

Chapter 2:

Economic Factors

Recent economic depression has bitten deeply into government budgets, and has made cost factors even more important than before. In general, small schools have higher unit costs than large ones. But this is not always true: sometimes it is cheaper to run several small schools than a single large one. And small schools sometimes find it easier to generate more resources from their communities.

(a) Costs and their Calculation

Compared with the related process of cost-benefit analysis, cost-effectiveness analysis does not require such rigorous and far-reaching mathematical calculations. This fact simplifies the task of the educational planner concerned only with cost-effectiveness. However, the planner certainly needs cost assessments that are as accurate and complete as possible.

In this connection, two conceptual points should be made:

- * First, cost is not the same as expenditure.

Expenditure is a narrow term, referring only to the use of money.

Cost is a broader term, referring to both financial and non-financial inputs. It includes donations 'in kind', of labour, land and goods. It also includes the 'opportunity cost' of benefits sacrificed when money is used for one project rather than another.

- * Second, official calculations even of expenditures (and even more so of costs) are often too narrow. When comparing expenditures on schools of different sizes, governments often calculate only *their own* expenditures. They ignore the expenditures of non-government bodies, of families and of

individuals. This creates a misleading total picture. Some government schemes may save *government* money but impose a heavy burden on society as a whole.

The value of non-financial and opportunity costs is very hard to calculate. Professionals concerned with cost-benefit (as opposed to cost-effectiveness) analysis have to deal with this matter very carefully. They have first to consider the amounts involved, and then what prices to put on them in order to express everything in monetary terms. Often, they have to use 'shadow' prices and discounted cash flow techniques. These are beyond the scope of this book, but more detailed discussion is contained in the works by Levin and by Little & Mirlees, mentioned in the Further Reading section on pages 85 and 86.

But even if cost-effectiveness analysis can avoid most problems of pricing non-financial and opportunity costs, it must still recognise and make some assessment of them. For example:

- * When schools become too large, they usually become more impersonal. This is a cost from expansion. By contrast, smaller schools usually achieve the benefit of a better atmosphere.
- * If the authorities decide on a large school rather than several small ones, it is likely that many children will have to travel long distances each day. At least five costs are involved:
 - the actual expenditure on their transport (which is in fact relatively easy to work out in money terms),
 - the cost of the children's tiredness, which is both a problem in itself and may reduce the effectiveness with which they learn,
 - the cost of a narrower curriculum if the school cannot organise extra activities because children must leave school as soon as the day is over,
 - the cost of the children's time spent in travelling, and,
 - if parents drive the children to school in a private car, the cost of the parents' time and tiredness.
- * As already mentioned, in many cases the direct financial costs of several small schools are greater than the costs of one large

school for the same children. If the authorities nevertheless opt for the small ones, they must also assess the opportunity costs of spending money in this way. When they decide on the more expensive option, they are also *sacrificing* alternative projects, e.g. in roads, sewage, forestry, etc..

Cost-effectiveness analysis does not have to express points of this type in monetary terms. But it does have to recognise their existence and make some judgement of their importance.

(b) Unit Costs

(i) Factors Favouring Large Schools

It is commonly said that large schools have lower unit costs. This means that the cost of educating one pupil at a specific grade/level for one year is lower in a large school than in a small one.

Lower unit costs are achieved in two main ways:

- * *Fixed Facilities.* All schools need at least some 'fixed' facilities: libraries, laboratories, playgrounds etc.. Large schools can spread the cost of these facilities over more children than can small schools.
- * *Pupil:Teacher Ratios.* Large schools often have higher pupil:teacher ratios, which result in lower costs per pupil.
 - Secondary schools usually offer a range of curriculum options (e.g. between science and arts), and large schools find it easier to get reasonably full classes in all subjects. In contrast, small schools may find that very few students want to do 'minority' subjects such as agriculture, French or music, and therefore that classes in these topics have high unit costs.
 - Large primary schools may also have higher pupil:teacher ratios, for is easier for them to get full classes, particularly if there are many streams of each grade.

