REAL-TIME SYSTEMS
Reflections on Higher Education in the Czech Republic, Hungary, Poland and Slovenia

Jon File and Leo Goedegebuure (Eds.)

Real-time systems *(An ICT definition)*

In real-time multiprocessing there is the extra requirement that the system complete its response to any input within a certain critical time. This poses additional problems, particularly in situations where the system is heavily loaded and is subject to many simultaneous demands. Real-time systems are always dedicated. Most systems are not real-time.

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6. Institutional Funding and Institutional Change

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Introduction

The aim of this chapter is to discuss a number of issues related to funding higher education institutions in the Czech Republic, Hungary, Poland and Slovenia. However, the discussion is also relevant for other countries and their higher education (HE) systems, as most of the issues are debated in some form in any system in transition from a primarily planned and regulated system towards a more deregulated, market-driven system. In many respects, the funding problems faced by universities and colleges in the four countries are certainly not unique. Many higher education institutions around the world face similar problems, although they are often less severe.

Though we concentrate on financial issues in this chapter, one cannot ignore the famous 'trinity' of *funding-quality-access*, which requires us to take account of the interrelationships between all three elements when discussing funding issues. Funding levels will affect the quality of services offered while the number of student places supported by the government (either through institutional funding or student support and scholarships) will in turn affect the opportunities available to potential students.

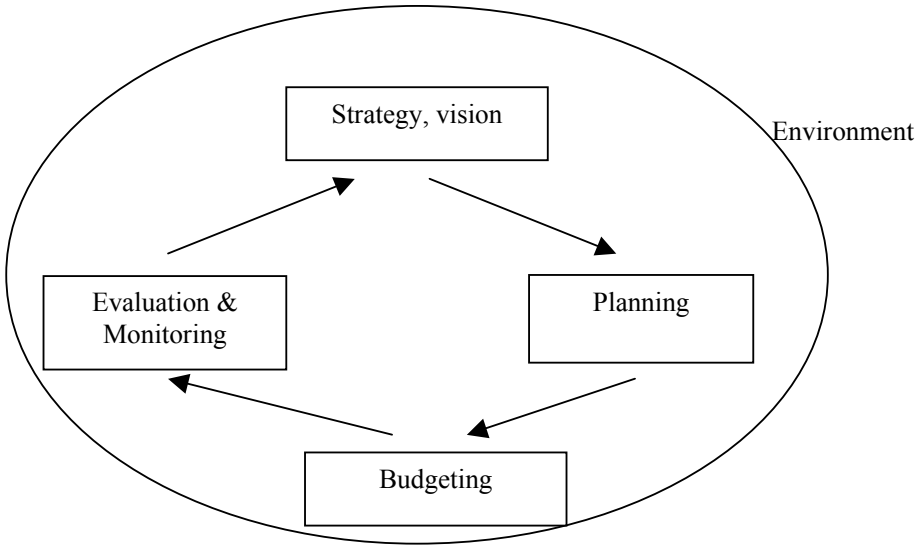
It is important to recognise that the relationships between funding, quality and access do not just work in one direction. The quality of the services offered by HE institutions will also affect their potential to generate additional funding from sources outside the government. In addition, a more open system of higher education, without centrally imposed restrictions on student places, will make institutions behave differently compared to a system in which access is restricted by either regulation or an absence of the necessary student support facilities.

To add another word of caution: Funding higher education is not an end in itself; it is a means to an end. As in all cases where government intervention may be warranted, one has to ask the following set of questions: What do we want to achieve? How are we going to do that? What are the financial constraints? How are we going to measure our success?

In other words, funding is part of the '*planning and control cycle*' that drives the operations of any organisation, be it a government agency (or ministry), a higher

education institution (HEI), or a private (for-profit) firm (see: Jongbloed, 2000). This cycle is shown in Figure 1.

Figure 1: The planning and control cycle



Keeping this in mind, the plan of this chapter is as follows[1]:

The first section identifies basic problems with higher education funding. In terms of Figure 1, it touches on strategy formulation as well as the choice of budgeting technique. The next section presents the environment in which the problems have to be addressed. It identifies the main global challenges affecting the lives of universities and colleges, but in particular the operations of HE institutions in the four countries and how they might plan in order to more effectively realise their objectives.

The final section presents a classification of institutional funding systems based on the mechanisms through which the state allocates subsidies to individual HE institutions. This classification enables us to typify the funding mechanisms in place in the four HE systems and to show the developments in the systems.

The Basic Problems

Every higher education system is faced with four basic policy questions regarding financing:

1. How much higher education can a nation afford?
2. How much should be spent per student, per graduate or per unit of new knowledge?

[1] The plan is based to a lagre extent on Jongbloed & Teekens (2000).

3. Who should pay?
4. How should public funds for higher education be made available to institutions and students?

Below, a number of comments will be made with regard to each of the four fundamental questions. Also addressed is the issue of how one would ensure or indeed measure whether any progress is being made towards reaching the goals to which government funds are supposed to contribute.

Size of the system

How much of a nation's productive capacity – skilled labour, natural resources, foreign exchange, new construction – can or should be devoted to higher education? How does the level of *public* resources available to higher education compare to other sub-sectors of education, such as primary and secondary education (Salmi, 1991, p. 8)? What proportion of a nation's youth should be expected to pursue some form of post-secondary education? In which programmes? For what degrees and for how many years? How many universities should there be, and how many colleges, or other non-university institutions? What should be their target enrolments?

Policy-makers trying to find answers to these questions will inevitably be guided by their own ideas of what size and shape a higher education sector should have and what types of programmes are best suited to meet the human capital requirements of the country. Ultimately, the answers to these questions will have to be given by the Parliament.

Whatever the ambitions may be, the answers to the questions listed here need to be based on sound information and judgements relating to the past, present and future. Effective planning and projecting with regard to the future course of the country, including the needs of industry and labour market, will all be necessary. Importantly, this does not necessarily mean a return to central planning or manpower planning. Rather, it calls for engaging society in discussions over preferred courses of action, including that laid out for the nation’s HE system as well as on the costs and benefits of alternative options.

In transition countries, like the four that are discussed in this book, a crucial question related to funding is the extent to which the higher education system should be driven by manpower planning (or numerus clausus) or whether the government can rely on student demand and student choice. This choice has important implications for the costs and design of the system. We will return to this issue later on.

Decisions over the size of the higher education sector and the public resources invested in it may be informed by comparisons with countries having comparable levels of economic and social development. A frequently used source for such information is the OECD publication *Education at a Glance* (OECD, 2002).

Table 1: Public expenditure on higher education institutions as a percentage of GDP

Country (year)	Public expenditure on HE (% of GDP)	Gross domestic product, 2001 (in billion US $)	GDP per capita, 2001 (in US $)
Czech Republic (2002)	0.9	57.2	5,600
Hungary (2001)	1.3	51.7	5,100
Poland (2001)	0.9	176.3	4,600
Slovenia (2000)	1.2	18.8	9,400
OECD country mean	1.0 *	836.7	22,100

Source: Column 2 based on information collected by CHEPS.
* OECD country mean figure relates to the year 1999, taken from *Education at a Glance*.
Columns 3 and 4 based on OECD Main Economic Indicators database.

The four HE systems do not deviate significantly from the OECD country average. This is shown in the second column of Table 1, that also includes data for GDP and GDP per capita. However, a proper assessment of the HE resource levels also must include the way in which the public funds are distributed to institutions. This topic is treated below. Moreover, one also has to realise that the table only shows money *flows*. *Stocks*, such as the stock of human capital, are equally important. Particularly since stocks change as a result of flows. What the present condition (i.e. stock) looks like is the result of history and tradition; it is the outcome of many years of policymaking, central planning and private decision-making.

Funds per unit

What action should be undertaken to achieve the desired objectives? Partly, though some would say *primarily*, this is a question that requires evaluating the level of *spending* per unit. If so, the question is principally one of determining faculty salaries, teaching loads, class sizes, equipment, and library expenditures for education. What is done to ensure that the maximum output is produced from the resources available (teachers, equipment)? This is a matter of productivity, efficiency and also lifestyle and ambitions. Should the latest, state-of-the-art techniques and equipment be used? Each nation will somehow have to decide to which 'class' it wants to belong within the boundaries set by its national resources and the tax levels it can afford. It may try to belong to the 'world class' or it may choose to set more realistic aspiration levels for itself.

