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Funding Systems and their Effects on Higher Education Systems

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Maria João Rosa, Diana Amado Tavares and Alberto Amaral

CIPES – Centre for Research in Higher Education Policies

Executive Summary

The major component of the funding of Portuguese public higher education institutions comes from the state budget and consists of three separate strands: for teaching (salaries and other current expenditures), for research and for investment. Research funding is allocated mainly through a competitive system while funding for investment results from the Ministry's approval of each institution's development plan. Funding for teaching has been allocated by a funding formula since 1986. The formula went through several changes and adaptations but it is fair to say that until 2003 it was based on inputs, and did not contain indicators related to institutional quality or efficiency. At the time of the 1974 revolution the participation rate was around 7% and increasing enrolments has been a major political objective until the late 1990s, which explains the design of the formula that aimed at giving incentives to increasing enrolments. More recently as the gross participation rate (20-24 years) is over 50% and as the number of candidates to higher education is starting to decline due to demography, further increasing of enrolments is no longer a political objective and the government designed a new formula that will increasingly consider institutional performance by moving into a more output oriented approach.

In general stakeholders agreed that the formula was more oriented towards promoting the system and the institution's development, rather than at punishing poor performance. Stakeholders mentioned some unintended effects and referred that the formula created an undesirable gap between teaching and research due to the separation between their funding systems, as well as incentives to hiring better qualified academics rather than younger but less qualified staff, and incentives to hiring an increasing number of "invited professors" which had the double advantage of not being tenured and having a higher teaching work load than staff in the academic career. Stakeholders agreed that as the funding system was primarily based on the number of enrolled students, it influenced institutional strategies, which in general aimed at increasing student enrolments. Some claimed that the funding formula created negative incentives to pedagogic efficiency. Stakeholders also mentioned that there was a tendency to increase alternative sources of funding by establishing relations with the external community and by setting tuition fees at its maximum allowed value. On research, stakeholders perceived a marked influence of the financing system on research strategies, because it is felt that the existent highly competitive system could easily lead to the promotion of certain research areas, more output oriented, instead of others, traditionally less appealing for the global market and consequently less financially attractive.

As main weaknesses of the funding system, stakeholders referred to insufficiency of government funding, insufficient consideration of the diversity among higher education institutions, not promoting equity between the university and polytechnic sub-systems (Polytechnics considered there was an explicit policy to minimise polytechnic education relative to university education which is reflected in the funding system), to frequent changes of the parameters of the funding formula that might result in less transparency and in difficulties in

foreseeing medium/long term financing, and to excessive dependency on student numbers. Despite these weaknesses the funding formula was viewed as an adequate methodology to allocate the available public funding among institutions, especially because it increased transparency and resource allocation equity. Nevertheless there were proposals to improve the formula by introducing explicit indicators related to the students' real cost, results of quality assessment and the qualification of the academic staff.

Finally, the large majority of academics tended to agree with the idea that teaching was dependent both on the students' background and the interest/priority teachers put in this activity. They also supported the idea that financial resources should be allocated based on the quality of research and on the number of students.

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1 Introduction

This chapter presents a short overview of the Portuguese public funding of higher education, mentioning the available mechanisms for the funding of higher education's teaching and research activities. Additionally, other sources of income of higher education institutions are described as well as their main categories of expenditures.

During the last three decades the Portuguese higher education system has undergone significant changes. Among these changes there was a fast massification of the system and its diversification, with the emergence of a binary system and a strong private sector. Simultaneously, and similarly to what happened in other western European countries, Portugal has followed a generalised trend towards the development of a regulation model based on institutional autonomy and stronger self-regulation, with the State reducing its level of intrusive regulation and moving to a more supervisory role. In 1988 the Parliament passed the University Autonomy Law (Law 108/88), conferring Public universities important administrative and financial autonomy, and reinforcing their academic autonomy. In 1990, the public polytechnics also had their autonomy broadened, though to a lesser extent than universities, especially in scientific and financial terms. Both autonomy laws contributed to establish a new framework for the relationship between the State and public higher education institutions (universities and polytechnics), the latter becoming more autonomous.

The Education System Act (Law 46/86 of 14 October) defined the main objectives of higher education, which did not significantly differ from the traditional ones of teaching and research and cultural production and the development of the entrepreneurial and scientific spirit and reflexive thought. Higher education should also train graduates to be integrated into the different professional sectors and to participate in the development of society and in continuing education; to promote research activities aiming at the development of science and technology, humanities and the arts and to contribute to cultural creation and diffusion. Higher education should also promote and valorise the Portuguese language and culture and promote critical thinking and the freedom of speech and research. However, the law did not refer to the role of higher institutions as providers of services to the outside community, namely to industry.

Despite the increased autonomy of public higher education institutions, the state remained an important partner in the higher education system (Teixeira, Rosa and Amaral 2004), the funding system of higher education being a very powerful steering instrument to implement national higher education policies.

There are two main mechanisms in Portugal for the public funding of teaching and research activities:

- Public funding for science and technology (S&T) includes direct funding to institutions and competitive funding (see 2.4).

- Public funding for higher education institutions:
  - Direct basic funding to public institutions for teaching (through a funding formula)
  - Investment funding
  - Contractual funding to public institutions (through contracts for specific issues)
  - Direct funding to students (social support of individual grants)
  - Indirect funding to students (includes meals, accommodation, sports, healthcare)

In the following sub-sections their main features are discussed, referring also to the formal and explicitly stated interrelationships between the funding system and national higher education policies. Additionally one will briefly describe other sources of financing, such as tuition fees paid by students and other private sources of income.

