleo de Estudos em Administração e Políticas Públicas (NEAPP) / Universidade do Minho	Silvia Maria Vale Mendes	5	Excellent
Núcleo de Investigação em Ciência Política e Relações Internacionais/Research Unit in PS and IR / Universidade do Minho	Maria Do Céu de Pinho Ferreira Pinto	6	Good

## Sociology, Anthropology, Demography and Geography

Research Unit / Home Institution	Scientific Coordinator	FTE PhDs <i>31.12.2003</i>	Evaluation Rating
Centro de Estudos Africanos - UP / Faculdade de Letras da Universidade do Porto	António Custódio Gonçalves	11	Good
Centro de Estudos Africanos (CEA/ISCTE) / Instituto Superior de Ciências do Trabalho e da Empresa - ISCTE	Franz-Wilhelm Heimer	23	Very Good



Centro de Estudos das Migrações e das Relações Interculturais/CEMRI / Universidade Aberta	Maria Beatriz Pinto de Sousa Amorim Rocha da Trindade	15.5	Very Good
Centro de Estudos de Antropologia Aplicada / Universidade Fernando Pessoa	Álvaro Campelo	9	Good
Centro de Estudos de Antropologia Social / Instituto Superior de Ciências do Trabalho e da Empresa - ISCTE	Maria Antónia Pedroso de Lima	16	Very Good
Centro de Estudos de Geografia e Planeamento Regional (e-GEO) / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	Maria de Nazaré Amorim de Oliveira Roca	21	Good
Centro de Estudos de Migrações e Minorias Étnicas / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	Susana Salvaterra Trovão Pereira Bastos	4	Very Good
Centro de Estudos Geográficos - Coimbra / Faculdade de Letras da Universidade de Coimbra	Fernanda Maria da Silva Dias Delgado Cravidão	11	Poor
Centro de Estudos Geográficos / Fundação da Universidade de Lisboa	Jorge Manuel Barbosa Gaspar	31	Excellent
Centro de Investigação em Antropologia / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	Cristina Maria Proença Padez	9	Good
Centro de Tradições Populares Portuguesas Professor Manuel Viegas Guerreiro / Fundação da Universidade de Lisboa	João David Pinto Correia	8	Good
Centro Português de Investigação em História e Trabalho Social - CPIHTS / Centro Português de Investigação em História e Trabalho Social - CPIHTS	Alcina Maria de Castro Martins	12.5	Fair
CEOS - Investigações Sociológicas / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	Casimiro Manuel Marques Balsa	5	Good
CET - Centro de Estudos Territoriais / Instituto Superior de Ciências do Trabalho e da Empresa - ISCTE	Maria Isabel de Carvalho Dias Duarte	4	Very Good
CIES - Centro de Investigação e Estudos de Sociologia / Instituto Superior de Ciências do Trabalho e da Empresa - ISCTE	António Manuel Hipólito Firmino da Costa	22	Excellent
Departamento de Antropologia Social (DepANT) / Instituto Superior de Ciências do Trabalho e da Empresa - ISCTE	Jorge Costa Freitas Branco	5	Poor

DINÂMIA - Centro de Estudos sobre a Mudança Socioeconómica / Instituto Superior de Ciências do Trabalho e da Empresa - ISCTE	Raul Manuel Gonçalves Lopes	11.75	Excellent
Gabinete de Estudos de Desenvolvimento e Ordenamento do Território / Faculdade de Letras da Universidade do Porto	Rosa Fernanda Moreira da Silva	12	Poor
IET - Centro de Investigação em Inovação Empresarial e do Trabalho / SACSA - Secção Autónoma de Ciências Sociais Aplicadas, FCT-UNL	António Paulo Brandão Moniz de Jesus	8	Fair
Instituto de Sociologia da Faculdade de Letras da Universidade do Porto / Faculdade de Letras da Universidade do Porto	João Miguel Trancoso Vaz Teixeira Lopes	8	Fair
Núcleo de Estudos em Sociologia / Universidade do Minho	Albertino José Ribeiro Gonçalves	7	Fair
SociNova - Gabinete de Investigação em Sociologia Aplicada / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	Manuel Gaspar da Silva Lisboa	8.25	Good
SOCIUS- Centro de Investigação em Sociologia Económica e das Organizações / SOCIUS- Centro de Investigação em Sociologia Económica e das Organizações	José Maria Carvalho Ferreira	11	Excellent
Unidade de Estudo e Investigação de Ciências Sociais Aplicadas / Universidade Lusófona de Humanidades e Tecnologias	Mário Canova Magalhães Moutinho	23.5	Fair

