Research in Higher Education, Vol. 31, No. 1, 1990

THE RISE AND FALL OF AN ALLOCATION MODEL: An Evaluation of Its Role as an Instrument for Policy Decisions

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The article evaluates the history of the present allocation model of a Dutch university. This model was widely accepted at the start. As the decrease of budgets continued, the model was more and more criticized. At this moment it is no longer accepted as an instrument for policy decisions. The details of the model itself have become issues of political interest and discussion. The article stresses the need for timely adjustment of allocation models and analyzes the circumstances that influence the lifespan of such models. Some general conclusions and implications for financial planning and budgeting will be drawn.

INTRODUCTION

"Governments can influence the behavior of higher education systems and institutions by altering the terms on which financial resources are made available" (Williams, 1984, p. 102). In other words, budget allocation is a policy instrument that can be used by governments to influence the behavior of institutions of higher education. The same applies to the situation within institutions of higher education. The way budgets are allocated depends on the relationships between central university administration and departments. Changes in the budget allocation process reflect changes in these relationships. Experience in many institutions of higher education shows that allocation models (or formula funding) can be an important policy instrument in the budgeting process (Acherman and Brons, 1989).

In the process of fund allocation different aspects can be distinguished. An

Presented at the 29th Annual Forum of the Association of Institutional Research, Baltimore, April 30–May 3, 1989.

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0361-0365/90/0200-0001$06.00/0

allocation model, if used at all, is only one of these elements. Brons (1989) distinguishes the following elements:

The relationships between the partners in the funding process;
A set of agreements about how to decide on policy, cost determination, and allocation;
A history of policy, cost determination, and allocation;
An allocation model;
Resources outside the allocation model;
A set of rules on authorization, accounting, and auditing.

The aforementioned article deals with the relationships between funding agencies—and in particular the government, being the main supplier of funds for research and education in The Netherlands—and institutions of higher education. In our view, the given characterization also applies to the relationship between central university administration and departments. Thus, even if an allocation model plays an important role in decisions about the allocation of funds, an evaluation of such a process cannot be complete without taking the other aspects into account. It is from this point of view that we will evaluate the role of the allocation model currently being used at the University of Utrecht as an instrument for budget allocation and policy decisions.

Within a university the allocation of budgets is decided at the central university level. Departments, however, are responsible for the development of educational and research programs. These two processes should be coherent. The vast literature on the use of allocation models, planning, and decision making in institutions of higher education shows that this problem is by no means simple. Although Hopkins and Massy (1981) have given a number of rules that modelers should follow in order to be successful, there is no guarantee for success. One of the main reasons is that decision making in professional organizations like universities is a complex and difficult process. In this context we refer to the analysis of professional organizations by Mintzberg (1983) and the famous article of Cohen, March, and Olsen (1972) that describes universities as organized anarchies. As a consequence, university administration should always be aware of fierce obstruction when major changes are proposed.

An evaluation of the discussion within the University of Utrecht about changing the current allocation model underlines this conclusion. In recent years, this model has played an important role in the process of budget allocation. At the start the model was widely accepted, mainly due to the way it was designed and implemented (Dijkman, 1985). But other circumstances also contributed to this wide acceptance, such as agreement between central university administration and departments about:

The use of the model in the planning and budgeting process;
The role of the various partners within this process;
The fact that, within constraints, departments are free to budget their activities differently from the allocation model (budgets are allocated as lump sums).

Changing circumstances—internal and external—have now created a situation in which both the departments as well as the university council[1] no longer accept the allocation model as an instrument for policy decisions and budget allocation. Several attempts have been made to adjust the model. None of these were successful. As a result, the relationship between the executive board, the university council, and the departments has worsened.