1.1   The public funding of higher education institutions

Since the late 1980's the Ministry allocates funding for higher education teaching using a formula. The formula was implemented following the increasing institutional autonomy, and was applied to the running costs of public institutions, being negotiated between them and the Ministry. Additionally, institutions negotiate funding for investments (new buildings and equipment) with the Ministry based on the institutions' proposed development plans.

The first funding formula was implemented in 1986. This formula allocated funding proportional to enrolments and contained four cost parameters: unit costs of laboratory and non-laboratory undergraduate programmes and unit costs of laboratory and non-laboratory graduate programmes. There was an additional parameter (E) that could be positive or negative, which aimed at taking into consideration special institutional characteristics. This first formula was applied only to universities and it aimed at improving resource allocation equity. Although this formula was considered an improvement for higher education institutions' financing, there was some feeling that it was too simplistic. Therefore, in 1990 the Ministry changed the formula by increasing the number of cost parameters: one for very expensive programs, such as medicine, and other for very low cost programs such as law and political sciences. Despite this change, the Minister of Education was not powerful enough to protect the formula from permanent interference from the Minister of Finances. Every year universities clashed with the government over the way the formula was ignored and eventually this undermined the relationship between universities and the government.

In 1993, with a new Minister in office, the Council of Rectors of Portuguese Universities, together with the Coordinating Council for Public Polytechnics, were able to negotiate a new funding formula, to be used for resource allocation not only to universities but also to polytechnic institutes. As previously, the new formula aimed at ensuring better resource allocation equity among HEIs, a second goal being to promote an increase of student enrolments. As its predecessor, this new formula reflected the funding basis from a throughput perspective. Funding was related to the costs supported by higher education institutions in their activity (namely in terms of enrolments). The formula varied according to the field of study, favour-

ing degrees that required more practical or laboratory classes, e.g., medical sciences and engineering. The funding of each programme took into consideration the following parameters: the academic staff/student ratio, the non-academic staff/academic staff ratio, the standard composition of the teaching staff, the expenditure (and structure) of central administration (based on central administration personnel/student ratio), and the budgetary structure expressed as the percentage composition of personnel costs and other operational costs. For every institution the number of enrolled students in each program combined with the staff ratios allowed for the calculation of the standard number of staff members. Multiplying this number by the average salaries and adding a percentage for other expenses the standard budget was determined for year **x**. This budget was then compared to the institution's operating (real) budget for year **x-1**. If the operational budget was higher than the standard budget, then the budget for year **x** was the former operational budget minus a percentage of the difference between the two; if the operational budget was lower than the standard budget, then the budget for year **x** was the former operational budget plus a percentage of the difference between the two. The idea was to make all HEIs budgets converge to the standard (ideal) budget in due time, though this process has in practice been somehow erratic. This formula was used until 2003, although with several adaptations.

It is possible to say that this formula contributed to an increase in resource allocation equity and transparency, to promote increasing enrolments and it allowed for improvements in staff management efficiency. Under this financing framework there was no relationship between funding and quality assessment, in agreement with the principles of the national quality assessment system, adapted from the Dutch system. However, as the system expanded, the formula run into increasing difficulties because the available financing "plafond" for public expenditure did not increase as fast as the expansion in enrolments and its associated costs. This is one of the reasons that explained the political decision to substantially increase the level of tuition fees, against strong opposition from the students, as an additional means to increase the funding basis of the higher education system (see sub-section 1.3 in this report). There were also other problems associated with this formula, such as the lack of output elements to determine the level of funding; there were no incentives to decrease students' retention – the incentives were indeed negative as retaining students would increase enrolments; the public universities were free to start new programmes that were almost automatically financed by the formula and finally there were too many annual adjustments to the formula that progressively decreased its transparency.

In 2003 a more neo-liberal government won the general elections and quality, efficiency and individual responsibility became part of the political discourse. A new financing law was passed and the allocation rationale was changed to become progressively more performance-based. "Quality related parameters" were progressively introduced into the formula to implement the new law. However, those in charge of implementing the changes in the formula for the calculation of the 2004 and 2005 budgets were not able to design appropriate parameters and the results were a disaster, while the Minister, unable to resist outside pressures, allocated extra funding outside the formula to some more privileged institutions, which

subverted much of the transparency and resulted in the destruction of the previous good relationship between HEIs and the government.

One of the problems of the formulas used so far was that they calculated a value for the budget of each institution without taking into account the available global budget for higher education, which left the Ministry with two alternatives: either to tamper with the formula until it fitted into the available plafond or to be brave and declare that there was a cut in the budget allocated to each institution in order to fit the plafond. This resulted in obvious complaints from university rectors and polytechnic presidents.

For the 2006 budget the new Government elected in 2005 adopted an approach that aims at allocating the available total budget among the public higher education institutions, while progressively introducing criteria related to quality and to performance, and at the same time avoiding the problem mentioned in the previous paragraph. The new formula does not calculate absolute budget values, but merely allocates the available plafond to the institutions thus avoiding the idea of cuts to the calculated values. It should be noted that under the current context of excess capacity, higher education institutions compete for students, so the number of students represents some level of performance, at least in terms of the attraction capacity of each course/institution. This formula (Table 1) was based on the overall number of students, but included the following quality factors:

- Qualification of teaching staff, as measured by the fraction of PhDs in the total number of teachers of each institution.

