Comment on the paper: Funding schools by formula

Schenker-Wicki, A
COMMENT
ON THE PAPER
“FUNDING SCHOOLS BY FORMULA”
ANDREA SCHENKER-WICKI

International Conference on Educational Systems and the Challenge in Improving Results, September 15 – 16, 2006 at the University of Lausanne, Switzerland.

Keywords: inefficient allocation, classification scheme, funding criteria, formula based funding, incentive system, autonomy, efficiency behaviour, standard cost accounting

1. Principles of Funding Mechanisms

In the past decade, education policy has undergone a paradigm change in many countries: state government and control has been replaced by supervision. The educational institutions have been granted a larger degree of autonomy combined with lump-sum budgets, contract management and target-oriented funding. Responsible for this change were new trends in public management based on institutional economics and theories of social choice.¹

Within this context, the paper of Rosalind Levačić gives a detailed insight into different funding methods for budgeting schools in seven European countries (the Netherlands, England, Finland, Sweden, Poland, Russia, and Iceland), describing “some key issues in designing and operating formula funding” and comparing “the relative advantages of funding schools by formula” to the traditional administrative discretion approach. While the traditional approach should lead to an inefficient allocation of resources, the formula funding is assumed to lead to a more transparent allocation of resources and to allow gains in efficiency.

With respect to formula funding, a number of variables – characterising a specific educational institution - are taken into account. This could be the number of pupils in different grades, poverty and learning, the need for indicators or the location of schools, for instance. To obtain a better general view of the different mathematical formula funding systems, Levačić suggests a classification scheme involving the following components: basic allocation (component 1), curriculum enhancement (component 2), pupil-specific factors (component 3) and school-specific factors (component 4), whereby the issue of appropriate indicators for the pupil-specific factors is the most difficult one.

In England, for instance, there is a strong emphasis on component 1. Components 3 and 4 are also utilised whereby component 2 is not featured at all. Generally speaking, the English formula system seems to be the most comprehensive one. In the Swedish example, component 1 dominates the formula, component 3 is not considered and component 4 is only considered indirectly. The funding system acts as a “quasi” voucher for schools.

With respect to mathematical formula funding, three areas of controversy are raised by Levačić: namely, the issue of how to determine the costs of a school (including salary, infrastructure and teaching materials), the issue of non-manipulable indicators and the debate concerning funding input versus performance. Finally, the incentives and impacts of the different funding methods are discussed in brief but not empirically validated.

Even though a number of different points could be raised for discussion, I shall concentrate on the following ones:

- does formula funding really enhance efficiency as proposed in the paper?

- is formula funding suitable for political governance? Does it help to reach political objectives and
- what are the advantages and disadvantages of formula based funding?

Finally, I would like to present very briefly a new funding mechanism for educational institutions on the tertiary level based on standard cost accounting.

2. Does formula-based funding enhance efficiency

Definition: Efficiency is a performance indicator and defined as an output / input relation. In the education system, student numbers, infrastructure and teacher salaries are often used as input factors. For output you can either use factors directly resulting from the education production process such as the number of diplomas or retention rates, or, you can base it on the outcome. The outcome of the education process is the quality of education. To calculate the efficiency of a system, there are two possibilities: you can calculate either the output efficiency or the outcome efficiency.

Output efficiency: concerning Levačić, formula funding appears to provide more efficiency than other funding methods based on the assumption that the allocation of resources by a lump-sum budget generates more efficiency due to increased financial flexibility. This efficiency gain should be due primarily to the notion that an organisation is better motivated and able to regulate its internal matters than a distant ministry. Unfortunately we do not have any data from the schools analysed in the seven European countries to test this hypothesis. To cope with this difficulty and to give the reader an idea whether efficiency gains are possible in the educational system, we quote a study from the university sector, in which the output efficiency of the Swiss universities was analysed for the years from 2000-2003. As the Swiss universities have enjoyed more autonomy since the late 1990s, it should be possible to make gains in efficiency visible over the course of time.