## Education Sciences

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs <i>31.12.2003</i></b>	<b>Evaluation Rating</b>
CEE-UTAD - Centro de Estudos em Educação da Universidade de Trás-os-Montes e Alto Douro / Universidade de Trás-os-Montes e Alto Douro	José Jacinto Branco Vasconcelos Raposo	16	Fair
Centro de Estudos da Criança (antigo Centro de Estudos da Educação da Criança, criado em 1994) / Universidade do Minho	Patricia Joyce Fontes	13	Fair
Centro de Investigação Didáctica e Tecnologia na Formação de Formadores / Universidade de Aveiro	António Francisco Carrelhas Cachapuz	26	Excellent

Centro de Investigação e Intervenção Educativas (CIIE) / Faculdade de Psicologia e de Ciências da Educação da Universidade do Porto	Stephen R. Stoer	20	Very Good
Centro de Investigação em Educação da Faculdade de Ciências da Universidade de Lisboa / Fundação da Faculdade de Ciências da Universidade de Lisboa	Maria Odete Tavares Alberto Tereno Valente	34	Excellent
Centro de Investigação em Formação de Profissionais de Educação da Criança / Universidade do Minho	João Manuel Formosinho Sanches Simões	30	Good
Centro Interdisciplinar de Estudos Educacionais / Escola Superior de Educação de Lisboa	Amália da Conceição Garrido Bárrios	18	Good
CIEd - Centro de Investigação em Educação / Universidade do Minho	Maria de Fátima Neves Guerreiro Sequeira	43	Very Good
Construção do Conhecimento Pedagógico nos Sistemas de Formação / Universidade de Aveiro	José Pereira da Costa Tavares	23	Very Good
UIED - Unidade de Investigação Educação e Desenvolvimento / Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa	Maria Teresa Vieira Ramos Bastos Ambrósio	17	Very Good
Unidade de I&D de Ciências da Educação / Fundação da Universidade de Lisboa	Albano Cordeiro Estrela	32	Excellent
Unidade de Investigação em Educação, Cultura e Cidadania / Escola Superior de Educação do Instituto Politécnico de Coimbra	Maria Luísa Cabral dos Santos Veiga	5	Poor
Unidade de Investigação na Formação de Professores / Escola Superior de Educação do Instituto Politécnico de Viseu	Maria Paula Martins de Oliveira Carvalho	3	Poor
Unidade I&D Observatório de Políticas de Educação e de Contextos Educativos / Universidade Lusófona de Humanidades e Tecnologias	António Neves Duarte Teodoro	13	Fair

### **Education Policies**

CIPES - Centro de Investigação de Políticas do Ensino Superior / Fundação das Universidades Portuguesas	Alberto Manuel Sampaio Castro Amaral	7	Excellent
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## Psychology