THE FINANCIAL SITUATION OF DUTCH HIGHER EDUCATION

About ten years ago, the financial situation of the universities in the Netherlands changed drastically, when the government decided to freeze the total amount of money being spent on university education and research; see Figure 1. During the sixties and the main part of the seventies, the budgets for the universities showed more or less the same growth as total student enrollment. After 1977–78, this fact was no longer true. While student enrollment still increased, the total budget for the universities started to decline. At the same time it was decided—in a joint venture between the ministry of education and research and the universities—to develop a new model for the allocation of budgets to the universities. It was not until 1983 that the budgets of the universities were for the first time based on this new model. Two of the main features of this model were:

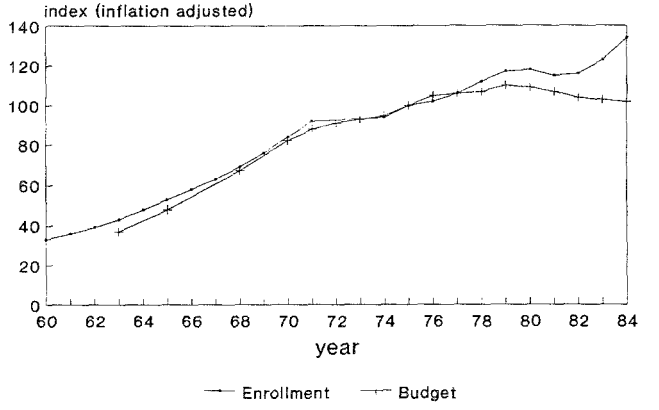

FIG. 1. Budget versus enrollment: 1960–1984. Index 1975 = 100. (From Groot, 1988).

1. Less dependence on student enrollment;
2. To a large extent a student-independent financing of research.

Because enrollment was expected to decline, these features were considered to be a good long-term financial strategy.

Things, however, turned out to be different. Rising enrollment and graduation rates required more money, while—mainly due to the economic situation—the government decided several times to reduce university budgets even further. These budget reductions have been brought about in two ways:

1. Almost every year one or more parameters in the model were changed in such a way that the total outcome of the model did not exceed the total available amount of money. In most cases, this situation led to more or less proportional cuts in the budgets of all universities.
2. Two times the government decided to reduce university budgets in a nonproportional way. In the first operation (announced in 1982 and implemented during 1983–87) specific fields of study were concentrated in one or two universities. This operation affected both highly specialized curricula with very small enrollment (such as exotic languages) as well as larger ones (see, for instance, Ligthart et al., 1986; Van Rosmalen and Otten, 1986). The second operation (announced in 1986 and to be implemented during 1987–91) was restricted to the reorganization of specific departments (medicine, arts and languages, social sciences) and a reduction of bureaucracy within universities (Brons, 1989).

These retrenchments have affected the financial situation of the universities in two ways:

1. Total university funding declined steadily, whereas enrollment and graduation rates increased (see Figure 2); in other words, more had to be done with less money.
2. Every year the universities had to readjust their long-term budget estimate. The reason is that the allocation of university budgets was still based on the outcome of the allocation model introduced in 1983. Even though this model was adjusted almost every year, it remained a linear model. Consequently, the outcome of the model steadily increased, because the government had to readjust its estimates of enrollment figures almost every year. And each time some parameters in the model were changed in such a way as to keep the total university budgets within the available amount of money. Figure 3 shows how this practice has led to several considerable readjustments of the long-term estimates of university budgets.

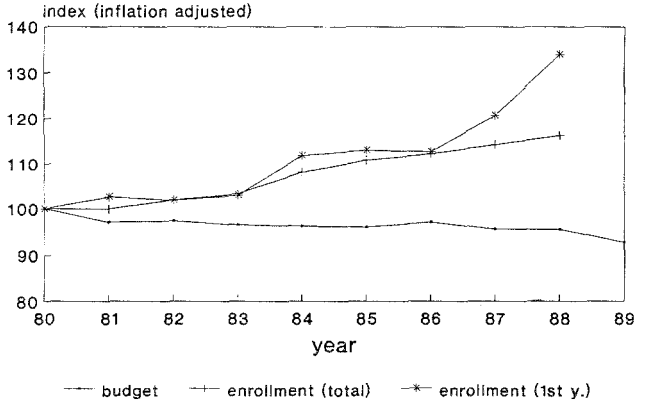

FIG. 2. Budget versus enrollment: 1980–1989. Index 1980 = 100.