Many nations have sought to reduce their public higher education spending per unit (in teaching and research) by encouraging higher education institutions to work more efficiently thereby increasing 'value for money'. Institutions are, for instance, encouraged to take on more students through financial incentives and regulatory instruments or simply forced to contend with 'fiscal squeezing' policies. Other measures include restructuring the higher education system through mergers and creating new types of institutions.

Reducing public spending has been carried out under the belief that institutions can find ways to work more efficiently and procure supplementary, private funding to

offset declines in public resources. Policies often express the belief that other areas and aspects of society (like health, infrastructure and social security) require more resources. Moreover it is also argued that private benefits of higher education justify higher private contributions.[2]

In times when higher education funding was dominated by central planning, the following approach or formula basically determined available funding for HE institutions (or their various sub-units, such as faculties, departments and research institutes):

$$\text{budget} = \text{tasks} \times \text{standard}$$

Where:

tasks	= number of students (educational demand)
standards	= normative cost per unit (closely reflecting actual cost).

In today's world, budgets are often set by means of the following formula:

$$\text{budget} = \text{volume} \times \text{price}$$

Where:

volume	= quantity (combination of input and output measures)
price	= tariff (normative contribution towards the costs per unit).

Today, funding levels tend to reflect the 'price' governments are willing to pay for a given amount of higher education. This coincides with a steering philosophy in which governments 'buy' education and research rather than just 'support' HE institutions. It also illustrates how funding rates may differ from the 'real costs' of providing a service. Often, funding rates are insufficient to cover the full cost of educating a student or engaging in research. Shortfalls then must be made up by securing alternative funding, such as private contributions, donations, or fees. If additional resources cannot be found, 'something will have to give'. In some cases, the quality of HE may suffer as a result.

This gives rise to the issue of 'incentives'. Funding HE institutions on the basis of prices that do not correlate well with actual costs encourages institutions to critically monitor their costs and to try and understand what drives them. It will encourage them to work efficiently if prices are low or urge them to seek additional funding from alternative sources.[3]

In any case, experiences in the OECD HE systems show that per unit spending will have to be financed from both the public and the private purse. We now turn to the issue of how to achieve an appropriate balance between the two.

[2] This topic is treated extensively in Chapter 7.

[3] Incentives also appear through the choice of funding base, that is the volume component in the above formula. We will return to this issue below.

Who should pay?

A third important question is who should bear the burden of financing the higher education sector? Specifically, how should institutional costs and students' living expenses be shared among parents, students and taxpayers?

Traditionally, HE institutions around the world have relied primarily on government funding. Yet fiscal stress and increasing enrolments have driven many governments to begin shifting part of the burden of higher education costs to those felt to be profiting the most from it: students that obtain a degree and the firms that demand and make use of the services of higher education institutions.

Therefore, the question of who should pay is related to the following issues:
1. Allowing institutions to charge tuition fees for students.
2. Whether and how governments should supply student loans and/or student grants.
3. Whether institutions should be able to seek private funding by 'selling' their services on the market (in competition with other organisations).
4. Whether HE institutions should be allowed to finance their debt on the capital market.
5. The regulation (tax instruments etc.) that may be introduced to encourage private companies to invest in HE or make donations to HE.

Students and their families in many Western European countries are increasingly being asked to bear part of their study costs, particularly their living expenses. In the four countries studied in this book, student fees of some sort are already in place. However, they are mostly paid by students enrolled in private institutions (including the private offshoots of public institutions) or by students studying part-time. Frequently, the full-time students who were fortunate enough to obtain a place in public institutions pay no tuition fee at all (or only a token charge).[4]

Whether or not students pay tuition fees and for those who do, how much, is often spelled out in legislation. For instance, the Higher Education Law of Slovenia states (in Article 77) that "Tuition fees may not be charged to citizens of the Republic of Slovenia … for education in state approved undergraduate programmes performed as a public service (…)". In the Czech Republic, fees charged to regular students are classified as study-related fees. These include administrative charges related to entrance proceedings (not to tuition) and fees for students exceeding the standard length of study. Other fees are to be paid by students in the so-called life-long learning programmes.

In Hungary, state-financed students pay no tuition fees, while self-financed students (about 30% of all students) do pay fees.[5] In Poland, full-time students in publicly funded institutions pay no fees, unless they are enrolled in 'weekend programmes'.

[4] See Chapter 7.
[5] The meaning of the terms *state-financed* and *self-financed* is also explained in Chapter 7.

Clearly, disparity and inequity arise as full-time students (who are likely to experience a sizeable monetary return on their degrees) seem to be subsidised by part-time students, many of whom originate from families unable to send their children to the best secondary schools or to support them financially.

Zero fees may also be found in Germany and throughout Scandinavia. The pertinent question is whether in these countries, as well as the four studied in this book, a no charge system is appropriate in light of the fact that graduates do well in the labour market and are more likely to come from privileged backgrounds. For societies, the opportunity costs from zero fees can be quite substantial. It may be argued that goals like improving access and social equity do not conflict with a policy of making students and their families bear more of the costs of HE. Rather, the question is what combination of charging fees (or graduate contributions) and providing student support can meet the important objective that all capable students, irrespective of background and financial means, can be offered a place in a HE institution.

At the same time, the goals of expanding opportunities for access and enjoying the social and economic benefits of higher education suggest that some degree of public subsidisation may have merit. As usual, the problem is finding the appropriate balance in the policy instruments (e.g. subsidies, incentives and regulations) to be employed to achieve the goals of access, efficiency and equity.

How are funds made available?

The mechanisms for allocating public funds to higher education institutions and their students take several forms. For any system, the goal is to incorporate mechanisms that provide incentives for institutions to operate efficiently and effectively utilise scarce resources. The most appropriate system depends to a large extent on political values (what does the government want higher education institutions to do?) and on behavioural considerations and assumptions (how do providers and students react to particular financial incentives?). This is where economic theory may be useful, since the question involves how people decide when faced with choices from a set of alternatives and this choice implies using limited resources and time.

The question of how funds are made available to HE institutions relates to the following three characteristics of funding mechanisms:

1. funding channel
2. funding basis
3. funding conditions

The choice of funding channel relates to the question of whether government funds flow to the student[6] or to the higher education provider. In other words, choosing between a *demand-driven* or a *supply-driven* funding model. In the first, students receive public funds to spend on tuition. In the second, HE providers are subsidised directly by the government.

The choice of funding base is connected to whether the amount of funds made available is allocated based on input or output measures. This is the choice between *input-based funding* and *output-based funding* or, in other words, a cost-oriented approach versus a performance-oriented approach. We will return to this issue below.

The third dimension of funding mechanisms distinguishes between *earmarked* (or targeted) funding and *lump sum* (or block grant) funding. In the former, institutions have no freedom to use funds according to their own preferences (funds can only be used for specified objectives). In the lump sum case, institutions decide for themselves how to finance their operations to produce the intended outcomes.

In reality, one observes a mix between the various characteristics of funding models. Extreme cases, for instance where funding is either fully earmarked or consists solely of a single output-based lump sum are non-existent. In practice, a percentage of the funds will normally be based on inputs and another part on outputs, with some budget items being provided only on the condition that they are used for specific purposes and other items left to the institution's discretion.

Turning to the funding *channel* again, in student-driven funding systems, where funds are supplied through students rather than directly to institutions, allocations are made through *vouchers*. The voucher is provided by the government (although private voucher systems also exist) and represents a stated value in terms of a number of years (months, or other units) of schooling. This voucher is then handed over to, or cashed in at, the higher education institution of the student's choice. Thus student choice becomes the key element in a system where students 'vote with their feet' and the outcome of their search for the highest value for money determines which institutions receive public funds for teaching. To our knowledge, however, systems of student-based funding do not exist anywhere in the world.