The method used to analyse efficiency behaviour was a DEA method, which calculates efficiency based on an optimisation process. As the DEA method allocates optimum weights to all input and output factors, the maximum weights is attached to those factors in which a university performs better in comparison with others. The DEA methods are benevolent due to optimisation of weightings and the fact that decision units are always compared to decision units with similar objectives and preferences.

The question as to whether autonomy for the Swiss universities has paid off could not be finally cleared. Taken on a whole, the behaviour of the universities was too heterogeneous and the results were not significant: only 40% of the universities showed small increases in efficiency, 30% of the universities reduced their efficiency and 30% showed no change in efficiency behaviour. With respect to these heterogeneous results, it is assumed that an increase in autonomy does not lead per se to an increase in efficiency. In order to achieve gains in efficiency, not only autonomy but also internal organisational reforms, which affect both processes and structures, are demanded and last but not least a change in university culture is necessary. In reality, all universities, which were able to increase their efficiency, have been confronted with major changes and restructuring-processes.

Due to the fact that only universities were analysed, it would be of interest to find out whether the results are homogenous for the whole educational system (primary, secondary and tertiary level) or if there are any differences.

---

3 These universities were efficient during the observation period.
Outcome-efficiency: A study which analyses outcome efficiency for schools is the Wössmann study. Wössmann analysed education quality by means of cognitive performance tests and discussed the input-outcome relation. The empirical results clearly show that neither financial autonomy nor more resources have led to better education quality. In contrast to the frequently used political argument that more resources and more autonomy automatically lead to better outcomes, other factors have been identified to enhance school performance in a sustainable and significant manner such as:

- competition within educational institutions (private and public sector)
- autonomy, but coupled with centralised examinations. Based on the results of the TIMSS and TIMSS-Repeat study, Grundlach and Wössmann found a positive central examination effect of approximately one year to be effective.
- a high number of private schools coupled with a high level of public funding.

Saving (efficiency) incentives: It is often assumed that traditional funding results in perverse incentives as less spending regularly results in a lower budget in the next year and therefore all the available resources are spent to keep the budget at the same level. But, this could also be true for formula-funded units. If formula-funded units save money and are not allowed to retain their savings, they will also spend their whole budget. Incentives for saving money are only given if savings can be retained and reserves built up independently if the units are historic or formula-based funded. However, in the public sector it is difficult to build up reserves and the reason why is obvious: building up reserves with taxpayers’ money is politically a very delicate matter.

3. Is formula funding suitable for political governance (vertical equity)?

As formula-based funding is a policy instrument, it should give incentive to schools to develop in a certain manner, which is determined by politics. For the measurement of the impact of the incentives, effectiveness could be analysed by measuring the achievement of a target. Unfortunately, we know very little about targets and the achievement of targets in the seven European countries described in the Levačić paper.

Even though we do not have data from the schools analysed, concerning the seven European countries I should like to discuss very briefly some results we obtained from an effectiveness analysis of the Swiss university funding system. To calculate the governance impact of the formula-based funding, the central state subsidies were examined for the period from 2000-2003.

In order to determine the behaviour of the universities, the relative changes in the individual universities were identified by analysing the most important indicators, derived from the main targets of the University Funding Law such as:

1st target: reducing study times
indicator: number of students in the norm study time

2nd target: increasing the number of foreign students
indicator: number of foreign students

3rd target: intensifying research activities
indicator: research months per professor granted by state research promotion institutions

---

5 idem
8 Schenker-Wicki, A. /Hürlimann, M., 2006, S. 73-91
4th target: increasing the acquisition of private funds

Indicator: private funds acquired in CHF

Based on the results of the years 2000-2003, the impact was found to be rather weak. Whether formula-based funding by the central state can really prove to be effective, could not be judged conclusively.\(^9\) Of particular note is that payment according to norm study times has not brought any positive change in the sense of reducing study times although both the central states and the member states use the same type of incentive system. One reason for the failure could be that the universities have been hesitant to introduce the necessary regulations - for example, significantly higher study fees for long-term students - to support this target.

