

***How Does the Romanian Ministry of Education Distribute
Doctoral Grants Towards Public Universities?
A statistical exploration of an institutional *black-box*****

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Abstract: This study attempts to clarify the logic behind the allocation of doctoral grants between 2012 and 2016 in Romania, based on statistical data regarding the cohorts of doctoral students and of doctoral supervisors available in official reports and in the Ministry's statistical data. After analysing the correlations of the doctoral grant distributions for first year admissions from the autumn of 2014, the study concludes that neither the offer nor the demand of doctoral students justify the decisions of the responsible Minister to the extent in which this is justified by the distribution following the 2011 classification of universities and the subsequent correction of 2012, following the change of the majority in power. To this, individual variations are added, whose logic is not explained by any of the variables included in this analysis, namely the position held in the university classification, the number of doctoral supervisors and the number of doctoral students.

Keywords: doctoral grants, doctoral grants distribution, Ministry of Education, Romania

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Introduction

During the last two decades of the previous century, pushes toward a more responsible allocation of financial resources for public universities have been made in the advanced democracies on both sides of the Atlantic. Explained to a large degree by phenomena like the post-WWII massification of higher education and its subsequent credential inflation, on the one hand, and by the neo-liberal revolution and the pressures toward more effective use of public resources of the New Public Management, on the other, this push towards budgetary accountability has usually entailed the introduction of some sort of so-called performance-based funding of public universities (Herbst, 2007). Such a change is expected to increase financial accountability of the university, as well as the quality of its deliverables and processes - be them teaching or research related (Geuna & Martin, 2003; Herbst, 2007; Orosz, 2012).

Funding of Romanian public universities followed closely this path. In 2003, the first performance-based funding mechanism was put in practice, which covered all the three cycles of tertiary education, including the doctoral studies¹ (Vîiu, 2015). Around 20 to 30% of the funds were yearly allotted based on performance indicators, which included both input and output variables. This is a ratio similar to other European countries (Orosz, 2012).

Considered on a cycle basis, with a focus on doctoral studies, performance-based funding is actually less correlated with the performance indicators: until 2012, universities had the freedom of distributing the performance-based funding across levels. Since 2012, doctoral grants under a Funding Methodology², grants which correspond to PhD scholarship openings, have been distributed directly by the Ministry of Education. It is clear that the main policy instrument concerning doctoral studies and research is the distribution of doctoral grants. The number of doctoral grants awarded to a university, which

¹ All the documentation of funding methodologies of public Romanian higher education institutions for the 1999-2011 can be accessed at: http://vechi.cnfis.ro/fd/f_baza.html.

² Which can be read at: <http://www.cnfis.ro/wp-content/uploads/2014/03/042512-MetodologieCNFIS2012-ordin.pdf>

continues the number of subsidized openings prior to 2012, is set at least partially on a basis of input indicators which, through the mechanisms of official claims on behalf of the university from the Ministry, produces the so-called “history based” (Miroiu & Vlăsceanu, 2012) criteria which is the local name for path-dependency in resource allocation.

Despite the complicated methodology included in the Ministerial Orders regarding funding allocations towards universities, the manner in which doctoral grants are distributed is the result of an institutional *black-box* which. In turn, this often gives rise to questions not only regarding the transparency of the methodology, but also concerning the policy objectives of particular public funding allocation for the organisation of doctoral studies as well as the consequences of such apparently arbitrary decisions on the quality of doctoral studies in our country.

In the following pages we will try to clarify as much as possible the logic behind the allocation of doctoral grants³ on the basis of statistical data available concerning doctoral students cohorts – according to calendar years, to years of study and to type of funding – and also on the basis of the data regarding doctoral supervisors available in the databases of the Ministry of Education.⁴ My focus will be primarily towards understanding year-on-year changes in number of doctoral grants allocated. we expect that, besides the public opacity of the allocation and re-allocation algorithms for doctoral grants, the evolution of the number of grants reflects not just the inertia of the system (expressed through the auto-correlation from one year to the next) but also the changes in the input indicators which, as such, can also justify the requests for grants submitted by the universities.

We will start by describing at first the national evolutions of PhD student numbers and then we will explore the logic of the distribution of doctoral grants for the first year to universities for the 2014 admission, linking this variable to the input indicators available in the

³ According to official documents, a doctoral grant is equivalent to a scholarship-holding doctoral place and corresponds to a certain budget allocation covering all the expenses per academic year that are incurred for the coordination and training of a doctoral student. See, for example, [OMECS nr. 3888/26.05.2015](#).

⁴ Due to the various changes in the title of the responsible Ministry, we prefer the simple title of Ministry of Education in this document.