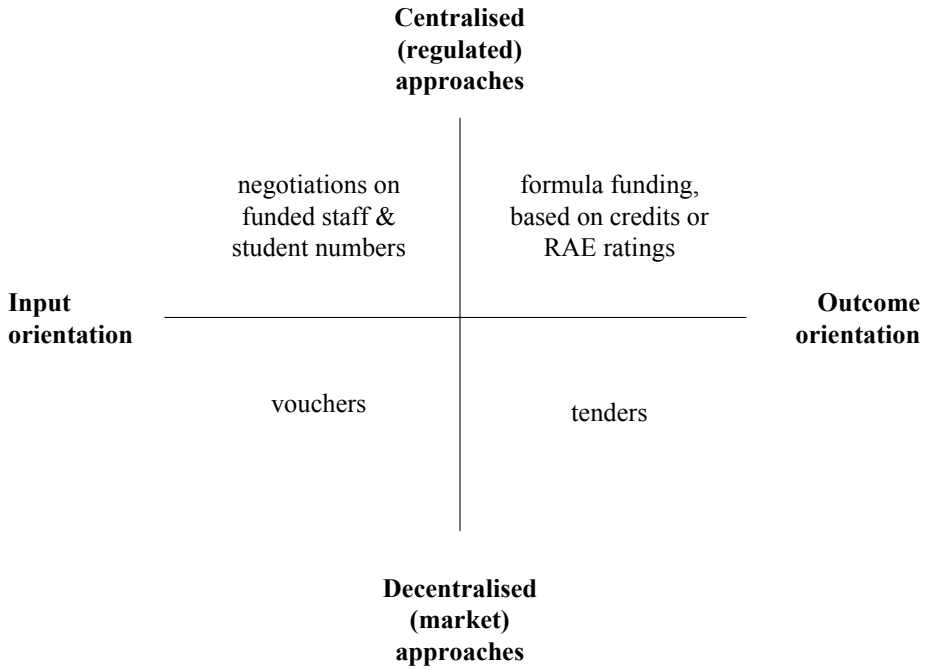
Built in to each allocation mechanism are specific *incentives*. With input-based funding, institutions have little reason to act efficiently or be responsive to changing external demands. In lump sum systems, institutional autonomy is seen as empowering the institutions and encouraging efficiency. Both the output-based and student-based mechanisms incorporate incentives for institutions to make the most effective use of scarce funds and to adapt to the labour market and to student demands. Student-based funding in particular promotes competition between institutions. In short, the funding methodology and the regulatory framework in which it operates *can* make a difference.

[6] This does not refer to student financial support but funding that enables institutions to provide education and research.

Changes in the state funding mechanisms and rules relating to non-state funding are likely to, or even intended to, alter HE institutions' objectives and the way in which they manage resources. In some HE systems, the goal to deliver 'value for money' may be stressed by governments by means of the introduction of performance-based funding (PBF) approaches (see Jongbloed & Vossensteyn, 2001). In PBF mechanisms, the public funds are allocated to the HE institutions on the basis of some measure (or *indicator*) of institutional performance (or *output*) and lead to a system of 'payment by results'.

The diagram below shows four examples of funding mechanisms, each characterised on the basis of two dimensions, which are:
The degree to which the approach relies on centralised planning (versus decentralised decision making), as shown on the *vertical* axis;
The degree to which funding is based on measures of performance (versus a reliance on inputs), as shown on the *horizontal* axis.

Figure 2: Some examples of funding mechanisms placed in a classification scheme



Output-based funding is shown in the upper right-hand corner and a good example of it in practice is the Danish scheme. They use a credits-based system that determines the institutional budget by multiplying the number of credits students accumulate (the volume measure) by a price per unit of output (a tariff). Other examples can be found in the Netherlands and Sweden, where part of the budget is also based on multiplying

the number of degrees awarded by a tariff per degree. Yet another PBF example would be the UK research funding case, where research is funded in proportion to a measure of research quality. Research quality is assessed and rated every five years (in Research Assessment Exercises; RAEs).

The top-left-hand portion of the diagram shows a more traditional type of budgeting where allocations are based on requests (activity plans; budget proposals) submitted to budgetary authorities. This is known as *negotiated* funding. In this mechanism, the budget allocation is often based on the previous year's allocation of specific budget items. Separate budget items (called *line items*) then are negotiated between representatives of educational institutions and the funding authorities (i.e. the ministry, or funding council). Annual changes (usually increases) in each budget item are discussed individually. This is also known as *line item funding*.

A very common approach is to fund on the basis of institutional cost projections. This is known as *input-based funding* and a system like this may also be situated in the upper-left corner of the diagram. In this case, budget items are likely to include categories like staff salaries, material requirements, building maintenance costs, and investment. Funding is line item based, and shows the different expenditure items as separate lines of the budget. The line items are determined by referring to norms with respect to indicators like unit costs (or unit cost rises) or capacity (e.g. funded number of students).

The bottom right of the diagram describes that system of *contracts* that result from tenders in which funding authorities demand HE institutions deliver a specified type and level of output (e.g. a specified number of graduates or research outputs). Each institution competes with other institutions for a contract and the accompanying budget. Competition takes place on the basis of price and quality. A good example of this is research funds awarded by *research councils*.

Finally, the bottom-left part of the diagram shows the *voucher* system. This system stresses student choice and institutions must compete for students in order to obtain public funds. In systems like this, one may expect governments to also allow institutions to set their own tuition fees, thereby encouraging differentiation and making the system even more market-oriented.

In the next section we argue that the general pattern in Western Europe has been a gradual, counter clockwise move beginning in the 'north-eastern' quadrant and ending in the 'south-eastern' quadrant. This move coincides with the trend towards 'steering from a distance'; the result being increased reliance on market-type co-ordination mechanisms in the HE sector. In terms of Figure 2, decision-making is left more to individual 'agents' (students, institutions) who choose on the basis of incentives instead of directives issued from above.

This marketisation trend affects both the established government-HE relationships as well as the traditional mode of operation *within* HE institutions. It is manifested, amongst other things, through increased competition for (both public and private)

funds, the introduction of user charges, and a strengthening of consumer (i.e. student) interests. The aims of marketisation are to encourage institutions to operate more efficiently, to ensure they deliver *value for money* and raise the quality of their services, and to stimulate them into generating revenues from entrepreneurial activities.

How do we measure our success?

When discussing resource allocation mechanisms, an important consideration is the national context or 'steering' framework in which resource decisions are made. Throughout Western Europe a fundamental change in the relationship between government and public sector-dependent organisations is evident. One can speak of a shift from regulation by control and central planning towards establishing boundary conditions within which universities and colleges must operate. Some researchers have labelled this a shift from a *state control* model towards a *state supervising* model (van Vught, 1989).

The trend towards greater institutional *autonomy* has given universities and colleges more freedom in areas such as academic affairs, finance and personnel. At the same time though there has also been a trend towards greater *accountability* for the use of public funds. Universities and colleges increasingly find they must demonstrate value for money and participate in quality assurance exercises.[7] As argued in the previous section, the way in which public funds are allocated to the institutions also reflects the desire to deliver results and improve quality. Reduced state intervention in operational matters implies that governments are less concerned with how funds are spent (on inputs) and increasingly interested in the achievements (the outputs) produced from the funds. Governments, more than ever, are interested in measuring success.

Thus, HE institutions are encouraged to innovate, to change and become more responsive to society's needs. To measure the impact of introducing market-type co-ordination, quality assurance mechanisms and peer review systems are put in place. As far as funding is concerned, the soundness of the HE institution's financial situation and its financial management is assessed through a system of reporting and monitoring that increasingly reflects practices and procedures found in the corporate (i.e. for-profit) sector. Accrual accounting, the publication of cash flow statements next to the operating statement and the balance sheet, and the reporting of indicators of financial health (liquidity, solvency, and profitability) are all becoming accepted throughout the higher education sector. The financial information reported to the government is often aggregated; it is left to the institution to decide on internal financial operations. Governments are primarily interested in the question of whether the institutional leadership is able to balance revenues and costs and whether it can meet its obligations in the short as well as the long term.

[7] See Chapter 8.

All of this means that HE institutions must observe a number of principles that ensure sound and effective financial management. The main principles of effective resource management are:

1. The governing body of the institution is responsible for the direction, key decisions and financial health of the institution.
2. The roles and responsibilities of the governing body, the head of the institution, its committees, the deans, etc. are defined, understood, accepted and reviewed regularly.
3. Competencies and skills are sufficient to meet the needs of the institution and are supported by adequate human resource management and recruitment policies.
4. There is a strategic plan that includes a financial strategy (an internal resource allocation model, budget and costing guidelines, incentives to generate external income etc.), that recognises opportunities and risks.
5. The information that is supplied to the board of the institution, the head of the institution, deans, etc. is relevant, reliable and on time. Information is communicated effectively throughout the institution.