- Graduation rate, as measured by two indicators:
    - The number of first cycle graduates;
    - The number of master and PhD degrees awarded

In addition, the formula included two institutional factors to answer to specific characteristics of each individual institution and training area:

- Average personal costs for each institution, to account for the specific characteristics of the teaching and non-teaching staff of each institution

- Specific student/teacher ratio for each scientific area.

Table 1 – Criteria used in the Funding Formula developed for 2006, based on current funding law

Terms in the new funding formula	Description
Overall number of students	Number of students for all the courses approved for public funding
Cost factor to allow considering specific institutional characteristics, as well as to differentiate areas of study	Staff average costs (indirect measure of qualification) Teacher/student ratios Teacher/non academic staff ratios Funding depends on reference costs calculated using the same criteria for every institution, using a predefined relationship between other current expenses and personnel costs (15/85)
Quality indicators	Level of the academic staff qualification (fraction of the academic staff holding PhDs) Graduation efficiency rate Post-graduation efficiency rates (masters and PhDs awarded)

Over and above the direct basic funding to public institutions for teaching (allocated through the formula), public funding of HEIs also includes investment funds and funds allocated on a contractual basis for specific issues or projects that HEIs intend to develop.

1.2   The funding of higher education institutions – other sources of income

HEIs have other sources of funding, the more relevant being earned income (without tuition fees). This funding source has acquired a more prominent role in recent years and often contributed with about a quarter of the funds to many institutions, though its importance varied from institution to institution. Some institutions, using their advantages in location, prestige and disciplinary composition, were more successful in obtaining funds through this source.

The third source of funding in importance was provided by student fees, which presented a clear growth pattern in nominal terms in recent years, especially due to the changes in the funding law in 1997 and 2003. Until 1992 the level of tuition fees in public institutions remained very low (ca. € 6 per year), because its value was kept constant since its establishment in 1944. In 1992 a new tuition's framework was established, corresponding to the actualisation of the 1944 value, taking inflation into account (ca. €300). This change led to resistance from the students, and significant political disturbance, with various ministers of education forced to resign due to this controversy. In spite of this resistance, the changes were implemented. With the change of government in late 1995, the discussion gained momentum again. The new government suspended the 1992 law, with the promise of preparing a new law on the funding of public higher education. By the mid-97, a new law was passed (Law 113/97), re-establishing tuition fees at a level similar to that previous to the suspension of the law. The main difference in the 1997 version was that the level of tuition was equal for all students of public institutions and linked to the national monthly minimum wage. In spite of some resistance of the students, the ministry managed to succeed in re-introducing the payment of fees. In August 2003 a new funding law was passed that significantly increased the annual level of tuition fees from its 2002 value (€ 350). However, the new law instead of setting a fixed value for all public institutions allowed each institution to decide on the level of fees between a minimum and a maximum value determined nationally (between €487 and €900 for academic year 2005-6). The idea was that the best institutions would be able to charge higher fees, thus creating a price differential related to quality. As the law allowed each school to set its own level of fees it happened that different schools belonging to the same higher education institution charged different fees, depending on the institution's level of centralisation or on the power of the students' union. It is also observed that in general fees are lower in Polytechnics than in Universities.

Student fees are earned income of institutions. Despite this increased participation of students and their families in the costs of higher education, their financial role is rather small (representing often less than 10% of the current budget allocated by government to public HEIs). Although in recent years Portugal was placed alongside many other countries in the

increasing visibility of cost-sharing, the impact so far was limited, especially on student participation (Teixeira, Amaral and Rosa 2006). This situation is very different from that of private institutions, which are basically supported by students' fees (at the moment between € 2,000-3,000). This gap in terms of tuition fees adds to the perceived different quality between these two sub-sectors, placing public HEIs (notably universities) as the first priority of prospective students, and minimising the competition threat posed by private institutions.

Table 2 presents the composition of the income budget of public higher education institutions, showing that funding coming directly from the government was by far the largest funding source and it remained like that throughout the period analysed. Despite a slow steady decrease, the combined effect of public funds for current expenses and for investment still represented 63.9% in 2004 (it was 70.7% in 2001).

Table 2 – The relative weight of different types of income in the budget of public higher education institutions

	Percentage of total income				
	Public budget	Fees	Earned income	Investment	Total
2001	61.69%	6.14%	23.15%	9.02%	100.00%
2002	61.20%	6.58%	23.61%	8.61%	100.00%
2003	60.95%	7.07%	23.35%	8.64%	100.00%
2004	57.09%	9.75%	26.32%	6.84%	100.00%
Average	60,23%	7.39%	24.11%	8.28%	100.00%

Source: GEFCES, MCTES, 2005

This means that although the Portuguese public higher education system became slightly less reliant on governmental sources during this period, it is still largely dependent on this source of funding. If the system seems to be more proactive in terms of alternative fundraising, this still has limited visibility in terms of the funding structure (Teixeira, Amaral and Rosa 2006).