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs 31.12.2003</b>	<b>Evaluation Rating</b>
Centro de Estudos de Psicologia Cognitiva e da Aprendizagem / Universidade Lusófona de Humanidades e Tecnologias	Francisco Gomes Esteves	5	Very Good
Centro de Investigação em Maturação Individual e Dinâmica Comunitária / Instituto Superior Miguel Torga	Carlos Manuel da Cruz Farate	6	Poor
Centro de Investigação em Psicologia do Comportamento Desviante e Saúde / Faculdade de Psicologia e de Ciências da Educação da Universidade do Porto	Jorge Nuno Negreiros de Carvalho	8	Fair
Centro de Psicologia Clínica e Experimental: Desenvolvimento, Cognição e Personalidade / Fundação da Universidade de Lisboa	Pedro Rodrigues Formigal Luzes	13	Very Good
Centro de Psicologia da Universidade do Porto / Faculdade de Psicologia e de Ciências da Educação da Universidade do Porto	Marianne Helene Lacomblez	24	Very Good
Centro de Psicometria e Psicologia da Educação (Universidade de Lisboa) / Fundação da Universidade de Lisboa	Maria José Miranda	22	Very Good
Centro de Psicopedagogia da Universidade de Coimbra / Faculdade de Psicologia e de Ciências da Educação da Universidade de Coimbra	António Simões	19	Very Good
CIPsi - Centro de Investigação em Psicologia / Universidade do Minho	Carlos Fernandes da Silva	30	Excellent
CIS - Centro de Investigação e de Intervenção Social / CIS - Centro de Investigação e de Intervenção Social	António Caetano	12	Good
Instituto de Psicologia Cognitiva, Desenvolvimento Vocacional e Social / Faculdade de Psicologia e de Ciências da Educação da Universidade de Coimbra	Manuel Amâncio Viegas Abreu	14.75	Very Good
NEICC - Núcleo de Estudos e Intervenção Cognitivo-Comportamental / Faculdade de Psicologia e de Ciências da Educação da Universidade de Coimbra	José Augusto da Veiga Pinto de Gouveia	3	Good
Psicologia Cognitiva do Desenvolvimento e da Educação / Instituto Superior de Psicologia Aplicada	Maria Margarida d Orey Alves Martins	15	Excellent

Unidade de Investigação em Psicologia Clínica / Instituto Superior de Psicologia Aplicada	Maria Emília Marques	6	Poor
Unidade de Psicologia da Saúde e Integração Social (UPSIS) / Fundação Bissaya-Barreto	Pierre Tap	6	Fair

## Linguistics

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs</b> <i>31.12.2003</i>	<b>Evaluation Rating</b>
Centro de Estudos de Linguística Geral e Aplicada / Faculdade de Letras da Universidade de Coimbra	Ana Cristina Macário Lopes	6	Good
Centro de Estudos em Letras / Universidade de Trás-os-Montes e Alto Douro	Carlos Costa Assunção	15	Good
Centro de Estudos Humanísticos / Faculdade de Filosofia da Universidade Católica Portuguesa	Mário Rosa da Silva Garcia	9	Fair
Centro de Línguas e Culturas (CLC) / Universidade de Aveiro	João Manuel Nunes Torrão	31	Good
Centro de Linguística da Universidade de Lisboa - CLUL / Fundação da Universidade de Lisboa	Maria Fernanda Gorjão Bacelar de Oliveira Nascimento	20.5	Excellent
Centro de Linguística da Universidade do Porto / Faculdade de Letras da Universidade do Porto	Fernanda Irene Araújo Barros Fonseca	12	Very Good
Centro de Linguística da Universidade Nova de Lisboa / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	Maria Teresa Rijo da Fonseca Lino	25	Excellent
Instituto de Linguística Teórica e Computacional - ILTEC / Instituto de Linguística Teórica e Computacional - ILTEC	Maria Helena Mira Mateus	3	Very Good
Onset - Centro de Estudos da Linguagem / Faculdade de Letras da Universidade de Lisboa	Isabel Hub Faria	11	Very Good

## Communication Sciences

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs</b> <i>31.12.2003</i>	<b>Evaluation Rating</b>
Centro de Estudos das Tecnologias, Artes e Ciências da Comunicação (CETAC.COM) / Faculdade de Letras da Universidade do Porto	Eugénio Francisco dos Santos	7.5	Fair