Therefore, the measure of success in using public and private funds to reach governments' and institutions' objectives may be deduced from information that relates to the issues touched upon in this list as well as the performance indicators reported in quality assessment mechanisms.

Summary

Having examined the four key problems in higher education funding we can conclude that the extent, sources and types of funding all originate from policy objectives and a policy framework (i.e. the regulations and incentives) laid out by the relevant national authorities. Within this *institutional* framework, HE institutions will have some room for manoeuvre. Put differently, the HE institutions experience some degree of government interference in areas such as spending decisions, the ability to raise additional funds, and the pursuance of goals that are institution-specific rather than centrally imposed (i.e. determined by government).

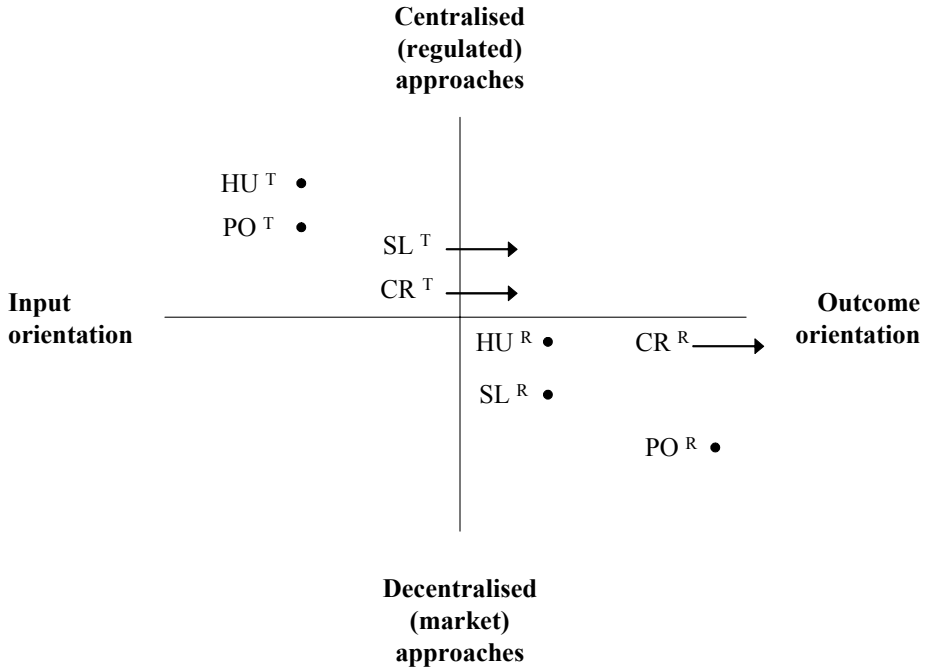
Having stressed this institutional framework, we observe the fact that HE institutions in many countries previously driven by central planning still experience an extreme politicisation of their environment. For those countries the challenge is how the HE system can become less uniform and rigid and move away from central planning and control. Part of the response to this challenge lies in the institutional funding system and reshaping the policy framework. In the following sections, the systems of institutional funding in the four countries are presented, along with some observations and reform suggestions.

Funding HE in the Czech Republic, Hungary, Poland and Slovenia

Characterisation of the funding models

Having laid out the key questions associated with higher education funding, the discussion now turns to the funding of HE in the four countries on which we focus in this book. Using the matrix in Figure 2, we will characterise the methodologies employed in the four countries for funding (higher) education and research and concentrate on the trends and developments in the funding methods.

Figure 3: A characterisation of the funding methodologies in the four countries



In Figure 3, the funding systems of the four countries are classified using the two dimensions introduced earlier . The abbreviations used are as follows:

CR: Czech Republic HU: Hungary
PO: Poland SL: Slovenia

The horizontal arrows illustrate the expected direction the funding system is likely to take in the foreseeable future. A distinction is made between the funding for education (or *teaching*) and research. This is shown through the respective superscripts: T for (undergraduate) teaching, and R for research. If no change is expected in the near future, a dot (●) is shown.

In the sections below, the characterisation of the respective national funding methods is discussed more extensively and the country's position in Figure 3 is explained.

Czech Republic [8]

Before 1992, institutional funding in the Czech Republic was based on the incremental (or negotiated) method. Since then, institutional education budgets have been calculated according to a formula (number of students x cost of study). Cost of study was at that time calculated based on historical levels and needs of particular faculties and was approximated by the average value found for 7 categories of programmes. The allocation formula lead to a lump sum, the distribution of which was left to the institutional management. The lump sum was meant to cover all activities of an institution.

Over the last several decades Czech HE institutions were not expected to carry out substantial research, since it was centralised in the Academy of Sciences. The 'cost of study' rate, therefore, did not cover the cost s of starting or continuing research. During a short period (one year, in fact) the formula was corrected by a so-called incentive coefficient, supporting research activities. This part of the formula, initially covering about 10% and later approximately 15% of the overall HE budget, was allocated on the basis of semi-research output and inputs. It was stressed that the allocation was to be spent on research directly related to teaching and learning, or 'specific research'.

The 1998 Act on higher education and the recent (2002) Act on research support have both brought significant changes. As far as the funding of teaching is concerned, the Act stipulates that the majority of the budget should continue to be allocated on a formula basis. The normative part is calculated as the product of student numbers in an institution and the normative per student study costs. There are six different cost categories. The normative cost for high cost programmes is 3.5 times higher than that for the low cost ones (humanities, social sciences). The value of the basic tariff is slightly less than 1000 euro. The formula has undergone several corrections and slight changes, agreed to jointly by the Representative Commission (composed of representatives the Ministry, the Council of Higher Education Institutions, the Czech Rectors Conference and institutional registrars).

A crucial consideration in funding debates has been the number of students that count towards the institution's public funding. Only agreed increases in student numbers are paid from the state budget, which ensures that study costs do not decrease (at least if not being increased due to inflation) and enables institutions to plan ahead in a

[8] This section is based to a large extent on Šebková & Beneš (2002).

relatively stable situation. There are negotiations between the state and the institutions about the capacity that is funded. This capacity constraint was deemed necessary because of the budgetary pressures experienced by the state. In the end though the decision on the total number of students in particular study programmes is left to the institutions themselves. In those cases where agreed targets are exceeded, the tariff of a particular institution may in fact decrease, especially since the student is not obliged to pay a tuition fee.

The Act also introduced a new and very important element: long-term development plans of each public higher education institution. The content of each plan and its accordance with the long-term plan of the state is to play an important part in the determination of the level of the state subsidy allocated. The Ministry invites institutions to submit projects that fit the objectives laid down in the state strategy. Approved plans lead to additional funding. The aim is to increase the percentage of the budget intended for long-term development projects to about 30%, making it an important instrument in steering the HE system.

Other non-normative funds are typically earmarked for various activities and purposes. Examples include student accommodation, and scholarships for doctoral students. Another important source of revenue from the state is the Higher Education Development Fund, which is administered jointly by the ministry and the Council of higher education institutions. Funds are also available for capital investments. In this case specific priorities are decisive as projects are selected on a competitive basis.

Turning to the funding of *research*, we note that the research budget is divided into two parts. One is for research specifically linked with teaching (explained above) and the other part is based on the institutional mission. The purpose of the latter, first introduced in 1998, is to increase overall research support and bring the institution's research in line with EU research.
The formula that determines the specified research grant includes the following criteria:

- the sum of money received by the institution from research and development projects,
- the ratio of professors and associate professors to the total number of staff,
- the ratio of students and graduates from doctoral study programmes to the total number of students of the institution.

The responsibility for determining the total amount of specified research money (including specified research) lies with the Research and Development Council of the Government.

A further possibility to obtain research funding from the state budget is to establish a 'Research Centre'. This was introduced to strengthen collaboration between higher education institutions and other research institutions, particularly those in the Academy of Sciences. Projects to establish a research centre are regulated differently to the above-mentioned institutional mission grants.