1.3   Higher education institutions main categories of expenditures

As discussed in sub-section 1.1 of this report, the money transferred by the government to public higher education institutions is given as a lump sum, according to a formula that essentially takes into account the number of students enrolled in each university. It is up to the institution to decide how to allocate internally the money; nevertheless the big share of the money goes to academic and non-academic staff salaries. Some institutions replicated internally the criteria defined in the national formula, whereas others made some adjustments. There are also some important differences internally in terms of the degree of financial autonomy of schools/departments in each institution that can explain different approaches in the internal distribution of the State funds.

The main category of expenditure of the Portuguese public higher education institutions was clearly the payment of salaries of academic and non-academic staffs., which normally represented more than 55% of the total expenditures (see table 3). The other current expenses represented over 20% of the total expenditure of Portuguese higher education institutions, their relative importance being rather stable in recent years and across institutions. The third main category of expenditures was investment (capital expenditure). These included basically those expenditures with buildings, equipment, labs and others not included in the current budget due to their long or medium term nature. This was the most variable portion of the total expenditure. It normally represented less than 10% of the overall expenditures, but it varied among institutions due to the specificity of this type of investments that may be more present in certain years than in others. The relative importance of this category has been decreasing with time.

Table 3 – The relative weight of different types of expenditure in the budget of public higher education institutions

	Percentage of total expenditure					
	Personnel	Others	Current expenses	Investments	Net balance	Total
2001	54.67%	28.42%	83.09%	6.52%	10.39%	100.00%
2002	55.70%	23.68%	79.38%	5.70%	14.92%	100.00%
2003	56.39%	21.53%	77.91%	4.24%	17.85%	100.00%
2004	55.00%	23.68%	78.67%	3.00%	18.33%	100.00%
Average	55.44%	24.33%	79.76%	4.87%	15.37%	100.00%

Source: GEFCES, MCTES, 2005

1.4   The public funding of science and technology (S&T)

The main research institutions under the Ministry for Science, Technology and Higher Education (MCTES) were organised in "Research Units" and "Associated Laboratories".

A network of associate laboratories was created in 2001, by contracting with existing R&D institutions with strategic orientations and missions considered of public utility. The status of "associated laboratory" was conferred by the Ministry of Science and Technology for a period of up to ten years, through a contract that specified the amount of public funding of the laboratory and the missions that it was committed. These laboratories had an initial funding for five years and their status of associate lasted for up to ten years. They were evaluated after five years and at the end of the contract period, which could be renewed following positive evaluation.

There are today 21 associate laboratories involving 31 R&D institutions in five scientific areas: Physics, Chemistry, Health Sciences, Chemical and Biotechnological Engineering and Electrical and Computational Engineering. Those laboratories have 2200 researchers, 1,452 of them holding a PhD and with funds totaling € 268 Million for the first 10 years. (http://www.fct.mct.pt/pt/apoios/laboratoriosassociados/quaissao/)

Research units may have different designations (Centros, Institutos, Unidades, etc.), most of them associated to public universities (Table 4). Indeed Table 4 demonstrates that most private higher education institutions and public polytechnics were mainly teaching only institutions.

Table 4 – Research centres accredited by FCT, 2004

Type of institution	Centres
Public universities	384
Public Polytechnics	8
Catholic University	14
Private universities	7
Other private institutions	20
Total	433

Source: The Foundation for Science and Technology

Two main basic public funding categories for S&T were implemented in Portugal since 1996:

▪ Core funding, which corresponds to a specific allocation to S&T institutions by the Portuguese Foundation for Science and Technology (FCT), based on periodic evaluations (every 3 years), including two components:
  - Basic funding in terms of number of researchers and level of evaluation;
  - Programmatic funding, for specific actions to be defined by evaluators.

▪ Competitive funding, including:
  - Individual scholarships and advanced training of human resources;
  - Research and Development Projects;
  - Prizes;
  - Other funds, including funding and cooperation models.

In particular, while public-based funding (core funding) was only dependent on the scientific evaluation of activities carried out, bearing in mind the size of R&D units, additional funding was attributed on the basis of competitive grounds by public tender calls.

The implementation of a new model for funding and assessment of R&D units started in 1996, covering all 270 units in existence at the time. International expert panels rated candidate institutions in a five degrees scale from 'poor' to 'excellent', and made recommendations for strategic orientation and future investment and activity plans. Quality assessment took into account research performance by international standards, including publications in international journals and patenting activity, where appropriate. Subsequent evaluations took into account the compliance with the recommendations and the good use of the previous funding, R&D performance, publications, etc. Following the assessment exercise, funding for units classified as 'Poor' was discontinued. The remaining 257 units with classifications above 'Poor' then received base funding per post-doc, with the level of funding being partially based

on the assessment. After this first exercise two more have been conducted, one in 1999/2000 and the last one in 2003/2004.

Table 5 presents the expenditure in R&D by sector of activity demonstrating that industry contributes less than expected, the state being responsible for over 70% of total expenditure.

Table 5 –Expenditure in R&D for each sector, constant prices1 (1990-2001)

Sector	1990		1995		1997		1999		2001	
	1,000 €	%	1,000 €	%	1,000 €	%	1,000 €	%	1,000 €	%
Industry	99 051.4	26.1	96 227.6	20.9	121 198.1	22.5	161 399.6	22.7	266 608.0	31.8
State	96 533.1	25.4	124 313.4	27.0	130 681.9	24.2	198 846.3	27.9	173 954.6	20.8
Higher Education	136 690.0	36.0	170 428.8	37.0	216 070.1	40.0	274 561.7	38.6	307 237.8	36.7
Non-profit institutions	47 087.6	12.4	69 067.5	15.0	71 676.2	13.3	76 782.7	10.8	90 362.6	10.8
Total	379 362.0	100.0	460 037.3	100.0	539 626.2	100.0	711 590.2	100.0	838 163.0	100.0

1 GDP implicit deflectors (1995 = 1), Principaux Indicateurs de la Science et de la Technologie, OCDE, 2002(2) - Base de données.
Sources: OCES, Inquérito ao Potencial Científico e Técnico Nacional, OCDE, Principaux Indicateurs de la Science et de la Technologia, 2002(2) Dase de données.