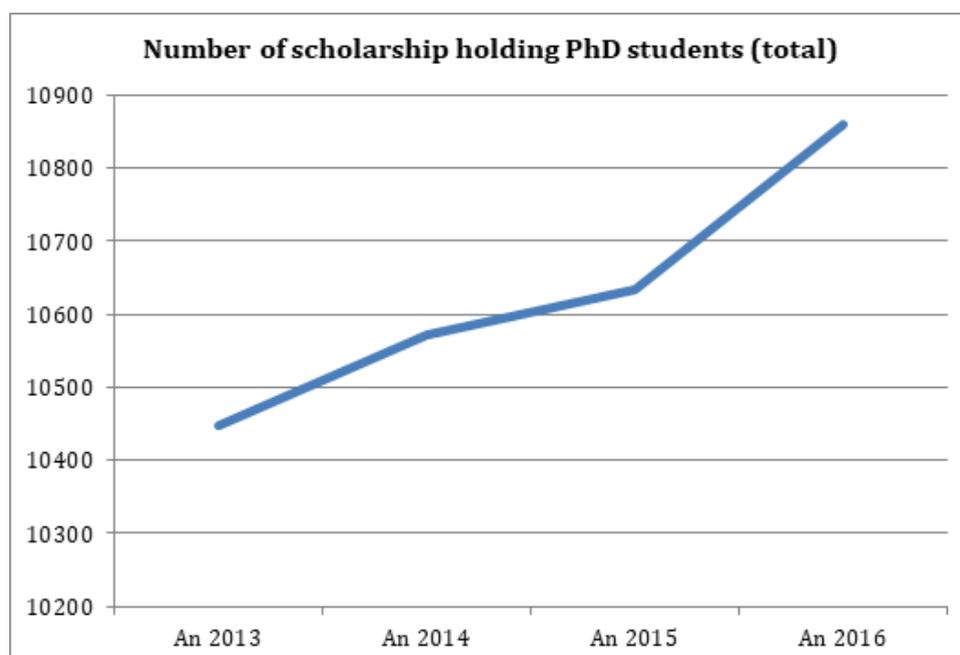
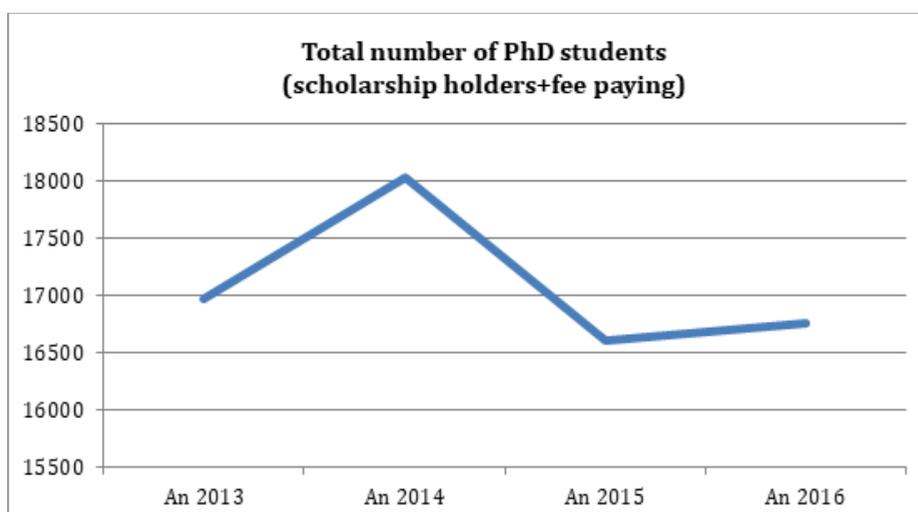
statistical reports, namely the number of PhD coordinators, global doctoral students and the number of doctoral grants in 2012. At the end of the study we will draw some conclusions and also put forward some policy recommendations for a transparent, fair and efficient practice of distributing public resources for doctoral training.