A final option is to submit a research proposal to an agency that distributes funds from specific ministries (e.g. the Ministry of Health, or the Ministry of Agriculture). The most important one of these is the Czech Grant Agency. These agencies allocate modest sums of money in a competitive way to various types of applicants.

All in all one can conclude that the distribution of research funds is relatively decentralised and leaves considerable room for university-level initiatives. The criteria used to distribute funds are to a large extent performance-driven and, with the expected increase of the Research and Development Plan funds, will make the Czech system more oriented to objectives that fit the government strategy but at the same time reflect institutional differences.

Hungary [9]

Institutional funding in Hungary by the Ministry of Education is largely formula-driven. The funding is based on the number of 'admitted', or state-financed, students. Such students do not pay tuition fees which distinguishes them from the 'self-financed' students. The funding rates are referred to as 'education and facilities maintenance norms' and differ across groups of study programmes.

In the mid 1990s, this system of financing replaced the older method based on negotiations between the HE institution and the Ministry of Education. When it was introduced there were 14 different categories and norms. Later the number decreased to 7, then to 5, and today only 4 different categories are used.

At various stages, different approaches have been used to determine the numerical value of the norms. In 1998, for example, more than 10 indicators were used that took into account theory- (or classroom-) and practice-oriented aspects of the various study programmes, including: student contact hours, support staff, the salary of lecturers and staff as well as material expenses. Study programmes with similar norms were grouped together.

The norms do not vary with enrolment levels or programme quality; thus they do not account for all aspects (costs) of a programme. It may therefore be the case that the norms do not cover all necessary expenses and this has lead many to conclude that Hungarian higher education is underfunded. The highest norms (equivalent to €5000 per student per year) are associated with medical and performing arts students, while the lowest (about €1000) are attached to college-level education, e.g. in the fields of humanities and economics.

The system of public funding is basically a centralised system (see Figure 3). There is no possibility of negotiations. The government determines the number of students admitted, taking into account the labour market situation (in particular fields), student demand and institutional capacity. Funding is input-oriented, but there are performance-related factors as well. When formula-based funding was introduced in

[9] This section is based to a large extent on Reffy (2003).

Hungary, funds were originally allocated in proportion to student numbers. It turned out, however, that this threatened the quality of education in any HE institution confronted with a shortage of funds. The reason was that institutions had little incentive to deny under-performing students from continuing their studies, since a lower number of enrolments reduced overall institutional funds. In order to prevent students from dropping out, institutions were tempted to lower the study requirements.

The potentially negative effects of such a system or any other (performance-driven) method tying budgets to student progress or enrolments are an important feature in discussions on funding methods around the world. To prevent a lowering of standards, of course, a quality assessment system could be introduced or the government could make decisions on the number of admitted (i.e. funded) students depend on the performance and quality of the institution.

The funding system was also changed to reduce the time taken by students to complete a degree. Today, institutions receive normative financing not on the basis of enrolments but the number of admitted students for the total duration of the study programme. This period is fixed due to the qualification requirements of the different study programmes. The effect was that the number of students supported by government funding decreased slightly from one year to the next. The annual drop-out was around 4%.

Apart from formula funding, part of institutions' budgets is proportional to the number of teachers holding a scientific qualification (a PhD) and the number of PhD students. This special funding is allocated in order to account for institutional quality. Since quality is hard to measure, the indicators chosen relate to PhD holders and PhD students. This special type of funding represents almost 7% of total institutional funding. For some institutions it can constitute a sizeable portion (15–20%) of its budget.

Before turning to research funding, we note that the state finances an agreed number of PhD students. There are two different educational norms, according to the cost differences between technical & natural sciences (equivalent approximately to 2400 Euro/year/student) on the one hand and social sciences (about 1200 Euro/year/student) on the other.

The public funding for *research* in HE institutions comes from two sources. The first is a normative part that is slowly increasing from year to year (presently it is somewhat more than 8 million Euro). The research activity funded from this source is connected to teaching. The funds are tied, on the one hand, to the same parameters underlying the teaching budget and, on the other, to the institution's success in generating income from competitive grants. The latter aspect makes the normative budget slightly performance-driven.

The other source of research funds is available through tendering from national funds (around 35 million Euro) or international (e.g. EU) programmes (around 6 million Euro). With respect to the national sources, the National Research Foundation makes

funds available to individual researchers carrying out basic research. The size of this fund has doubled from €42 million in 2000 to €85 million in 2001.
In sum, the Hungarian system of research support is a dual model, with normative (formula-driven) funds and competitive funds. It can be characterised as being primarily decentralised, with funding more oriented to output instead of input (see Figure 3).

Capital investment in HE institutions is also supported by public funding. All institutions are obliged to prepare an Institutional Development Plan (IDP), which is judged by a body of higher education experts from Hungarian institutions that are nominated by the minister of education. After an institution's IDP has been accepted the institution then compiles a Capital Investment Plan (CIP). Funding is then distributed on a competitive basis, taking into account the institutions' CIPs. The capital funds available in the Ministry of Education's budget are equivalent to approximately 430 million Euro/year.

Poland

Until 2002, public funding for public HE insitutions in Poland was distributed according to a system formula funding.[10] The formula took into account the weighted number of students and the number of teaching staff holding scientific degrees. The weights applied to student numbers varied by field of study and ranged from 1 to 3 in incremnts of 0.5. For the teaching staff, three weights were used: 1, 1.5, and 2, for a doctor, a *habilitowany doctor*[11] and a professor respectively. In other words, the formula was very input-oriented and tied heavily to the institution's staff in terms of both numbers and composition. This situates Poland in the upper-left part of Figure 3.

However, the application of this formula was suspended from 2001 onwards. Until an agreement is reached on a new funding methodology the HE system is funded incrementally. Today, the budget received by a public institution is based on the previous year's budget, partly corrected for inflation and with very modest compensation for extra students or additional expenditures. This implies that allocations are more or less 'frozen', although they do reflect the number of enrolments and staff in the recent past.

The old formula also provided different levels of funding for public institutions for full-time students (around 2000 euro) and part-time students (around 500 euro). On top of that, public institutions were allowed to charge a tuition fee for part-time and weekend students.[12] As stipulated in the Polish Constitution, full-time students in public HE institutions do not pay any fees.[13] Since private institutions charge fees and do not receive any public funding, private institutions face a distinct funding

[10] Our description of the Polish funding system is partly based on Wach (2002).
[11] As in the German system, this is a PhD holder,who has completed habilitation but is not yet a professor.
[12] See Chapter 7.
[13] With the (only) exception of students in medicine, where additional students (in excess of the publicly funded quota) pay quite substantial fees (of around 3000 euro).

disadvantage. To offset this, private institutions compete with public institutions by offering particular programmes to students not able to enrol in a public institution.

With the abolishment of the old funding system, public HE institutions are now engaged in a kind of 'rat race' to enrol as many part-time students as they can in order to increase their revenues. While they can accept as many full-time students as they wish, public HE institutions do not receive additional funding for numbers in excess of the funded capacity. Accepting 'extra students' therefore may have a negative effect on the quality of provision. Selecting part-time students, though, is left to the institutions themselves.

Discussion about educational quality is also connected to the funding formula. The old system was criticised by the big universities on the argument that it paid no attention to teaching quality. While the Main Council of Higher Education supported this opinion, the ministry did not change the algorithm (i.e. the resources per student) in this respect.

At present, the public HE system is at an impasse and in clear need of revitalisation. Public institutions argue that they are only able to pay for salary costs and not able to maintain their buildings (owned by the institutions themselves) and equipment. In the absence of well-delineated funding policies and a Constitution that does not allow institutions to charge fees to full time students, HE institutions are being forced to make ends meet, sometimes sacrificing quality, infrastructural needs and having to face the brain drain.

The public research institutions[14] in Poland include (public) universities, industrial research institutes and the institutes of the Polish Academy of Sciences. Of the three, the universities are the most important and some have long traditions of academic research. The universities of technology have traditionally carried out applied research.

A system of industrial research institutes was created under the central planning economy. These institutes were established to serve the needs of various branches of industry, with some of the institutes concentrating on narrowly defined research fields. The narrow focus and the restructuring of the Polish economy have had a negative effect on the financial condition of many of the institutes.