Table 6 presents the evolution of the total expenditure in R&D at constant prices and at current prices, as well as the GERD, showing a significant progress. It is also important to realise that higher education has the more important share of the expenditure in R&D and, as most non-profit institutions are associated to universities, then higher education represents almost 50% of total expenditure.

Table 6 – Total expenditure in R&D, 1982-2001

Year	Current prices 1,000 €	Constant prices[1] 1,000 €	t.m.c.a.[2]	PPCC[3] millions US$	GERD %
1982	32 627.4	166 255.8	-	164.6	0.30
1984	56 402.1	185 000.0	5.5	200.2	0.34
1986	99 099.2	221 677.6	9.5	254.4	0.38
1988	149 194.4	272 684.4	10.9	335.7	0.41
1990	259 535.5	379 362.0	17.9	501.8	0.51
1992	401 022.5	477 780.5	12.2	695.7	0.61
1995	460 037.3	460 037.3	- 1.3	774.5	0.57
1997	576 882.7	539 626.2	8.3	978.0	0.62
1999	814 747.0	711 590.2	14.8	1 283.5	0.76
2001	1 038 431.7	838 163.0	8.5	1 582.8	0.85

Sources: OCES, Inquérito ao Potencial Científico e Técnico Nacional. OCDE, Principaux Indicateurs de la Science et de la Technologia, 2002(2) Dase de données.
1 GDP implicit deflectors (1995 = 1), Principaux Indicateurs de la Science et de la Technologie, OCDE, 2002(2) - Base de données. 2Average yearly growth rate at constant prices. 3 PPPs at constant prices, OECD (ibid). 4 GDP values published by OECD (ibid).

2 Results[1]

This section of the report will explore the opinions of Portuguese stakeholders on the funding system of higher education. Additionally, the views of academics on this issue will be presented.

All of those who were interviewed shared the Humboldtian perspective assuming Higher Education as having objectives intimately related with knowledge creation and development, considering Education and Research as their main functions[2]. However, it was also common understanding that Higher Education, as an institution, should promote close relationships with its environment, namely by serving the community. This recognised compulsion for sharing knowledge and scientific production[3] was referred by the respondents from all Higher Education institutions, being specifically focused by those from new universities and those from the Science and Technology area. They were the same who pointed out the importance of national and international competitiveness and the relevance of innovation and cooperation networks. The Higher Education role, while system with active and significant contribution for the regional and national developments, appeared mainly cited by the Directors of the Schools. Curiously, only those respondents with positions in the financial administration (Higher Education institutions or even the Ministry of Science, Innovation and Higher Education) referred to the students' personal and social development as a Higher Education goal.

2.1 Main Features of the Funding System of Higher Education

When interviewees were questioned about the main features of the funding system of higher education, the first big difference that stands out among them is the structure of reply itself. Universities immediately referred to the existence of separate systems for funding Education and Research. On the other hand, Polytechnic Institutes emphasised the negative discrimination in their funding system, if compared with that of the Universities. Although the funding formula was the same for both universities and polytechnics, it used different parameters – for instance, the student/staff rations were different for the two sectors and quality parameters tended to favour universities as they related mainly to the number of PhD holders in the academic staff and to research. The Ministry of Science, Innovation and Higher Education, represented by members of the Directorate General for Higher Education, focused on the

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[1] The stakeholders views presented in this section are based in in-depth interviews and answers to an on-line questionnaire (see section 4 of this report). The opinions expressed refer to the formula that has been used to calculate the budget for 2004 and 2005, which as we refer in section 1.1 included poorly designed quality-related parameters.

[2] The large majority of the respondents to the on-line questionnaire classified education and research as very important objectives of higher education institutions (26 and 20 out of 29, respectively).

[3] 17 (out of 29) respondents to the on-line questionnaire considered dissemination as a very important objective of higher education, while 11 (out of 29) though it was an important objective.

funding of the education component, which is explained by the indirect relation of the interviewees with the funding system for research activities.

When characterising the main features of the funding system, the entire sample referred as central feature the use of a funding formula, which worked as instrument to calculate the national budget allocation to each HEI. They also pointed out that this formula was essentially based on the number of students.

Rectors, Presidents of the Polytechnic Institutes, as well as the Administrators, were those who seemed to have better knowledge of the funding system and of the way budgets were calculated. The Directors of Faculties or Schools were, as one can understand, more worried about the internal allocation system than with the national funding system itself. There were significant differences in the relationships between Faculties/Schools and the respective central administration, especially between Classic and New Universities, as well as with the Polytechnic Institutes. Such differences were based on the diverse institutional structures that they assumed: in Classic Universities and Polytechnics, Faculties/Schools had in general more institutional autonomy, while some New Universities were not organised in Faculties, having instead a departmental structure where units had lower dimension and less autonomy. This difference in autonomy had immediate repercussions in the way their funding was allocated and used. Some respondents saw funding allocation to Faculties/Schools as an instrument of control and regulation of its functioning, as they were only awarded the power to spend the budget within the limits assigned by its line structure. The funding for investments in infrastructures was pointed out by the majority of our respondents as distinct from the current expenses funding system, being centrally regulated by the Ministry, based on the specific needs of each institution and listed in its negotiated development plan.