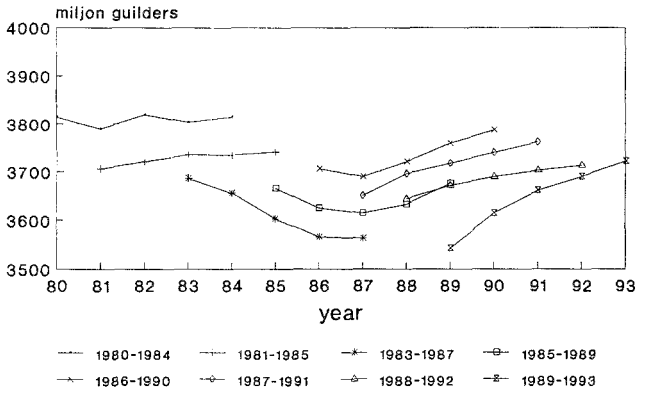

FIG. 3. Estimated university budgets 1980–1993 (corrected for inflation).

THE ALLOCATION OF BUDGETS WITHIN THE UNIVERSITY OF UTRECHT

Both the introduction of a new allocation model at the national level and the decline of budgets led to the introduction of an internal allocation model at our university. Also other government measures—often in one way or another related to retrenchment—have influenced the introduction of the model (see also Savenije and Otten, 1986):

The restructuring of the curricula from the existing five or six years into a four-year curriculum; an important objective of this change was to increase the program output.
The aforementioned concentration of specific fields in one or two universities.
New budgeting procedures by the ministry of education and research in order to

allocate research funds to universities on the basis of the volume of submitted research programs of acclaimed and externally reviewed quality.
New regulations for the structure of academic staff; for instance, a drastic reduction of the numbers of full and associate professors.

The implementation of these measures affected, of course, the allocation of budgets to departments. The old budgeting procedures were mainly enrollment-driven and could no longer be used. So, a new allocation model for teaching and nonteaching staff was developed. In the model, all activities have been grouped into several programs, such as undergraduate teaching, graduate programs, research projects, and management. For each program the total academic staff full-time equivalent is considered. For instance, for undergraduate and graduate programs a standard cohort technique is used with normative student: staff ratios, while there is also a base allocation—independent of student numbers—of 4 f.t.e.; the total volume for specific research projects is a negotiated quantity in which external peer review procedures guarantee program quality. The total staff F_i of type i is given by:

$$F_i = \sum_j A_{ij} \times P_j,$$

where the matrix elements A_{ij} give the ratio of (both academic and support staff) positions of type j to total full-time-equivalent academic staff positions P_j in program j. The total normative budget is calculated by:

$$B = \sum_j F_j \times C_j,$$

with C_j The sum of the salary and material cost of personel type j. Although the calculations are rather detailed, the total budget is provided to departments as a lump sum. For a review of the development and implementation of this model we refer to Dijkman (1985).

But as important as the introduction of this new model were the changes in the whole process of planning and budget allocation:

It was decided to draw up every year (later every two years) a five-year plan dealing with the research and educational policy of the university. (This plan is called the development plan.)
The development plan also contains the so-called internal financial scheme. In this scheme the allocation of budgets for the next five years is outlined.
The actual allocation of budgets for the first year of the next five-year period is to a large extent based on the financial figures for that year in the internal financial scheme.

The outcome of the allocation model is only calculated for the last year of the five-year period. So, there is no one-to-one relation between the outcome of the model and the actual budget allocation. Other considerations also play an important role, such as last year's budget; the difference between last year's budget and the outcome of the allocation model for the last year of the five-year period; the total available budget for the university; considerations as to how fast budget adjustments can be implemented.

The implementation of the aforementioned measures and the introduction of the new allocation model have affected the allocation of budgets in a nonproportional way. Figure 4 illustrates how over the years 1984–88 budgets of departments have changed (both for departments with increasing budgets and for departments with decreasing budgets). The same is also illustrated for the years 1989–93.

CHANGING CIRCUMSTANCES: WHAT WENT WRONG?

