PUBLIC FINANCING, FEES AND INSTITUTIONAL STRUCTURE AND CHANGE IN THE ROMANIAN HIGHER EDUCATION SYSTEM

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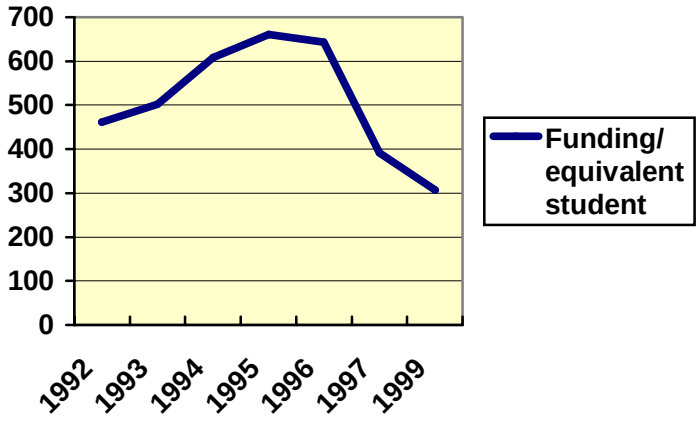
Abstract

This paper is a contribution to the study of funding mechanisms seen as institutional arrangements pivotal both for the understanding and the management of the education systems. The paper focuses on the Romanian higher education case study and argues that many of the dysfunctions the Romanian higher education system experienced at the end of the past decade could be explained as a result of the incentives and constraints provided by the very structure of the funding mechanisms involved. Two models of financing higher education are discussed. In one the state budget is conceptualized as a common-pool resource, and the usual consequences that are expected to emerge in such circumstances, i.e. suboptimal university behaviour, are traced down and explained. The other is used to argue that the present type of state intervention leads to equally undesirable consequences: extensive university development policies and very low levels of financing through university fees.

Introduction

The mechanisms that allocate public funds to universities are often considered a source of distortion of the higher education markets. In this paper we will discuss two such mechanisms relevant for the policy of allocating public funds to Romanian universities. We will show that in both cases the state intervention is highly controversial. Specifically, we will argue that the policy of allocating a certain number of complete student grants entails adverse consequences: a paucity of university resources, and strong incentives to an exaggerated extensive development.

A hotly debated issue on the Romanian education reform agenda is the reality that higher education is severely underfinanced. The sums allocated per student from budgetary funds are very small. In the past decade, as seen from Figure 1, the total grant (from public sources) for a student enrolled program like business, law or social science was in general under 400$ per year. According to the data offered by the National Council for the Financing of Higher Education (CNFIS), the level of financing per student[1] was 373$ in 2001. On the other hand, starting with 1999, public universities offered a larger number of places for people who wish to pay themselves the tuition fees. However, these fees are extremely low too. Data provided by the Ministry of Education show that they range from 350 to 650$ per year in the case of both public and private universities. Romanian higher education is indeed very cheap. Current developments confirm that. In 2004 the state budget did not bring about an increase in the public allocations; at the same time, universities did not raise the level of the fees.



[1] We used the number of 'equivalent' or 'weighted' students (according to the type and level of study programs they are enrolled in) (Miroiu, Dinca, 2000).

Figure 1: Level of financing per student.
Source: National Council for the Financing of Higher Education

This may look very strange, because in the past years most prices of the commodities and services tended to increase; many of them are already close to the European Union prices. On the other hand, this lack of resources clearly constrains the capability of Romanian universities to provide high quality programs. They are less and less able to offer access to updated information to their faculty and students; attractive salaries; student facilities; facilities for advanced research, etc.

In order to collect more funds, the only available solution for the Romanian universities was to implement policies of extensive development. Beginning with 1999, they got a very high degree of financial autonomy. They used it to offer a very large number of 'non-budgetary' student places, which immediately resulted in a much larger university budget. This number is established by each university.