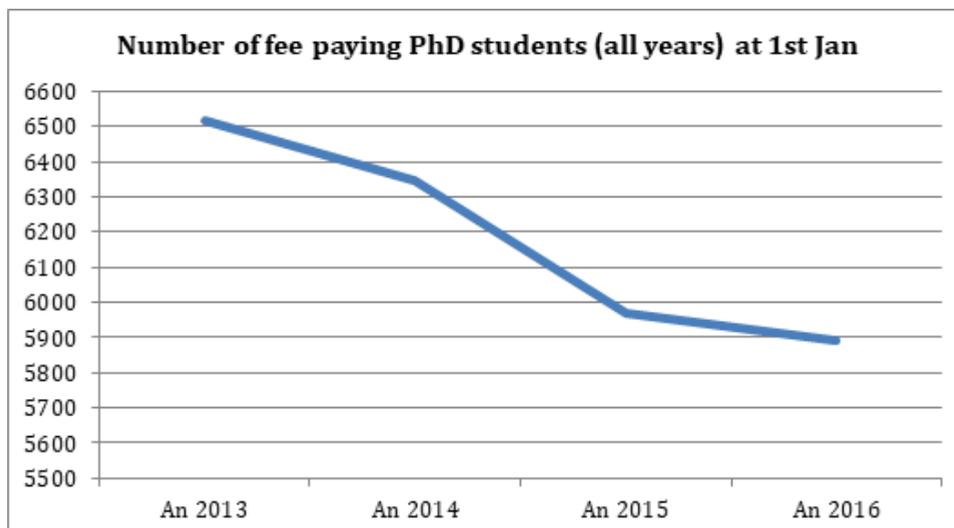
National Evolution of PhD Students

Developments between 2012 and 2016 of doctoral candidates registered at the Ministry of Education indicate sudden variations in the total number of doctoral candidates between 2013 and 2015 (a sharp increase followed by a steep decline) as well as a steady increase in the number of scholarship-holding PhD students, alongside an uninterrupted decrease of the number of fee-paying doctoral students.

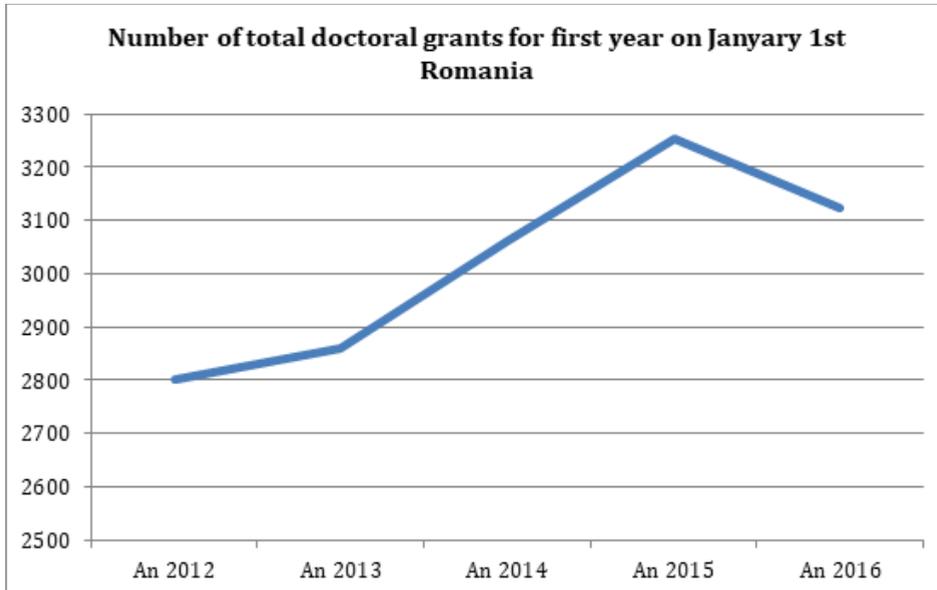
The seemingly disorderly evolution of the total number of doctoral students may be probably partly attributed to the impact of doctoral scholarships allocated through the [SOP HRD](#) program - these have motivated extrinsically many young people to enroll in a doctoral programme, subsequently determining by force of their own regulations, massive exits from the doctoral programme by the time of finalizing the projects. The impact of doctoral scholarship programs funded through the European Social Fund on the quality of doctoral programmes in the country remains to be assessed.

The general tendency is, however, to decrease the share of the number of fee-paying PhD students and to increase the share of scholarship-holding PhD students in the total PhD population.





Increasing the number of doctoral grants is probably the result of a governmental policy meant to support universities facing declining number of students, including PhD students. Thus, for the admissions between 2012 and 2014, the number of grants allocated for the first year of doctoral studies increased from 2800 to 3254 (a 16% increase). This policy has undergone a fall back for the 2015 admission, when for the first time the number of grants for the first year declined by 131 countrywide.



This adjustment was not applied homogeneously to all universities. Three universities benefited from increases in the number of grants by at least ten units, namely: the Technical University "Gheorghe Asachi" from Iași (19 grants), the Polytechnic University of Bucharest (12 grants) and USAMV from Bucharest (10 grants). Several other universities benefited in turn from increases in the number of doctoral grants even if less important in absolute figures.

However, 27 universities lost a total of 182 doctoral grants in comparison to the previous year. 16 universities lost during the adjustment at least 10% of the number of doctoral grants they had received the previous year.