We will discuss the major circumstances that have led to a situation in which the currently used allocation model of the University of Utrecht is no longer accepted as an instrument of budget allocation and planning:

1. Due to the constant reduction of the university budget the outcomes of the internal allocation model were no longer in agreement with this budget. This disagreement affects the credibility of the model. There have been several discussions about how to adjust the model.
2. Due to the reduction of budgets many departments experienced great

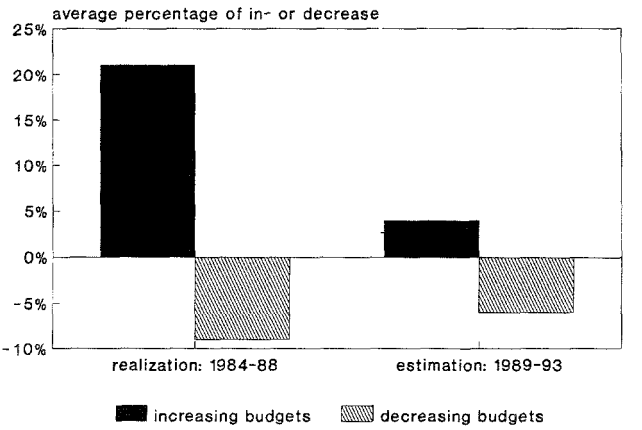

FIG. 4. Budget development 1984–1993.

difficulties in providing the necessary means and conditions for innovation. This situation has motivated the university administration to stimulate the innovation of academic programs by creating incentives by means of so-called revolving funds to provide temporary financial support for innovative developments. A recent evaluation within our university indicates that revolving funds are not always the best means for stimulating innovative activities (Savenije and Van Rosmalen, 1988). This circumstance raises the question of how financial incentives can best be incorporated in the process of budget allocation.

3. As we have described in the previous paragraph, the universities in the Netherlands have had to implement several government measures directly related to research and education. Opinions within the university differ as to how these measures have affected the quality of research and education. One effect, however, seems unquestionable: these measures have certainly led to an improvement of the administrative and managerial strength at the departmental level. As a consequence, the relationships between the central university administration and departments have changed in an irreversible way. Departments not only demand more freedom and autonomy but they also want more influence on university policy, and as far as they are concerned, this need also applies to the process of budget allocation. As several departments have put it: "We want our fair share of the total university budget."

These circumstances have led to an almost continuous discussion about how to change the allocation model. The executive board of the university published two proposals: the first in October 1987, the second in October 1988. Also, in May 1988, the university council carried a motion in trying to find a way out of the discussion. All these proposals could not count on enough support within the university community. In fact, every proposal led to fierce discussions about the allocation model. This model may be characterized as highly normative, leading to lump sums to be allocated to departments. Calculating the outcomes of the model leads to many interim results, such as teaching load, number of full-time equivalent academic staff, number of nonacademic staff, and so on. In the end, all these results are put together into one lump sum, with as few constraints on actual spending as possible. However, all the interim results started to lead a life on their own and departments compared these results with reality, with what they thought the results ought to be or with the situation of departments at other universities. The comparisons led to endless technical discussions, ad-hoc coalitions, and very often completely contradictory claims. In the end, the discussion was mainly focused on the details of the model and was diverted from the real issue: Can departments keep up the output and quality of their programs with the allocated budget? We will illustrate this with some examples.