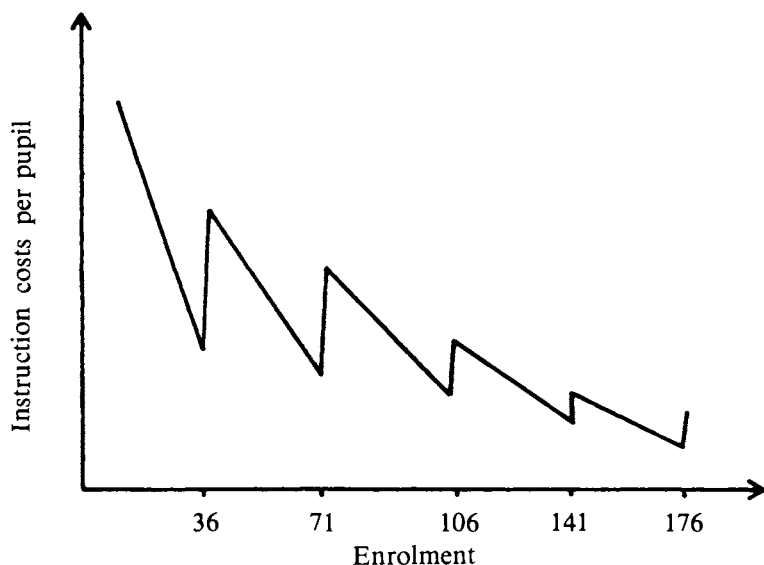
Teachers' salaries usually account for 80 per cent of school recurrent budgets. It is therefore particularly important to use teachers efficiently and to have reasonably high pupil:teacher ratios.

Small schools do not necessarily have low pupil:teacher ratios,

however, for sometimes the numbers fit neatly and classes are full. At the secondary level, a lot depends on the range of subjects that must be offered: schools can raise class sizes if they are allowed to reduce the number of options. At the primary level, the most important factor is the threshold number beyond which regulations require one class to be divided into two.

The latter point is illustrated by Figure 1. With only 10 pupils, the school has only one teacher. If the number of pupils increases but no new teacher is employed, unit expenditures (i.e. average expenditures per pupil) fall. However, in the system illustrated here, the regulations set a maximum class size of 35. As soon as 36 pupils are enrolled, the class must be split, an additional teacher must be employed, and unit costs rise sharply. This is because instead of one teacher's salary being spread over 35 pupils, each teacher's salary is now spread across only 18 pupils (because 36 pupils have two teachers). A similar process happens when there are 71, 106, 141 and 176 pupils.

Figure 1: School Size and Instruction Costs per Pupil



Three extra points are worth making about the graph:

- * Although unit expenditures jump every time a new teacher is employed, each jump is lower. This is because each new salary is spread over a larger number of pupils.
- * The bottom point of each curve gradually gets lower. This is because the costs of fixed facilities (libraries, playgrounds etc.) are being spread over more children.
- * Despite the gradual fall in the curve, if the school continued to grow there would be some jumps in expenditure on fixed facilities. The school would need additional football pitches, classrooms, administration blocks, etc.. This would cause occasional jumps in the curve.

Planners must pay Close Attention to Threshold Points

Regulations on threshold points and maximum class sizes are very important. Sometimes they eliminate savings from amalgamation of small schools.

This may be demonstrated by an example. Suppose:

- (i) that regulations state that no class should have more than 40 pupils, and*
- (ii) that there are two small schools near each other. School A has one teacher and 20 pupils, and School B has one teacher and 21 pupils.*

In this case, amalgamation would not save a teacher's salary, for the combined school would still have two classes. Indeed, amalgamation would probably increase costs. Some children would have to travel further each day, and a new classroom would have to be built on one of the school sites.

On the other hand, suppose that School A had one teacher and 20 pupils and School B also had one teacher and 20 pupils. Then a salary could be saved by combining the schools.