	first year grants in minus (2016 vs 2015)	grants in minus as percentage of the grants of the previous year (2016 vs 2015)
Universitatea Maritimă din Constanța	-5	-0.50
Universitatea „Dunărea de Jos“ din Galați	-21	-0.32
Universitatea „Alexandru Ioan Cuza“ din Iași	-49	-0.22
Universitatea din Petroșani	-3	-0.21
Universitatea de Medicină și Farmacie din Craiova	-6	-0.21
Universitatea de Arte din Târgu Mureș	-1	-0.20
Universitatea din Pitești	-3	-0.18
Universitatea „Ovidius“ din Constanța	-5	-0.16
Universitatea „Valahia“ din Târgoviște	-3	-0.15
Universitatea „Transilvania“ din Brașov	-10	-0.15
Universitatea din Oradea	-4	-0.13
Universitatea de Științe Agricole și Medicină Veterinară a Banatului Timișoara	-5	-0.13
Universitatea de Medicină și Farmacie „Iuliu Hațieganu“ Cluj-Napoca	-11	-0.13
Academia de Muzică „Gheorghe Dima“ Cluj-Napoca	-2	-0.12
Universitatea Națională de Arte din București	-2	-0.12
Universitatea „Lucian Blaga“ din Sibiu	-5	-0.11

Table 1. Doctoral grants gained and lost in 2016 as compared to 2015

These variations and inconsistencies in the evolution of the distribution of the number of doctoral grants raise questions about the motivations behind the allocation schemes. During the 2011 admission, the distribution of the doctoral- places was based on the results of the 2011 classification. Subsequently, the classification was no longer issued, being even challenged in court, so the subsequent allocations of the scholarship-funded doctoral places are probably mostly correlated with the 2011 distribution, which was based on the classification and on the result of the next year's correction. Reallocations such as the one noted in the previous paragraph certainly have a justification other than the pursuit of scientific performance or educational efficiency indicators.

How were the first-year doctoral grants been awarded between 2012 and 2016?

We explored the allocation of the number of doctoral grants according to several characteristics that could justify the administrative decisions for the distribution of resources for doctoral schools:

- 1) the results of the 2011 university classification;
- 2) the number of coordinators and the number of PhD students per coordinator;
- 3) the total number of doctoral students in the university (indicator of the local demand for doctorates);
- 4) the distribution of first-year doctoral grants after the 2012 autumn admission.

In other words, we tested the assumptions that the allocation is based on the doctorate offer (number of coordinators), the doctorate demand (number of fee-paying doctoral students) and by a "historical" criterion, i.e. by institutionalizing the path dependence.

Methodological aspects

The analyses in this study are based on statistical data regarding the number of doctoral candidates and doctoral coordinators drawn from two sources. Some of the information was extracted from the CNFIS Annual Public Reports of 2012, 2013 and 2014⁵. More recent data were obtained from ANS platform - "National Platform for Collection of Statistical Data for Higher Education", which can be accessed partially at: <https://date.invatamant-superior.ro/>⁶. Some methodological issues deserve to be highlighted here:

The data published by CNFIS or those extracted from the ANS do not contain information about several public education institutions that organise doctoral studies - the National Academy of Information, the Military Academy, etc. From this point of view, the analysis is, obviously, incomplete.

Data from the CNFIS reports or from the ANS databases used are those relating to the situation as of 1st January of the reporting year. Thus, the data on first year doctoral grants for 2013 are those corresponding to the September 2012 admission.

For 1st January 2016, i.e. the most recent data used in this study, some universities did not report complete data when the analyses were performed, so we worked in most cases with data valid on 1st January 2015, the dependant variable on the following pages being the number of doctoral grants on universities at the September 2014 admission.

We did not always have complete data from all universities so the number of cases may vary from one analysis to the other. Thus, although the database we worked with includes data on 48 public universities, some analyses were conducted on only 46 or 47 universities.

Because we cannot speak of statistical data at sample level but at population level, the analyses in the following pages do not include significance tests.

⁵ In the extraction of the data from the CNFIS reports I was helped by Adrian Pop (PhD student in sociology).

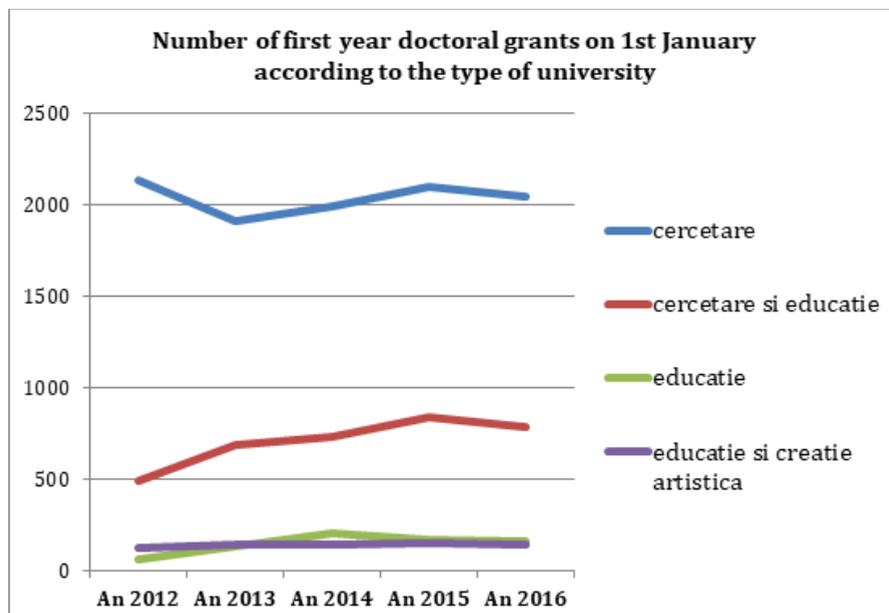
⁶ ANS database querying was conducted by Gabriela Jitaru and Marlena Rotar from UEFISCDI whom I thank for their support.