Based on these results, it has to be assumed that formula-based funding, especially in subsidiary allocation systems, is not a very powerful instrument for political governance. This is especially true for a funding system involving several objectives. The results from this study are in line with the results of Burke & Minassians, who also found only a moderate impact resulting from formula-based funding and contract management.\(^{10}\)

4. The Advantages and Disadvantages of formula-based Funding

**Horizontal equity:** One of the most important advantages of formula-based funding is the transparency and equity with which it is associated. It is true that, using formula-based funding, all institutions are treated equally and there is no negotiation advantage of more or less skilled principles. But one of the remaining problems is the problem of fairness. If the formula is not comprehensive and does not involve a satisfying number of a school’s characteristics, formula funding becomes unfair. On the other hand, if the formula considers too many parameters, it would be difficult to explain it to Parliament and the sensitivity of the system will be low (inert system). This reduces the impact given by this type of funding.

**Vertical equity:** Vertical equity means that schools will receive a higher price for students with defined special needs. This should compensate schools for additional costs and encourage them to accept students with special needs. Even though vertical equity is assumed to be important in many of the countries analysed, we do not know if vertical equity has been paid off by the formula funding system. As already mentioned before, the results from the Swiss university system show a rather weak impact.

**Fairness:** very little is known about the fairness perceived by the schools with respect to formula-based funding. It would be very interesting to know how schools have reacted and how much time they needed to adjust from traditional funding to formula-based funding.

**Side effects of formula funding (perverse incentives):** Even though there is large number of different funding practices, we do not know which ones induce positive and which ones induce perverse effects. Nor do we know how schools have developed after the formula-based funding system was introduced. The positive and negative effects of different funding incentives in a given context would be a topic of interest to make sure that the educational institutions learn from each other and develop in a favourable way.

**Performance-based funding versus input-oriented funding:** performance-based funding has been one element, which was introduced with paradigm change in the public management systems. Performance-based funding involves contract management, lump sum budgets and output-oriented funding. In very rare cases, outcome is funded but, due to the complexity of the social

---

\(^9\) One of the reasons could be the relatively brief period of time since the new University Funding Law was put into effect (four years).

systems, outcome is difficult to determine and can be influenced by many factors beyond of the control of a certain public institution.

The examples in Rosalind Levačič’s paper are all more or less based on an input-oriented funding system. It is surprising that, on the primary school level, performance-based funding has not really entered the system compared with university funding, where contract management and output-oriented funding (including target-oriented funding) becomes more and more important (see table 1). Even though there is a basic budget nearly everywhere, which is input-oriented funded, contract management and output-oriented funding are used widely.

Table 1: Funding Systems of Universities

<table>
<thead>
<tr>
<th>Country</th>
<th>Basic budget: input-based, number of students (different weights)</th>
<th>Contract management</th>
<th>Output-oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>Yes</td>
<td>Yes</td>
<td>-</td>
</tr>
<tr>
<td>Austria</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Baden-Württemberg</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Bavaria</td>
<td>Yes</td>
<td>No</td>
<td>Yes: small part 1.5% of the whole budget</td>
</tr>
<tr>
<td>USA: Tennessee</td>
<td>Yes</td>
<td>No</td>
<td>Yes: small part 2%-6% of the whole budget</td>
</tr>
<tr>
<td>Australia</td>
<td>Yes</td>
<td>Yes: very rudimentary</td>
<td>Yes: but only for research</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes: 37% of the whole budget</td>
</tr>
<tr>
<td>Denmark</td>
<td>No</td>
<td>No</td>
<td>Yes: taxameter system, weighted with respect to different study domains</td>
</tr>
<tr>
<td>France</td>
<td>Yes</td>
<td>Yes: 1/3 of the budget</td>
<td>No</td>
</tr>
</tbody>
</table>