The Foundation for Science and Technology (FCT) is referenced as the funding institution of research, the merit/quality of each project or research unit being the main criteria for funding allocation. This issue was also mentioned by Polytechnic Institutes as source of negative discrimination, because they considered that the funding criteria were favourable to the Universities.

2.2 Formal, Explicitly Stated Interrelationships between the Funding System and National Higher Education Policies

It seemed consensual for all the interviewees that the system's funding formula had been conceived at a historical moment where Higher Education was in expansion, and for this reason its central criterion were the enrolments. Simultaneously, the formula favoured the institutions with lower ratios of faculty or non-academic staff relative to the number of students.

On the other hand, the allocated funding covered only current expenses, and HEIs were compelled to use their earned income for investments not included in the approved development plan. For this reason they had developed alternative financial support without contribu-

tion from the State. The productivity of each institution assumed an increasing important role on its management strategy, evolving to a situation of wider autonomy from state funding. As public funding was sometimes notoriously insufficient, HEIs were increasingly creating more internally controllable new ways of funding. These new funding sources could be of different natures, such as overheads from faculty services to community, or from post-graduation courses fees or from knowledge transfer to industry, among others. Research funding had also a contribution for the financial management of the different institutions, because not only allowed for overheads, but also contributed for maintenance and operating expenses.

In general, all interviewees agreed that the funding system for Higher Education was based on inputs: the number of students, the number of professors, their qualification, etc., assuming a quantitative perspective rather than a qualitative one. The funding system goals seemed to be more oriented to promote the system and the institutions' development, rather than to be a reflex of the outputs of each institution, or punishing poor performance.

2.3 Intended and Unintended Effects of the Funding System on Higher Education and on the Core Tasks Teaching and Research

The fact that the public funding of higher education institutions for teaching was distinct from the funding for research created, in the opinion of some interviewees (namely Faculties/Schools Directors), an undesirable gap between these two activities. Frequently, research units worked on subjects diverse from the themes associated to the Curricula. On the other hand, academics tended to divide their time among these two tasks, which contributed to lower efficiency. In one stakeholder's opinion this lead *"to the impoverishment of education and, thus, of the society"*.

Referring directly to the formula used in 2004 and 2005, which included poorly designed quality-related parameters, interviewees mentioned that the component in the formula aiming to include a quality parameter related to research tended to privilege the number of research units rather than their quality and dimension, meaning that an institution would do better by splitting large good quality research centres into a large number of smaller units, even if this resulted in lower quality.

Interviewees also recognised that the funding formula, by using as one parameter the average salaries of the academic staff, intended to privilege HEIs with adequate teacher/student ratios and better-qualified academics. Therefore, it favoured the academic qualification of academics and their career promotion or hiring better qualified academics, rather than preferring new admissions of younger but less qualified teachers.

Another unintended effect of the funding system wad the increasing use of "invited professors", not inserted in the academic career, which had the double advantage of not being tenured, while their work load was higher than normal staff. On the other hand as the law did not

allow for the payment of extra time, some people complained that sometimes they were asked to work extra hours without adequate institutional recognition.

2.4   Influence of the Funding System on Institutional Strategies

As the funding system was primarily based on the number of enrolled students, HEIs were well aware of the major importance of maintaining or increasing their student populations. Three different possible strategies to cope with this new (or renewed) concern were mentioned. Firstly, HEIs increasingly assumed as important institutional task attracting more students, either recurring to explicit strategies of direct publicity or by using more sophisticated methods, such as creating marketing offices to improve the institution's public image. Secondly, HEIs might use a strategy based on improving the quality of their services, namely those that influenced the quality of the students life, aiming both at preventing enrolled students from leaving the institution and at attracting more new ones. Finally, and on a more negative tone, some interviewees mentioned that institutions might be tempted to keep or increase student enrolments recurring to "artificial" solutions, which could be seen as a perverse effect of the funding system[4]. For instance they put forward the hypothesis that a HEI in a problematic situation, might resort to "tricks" such as information system bugs that counted as students those who had already graduated. On the other hand the formula did not create incentives to pedagogic efficiency since a way to increase enrolments might just be increasing failure rates[5].

New courses were an alternative way for increasing student enrolments. These courses usually had an attractive denomination, even if without relation with the HEI culture or mission or with local and regional needs, therefore having a dubious employment rate. Another strategy was increasing the duration of courses, without goals related with quality, but just to maintain students in the institution.

As already mentioned, the funding system induced HEIs to resort to different strategies to deal with their financial needs that exceeded the state contribution. In this way, a renewed interest on establishing relations with the external community emerged, especially the entrepreneurial world, such as technological transfer partnerships.