Figure 2: The number of students in Romanian public universities

	1996	1997	1998	1999	2000	2001
State-supported students (undergraduate)	233390	233015	230207	244032	251728	254675
Students who pay fees (undergraduate)	8514	8046	10166	32761	72166	126103

Source: the Ministry of Education

However, the question is why did the universities not take another road, i.e. to increase the student fees from non-budgetary students? As part of the folk explanations the following reasons were advanced. First, it was argued that people in Romania are very poor; they cannot afford to pay more for education. Higher fees would then prevent people from enrolling in university programs. But meanwhile all prices began to raise: nearly all goods can be acquired at prices close to those in the European Union, from milk to books, from gas to refrigerators, from cars to houses. How is it that people can pay for anything else except higher education? Now loans are widespread in Romania; but nothing similar exists on the higher education market. Secondly, it was argued that the reason why university fees are small is the very competitive market of higher education. Universities, both public and private, offer a very large number of programs and of student places, especially in domains like business, law, social sciences, humanities. The higher the supply, the lower the price. This argument is misleading. Many other domains are very competitive, but the prices

increased enormously in the past years. Secondly, it does not explain why one still has not a diversified offer: no university managed to offer programs for which the fees required were much higher then the median one. Even foreign supply of education is not much priced: the number of young people who study abroad (in undergraduate programs) is insignificant. However, the percentage of people who buy cars manufactured abroad is very high, while domestic car industry is still flourishing.

The explanation we wish to put forth is different. Romanian higher education is paradoxically inexpensive mainly due to the type of intervention introduced by the state. By supporting a number of student grants, the state not only distorts the higher education market, and constrains the universities to adopt the lower levels fees, but, more important, the state creates a different market from the usual competitive one, on which universities must also perform. We will present two models of state intervention aimed at identifyinf these structural conditions created by state's intervention. The first is mainly intended to show how the state demands that the universities enter a new type of market that is best described as a common-pool resource (Ostrom, Gardner, Walker: 1994). The second makes apparent the distorting implications of the state support of student grants.

State support of higher education

The starting point is the mechanism of the state intervention on the higher education market and whose main instrument is the financing mechanism of the universities. In 1999 in Romania the old, historical mechanism, was replaced by a new, formula-based one (Miroiu, Dinca: 2000). Funding is based on input criteria (Kaiser, Vossensteyn, Koelman: 2001). The most important criterion is the number of students enrolled in different (undergraduate and graduate) programs The Ministry of Education offers yearly a number of student grants for undergraduate studies. This number is around 60 000 for new entrants. The grant is intended to cover all the tuition costs. The Ministry of Education distributes the student grants to the public universities, mainly according to historical criteria[2]. A university that receives a number of student grants is required to enroll that number of students who do not pay any fee. Besides this number, universities are allowed to enroll other students who are willing to pay for their education.

For analytical reasons that could be described in a formal way. The state budget allocates a sum Q of money for supporting the total number n of student grants. Each of the k

[2] It is reasonable to argue that these very criteria are distorting. However, we shall not focus on this issue.

Romanian universities will enroll a number n_i of students whose tuition fees are meant to be covered by the state grant. We will assume that the same amount of money is allocated for each student. (This is, of course, a simplifying assumption, but it helps keeping the model easier manageable. Actually, the National Council for Financing Higher Education prepared a very sophisticated procedure to allocate funds according to the level and type of programs offered by universities; see CNFIS, 2004.) As a result, a university i will receive a sum $n_iQ/\Sigma n_i$ of money. The income v_i derived from fees of university i has also another source: the funds coming from the students who pay themselves the fees. Let m_i be the number of those students. If the fee per student is q_i, then the total income v_i will be:

$$v_i = n_i\, Q/\Sigma n_i \; + q_i\, m_i.$$

To further simplify our model, suppose that the Ministry distributes the number n equally among the k universities. Then we have $n = \Sigma n_i = kn_i$, and hence:

$$v_i = Q/k \; + q_i\, m_i.$$

For each student, let c_i be the university's costs associated with it. We will assume that these costs are higher then the budgetary allocation $Q/\Sigma n_i$, i.e. that the Romanian higher education is underfinanced:

$$c_i > Q/\Sigma n_i$$

which means that we may put

$$c_i = Q/\Sigma n_i + a_i$$

where $a_i > 0$ is a constant (it is important to note that this constant will be not essential in our argument). The total costs C_i of university i are

$$C_i = (n_i + m_i)\, c_i$$

And its net benefit u_i is:

$$u_i = v_i - C_i = n_i\, Q/\Sigma n_i \; + \; q_i\, m_i - (n_i + m_i)\, c_i$$

Given its resources, a university i can enroll (yearly) a maximal number of $s_i = m_i + n_i$ students. Obviously, we have $m_i = s_i - n_i$, and thus:

$$u_i = \; n_i\, Q/\Sigma n_i \; + \; q_i(s_i - \; n_i) - s_i\, (Q/\Sigma n_i + a_i)$$