1. A main objective of the introduction of the new allocation model some years ago was to make the financing of research student-independent (Savenije and Otten, 1986). This objective led to an allocation of research funds to departments on the basis of the volume of submitted research programs of acclaimed and externally reviewed quality. The result was large differences between departments with respect to the relative volume of their research activities, ranging from 40% to 80% with an average of about 60%. Several departments with a relatively small research volume now claim a larger share of the total university research budget. At the same time, some of the other departments stress that the relative sizes of research and educational budgets can be no argument for adjusting the allocation of research budgets; only quality should. Moreover, they like to point out that changing the allocation of the university research budget—for reasons not based on quality considerations—will endanger their capability of attracting grants from university grant committees and contract research. Both reasonings can never be applied at the same time, because it would for almost every department lead to a larger share of the total university research budget.
2. The departments of arts and humanities claimed that almost every parameter in the model was "too low," for instance, the parameter relating the number of academic staff to the number of nonacademic staff. When confronted with the fact that the internal parameter for calculating the number for nonacademic staff was about twice as large as the parameter being used in the model of the ministry of education, they just changed the argument and said that departments at other universities were much better off. On the other hand, the natural and medical science departments claimed that the internal model did not lead to the same number of nonacademic staff related to the number of academic staff financed by university grant committees if compared with the model used by the ministry of education. So, again, almost every department claimed a larger budget.
3. A third example is the way funds for computer time at the university computer center were allocated, when it was decided that this center would have to earn about half of its budget by sending departments a bill; the budget of this center was therefore reduced by 50% and this money was allocated to the departments. Again there were totally contradictory opinions of how this allocation should be worked out. Departments that had used in the past hardly any computer time objected to the proposal that budget increases would be partly based on the amount of computer time used in the past. They wanted a larger increase, because things would be very different in the future than in the past. On the other hand, departments with a large consumption of computer time in the past also claimed a larger budget increase, because the methods being used to predict the future use of

computer time led to too-low estimates. And again there was no way to satisfy everybody.

A NEW APPROACH

What can be done to avoid or overcome a situation as described in the previous paragraph? Solutions adopted by many universities in the Netherlands show that there is a tendency to make allocation models less detailed and complex and to base the allocation of budgets on more global and simple principles. In many allocation models it takes a whole lot of calculations to get from input (for instance, number of students, volume of research projects) to the allocated budget. It is also possible to take a shortcut and relate more directly the input variables to the allocated budget, for instance, to allocate a certain budget for salaries and material costs per student. If such a line of approach is followed, many in-between results, such as the number of academic and nonacademic staff for educational programs, are no longer necessary to calculate the budget and the allocation model becomes less detailed and complex. One should only follow such an approach if the in-between results used to play a role in the budget allocation process. Other main features—next to adjusting the allocation model—are financing of output instead of input and throughput, an even more distinct financing of research and education, and more market orientation (Acherman and Brons, eds., 1989).

We do not disagree with solutions showing some of these elements. However, we also think that it is not enough, because most solutions focus too much on changing the allocation model only. In the introductory paragraph of this article we state that the allocation model is only one of the elements in the process of budget allocation. The other elements should also be taken into account. For instance, changes in the budgeting procedures must reflect the increased autonomy at the departmental level. Also they should strengthen the innovational capacity of departments.

Such an attempt, by starting two projects, was made at the University of Utrecht. The first project (described in Savenije, 1989) covers most policy issues: education, research, services, human resources, finance, facilities, housing, enrollment, alumni, external relations. Some of the results relevant to the subject of this article are:

1. A restricted number of research groups was selected, whose research is of excellent quality by international standards. The aim is that by taking appropriate measures these groups will contribute to the research profile of the university.
2. All departments are invited to develop a special program for a restricted number of very good students. The aim is that the quality of this program

will first attract highly motivated students from all over Holland and in a later stage also from other countries.
3. Several committees have advised the executive board on the future policy of the university with respect to human resources, finance, facilities and housing, and external relations.

A second project is aimed at changing the way the university is being managed, both at the central university level as well as at the departmental level. The key words of this project are decentralization, autonomy, and accountability.

Although this project is not concerned with the research and educational policy of the university as such, one of the aims is to change some of the elements of the process of budget allocation as mentioned in the introduction of this article. More autonomy at the departmental level will no doubt change the relations between the executive board, the university council, and the departments. Decentralization can only succeed if the rules on authorization, accountability, and auditing are adjusted. Many departments have made perfectly clear that they will measure the success of the project also by the way it will affect the rules on how to decide on policy and budget allocation.

It is hoped that both projects will also contribute to solving the present crisis with respect to the budgeting process. The first project must give an answer to the question *which* elements from the research and educational policy of the university can influence the allocation of budgets. The second project must answer the question *how* the rules and procedures in the budgeting process should be adjusted. Both answers are necessary, but not sufficient. Therefore, the executive board has recently published a policy paper on the internal financial scheme for the years 1990–94 in which the interim results of the two projects are integrated and translated into real figures about the allocation of budgets. It would be outside the scope of this article to go into the details of the financial scheme for the years 1990–94. We will describe, however, in general terms how this approach has been worked out.