The stakeholders also perceived a marked influence of the financing system on research strategies. It was mentioned that the existent highly competitive system could easily lead to

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[4] More than half of the stakeholders that answered the on-line questionnaire agree (15)/fully agree (8) with the proposition *"If allocation of resources is based on the number of enrolled students, HE institutions could be tempted to enrol students with insufficient knowledge, which is unethical both in relation to the students and for the society."*

[5] More than half of the stakeholders that answered the on-line questionnaire agree (16)/fully agree (6) with the proposition *"the present financing system is not satisfactory as it does not give incentives to students in order to complete their studies as early as possible."*

the promotion of certain research areas, more output oriented, instead of others, traditionally less appealing for the global market and consequently less financially attractive. Additionally, stakeholders mentioned that the difficulties that some of the bigger research units faced, due to unusual delays in obtaining financing from the Foundation of Science and Technology, had make them more open to the possibility of developing alternative funding sources (providing services to the community in general, and the industry in particular); and they were also considering the hypothesis of applying to the more favourable statute of associated laboratory, even if this meant some separation from the higher education institutions.

Some interviewees referred to other strategies for coping with financial difficulties such as increasing tuition fees to its maximum legal value and containing the running costs. The respondents to the on-line questionnaire tended to agree (12) or to fully agree (6) with the idea that *"it could be appropriate to pay tuition fees in a higher education degree"*. They further corroborated this by agreeing (12) or fully agreeing (4) with the proposition *"If education results in high salary then it is reasonable that students pay tuition fees"* (only 9 respondents did not agree with the proposition).

2.5 Stakeholders' Views Concerning Strengths and Weaknesses of the Funding System

From the answers given to the stakeholder on-line questionnaire it is possible to conclude that more than half of the respondents (20 in 29) disagreed (14) or fully disagreed (6) with the proposition *"the present higher education financing system is satisfactory"*. The central criticism made by the interviewees, direct or indirectly, was the insufficiency of government funding to HEIs. Polytechnic Institutes felt themselves as being the first victims of a discriminatory system, receiving less funding than Universities. This was a reflex, in their view, of an explicit policy to minimise polytechnic *education vis-à-vis* university education.

One of the main weaknesses of the funding system focused by our interviewees was the need for the full implementation of the Autonomy Laws. The excessive dependency of government (Ministry of Finances and Ministry of Science, Innovation and Higher Education) was seen to hinder a better management of HEIs. The interviewees that had financial responsibilities in Universities suggested the implementation of a multi-annual financing model that by allowing a prospective analysis would increase their work's efficiency. There were also claims that the financing system did not reward good management practices.

The funding formula was viewed as an adequate methodology to calculate the distribution of government funding. Its weakness was lack of transparency, with examples of bad application and inadequate standard values. Its excessive dependency on student enrolments was frequently criticised and all interviewees made proposals about different criteria to be considered in the formula. Some of the more frequently mentioned criteria were the student's real cost, the results of teaching quality assessment, research quality and faculty qualification. The specificities of each HEI were also a concern of the interviewees, which should be taken

as a starting point to calculate funding allocation. On the other hand, some proposed a funding system that completely covered current expenses, including maintenance and functioning costs and faculty and staff salaries. Others preferred a funding system based on outputs, taking effectiveness as the central criteria, although there was perception this might have unintended effects[6]. In a similar vein, another proposal suggested the recognition of the HEIs with best results, rewarding them with extra funding.

The research financing system was mainly seen as not satisfactory[7] due to several factors. Polytechnics claimed that it practically did not recognise this type of institution because of their limitations regarding post-graduation. It was also mentioned that as this type of funding was channelled to the research units (by-passing the governance structure of the higher education institution), the actual research budget of higher education institutions was very limited, which hampered the set-up of a long term institutional research strategy.

According to the stakeholders another weak point of the present research funding system was that it did not allow for innovations[8], as was further elaborated by other respondent: *"The financing of research leads to homogenisation of knowledge production, especially because what is stressed is mainly 'commercial' knowledge linked to the entrepreneurial field".*

The fact that the government decided to finance research on a more competitive basis, using foreign experts to evaluate the quality of research teams and projects has resulted in a system of direct financing of research units bypassing institutions, which might explain some of the negative comments. It needs to be recognised that after the implementation of the new funding system the research sector made significant progress. For instance, in recent years the number of new PhD holders has been increasing at an annual growth of 12%, while in terms of publications, Portugal presented between 1995 and 2000 an average annual growth rate of almost 16%.

2.6 Other Results – Academics' Views on the Funding System of Higher Education

With the aim of better understanding the question of intended/unintended effects of the Portuguese higher education funding system and to analyse academics' opinions about

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[6] Almost all stakeholders that answered to the on-line questionnaire agree (17) or fully agree (8) with the proposition *"If the funding system allocates resources to HE institutions based on total number of students achieving their BA, institutions could be tempted to reduce their quality control requirements in order to get more resources".*

[7] More than half of the stakeholders that answered to the on-line questionnaire disagree (20) or fully disagree (2) with the proposition *"The present research financing system is satisfactory".*

[8] Half of the stakeholders that answered to the on-line questionnaire agree (12) or fully agree (4) with the proposition *"The present research financing system does not allow innovations"* (9 of the remaining respondents were neutral).

strengths and weaknesses of the system, a survey of academics holding a PhD degree was conducted.

Regarding teaching activities there was consensus among the academics on the lack of resources (81% agreed that teaching suffers from lack of resources) and the idea that teaching should be more closely linked to research activities (84% of the academics agreed with this proposition), which goes in the same direction as the opinions expressed by stakeholders. Academics tended to think that the quality of teaching was dependent on the students' characteristics: their passivity and lack of effort constituted obstacles to better teaching (83% agreed with the proposition) and the significant differences among their previous knowledge and the pre-requisites made teaching harder (74% agreed with the proposition). Additionally 75% of the academics agreed with the idea that the knowledge/scholarly level of students was lower than before.