Two models of allocating funds

In this section we will present two models of allocating funds. On the former one, each university is allowed to propose a number n_i of state-supported student grants. The Ministry of Education does not question this proposal, and accepts to finance that number of students. In this case, the total number Σn_i of such grants depends upon the behavior of the

universities. The level of state allocation per student is $Q/\Sigma n_i$ will then depend upon how each university behaves. According to the second model, the Ministry is assumed to establish a certain value for n. Its main problem is to distribute the grants among the k universities. Since this model roughly describes better the Romanian case, the policy implications will be discussed relative to it.

Model I: *Unconstrained number of state-supported students*

According to this model, each university offers a number n_i of grants, the source of which is the state budget. The number of these grants n_i is established independently by each university i. Of course, Σn_i depends upon the choices of all the universities. Now, simplifying, suppose that all universities will enroll the same number s of students. Each university i will then offer a number $s - n_i$ of places for students who wish to pay themselves the fees. It is important that the level q of the fee is to be established on the market (and thus it is not relative to each university). The income of university i coming from those students is then qm_i, i.e. $q(s - n_i)$. Secondly, let us move to the budgetary income of i. This does not depend only on n_i, but also on the number of places offered by the other universities, i.e. Σn_i. For university i its income from budget is $n_i/ \Sigma n_i$.

It is important to note that the sum Q allocated from the state budget can be described as a common-pool resource. A common-pool resource is a natural or man-made resource from which it is difficult to exclude or limit users once the resource is provided, and one actor's consumption of resource units makes those units unavailable to others. Therefore, the actors face strong incentives to appropriate more and more resource units, leading unsurprisingly to congestion and overuse of the resource (Ostrom, Gardner, Walker: 1994; Ostrom, Walker: 1997). In our case, each university i will try to appropriate a larger share of Q and consequently will offer a higher number n_i. But if all universities proceed in this way, the implication is that Σn_i is larger, and the sum per student is smaller, even if for each university the proportion $n_i/ \Sigma n_i$ from Q remains the same. As a result, universities will be interested in getting not a larger income v_i, but a larger income V_i per student. This income depends upon Q and Σn_i. If Q is a constant, it follows that V_i is a function $f(\Sigma n_i)$. We have:

$v_i = (q(s - n_i) + n_i f(\Sigma n_i))/s$

We will assume that the function f has certain properties. First, we will assume that

(a) $f(0) = 0$.

This condition is obvious: if no university gets any budget-supported grant, then none will get any sum of money. Further, we require that:

(b) $f'(0) > 0$ (where f' is the derivative of f);

(c) $f'(ks) < 0$;

(d) f is concave (hence $f'' < 0$).

According to conditions (b) and (c), it is stimulating at the beginning for an university to offer state-supported student places; but if all universities promote such policies and each will offer a number s of state-supported student places, then the incentive becomes negative. Hence there is a point in between 0 and ks which, if passed, determines that offering state-supported student places becomes counterproductive. According to (d), the marginal benefit decreases as the offer of such places increases.

The most important result is that universities will reach an equilibrium, but that it is lower then the Pareto optimum[3]. The Pareto optimum is reached when ΣV_i is maximal. We get:

$$\Sigma V_i = (kqs - q\Sigma n_i + \Sigma\, n_i f(\Sigma n_i))/s$$

And the maximum is reached when $(\Sigma V_i)' = 0$. We have:

$$(\Sigma V_i)' = q/s + f(\Sigma n_i))/s + \Sigma\, n_i f(\Sigma n_i)'/s$$

On the other hand, the Nash equilibrium is reached when $V_i' = 0$ for each university i. To simplify our job, observe that the situation is symmetrical, i.e. we may assume that the number of state-supported students offered by each university is the same. Then $\Sigma n_i = kn_i$. Secondly, the function f has to be defined. We will assume that its form is (Ostrom, Gardner, Walker: 1994):