Centro de Estudos de Comunicação e Linguagens / Centro de Estudos de Comunicação e Linguagens	José Augusto Nunes Bragança de Miranda	19.5	Good
Centro de Investigação Media e Jornalismo / Centro de Investigação Media e Jornalismo	Nelson Traquina	10	Good
Centro Interdisciplinar de Ciência, Tecnologia e Sociedade da Universidade de Lisboa / Fundação da Universidade de Lisboa	Maria Elisa Viriato de Matos Maia	9	Fair
CICANT - Centro de Investigação em Comunicação Aplicada, Cultura e Novas Tecnologias / Universidade Lusófona de Humanidades e Tecnologias	Rogério Augusto Carvalho Ferreira de Andrade	7.5	Fair
LABCOM - Laboratório de Comunicação e Conteúdos On-line / Universidade da Beira Interior	António Carreto Fidalgo	8	Good
Núcleo de Estudos de Comunicação e Sociedade / Universidade do Minho	Moisés Adão de Lemos Martins	10	Very Good
UNICA - Unidade de Investigação em Comunicação e Arte / Universidade de Aveiro	Fernando Manuel dos Santos Ramos	26	Fair

## Arts and Human Sciences

### Literature

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs</b> <i>31.12.2003</i>	<b>Evaluation Rating</b>
CEAUL / ULICES - Centro de Estudos Anglisticos da Universidade de Lisboa / Fundação da Universidade de Lisboa	João de Almeida Flor	23	Very Good
Centro de Estudos Alemães e Europeus / Faculdade de Letras da Universidade de Lisboa	Maria Fernanda Gil Pinheiro da Costa	13	Fair
Centro de Estudos Anglo-Portugueses / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	Maria Leonor Ribeiro da Fonseca Calixto Machado de Sousa	10	Good
Centro de Estudos Clássicos / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	António Manuel de Andrade Moniz	5	Poor
Centro de Estudos Clássicos da Faculdade de Letras de Lisboa / Fundação da Universidade de Lisboa	Aires Augusto Nascimento	20	Excellent

Centro de Estudos Clássicos e Humanísticos / Faculdade de Letras da Universidade de Coimbra	Maria do Céu Grácio Zambujo Fialho	22	Very Good
Centro de Estudos Comparatistas / Faculdade de Letras da Universidade de Lisboa	Helena Etelvina Lemos Carvalhão Buescu	11	Excellent
Centro de Estudos de Culturas Lusófonas - CECLU / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	Maria Fernanda Antunes de Abreu	5	Poor
Centro de Estudos Humanísticos / Universidade do Minho	Vitor Manuel Aguiar Silva	40	Very Good
Centro de Estudos Linguísticos e Literários / Faculdade de Ciências Humanas e Sociais da Universidade do Algarve	Pedro Alfonso Ferré da Ponte	10	Good
Centro de Literatura e Cultura Portuguesa e Brasileira / Universidade Católica Portuguesa	Manuel Barbosa da Costa Freitas	22.5	Good
Centro de Literatura Portuguesa / Faculdade de Letras da Universidade de Coimbra - Instituto de Língua e Literatura Portuguesas	José Oliveira Barata	10	Very Good
Centro de Literaturas de Expressão Portuguesa da Universidade de Lisboa - CLEPUL / Fundação da Universidade de Lisboa	Maria de Lourdes A. Ferraz	14	Good
Centro Interuniversitário de Estudos Camonianos / Biblioteca Geral da Universidade de Coimbra	Aníbal Pinto de Castro	4.5	Fair
Centro Interuniversitário de Estudos Germanísticos / Faculdade de Letras da Universidade de Coimbra	Maria Manuela Nobre Gouveia Delille	15	Excellent
Instituto de Estudos de Literatura Tradicional / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	Ana Paula Amorim de Sousa Guimarães	12	Excellent
Instituto de Estudos Ingleses / Centro Leonardo Coimbra - Faculdade de Letras da Universidade do Porto	Gualter Mendes Queiroz Cunha	8	Good
Instituto de Estudos Norte-Americanos / Centro Leonardo Coimbra - Faculdade de Letras da Universidade do Porto	Carlos Manuel da Rocha Borges de Azevedo	3	Fair
Instituto de Literatura Comparada Margarida Losa / Centro Leonardo Coimbra - Faculdade de Letras da Universidade do Porto	Gonçalo José do Vale Peixoto e Vilas-Boas	8	Very Good