Evolutions considering the university classification

Developments in the number of first year grants broken down by type of university, according to the 2011 classification, show that an important correction was made at the September 2012 admission (January 2013 data). If on January 1st, 2012, over 75% of first-year doctoral grants were distributed towards advanced research universities, by reducing by 222 the grants allocated to universities in this category and by increasing by 199 the number of grants allocated to universities in the "research and education" category, the percentages changed significantly: 67% of the grants for advanced research universities and 24% for research and education universities. These percentages have remained relatively unchanged since then, even after the correction concerning the 2015 admission, when the number of doctoral grants decreased for the first time for all four categories of universities. In relative terms, however, the decrease was more important for research and education universities.

Classes of universities	Year 2012	Year 2013	Year 2014	Year 2015	Year 2016
Advanced research and education	76	67	65	64	65
Research and education	17	24	24	26	25
Education	2	5	7	5	5
Education and artistic creation	4	5	5	5	5

Table 2. Percentage of first-year grants at 1st January, on university types under Law no. 1/2011 (%)



Thus, seemingly, the analysis of the official types of universities suggests a period during which research and education universities benefited - or rather, a period when the advantage of the advanced research universities and education was gradually diminished, a phase followed by an end of this trend over the past two years of the period analysed. The temptation to associate these trends with changes in the political composition of governments is hard to resist.

Allocation according to the number of PhD coordinators

Another variable that could determine the number of grants awarded by the Government could be the number of doctoral coordinators. Theoretically, being a doctoral coordinator means a high level of research performance and the difference between university classes could be determined primarily by the number of doctoral schools and / or by the number of doctoral coordinators.

On 1st January 2016, the 47 public universities included in the report employed a total of 2124 PhD coordinators (associates and tenured). Of these, more than half were employed by advanced research

and education universities where both the total and the average number of coordinators are double in comparison to similar indicators in research and education universities.

Classes of universities	Average	Total number	N
Advanced research and education	110	1210	11
Research and education	46	692	15
Education	13	140	11
Education and artistic creation	8	82	10
Total	45	2124	47

Table 3. Average and total number of PhD coordinators according to university classes on January 1st, 2015

Given that the share of doctoral coordinators employed at advanced research and education universities is about 57% of the total, the fact that about 65% of first year doctoral grants are allocated to these universities indicates an administrative advantage of these universities, an advantage which is probably justified by the results of the 2011 evaluation and attests to the better scientific outputs of these universities.

This advantage is immediately made visible by calculating of the average number of first year grants per coordinator (see Table 4): the lowest number of grants per coordinator is recorded for universities of scientific research and education while the similar average for universities of advanced research is 29.5% higher. Surprisingly, the state is the most generous with universities of scientific education and artistic creation.

Classes of universities	Average number of first year doctoral grants (1st Jan 2016) / coordinators (1st Jan 2015) ⁷
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⁷The calculation of the average by reporting the number of grants on 1st January 2016 to the number of coordinators on 1st January 2015 is primarily justified by the availability of data – 1 October 2016 when we conducted the analysis, some universities had not yet reported all the data pertaining to 1st January 2016. On the

Advanced research and education	1.67
Research and education	1.29
Education	1.37
Education and artistic creation	2.22
Total	1.52

Table 4. Average number of first year doctoral grants (1st Jan 2016) / coordinators (1st Jan 2015)