However, academics believed that teaching also depended on faculty/staff: their lack of interest and priority hindered better teaching (agreed by 64% of the sample). On the lack of administrative support as an obstacle to a better teaching, there was no consensus among the sample, the answers being approximately divided between agreement and disagreement.

There was clear disagreement (72%) from the sample on the proposition *The department is too little concerned with teaching quality*. Nevertheless when asked about the present quality of teaching only 40% agreed that in general it was good enough (58% disagreed with this proposition).

Academics were also asked about the way financial resources should be allocated to schools/faculties/departments. There was large consensus on the allocation based on the quality of research (88%) and slightly less agreement on the allocation based on the number of students (68%). On allocation based on academics' priorities, there were mixed feelings: 50% agreed with this idea and 42% disagreed. Approximately the same happened with the proposition *Departments that do not have a high scholarly quality should be closed*: although 59% agreed with it, 37% disagreed.

3 Conclusions

The introduction of a funding formula was in general seen as positive and adequate for a period of expansion. At present, as the expansion period has come to an end, there was tendency to pay increasing attention to the quality and efficiency of institutions, which meant that the formula needed to be adapted to the new circumstances.

At governmental level there was a move to introduce an accreditation system and to promote the internationalisation of the system by using foreign reviewers, which would foster the relevance of quality of teaching and research. Therefore, at governmental level there seemed to be increasing tendency to link funding to quality.

HEIs were compelled to use their earned income for investments not included in the approved development plan. For this reason they had developed alternative financial support without contribution from the State. The productivity of each institution assumed an increasing important role on its management strategy, evolving to a situation of wider autonomy from state funding.

Recent developments indicated that there would be tendency to discriminate institutions due to their research quality rather than by its teaching achievements. Indeed as the number of students was declining due to several factors including demography, the government seemed to be inclined to keep constant the total funding for teaching (in nominal terms) while substantially increasing the budget for research. In principle the budget for research will increase 100% over the next years and will contribute to differentiate institutions.

4 General Design and Study Goals

This research project intends to analyse the Portuguese higher education funding policy and its consequences over the institutions and the system as a whole. In order to do so specific key research areas were defined, a set of research questions was raised and a whole study methodology was designed. In the following sub-sections the general design of the research conducted is described.

4.1 Key Areas

In order to address the research project main goal, four key research areas were identified:
- analysis of the Portuguese higher education funding policies;
- analysis of the institutional responses to those policies;
- analysis of the academics reactions to the effects of those policies;
- analysis of the opinions of other stakeholders on the effects of those policies.

4.2 (Key) Questions

Five key questions were raised and were addressed in this research project:
- What are the main features of the funding system of higher education?
- Are there formal, explicitly stated interrelationships between the funding system and national higher education policies?
- What are the intended and unintended effects of the funding system on higher education in general and on the basic core tasks of teaching and research?
- Does the funding system influence institutional strategies? How do institutions respond strategically to the funding system?
- What are the stakeholders points of view on strengths and weaknesses of the funding system?

4.3   Study Methods

Research methods used in this project included document analysis, interviews and survey data. The research design included data from interviews conducted in four HEIs and with the Directorate for Higher Education, policy analysis, a survey of academics holding a PhD and a stakeholder survey, as well as the results of previous research work carried at CIPES

Interviews were conducted in four representative HEIs, universities and polytechnics, old and new, large and small. In all of them the Rector/President and directors from some faculties/schools were interviewed. In the two universities interviews were also made to their top administrative leaders. The institutions included in the study were:

- University of Aveiro, new, approximately 10,300 students
  - Department of Economics, Management and Industrial Engineering
  - Department of Social, Juridical and Political Sciences

- University of Porto, old, comprehensive, approximately 25,000 students
  - Faculty of Engineering
  - Faculty of Psychology and Education

- Polytechnic Institute of Coimbra, old, approximately 9500 students

- Polytechnic Institute of Viana do Castelo, new, approximately 3200 students

The interviews aimed to understand the connections between the funding system and institutional strategies and to analyse views on the strengths and weaknesses of the funding system, although other key questions of the study were also discussed with the interviewees. The policy analysis was based on documents from the Ministry of Science, Innovation and Higher Education, and intended to answer the question on the main features of the funding system, its connection to general policy and its intended effects. The survey of academics holding a PhD degree aimed at answering the question on intended/unintended effects and to collect opinions on strengths and weaknesses of the system. The survey was conducted in February 2006; the sample consisted of 5,000 academic members from all public universities and polytechnic institutes. 3,210 academics answered, which corresponded to a response rate of 62% and around 39% of the whole population.

Finally, a stakeholder electronic survey of diverse stakeholders, including the President and members of the Rectors' Conference, the President and members of the Coordinating Council of Public Polytechnics, and rectors (and presidents) and directors of the HEIs, and representatives of the Ministry of Science, Technology and Higher Education aimed at completing the diagnosis of the funding system on the question of goals and measures, intended and unintended effects and strengths and weaknesses. 29 stakeholders answered an on-line questionnaire on the issues of education and research financing, more specifically on the functioning of the funding system and its unexpected impacts and side effects.

5   Bibliography

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