Núcleo de Estudos Literários – Texto, Crítica, Mentalidades (NEL – TCM) / Faculdade de Letras da Universidade do Porto	John Thomas Greenfield	7	Good
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## Art and Architecture

Research Unit / Home Institution	Scientific Coordinator	FTE PhDs <i>31.12.2003</i>	Evaluation Rating
CEARQ - Centro de Estudos de Arquitectura / Faculdade de Ciências e Tecnologia da Universidade de Coimbra	Mário Júlio Teixeira Kruger	7	Fair
Centro de Estudos de Arquitectura e Urbanismo / Faculdade de Arquitectura da Universidade do Porto	Nuno Rodrigo Martins Portas	15	Very Good
Centro de Estudos de Arquitectura Paisagista - Professor Caldeira Cabral / Instituto Superior de Agronomia da Universidade Técnica de Lisboa	Maria Manuela Cordes Cabêdo Sanches Raposo Magalhães	4	Good
Centro de Estudos de Sociologia e Estética Musical / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	Mário António Pinto Vieira de Carvalho	10	Very Good
Centro de Estudos de Teatro / Fundação da Universidade de Lisboa	Maria Helena Zaira Diniz de Ayala Serodio Pereira	7	Excellent
Centro de História da Arte / Universidade de Évora	José Alberto Simões Gomes Machado	11	Excellent
Centro de Investigação em Ciências e Tecnologias das Artes / Universidade Católica Portuguesa - Centro Regional do Porto	Francisco José Amorim de Carvalho Guerra	6	Good
CIEIA - Centro Interdisciplinar de Estudos e Intervenção Artísticos / MPIAEP	Lucilia Maria de Oliveira Rodrigues da Costa Valente	7	Poor
Instituto de Etnomusicologia / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	Salwa El-Shawan Castelo-Branco	10	Good
Instituto de História da Arte / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	Margarida Maria Acciaiuoli H. C. Tavares Brito	7	Good
Unidade de Investigação em Design e Comunicação - UNIDCOM/IADE / IADE, Instituto de Artes Visuais Design e Marketing	Fernando António de Oliveira Carvalho Rodrigues	14	Fair
Vidro e Cerâmica para as Artes / Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa	José Carlos Fernandes de Carvalho e Melo	3.5	Very Good



## Philosophy

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs 31.12.2003</b>	<b>Evaluation Rating</b>
Centro de Estudos do Pensamento Português / Universidade Católica Portuguesa - Centro Regional do Porto	Arnaldo Cardoso de Pinho	7	Good
Centro de Estudos Filosóficos / Faculdade de Filosofia da Universidade Católica Portuguesa	João José Miranda Vila-Chã	12.5	Very Good
Centro de Filosofia da Universidade de Lisboa / Fundação da Universidade de Lisboa	Manuel José do Carmo Ferreira	30.5	Excellent
Centro de Filosofia das Ciências da Universidade de Lisboa / Fundação da Faculdade de Ciências da Universidade de Lisboa	Olga Maria Pombo Martins	6	Fair
Centro de História e Filosofia da Ciência e da Tecnologia / Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa	António Manuel de Sá Nunes dos Santos	8	Very Good
GEPOLIS - Centro de Estudos de Filosofia e Cidadania / Universidade Católica Portuguesa	António Mendo de Castro Henriques	11	Very Good
Instituto de Filosofia / Centro Leonardo Coimbra - Faculdade de Letras da Universidade do Porto	Maria Cândida Gonçalves da Costa Reis Monteiro Pacheco	15	Excellent
Instituto de Filosofia da Linguagem / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	António José Duque da Silva Marques	15	Excellent
Instituto de Filosofia Prática / Universidade da Beira Interior	José Manuel Boavida Santos	3	Very Good
Linguagem, Interpretação e Filosofia - LIF / Language, Interpretation & Philosophy/LIF / Faculdade de Letras da Universidade de Coimbra	António Manuel Martins	11	Excellent
Unidade de Estudo e Investigação em Ciência, Tecnologia e Sociedade / Universidade Lusófona de Humanidades e Tecnologias	António Fernando Martins dos Santos Neves	15	Fair