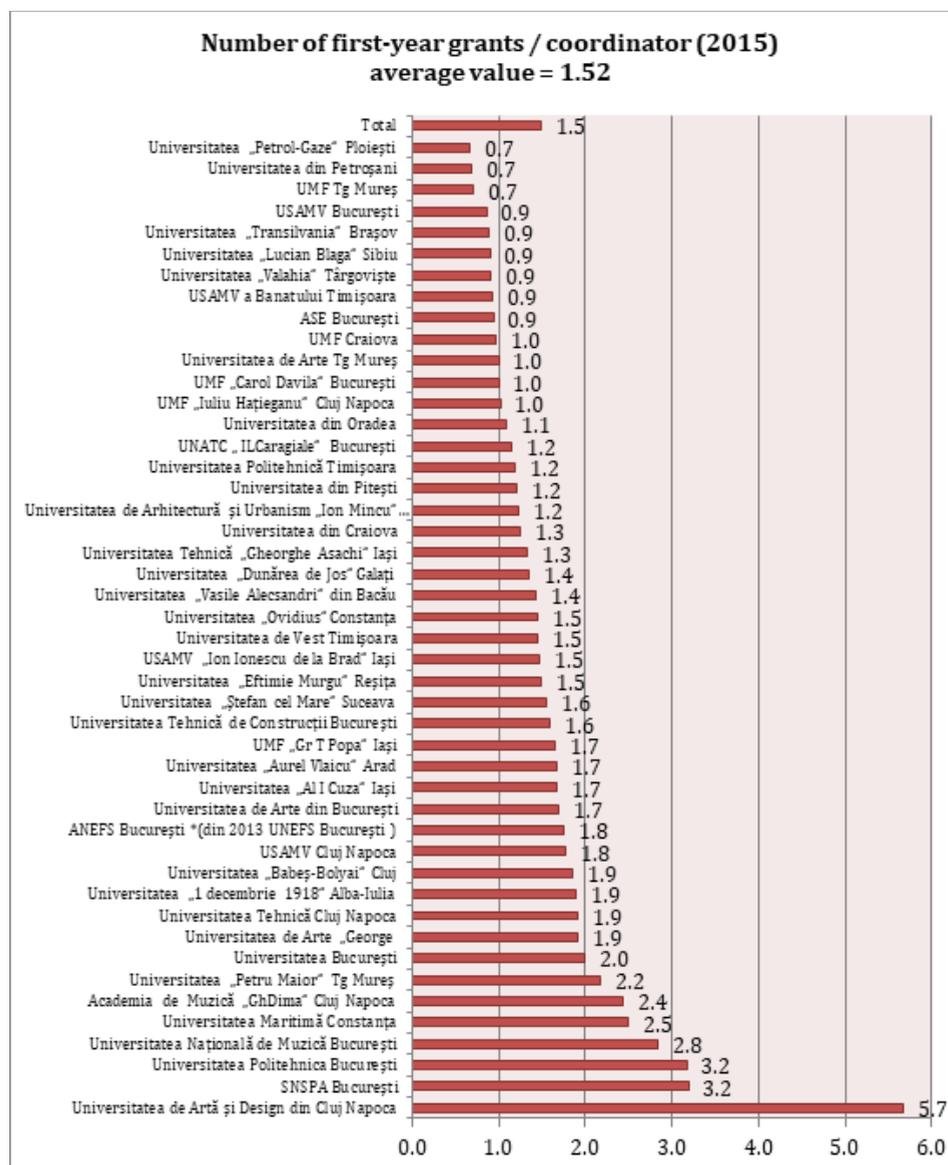
The regression lines of the number of first year doctoral grants, depending on the number of coordinators on university classes, clarify the relationship between the two variables better. This relation is best determined for advanced research universities ($R^2 = 0.618$) and the least determined for universities of education and artistic creation ($R^2 = 0.346$). Table 5 shows that, on average, for each PhD coordinator, advanced research and education universities receive more than two grants, while each coordinator brings less than one grant to research and education universities.

Classes of universities	Constant	Coefficient – number of coordinators
Advanced research and education	-45.8	2.1
Research and education	14.6	0.7
Education	1.7	0.9
Education and artistic creation	7	0.9

Table 5. Coefficients of the regression of the number of first year grants on 1st January 2016 according to the number of coordinators on 1st January 2015

other hand, the methodological decision may also have a logical justification - we assume that the allocation decision depends on the number of coordinators of the previous year.

The ratio between the number of doctoral grants and the number of PhD coordinators has a great heterogeneity among universities. At an average of 1.52 grants / coordinator, it ranges from a minimum of 0.7 to a spectacular maximum of 5.7 at the University of Art and Design from Cluj. After this university with an extreme number, the top three is completed by the Politehnica Univeristy from Bucharest and by SNSPA, also in Bucharest.



Relation with the number of doctoral students

Another plausible hypothesis regarding the judgments on which universities are awarded doctoral grants would be that the Ministry of Education makes this distribution according to the doctoral demand, as evidenced by the number of doctoral candidates. The total number of doctorates, including the number of fee-paying doctoral students, is an indicator of the demand for doctoral studies.

The regression of the number of doctoral grants allocated to each university for the first-year admission in 2015 (figures valid on 1st January 2016) according to the total number of PhD students on the same date, by university class, shows a heterogeneous relationship between the two variables depending on the type of university. Thus, the studied relationship is the strongest in the case of the advanced research and education universities, on the one hand, and in the case of the universities of education and artistic creation, on the other. In these cases, universities receive a scholarship-funded place for each 5th and 10th PhD student, respectively. The relationship is far weaker for the other two classes of universities. On average, research and education universities receive a scholarship-funded place for more than 100 PhD students!