The institutes of the Academy of Science, concentrating on basic research, form the smallest part of the research infrastructure in Poland and account for only 7% of all research conducted in Poland.

The system of research funding and the accompanying evaluation system are relatively modern when judged by international standards. It may be classified as output-driven and largely based on decisions on the performance of individual research units (see Figure 3). Every four years, all research institutions are evaluated by the State Committee for Scientific Research (KBN), the major research-funding agency in

[14] The information on research infrastructure is based on Kurzydlowski (2002).

Poland. Each institution or faculty receiving funds from the KBN is evaluated ('ranked') by scoring the institution according to the following criteria:

- number of publications in international and domestic journals
- number of awarded degrees
- number of patents and registered innovations
- number of certified test laboratories
- weighted number of registered research contracts with industrial partners.

The KBN consists of 13 sub-committees dedicated to specific fields of research, both fundamental and applied. The most recent evaluation exercise took place at the end of 2001. There are five categories of research quality and only 20% of units evaluated are allowed to be ranked in the highest category. The points scored by a given institution determines to a significant degree the budget (the statutory grant) of the institution.

While this research evaluation system and its criteria are largely accepted by the scientific community and seem to work well, concerns have been expressed about funding levels as well as the relative weights given to the respective dimensions used in the evaluation.

In terms of the former we note that the average research budget in public HE institutions represents about 16% of the total budget, while for teaching it is nearly 80%. The highest share of research money (25%) is found in Technical Universities. For the average public HE institution, available research funding is distributed between the KBN (39%), institutional research funds and endowments (15%), grants (18.6%), and contract research for business and industry (24%). The highest share of contract research (30%) is found in Technical Universities and Medical Academies.

Slovenia

Much like in other countries, Slovenian HE institutions generate funding from the government, tuition fees, payments for services, institutional endowment, legacies, donations, and other sources. In practice, a significantly large portion of funding for HE comes from the government, particularly the Ministry of Education and Sport. The Ministry of Science and Technology participates in financing research and graduate studies. The two ministries were merged in 2001 to form the Ministry of Education, Science and Sport.[15] Through a system of concessions (i.e. contracts), the state also finances some private higher education institutions ('free standing' institutions) provided they meet specific criteria with respect to teaching staff and programmes.

Although the recent adoption of a Master Plan for higher education states that the system of funding for education will change from a system of funding per study programme to a lump sum funding system, the existing system can still be characterised as input-based and centrally planned. The state finances the salary costs necessary to educate a specified number of full-time undergraduate student places on the basis of the number of university lecturers and auxiliary staff, their qualifications

[15] The Ministry of Economic Affairs has taken over the responsibility for technology policy.

and work experience, the number of students and the number of graduates. Material expenditures are funded on a similar basis, using the same parameters with the exception of the number of graduates. In addition, the number of teaching hours is taken into consideration. These line items are transferred directly to the university, although prior to that most funds are already divided up across faculties and departments. In other words, there is little room for central university administrations to make internal reallocations.

A contract between the state and the HE institution is signed each fiscal year, specifying the level of resources and the conditions attached to their use. Available study places are negotiated between universities, who propose numbers in different fields, and the government, who approves funded numbers. The final decision is driven primarily by the available premises, laboratory and other infrastructure.
For full-time undergraduate studies, students enrolled in public HE institutions and private HE institutions with a concession do not pay tuitionfees. Part-time students do pay a tuition fee. Income from fees constitutes an important source of income for public universities.

Investments and maintenance of facilities is financed in accordance with a preference list of the university and a four-year investment programme laid out by the government. Because universities own their buildings, maintenance costs can be a problem. Often universities must finance such costs out of the supplementary revenues they manage to bring in.

For several years now, preparations for introducing a new financing system based on the 'lump sum' approach have been under way. Eventually, resources will be allocated on the basis of the number of students, the number of graduates and the number of 'repeaters'. All of these measures will be weighted. Repeaters, students that fail to pass on to the next programme year, are taken into account only if the delay is less than a year. The institutional budgets are based on normative funding rates reflecting differing cost structures in five different clusters of programmes. The budgets will be allocated as a lump sum, covering both salaries and material expenditures.

The first attempt to introduce lump sum funding, in 1998, involved postgraduate studies. Each year, the state issues a public invitation to tender for the supply of postgraduate programmes in selected areas. All HE institutions can apply, provided they meet a number of conditions:

1. the level of the tuition fee (which has to be less than the standardised level, set by the government at around 2,100 euro)
2. a minimum number (i.e. 15) of students enrolled
3. the requirement that programmes are credit-based
4. the requirement that the HE institution is active in international co-operation.

Funding is formula-driven and derived by multiplying a tariff of 80% of the standardised tuition fee by the number of enrolled students. Students pay the remaining part of the tuition which is why the procedure is known as co-financing.

The higher educational institutions define for themselves the purpose for which the funds are used, but are not allowed to spend more than 70% of the funds on salaries. The Ministry signs a contract with each co-financed faculty.

Regulations on co-financing postgraduate studies also foresee a payment of their reward to higher educational institutions for co-financed students that finish studies in three years for study programmes leading to the *magisterij* (Master's degree) or five years for study programmes leading to the *doktorat* (PhD).

Postgraduate students not co-financed cover the full cost of their studies. For the academic year 2001/2002 the state co-financed 3011 post-graduate students or 61 % of all post-graduate students.

Research funding takes place mainly through a system of tenders. The research within public HE entities is funded through research programmes, project funding, the funding of postgraduate studies (including PhD programmes) and the funding of research infrastructure. Research programme financing, constituting about two-thirds of research funds, is for 5-year research programmes. Project funding, roughly one third, is for short-term projects.
The public research organisations consist of universities (Ljubljana, Maribor and the recently established Primorska university), 17 national research institutes and some 33 other public research organisations.

Slovenia has managed to organise a relatively stable pattern of financing public research institutions and universities. In terms of expenditure on R&D (1.5% of GDP in 2000), Slovenia is closer to the EU average than any other candidate country. In 2000, R&D in the HE sector accounted for 17% of overall expenditure on R&D in the country. As part of its national development plan, Slovenia intends to establish an intermediary body by the end of 2003 that will distribute research funds. Public-private arrangements and international co-operation are very much stressed.

Some Specific Issues Related to Funding

Introduction: a list of special topics

After having characterised the HE funding methods of the four countries in the previous section, the discussion now turns to a number of specific issues related to funding decisions and reflects the practical problems that HE institutions and their national (funding) authorities are confronted with. Many of the issues are interrelated but are presented here separately for the sake of discussion. The specific problems addressed have certainly not yet been 'solved' for the higher education systems in Western Europe – perhaps they never will be – but 'Western' experience may help in analysing them.

The issues are:

1. To what extent should governments (or educational authorities) decide what to fund, thereby influencing patterns of enrolment?
2. What percentage of education costs should be derived from student fees?
3. Who should pay for the research component in advanced education?
4. Recognising that higher education institutions are generally accountable for how they deploy public funds, should the use of funds be as free as possible from external control?
5. Given the state of deferred maintenance and neglect in the higher education sector's physical assets (buildings, equipment), how should funds be made available to solve these problems and how should priorities be established for these purposes?
6. Should the entire allocation, or part of it, be decided by the application of a formula?
7. What constitutes equitable treatment among the institutions in funding matters, and how can this be achieved?

We now make a few remarks on each of these issues.

Public policy and market forces

The main question addressed here is: 'Should funding be based simply on numbers which reflect student choice, regardless of cost, or perceived social or economic need?' In other words, should students be allowed to register in the programme of their choice, even if the possibility of employment in that profession seems low? In the latter case, funding is determined by market-forces. In the former case, funding mechanisms are designed to encourage students to choose an educational career that will lead them to enter professions where there is a direct need for personnel. This type of funding is known as targeted or selective funding, because the government influences patterns of enrolment by deciding what to fund. The situation is complicated by the fact that labour-market predictions are usually unreliable and that policies based on them cannot be adjusted as quickly as societal needs change.