## History

<b>Research Unit / Home Institution</b>	<b>Scientific Coordinator</b>	<b>FTE PhDs 31.12.2003</b>	<b>Evaluation Rating</b>
Campo Arqueológico de Mértola / Campo Arqueológico de Mértola	Cláudio Figueiredo Torres	4	Very Good

Centro de Arqueologia da Universidade de Lisboa (UNIARQ) / Fundação da Universidade de Lisboa	Victor Manuel dos Santos Gonçalves	6	Good
Centro de Cultura Árabe, Islâmica e Mediterrânica / Universidade do Algarve	Maria Teresa Judice Gamito	4	Poor
Centro de Estudos Arqueológicos das Universidades de Coimbra e Porto / Faculdade de Letras da Universidade de Coimbra	Jorge Nogueira Lobo de Alarcão e Silva	11	Very Good
Centro de Estudos de História Contemporânea Portuguesa / Instituto Superior de Ciências do Trabalho e da Empresa - ISCTE	Magda de Avelar Pinheiro	13.25	Good
Centro de Estudos de História e Filosofia da Ciência (CEHFC-UE) / Universidade de Évora	Augusto José dos Santos Fitas	9	Good
Centro de Estudos de História Religiosa / Universidade Católica Portuguesa	Manuel José Macário do Nascimento Clemente	14	Very Good
Centro de Estudos de Património / Faculdade de Ciências Humanas e Sociais da Universidade do Algarve	Nuno Gonçalo Viana Pereira Ferreira Bicho	8	Fair
Centro de Estudos Históricos / Reitoria da Universidade Nova de Lisboa	António Henrique Rodrigo Oliveira Marques	11	Excellent
Centro de Estudos Históricos Interdisciplinares / Universidade Aberta	Maria José Pimenta Ferro Tavares	10	Poor
Centro de Estudos Interdisciplinares do Século XX da Universidade de Coimbra - CEIS20 / Reitoria da Universidade de Coimbra	Luís Manuel Soares dos Reis Torgal	22	Very Good
Centro de História da Cultura da UNL / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	José Esteves Pereira	21.25	Good
Centro de História da Sociedade e da Cultura / Faculdade de Letras da Universidade de Coimbra	João Marinho dos Santos	25	Very Good
Centro de História da Universidade de Lisboa / Fundação da Universidade de Lisboa	José Nunes Carreira	33	Good
Centro de História das Ciências da Universidade de Lisboa / Fundação da Faculdade de Ciências da Universidade de Lisboa	Ana Isabel da Silva Araujo Simoes	4	Good
Centro de História de Além-Mar / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	Artur Teodoro de Matos	14.25	Excellent

Centro de Investigação e Documentação de História Medieval / Universidade Portucalense Infante D. Henrique	Humberto Baquero Moreno	3	Poor
Centro de Investigação Histórica -FLUP / Faculdade de Letras da Universidade do Porto	Armando Luís Gomes de Carvalho Homem	11	Good
Centro Interuniversitário de História da Espiritualidade / Centro Interuniversitário de História da Espiritualidade	José Adriano Moreira de Freitas Carvalho	10	Good
Centro Português de Estudos do Sudeste Asiático / Centro Português de Estudos do Sudeste Asiático - CEPESA	Ivo Manuel Veiga Carneiro de Sousa	29.5	Fair
CEPESE - Centro de Estudos da População, Economia e Sociedade / CEPESE - Centro de Estudos da População, Economia e Sociedade	Fernando Alberto Pereira de Sousa	22	Very Good
CIDEHUS-UE - Centro Interdisciplinar de História, Culturas e Sociedades da Universidade de Évora / Universidade de Évora	Mafalda Sousa Machado Soares Cunha	28.75	Good
Gabinete de História Económica e Social / Instituto Superior de Economia e Gestão da Universidade Técnica de Lisboa	Nuno João de Oliveira Valério	6	Excellent
GEHVID - Grupo de Estudos de História da Viticultura Duriense e do Vinho do Porto / Centro Leonardo Coimbra - Faculdade de Letras da Universidade do Porto	Francisco Ribeiro da Silva	8	Good
Instituto de Estudos Medievais / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	Luis Filipe Llach Krus	8	Fair
Instituto de História Contemporânea / Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa	Fernando José Mendes Rosas	10	Excellent
Instituto de História Moderna da Universidade do Porto (IHM-UP) / Centro Leonardo Coimbra - Faculdade de Letras da Universidade do Porto	Luís António de Oliveira Ramos	8	Fair
Núcleo de Arqueologia da Universidade do Minho (NARQ) / Universidade do Minho	Maria Manuela dos Reis Martins	5	Good
Núcleo de Estudos de População e Sociedade - NEPS / Universidade do Minho	Maria Norberta Simas Bettencout Amorim	9	Good
Núcleo de Estudos Históricos / Universidade do Minho	José Viriato Eiras Capela	7	Poor