5. New Aspects of Formula-based Funding in Swiss Universities: Standard Cost Accounting

University funding – at least in Switzerland – is slightly different from the funding of the primary and secondary school level due to our federally organised state. In Switzerland, the member states (cantons) are the legislative bodies for the universities and therefore largely re-

---

11 This funding mode is considered for teaching activities. Research activities are funded separately. In: CHEPS, 2001.
sponsible for their funding. The central state has merely a secondary allocation function, the so-called vertical financial equalisation. In addition to vertical financial equalisation, there is also a horizontal one, resulting from non-university cantons payments for their students to the university cantons. These payments are de facto political prices and do not reflect the real costs which students create during their study time. This situation is not at all satisfactory because the political prices are estimated to be too high or too low depending on the field of study. Based on this fact, the author was mandated by the central state and the University cantons to develop a standard cost accounting system, which should help to determine the ‘right’ prices.

Standard-cost accounting is defined as a cost accounting system based on full costs and standard capacities. It is a widely used method in the business environment, but not in the university sector. This is due to the fact that there is often no management accounting as such at the universities. Additionally, standard-cost accounting is conceived as being difficult to be defined due to the lack of an ideal production function as a benchmark for standardisation. This difficulty has to do with the different profiles and activities which universities want to achieve and might be one reason why there are no empirical data for standard-cost accounting at universities.

With respect to the definition in the former paragraph, it is evident that standard-cost accounting, resulting from industrial production, cannot be directly implemented in the university system. Despite the differences, there are two elements, which can be applied both in industry and universities: full-cost accounting based on actual costs and the so-called standard capacities. Whereas the actual costs (full costs) do not have to be discussed in detail, the second component – the standard capacity – has to be analysed further. The question as to what standard capacity – no too great or too low capacity - means to a university can be answered by using a so-called standard faculty-student ratio, whereas a high faculty-student ratio is related to a good interaction with the faculty staff and to outstanding education quality. Due to that, the faculty-student ratio has been chosen as a pendant to standard capacity in the industrial production process.

To determine a ratio suitable for standardisation, different ratios derived from literature were analysed, but nobody was satisfied with the results. In the end, it was agreed to enhance the simple ratio and to design a new model, which is better suited to reflect the workload of the system. The new model is based on supply and demand capacities and students and staff were asked to give their ideal norms to allow us the calculation of a benchmark for standardisation. For the time being, the data from the first run were evaluated and we are optimistic to find a valuable benchmark.

6. Conclusion

In the seven European countries, which form the basis for the Rosalind Levačić study, different mechanisms to finance educational institutions are analysed. In practically all countries, formula-based funding has asserted itself whereby the greatest part of resources is still allocated input-oriented and not output-oriented. If the efficiency is analysed, it has been shown that formula based funding (coupled with a lump sum budget) does not automatically lead to significant gains in efficiency although this is a frequently used political argument in this connection. Also the question as to whether political governance by means of formula funding is possible cannot be answered without further ado in particular in those cases in which different political bodies are responsible for funding (central state and member states).

---

12 http://www.manalex.de/d/standardkostenrechnung/standardkostenrechnung.php
If it is assumed that not the funding mechanism but institutional factors are responsible for outstanding education quality, the discussion about the advantage of formula funding methods compared with traditional administrative methods loses its importance, at least in the western countries where schools are sufficiently equipped with staff and have an adequate infrastructure.

But, although the introduction of formula based funding has – up to now – not led to major changes, this kind of funding is, despite everything, preferable to the traditional administrative discretion approach as it is based on targets or objectives to be achieved and not on ownership level guarantees. And last but not least: undisputable advantages of formula-based funding are, horizontal transparency and equity – as long as the formula takes the characteristics of a certain unit into consideration.

References