$$f(\Sigma n_i) = a\Sigma n_i - b(\Sigma n_i)^2$$

where a and b are positive constants. Note that this function satisfies conditions (a) – (d) above. Since $f'(0) = a$, we must have $a > q$ in order that universities have any incentive to offer state-supported student grants. We get:

$$\Sigma V_i = (kqs - qkn_i + kan_i^2 - k^2\, bn_i^3)/s$$

$$(\Sigma V_i)' = -qk/s + 2kan_i/s - 3k^2\, bn_i^2/s$$

To establish the maximum, put $(\Sigma V_i)' = 0$. On the other hand, we get: $V_i = (q(s - n_i) + an_i^2 - bn_i^3)/s$ and $V_i' = -q/s + 2an_i/s - 3bn_i^2/s$.

Algebraic calculations show that for n_i large enough the Nash equilibrium is lower than the Pareto optimum. (In fact, n_i is very small in most cases. For example, let $q = 500$; if $a = 600$

[3] It is also important to note that the result depends upon k, i.e. upon the number of universities existing in a country; the equilibrium they reach is closer to the Pareto optimum when k is smaller. As a matter of fact, the number of Romanian universities is very high, and they enrol each a small number of students. It is no surprise then that many Romanian policy-makers tried to provide incentives for merging among the universities (both public and private). The Ministry of Education is currently preparing a law on university consortia, the aim of which is to reduce the number of universities.

and $b = 7$, then the number n_i of students enrolled by university i is smaller than 60. Consequently, this result applies to virtually all real-life cases.) For those values of n_i the function V_i is decreasing: the benefit per student decreases when the number of state-supported students is larger.

Model II: *Fixed number of state-supported students*

According to this model, the total number Σn_i of state-supported students is established by the Ministry of Education, and equals n. The higher education funding in Romania fits this model. The number n is distributed to universities mainly on the basis of historical criteria. To simplify the model, suppose that the Ministry decides to split this number equally among the k universities in the country. Then university i will then receive a number of n/k student grants. We get:

$$u_i = Q/k + q_i(s_i - n/k) - s_i (Q/n + a_i)$$

This is equivalent with:

$$u_i = (Q/k + q_i s_i + s_i a_i) - (nq_i /k + s_i Q/n)$$

Since Q, q_i, k, s_i and a_i are positive constant, what we have is a function in which n is the only variable. Note that:

$$u_i' = - q_i /k + s_i Q/n^2$$

$$u_i'' = - 2s_i Q/n^3$$

The net benefit u_i of the university i is an increasing function when

$$s_i Q/n^2 - q_i /k \geq 0$$

and since the second derivative u_i'' of this function is strictly negative, it follows that u_i is strictly concave. This result says simply that the marginal benefit of a university decreases when the number of state-supported students increases[4]. Now, from the above expression we get:

$$s_i kQ - q_i n^2 \geq 0$$

which means that we must have

$$n^2 \leq s_i kQ/q_i$$

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[4] The Nash equilibrium is reached when $u_i' = 0$ for each university i. In our example, the equilibrium is easily computed, because we already assumed that universities behave in a symmetrical way. However, in general it is necessary to solve all the k equations. It is interesting to compute the optimum for higher education. We must first determine the total amount of benefits of Σu_i and then compute the maximum of this function. Assuming again that each university receives the same number of student grants, the maximum is reached when

$$u_i' = - \Sigma q_i /k + \Sigma s_i (Q/n^2) = 0$$

We get then $n = (kQ\Sigma s_i/\Sigma q_i)^{1/2}$. If $q_i = q$, and $s_i = s$ for all universities, then the Nash equilibrium is optimal.

The maximum of u_i is reached when $u_i' = 0$, hence when $n^2 = s_i kQ/q_i$. Let us briefly focuss on the cases when this happens. Observe first that in general $Q/n \leq q_i$, i.e. $Q/q_i \leq n$, but $s_i k \geq n$. Take for example the case in which $m_i \geq n_i$, i.e. the case in which the number of state-supported student grants offered by university i is smaller than the number of places occupied by students who pay themselves the tuition fees. Then we have $s_i \geq 2n_i$, and hence $s_i k \geq 2n$. But in this case Q/q_i is smaller than $n/2$, whence it follows that

$$2(Q/n) \geq q_i$$

i.e. the tuition fees must be at least twice the per student state allocation. But if m_i is only half of n_i, then we have $s_i k \geq 3n/2$; whence, analogously, we get

$$3/2(Q/n) \geq q_i$$

i.e. the tuition fees must at least be only fifty percent larger than the per student state allocation.