In the financial scheme for the years 1990–94 two main factors determine the budget of a department:

1. The way the department contributes to the total budget of the university; this departmental contribution to the total university budget is referred to as the earning capacity of the department. By improving the quality and/or output of their activities, departments can influence the total budget of the university and consequently increase or decrease its earning capacity. Thus, the allocation of budgets should take this earning capacity into account.
2. Deviations from the earning capacity in the final budget allocation to departments must be directly related to the research and educational policy as stated in the development plan of the university.

In such an approach the roles of the partners in the budgeting process should be clearly defined. Also, all participants should have a real chance of influencing the outcome of the decision-making process. Therefore, the whole process must be well structured. It is done in the following way.

First, the executive board makes a proposal; it should be clear why the budgets are as proposed. If a department does not agree with the proposed budget, it must explain why. For the discussion to be fruitful, departments have the right to know which arguments can be used if they want to convince the executive board. For instance, these arguments could be related to the output and quality of their programs, their contribution to the policy of the university, or the strategic position of a department in relation to other departments. An agreement is also required on how output and quality are measured and how the activities of a department influence the university budget. The latter may seem to be technical aspects; however, differences of opinion on these issues can easily frustrate the whole process of negotiations and decision making.

Another important point on the agenda should be that departments can address the executive board on their responsibilities, such as the care for infrastructural facilities, real deregulation and decentralization, effective rules and procedures for authorization, control, accountability, and auditing. These issues also determine the possibilities for a department to improve the output and quality of its programs and to contribute to university policy. After these negotiations, the issues that have been agreed upon should be embodied in a formal contract.

Of course, in the end a final decision about the allocation of budgets must be made, either by the executive board or—as in the case in The Netherlands—by the university council. There will never be a guarantee for an overall consensus on this final decision. We do think, however, that the changes we have described can eliminate some of the shortcomings that have frustrated the discussions on budget allocation within our university for too long.

CONCLUSIONS

Allocation models are often introduced as a policy instrument in the process of budget allocation when budget cuts are inevitable. Experience in many institutions of higher education indicates that such models can indeed be very useful. Retrenchment is very often related to specific measures with respect to education and research. The way these measures are implemented can have a great influence on (changes in) the structure of the allocation model.

Once a certain measure is implemented, there is often no more need to use the part of the model associated with this particular measure. In other words, the

allocation model can become less detailed and complex and the allocation of funds can be based on more global and simple principles.

As we have illustrated previously, without such changes the danger becomes real that the very details of the model itself become principal issues of political interest and discussion. The experiences at our university show that the way out of such a situation can be very difficult and time-consuming.

To overcome or avoid such a situation it is necessary to adopt a new approach. To ensure that the discussion is not once more diverted from the real issues—these being the relation between research and educational policy of the university and the allocation of budgets—more elements than just the allocation model must be taken into account.

First, it should be clear what the main policy issues and choices are, what the relation is between research and educational policy and the allocation of budgets, and which rules and procedures determine the budgeting process. All participants must have a real opportunity of changing the outcome of the budgeting process. Therefore, it is necessary that proposals put forward by the executive board are not final and that departments know which arguments can be used in the negotiations. If possible, these negotiations should lead to explicitly formulated agreements, stating what can be expected from all participants over the next period of time.

We believe that if the suggestions in this article are taken into account in (a process of changing) budgeting procedures, the university as a whole will maintain its capability to adjust to new internal and external circumstances. Also, it will be possible for an allocation model and budgeting procedures to maintain their roles as effective instruments for policy decisions.

NOTE

1. The university council of a Dutch university has the power to draw up the budget book of the university and consequently decides how the total university budget will be allocated. The 30 members of the council are chosen on a one-person-one-vote basis by all the employees and students within the university; 10 members are chosen by the academic staff, 10 by the nonacademic staff, and 10 by the students.

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Received December 1, 1989