Table 2: Central planning of funded student places?

	centrally planned?	additional remarks
CR	yes: "negotiated"	but institutions accept more students
HU	yes: "admitted"	centrally fixed by government
PO	no: "rat race"	institutions decide, but funds remain the same
SL	yes: "contracted"	in addition, institutions accept part-time students

In Table 2 we show the situation for the four countries treated in this chapter. Three out of the four countries still rely very much on central planning. However, students not able to gain a funded place are often given the opportunity to enrol as a self-financed student, either in a public or a private institution. The downside, at least for students, is that they are likely to have to pay sometimes substantial tuition fees.

There are two main reasons why selective funding is not often utilised by many Western governments: (i) the need for adaptability (institutions and students must be able to react to changing circumstances and this need is likely to increase in the future); and (ii) while many HE degrees relate closely to the practice of certain professions, they should not be seen simply as providing a guarantee of employment.

Regarding the first reason, some argue that the majority of institutional funding for education should not be earmarked, because institutions should not be encouraged to offer narrowly-defined programmes. More broadly-based first degree programmes should give students the maximum opportunity to acquire important critical (scientific) skills rather than in-depth knowledge of a particular discipline. In fact, having advanced knowledge in a specialised area may preclude an individual from making a career change in response to a new societal need.

The other side of the coin is that governments are major employers, especially in the fields of education and health. It is possible to predict retirement patterns and to encourage the training of teachers and health professionals so as to avoid the extremes of shortage and over-supply and to maintain overall quality.

Accountability for the use of public funds is also relevant. HE institutions have demonstrated persistent resistance to change, urging the funding of more staff when student enrolment in a discipline increases but reluctant to reduce staff when enrolment decreases. Institutions must be both transparent (i.e. using procedures and implementing policies which are available for public scrutiny) and accountable (i.e. willing to be judged by their own mission statements and the priorities set forth in them). A constructive step might be to develop a system-wide agreed upon set of criteria and procedures for the elimination of courses and/or programmes for which there is no longer any demand or which do not meet agreed accreditation requirements. The viability of consolidating departments – creating a single comprehensive unit instead of keeping two or three smaller ones – could also be considered. In a similar vein, the effectiveness of several universities starting up new courses which duplicate popular/successful ones at other institutions may also be regarded as questionable.

Student fees

In many Western economies, tuition fees for students in higher education have risen considerably without commensurate increases in available student aid. Policy-makers often justify this trend by stating that students are the chief beneficiaries of advanced education and should therefore bear most of the cost.

The question of what constitutes a reasonable fee for students is a contentious one. Should there be differential fees for different programmes (meaning, for example, that students should pay more to study agriculture, engineering or medicine than for language studies, law, journalism or sociology)? If differential fees exist, what factors should determine the difference? Other questions include: who should set the level of the fees, who collects them, and will fees discourage some individuals who would otherwise have attended a HE institution?

The question of appropriate fees depends on whether fees already exist in the higher education sector and, if so, what level they have reached. Also, the existence of student aid schemes is important. When introduced or adjusted, fees may be related to the programme costs or salary expectations of graduates of the programme. They may also reflect the quality of specific programmes or be made dependent on an estimation of the benefits to graduates or society. There is no simple answer to the multi-dimensional problem of fee levels.

In the next chapter of this book, the issue of fees and student support programmes to help students pay for their higher education is discussed so we will not treat it here. However, because it relates to institutional funding and institutional autonomy, we need to point to the issue here.

Who pays for research?

There is a growing trend in Western Europe for governments to provide research funds separately from the general institutional allocation for education. Greater efforts are also being made to encourage HE institutions to obtain research funding through alternative sources such as private or government-operated research foundations and from businesses. One suggestion for increasing university income is for the government to match (up to a stated figure) contributions by third parties.

If government pays for research, the pertinent question becomes how much and through what mechanism? This question was treated in the previous section for each of the four countries. The conclusion reached was that many systems treat research separately from teaching, with some governments providing modest funding for teaching-related research. The bulk of research funding is provided through competitive channels and a quite substantial role is played here by the Academy of Sciences. When competitive funding is in place, funding is often distributed by buffer agencies such as Research Councils.

If the private sector subsidises research we touch upon the issue of entrepreneurialism. This is a very contentious issue, especially in countries where higher education has always been regarded as a pure public affair. However, with governments actively promoting the generation of non-government resources and some institutions demonstrating remarkable successes, entrepreneurial activity has become a ‘fact of life’. The HE sector simply cannot do without it anymore.

It is difficult to give an indication of the share of contract income for each of the four countries. However, all actively promote the generation of supplementary income by HE institutions and try to stimulate co-operative research efforts between HE institutions and business or research institutes.

An issue that becomes important is whether barriers to engaging in entrepreneurial activities exist. All of the countries report no real obstacles here. The only obstacle mentioned was the lack of resources and the absence of connections to the private

sector that prevent institutions from building up a track record and reputation in carrying out contract research.

Institutional autonomy and control over public funds

The question here is whether it is desirable for funding authorities to limit and prescribe how public funds should be spent by HE institutions. Earlier, we made a case for *lump sum funding*, specifically because it would allow the recipient institution to decide, on the basis of its own criteria and experience, how to use the funds. The underlying idea is that those directly engaged in (or supervising) the basic activities should be capable of finding the best possible use for the resources granted to them, especially if they are simultaneously held accountable for the resulting costs.

Table 3: Lump sum funding in place?

CR	Yes
HU	Yes
PO	Yes
SL	Not yet

Table 3 makes clear that lump sum funding is evident in each HE system except for the Slovenian one. However, Slovenia plans to introduce lump sum funding have been prepared and the question now is how increased autonomy in financial matters can be combined with the 'right' amount of external and internal control.

Institutional leaders anywhere will welcome being made responsible for their decisions and the resulting costs only if they are also given the resources to cover the costs. This extends to the authority to cut certain expenditures and redirect the released funds to alternative and more worthwhile ventures.

This means that knowledge and information about costs and opportunities is crucial. It also requires institutional leadership to have the authority and the will to act upon the results of outcomes of cost-benefit studies, to be prepared to downsize or close programmes that have become too small or expensive, and to move the released funds to programmes with a higher priority. This is called 'growth by substitution' and is on the agenda of institutional leadership in all HE systems experiencing a shortage of funds or in need of institutional change. 'Growth by substitution' is perhaps the biggest challenge facing HE institutions anywhere in the world today.

HE institutions in previously bureaucratic and centrally planned economies can only change during times of financial austerity when resources – including people – are reallocated. This is difficult in all types of organisations and systems, especially in a society where jobs have been virtually guaranteed for many years. Because it is often difficult to get institutions to change, it may sometimes be worthwhile to make use of earmarked funding, especially when major system-wide objectives must be reached in the short term. However, the question is one of finding a right balance between earmarked funds and general lump sum allocations.

It goes without saying that even with lump sum funding all spending has to be directed towards the general objectives of any higher education system: teaching and research. Inefficiencies and unintended use of public funds should be prevented or at least mitigated. Therefore, higher education institutions will have to keep sound financial accounts and observe high reporting and accountability standards. It is also evident that increasing HE institutions' autonomy and their control over the use of (public) resources can only work if the institutional management has sufficient capacity and meets high standards.

Deferred maintenance and new construction

The stringent financial constraints imposed on HE institutions in many formerly centrally planned countries are nowhere more apparent than in the condition of their buildings. Many necessary repairs and additions to buildings have been deferred. The question is whether special allocations should be made for these purposes. If so, how should the priorities be established? There are at least three ways of approaching this (very costly) problem:

1. assume that institutions will allocate some operating funds to a systematic maintenance programme;
2. allocate to each institution a sum of money which may only be used for maintenance; and
3. establish a (regional) priority list and fund the highest priority work each year.

Since the first may not be the most appropriate way of solving the problem, restricted funding probably offers a better solution. Specifically, what is needed is an objective method for establishing the space and equipment standards for academic buildings. This would mean funds would be directed not only to institutions with buildings in disrepair, but also to those with well-maintained but insufficient space.

Institutions might be asked to present an inventory of their buildings, identifying major needs and necessary repairs and outlining a plan that seeks to maintain the buildings in the long run. Earlier, we presented the case of Hungary where capital investment plans are made in a way that resembles option (iii). In general, an investment plan could be based on a system of depreciation, together with an internal (i.e. institutional) revolving construction fund.