We may then conclude that - given the resources of the universities, i.e. their capacity to enroll a number s of students - the more state-supported places are offered by a university, the smaller the tuition fees for the other students. As a result, when Romanian universities began to offer a larger and larger number of student places for people who want to pay themselves the tuition fees, they succeeded, first, in increasing their budget. But, indirectly, as our second model shows, they opened the way to increasing q, the level of student tuition fees. The more non-budgetary student places, the larger the fees universities could demand. The problem with the extensive development is that it reaches very soon the limit. In fact, we believe that the limit was reached quite soon: already in the academic year 2001 – 2002 the offer of the Romanian universities became higher than the demand for higher education. As a result, the fees increases, but they cannot go beyond the natural limit. It is worth emphasizing: according to our model II, fees continued to be so small not because the competition became very fierce, not because universities offered a larger number of non-state supported student places. On the contrary, if unbounded such an extensive development would have resulted in neutralizing the effect of state intervention (consisting in financing the n students) and in an increase of the tuition fees. The reason why higher education is so cheap in Romania is quite different: on the one hand, the number of state-financed student grants is very large; on the other one, extensive development is strongly bounded. In the past eight years, the state fully supported nearly 60000 new enrollments, while the total number of high-school graduates did not exceed 170000 yearly; out of them, no more than want to120-130000 enroll in (public and private) university programs. Roughly, then, $m_i = n_i$, in spite of

the fact that the universities offered more places for the students who are willing to pay themselves the tuition fees.

Conclusion

It is important to note that our conclusions depend neither on the value Q of the state budget for higher education, no on the level of its underfinancing (i.e. the level of a_i). Of course, for a given Q, the larger n is, the smaller the state allocation per student. And while a university i offers a given number s_i of student places, it is constrained to keep very low the tuition fees. The answer to our question: why is higher education so cheap? is then simple. Higher education is cheap because of the state mechanism of financing universities, which consists in subsidizing yearly a number of full student grants, while the other students have to pay entirely their tuition fees. Consequently, if we do not want a very cheap higher education, then the only reasonable policy is to change the instrument of public funding: the allocation of a number of full student grants.

It is important to note that it does not follow that the state should stop supporting higher education. The only implication is that its policy instrument of subsidizing a number of full student grants must be replaced by another one. This conclusion is in the air. At least two options have been proposed. Dinca (2003) sees the problem in the full state support of students. He argued that this should be replaced by a compulsory tax to be paid by each student, in addition to the student grants. Miroiu (2000) argued that the problem is with the clear cut split between state-supported students, and students who pay themselves their tuition fees. He suggested that student grants should be allocated in different percentages to all the students enrolled by an university: some student may receive a one hundred percent coverage of her tuition fees out of budgetary funds, while for another student the fees are covered only in a proportion of fifty percent, etc. However, it is not the aim of this paper to discuss these policy proposals.

References

CNFIS (The National Council for Financing Higher Education), *Metodologia de repartizare pe instituții de învățământ superior a alocațiilor bugetare aprobate prin Legea Bugetului pe anul 2004*, CNFIS, Bucharest

Dincă, G. (2003), *Schimbări în sistemul de finanțare a învățământului superior*, Romanian Ministry of Education.

Kaiser, F., Vossensteyn, H., Koelman, J. (2001), *Public funding of higher education. A comparative study of funding mechanisms in ten countries*, Center for Higher Education Policy Studies, Enschede.

Miroiu, A. (2000), *Cifre de şcolarizare şi finanțarea învățământului superior*, Romanian Ministry of Education.

Miroiu, A., Dinca, G. (2000), *The Policy of Higher Education Funding in Romania*, Paideia, Bucharest; also at www.govloc.ro

Ostrom, E., Gardner, R., Walker, J. (1994), *Rules, Games, & Common-Pool Resources*, The University of Michigan Press, Ann Arbor, Ch. 5.

Ostrom, E., Walker, J. (1997), "Neither Markets Nor States: Linking Transformation Processes in Collective Action Arenas", in Mueller, D.C. (ed.), *Perspectives on Public Choice: A Handbook*, Cambridge University Press, Cambridge.