Classes of universities	Constant	Coefficient – Total number of PhD students	R2
Advanced research and education	1.8	0.21	0.695
Research and education	18.9	0.09	0.468
Education	8.3	0.05	0.546
Education and artistic creation	5.1	0.11	0.777

Table 6. Coefficients of the regression of the number of first year doctoral grants according to the total number of doctoral students on 1st January 2016 by type of universities

The simple explanation of this apparent lack of coherence between the allocation of doctoral grants and the total number of PhD students is that the number of grants is not correlated with the number of PhD students and, in other words, is not determined by the local doctoral demand.

A simple interpretation of the number of doctoral students in relation to the number of fee-paying doctoral students on official university classes reveals one of the main differences between the four classes of higher education institutions. Thus, in the case of advanced research and education universities, this ratio is 2.6 whereas for research and education and education universities it is around 1. In other words, while advanced research universities can afford to recruit for the fee-paying places less than a third of PhD students, research and education universities have almost half of the doctoral students paying for their studies. For all public universities included in the Ministry's statistics, this ratio is 1.8 scholarship holding PhD students for one fee-paying PhD student.

Classes of universities	Scholarship holding / Fee paying PhD Students on 1st Jan 2015	N
Advanced research and education	2.6	11
Research and education	1.1	15
Education	0.8	11
Education and artistic creation	1.7	10
Total	1.8	47

Table 7. Number of scholarship-holding PhD students according to the number of fee-paying doctoral students by type of universities on 1st January 2015

The impact of this distribution by form of funding should not be underestimated and requires further analysis. It is known that the fees paid by doctoral students are lower than the amount of the doctoral grant so that a preponderant funding from grants automatically means access to more financial resources than in the case of funding from fees. Moreover, the motivational aspect should not be neglected neither- fee

paying students, who in other words are self-financing, may have other expectations and aspirations concerning their doctoral degrees than those who receive public doctoral grants. In addition, self-financing doctoral candidates are often matriculated in the form of "reduced frequency" and, because they are often employed, it is difficult to include them in the research activities of their doctoral coordinators or of their colleagues from the faculty.

In relation to the objective of financing scientific performance through doctoral grants, the current allocation mechanism is one that works to a degree that is difficult to establish, in a logic of the vicious circle. Universities benefiting from a large average number of grants in relation to the number of coordinators have better funding and doctoral candidates better motivated for scientific activity, unlike universities that have less access to public funding. It is quite clear that, if the current situation remains unchanged, in the medium and long term the scientific productivity gap between the two categories of universities will increase, which creates the prerequisites for increasing differentiation in access to doctoral grants and so on.

Still, the fact that research and education universities are able to recruit an important number of fee-paying PhD students shows that there is an important demand for doctoral studies in their areas and fields. This demand, which is often local and can not be transferred to other universities, should also be considered for the doctoral funding policies, at least in terms of optimizing the use of research resources, including through more nuanced mechanisms for stimulating performance in doctoral research.

Final analysis: what determines, after all, the doctoral grant allocation?

The analyses so far have indicated that the number of doctoral grants allocated for the admission sessions varied strongly among the classes of universities established as a result of Law 1/2011 and that this indicator is poorly dependent on the number of doctoral coordinators or number of total PhD students in a university. Obviously, the most plausible predictor for awarding grants for the September 2015

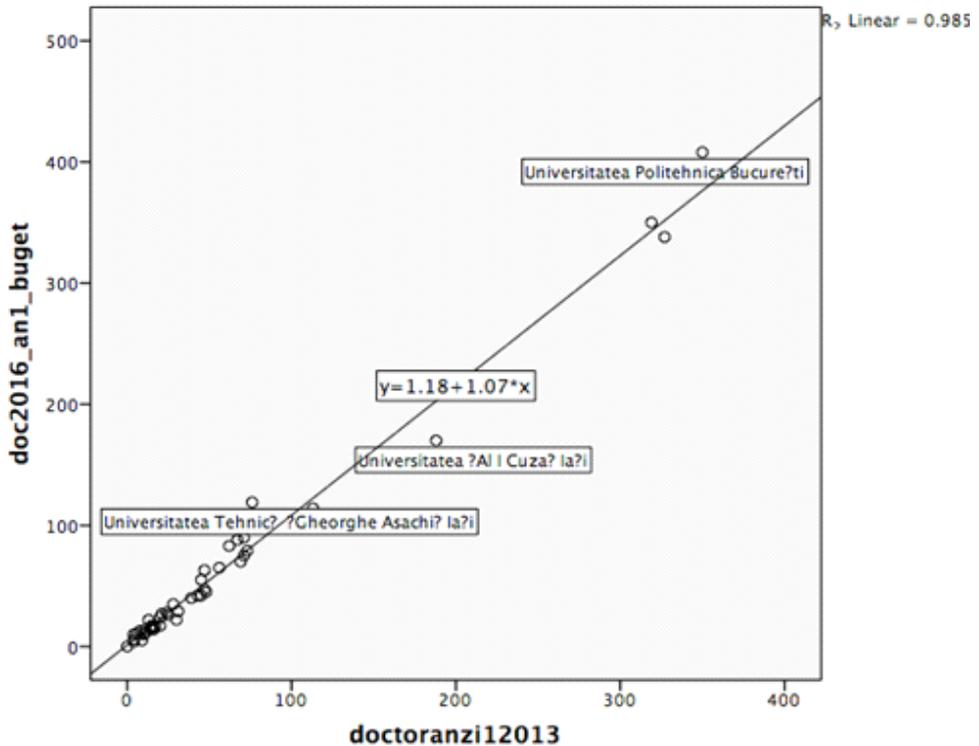
admission is the similar number corresponding to the September 2012 admission.