Deciding on the best way to go forward in this matter is all the more relevant in the case of systems where HE institutions – like in the Czech Republic, Slovenia, and Poland – own their buildings.

Formula funding

Earlier in this chapter we discussed resource allocation methods argued that each transfer mechanism has its incentives. We justified the use of these methods as encouraging HE institutions to be efficient and responsive to changing demands from students and the labour market. In any case, allocation methods will have to be transparent, meaning that educational authorities should clearly express their commitment to the sector and, in line with Figure 1, translate this into clear objectives (goals) and incentives (instruments), both of which are reflected in the funding basis, the funding level, funding conditions, and accountability requirements.

Table 4: Funding formula in use?

CR	Yes, plans for revision (introduction of output measures)
HU	Yes
PO	No (formula 'suspended' and replaced by incremental method)
SL	Yes, plans for revision (introduction of output measures)

Formula funding is the result of applying straightforward rules to the decision over which institution should receive what sum of money. It normally takes into account such elements as overall enrolments, programme costs, research capacity (in fte), administration and maintenance add-ons. From Table 4 it is clear that, apart from Poland, the four countries all employ formulas to derive the teaching budget for the HE institutions.

The advantages of a formula include the following (see for example Lasher & Greene, 1993):

1. money is no longer allocated in an ad hoc manner, but according to certain guidelines, some of which are quantifiable;
2. the process is clear to the institutions concerned and to the general public;
3. the roles of the funding authorities (or agency) and the institutions reinforce accountability; and
4. HE institutions may engage in more realistic planning.

Funding based on the application of a formula is easy to defend, as it is the result of a mathematical exercise. Yet problems still can arise. We mention the following:

- reliable data do not exist,
- the base (the starting point) is not appropriate,
- the formula does not reflect the complexity and diversity of the HE institutions and activities in the system.

In such cases, one of the principles of formula funding, that equal institutions are treated equally and receive equal amounts of funds (see below), is absent. Some formulae will have to be 'fine-tuned' so that they more clearly reflect the needs of different institutions. The trade-off, however, is that such efforts are likely to affect the transparency of the funding mechanism.

To inform discussions on the adequacy of the formula, the costs of offering the same programme in different institutions need to be estimated. Until it is known what it costs to provide a particular programme, the process of establishing programme weights will inevitably have to be based largely on intuition and hence open to question.

Other factors influencing the funding formula include: (i) the size of the institution; (ii) the age of the buildings; (iii) the geographical location; (iv) research; (v) special responsibilities to the local community; and (vi) performance in relation to agreed goals. The development and use of funding formulas presupposes decisions over which programmes should be offered where, and at what level. It also presupposes that some form of performance assessment is in place, both within institutions and across the system.

Our personal view is that formula funding is a very effective allocation mechanism, based as much as possible on genuine differences among the institutions and facilitating progress towards achieving the goals of accountability and transparency. The key elements in a formula will normally include enrolment (both system-wide and in individual institutions), enrolment thresholds (for each institution and for certain programmes in institutions) and programme weights, or funding rates (see Table 5). These constitute 'input elements' in a formula, distinct from 'output elements' like performance in terms of quality and efficiency (system-wide and in individual institutions).

Table 5: Number of funding rates underlyingthe teaching budget

CR	6 normative rates
HU	4 funding categories
PO	not applicable
SL	5 normative rates

Equity

Closely related to the above-mentioned issue of the appropriateness of the components incorporated into funding formulas, is the problem of what constitutes an *equitable* funding mechanism. Equitable conditions are deemed to exist when institutions in similar situations are treated similarly and those in different situations are treated in a manner commensurate with their differences. The equity principle reflects the goal of treating people and groups in ways that reflect their different features, needs and obligations. Because no two institutions are identical, the significance attached to differences is a source of continuing controversy when, for instance, a funding formula is to be developed or maintained.

Therefore, one of the major challenges to achieving some degree of funding equity arises from the degree of diversity in higher education institutions – ranging from small, single-discipline and specialised, to research-intensive and multidisciplinary. An equitable funding situation can be approximated by a funding formula that includes agreed programme weights, which in turn are based on actual programme costs. However, the desire to agree on programme weights for a range of different

programmes and institutions may conflict with the need to keep the funding formula relatively simple. Table 5 has shown that, like in other European funding mechanisms, three of the four countries have agreed on a limited number of funding rates to be used for funding programmes that have more or less similar cost structures.

However, formulae will always be open to criticism, especially in times of severe financial constraints. In order to obtain greater funding, HE institutions may try to use the funding methodology to their advantage by manipulating the information and inputs on which the formula-outcomes are based. Alternatively, particular HE institutions can try and claim extra non-formula funds on the basis that they are in an exceptional position or deliver unique (e.g. high quality) services.

Apart from programme weights, formulae may or may not include special provisions for small enrolment programmes. In these programmes, the fixed costs of labour (professional salaries) and capital (equipment) must be spread among small numbers of students. Governments that employ a linear formula for the funding of teaching (one that does not include a fixed allocation to each institution/department irrespective of the number of students) may be deliberately aiming to steer institutions towards achieving at least a minimal level of programme enrolment.

Concluding Remarks

This chapter has argued the need for analysing funding issues in a wide context. One needs to take into account both the overarching objectives of the HE system as well as those of individual providers. Doing so forces those in a position to act on funding issues to also address broader notions like access, quality, social-economic needs, and labour market projections. In the end the question is one of *ambitions*: what does the country want to achieve and to what 'class' does it want to belong. Only then can questions about the funding *mechanism* be included in the picture. What is an appropriate way of funding HE providers (and their students) to achieve such objectives? This is in fact a two-part question: one has to consider not just the level of funding (along with contributions from either public or private origin) but also the mechanism of providing public funds for education and research.

The way funds are made available does make a difference. Performance depends not only on available resources but equally on how available resources are allocated, what incentives are incorporated in the funding models, and which responsibilities are given to institutional leaders and individuals.

Several funding models were presented in this chapter. First they were considered abstractly and placed into a general categorisation, stressing the dimensions of performance orientation and individual (decentralised) decision-making. From this, it was shown how the funding of education and research in the Czech Republic, Hungary, Poland and Slovenia fits into such a framework. Finally, in the last section, we discussed a number of specific policy issues that should also be considered when tackling the multi-faceted problem of funding HE institutions.

Whether the four countries will be successful in realising their ambitions within the confines of financial constraints and many other problems will heavily depend on the interplay between policies, people and available (human and financial) capital. This interplay, in turn, depends on each country's institutional framework which, following North (1993, pp. 215), may be defined by "the informal constraints and formal rules and their enforcement characteristics … that provide the rules of the game of human interaction".

Especially since 1990, these four countries have sometimes rapidly pursued institutional reforms in the process of transforming into a more market-driven society. Some of the reforms have had direct consequences on the HE sector. Clearly, the HE funding mechanism is an important ingredient of the institutional framework, and, as shown in this chapter, funding reforms have been carried out or are currently underway. In some cases though funding reforms have come to a standstill, particularly in the biggest country of the four: Poland.

Looking beyond the institutional reforms manifested in the funding models, we can conclude that financing mechanisms will need to provide incentives (the 'carrots and sticks') if higher education institutions are expected to operate efficiently and work towards desired results. The trends and practices in Western Europe point increasingly toward more market-based, or performance-oriented and decentralised types of funding mechanisms. This means that institutional budgets depend more on student choice and less on central planning. For research budgets it implies that, like elsewhere in Europe, competitive funding is the main allocation mechanism.

Whether HE systems and providers meet their objectives will need to be monitored. Importantly though this does not mean that the state is prescribing the institution's activities or controlling its expenses. Rather, it implies that the state will need to communicate with HE providers and set out clearly what it expects institutions to deliver and provide institutions with reasonable budgets to work towards agreed goals. Again, this may require a reshaping of budget management or greater institutional autonomy to make decisions on using and generating sufficient resources. Greater responsibilities and autonomy in financial and managerial matters go hand in hand with clear accountability standards. It also requires that governments are prepared to act upon information collected on institutional quality, efficiency and equity.

Surely, this is a difficult task and the job will not make policy-makers very popular. But it needs to be done: Building an intelligent nation requires intelligent policies.

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