## ANNEX 5.

### PROCEDURE USED TO CALCULATE THE AMOUNT OF PROGRAMMATIC FUNDING ALLOCATED TO THE RESEARCH UNITS

Following the assessments and funding recommendations made by of the Evaluation Panels of all scientific areas, and having into consideration the financial resources available for the period 2003-2005, the amount of Programmatic Funding allocated to the each Research Unit was calculated using the following procedure:

1. A global sum of 15.1 million Euros of Programmatic Funding was established for the period 2003-2005.
2. This Funding was allocated only to the Research Units classified with *Excellent* or *Very Good* and to new Units classified with *Good* or better. The reason for the latter case was the necessity to support the start-up efforts of these Units.
3. When the Evaluation Panels did not propose the allocation of Programmatic Funding to a given Unit, FCT abided by that decision; the exception were the Units classified as *Excellent*, to which was allocated an amount of Programmatic Funding, which depended on the respective scientific area and the FTE PhDs number of the Unit.
4. The global sum of Programmatic Funding assigned to each scientific area was defined by FCT considering the following parameters:
  - a. Global number of FTE PhDs of the Units to be financed in each scientific area;
  - b. The relative cost of the research activity in each scientific area, weighed as:
    - I Health Sciences, Engineering Sciences, Agricultural and Biological Sciences, Earth and Space Sciences, Marine Sciences, Exact Sciences (with the exception of Mathematics) – weight factor 5
    - II Mathematics, Economy and Management and Sociology, Anthropology, Demography and Geography - weight factor 3
    - III Social sciences and Humanities - weight factor 2
5. After determining the global amount per area, the following methodology was used:
  - a. When the total value of Programmatic Funding recommended by the Evaluation Panel for a given area was smaller than the sum defined by FCT for the same area, the funding proposed by the Panel for each Research Unit was chosen.
  - b. When the total value of Programmatic Funding recommended by the Evaluation Panel for a given scientific area was higher than the sum defined for the FCT for the same area, the funding proposed by FCT was chosen. This sum was assigned to each Unit proportionally to the Panel proposals.
6. The difference between the total funding, determined in accordance with this procedure, and the maximum value previously defined, was reallocated to the Research Units that had received an amount inferior to that proposed by the Evaluation Panel, proportionally to the funding already defined.
7. A Programmatic Funding of 180 000 Euros was allocated to the CIPES Research Unit, the only one in the Education Policies sub-area, and carrying out research activities that were considered a priority at national level.
8. FCT decided that no scientific areas should be excluded from receiving Programmatic funding; since the History Evaluation Panel did not propose any such funding, an amount of 55 000 Euros was allocated to this area.
9. Since no Units were classified as *Excellent* by the Civil Engineering Panel, the total amount of Basic Funding allocated to this area was relatively low. To compensate for this, FCT decided to award it an additional Programmatic Funding of 538 000 Euros, thus increasing the overall amount of this Funding to 15.6 MEuros.