We tested this hypothesis by elaborating the simple regression model of the number of grants received in September 2015 based on the number of grants received in September 2012 and the number of coordinators on January 1st, 2015. The resulting model explains 98.4% of the variance in the number of grants received in September 2015 but, as shown in the table below, this explanatory capacity is almost entirely due to the variable number of grants received in September 2012.⁸

	B	Beta
Constant	1.835	
First year scholarship holding PhD students on 1st January, 2013	1.091	1.011
Total number of coordinators on 1st January 2015	-0.04	-0.02

Obviously, there are positive or negative deviations from university to university since 2013. The scattering cloud of the two variables shows that, as of January 1st, 2013, the Polytechnic Universities of Iași and Bucharest have had the most to gain, while "A.I. Cuza "University of Iași lost the most significant number of doctoral grants. However, these losses and gains can not be explained by the evolution of the number of coordinators or of the number of fee-paying PhD students.

⁸ Because estimation is made on the population and not on the sample, neither the standard errors nor the multicollinearity measures will not be made public in this article. On the other hand, as someone may ask the September 2011 data is not used, we warn that the correction of the doctoral grant allocation in September 2012 compared to September 2011 was important enough so that the regression similar to the 2011 data would have a R² of "only" 0.84.



Conclusions and recommendations

The present study aimed at clarifying one of the problems that has been troubling university managers in Romania: how the Ministry of Education allocated the doctoral grants between 2012 and 2015. Perhaps a direct question sent to the decision-makers in the ministry would have clarified the situation, but since the investigated administrative-distributive phenomenon is rather opaque, we felt it might be helpful to look for answers in statistics. Following the analysis of the statistical data on doctoral students and doctoral coordinators from the majority of public universities in Romania during 2011-2015, we came to the following conclusions:

The allocation of doctoral grants is based on the "historical" criterion, having as reference the allocation related to the September 2011 admission, following the classification of the universities and the

ranking of study programmes carried out under Law 1/2011 and GD 789/2011 and especially, as shown by the analyses in this study, based on the distribution resulting from the September 2012 admission.

Despite this path dependence, from one year to the next and from one university to another, variations were difficult to understand. Such an interesting variation was the correction of the 2012 doctoral grants in favor of research and education universities. Another seemingly arbitrary correction is the reduction in the number of doctoral grants in 2015 that affected various Romanian universities to different extents. The explanation by changes in the political structure of governments can not be ignored.

The allocation of doctoral grants is not correlated with the number of PhD coordinators in universities, nor with the total number of doctoral students - in other words neither with the offer nor with the demand for doctoral studies.

The current allocation, largely based on performance indicators collected in the 2011 ranking exercise and on subsequent corrections, privileges advanced research universities and, unexpectedly, universities of education and artistic creation.

Despite the budgetary constraints determined by the grant allocation system described above, research and education universities enroll a large number of fee-paying PhD students. This is due, on the one hand, to the existence of a relatively large number of doctoral coordinators and a small number of doctoral grants (*supply side*) but also to an obvious demand for doctorates. Budgetary constraints as well as the specificity of fee-paying doctoral students' activity create the premises of creating or perpetuating a situation of lack of scientific performance that future evaluations of universities or of doctoral schools will have to face and ironically will turn it into the basis for future schemes of doctoral grants allocation.

The above results allow us to make some short policy recommendations regarding the allocation of doctoral grants:

Apart from the scientific performance indicators of universities (which often have nothing in common with the activity of doctoral schools) or of doctoral schools, on the one hand, or the strategic priorities on the other, the allocation of doctoral grants must also be correlated with the number of doctoral coordinators and the doctorate demand indicated by the number of fee-paying doctoral students. The allocation scheme

should reward scientific added value relative to specific conditions, to prevent the decline in the quality of performant doctoral schools (or potentially performant precisely because of underfunding) and prevent inflationary trends in cases where important budgetary constraints are introduced.

It is necessary to introduce transparency mechanisms for the logic of distribution of doctorate grants to universities.

The transparency recommendation should be extended to the publication and collection of doctorate data in the fields that are not even included in the Ministry's statistical data: military sciences, information and public order – as it is hard to accept that scientific scholarships funded from public resources are exempt from to public accountability.

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