However, planners would still have to think about the future. Population projections would be especially important, for as soon as an extra child enrolled, the school would have 41 pupils and two teachers would again have to be employed.

(ii) Factors Favouring Small Schools

When making cost estimates, it is essential to include *all* factors. Several factors favour small schools.

- * *Travel.* If pupils have to travel long distances each day to attend a large school, they have to spend money on transport and they get very tired. Some governments provide buses or give travelling allowances to help the children get to school. Other governments require the children and their families to pay for themselves.

In both contexts the costs must be calculated, (a) because they are always a cost to the nation as a whole, and (b) because in countries where schooling is not compulsory the travel might discourage children from attending school. In the latter case, replacement of one large school with several small schools might increase total enrolments, and the small schools would turn out to be bigger than originally calculated.

- * *Boarding.* In an area without a good transport system, it may only be possible to fill a medium-sized or large school if boarding facilities are provided. Small schools are generally nearer children's homes, so are less likely to need boarding facilities and can be cheaper.
- * *Salaries.* Sometimes, schools get so large that they have to employ specialised administrative and liaison personnel. This increases their unit costs.

Also, headteachers of medium-sized and large schools are usually more senior, and thus have higher salaries than headteachers of small schools.

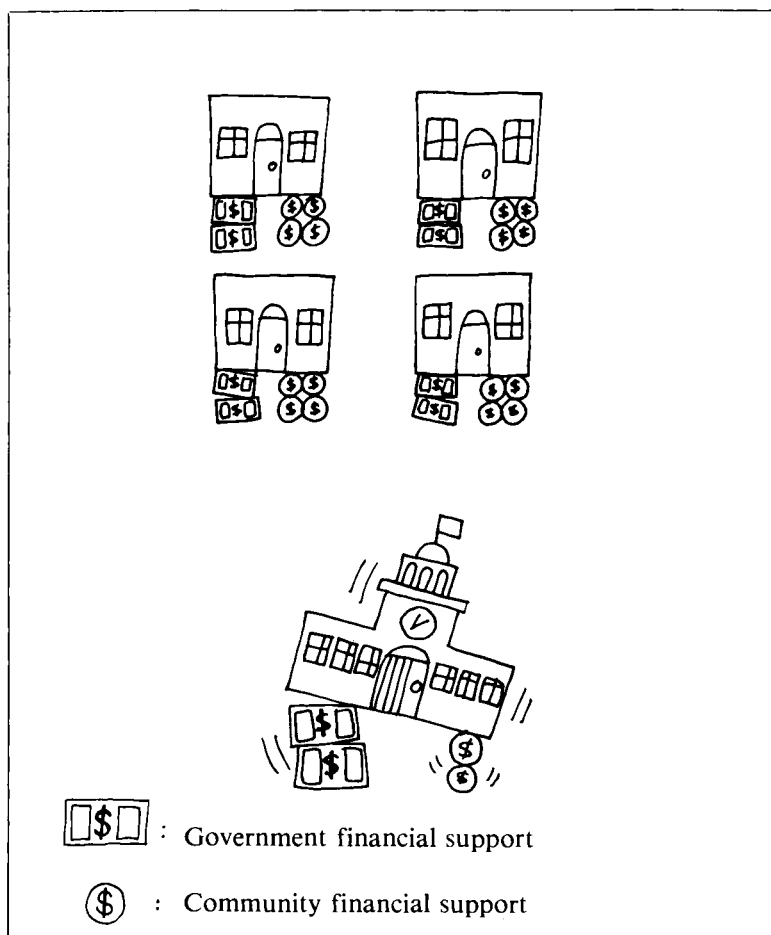
(c) Generation of Resources

In many countries, schools have to rely heavily on resources contributed by their communities. Construction and maintenance of buildings is particularly common, and in some systems communities also provide money for teachers' salaries.

For three reasons, small schools usually find it easier to raise community resources:

- * small schools are likely to be physically closer to their communities, so it is easier for communities to identify with them;

- * in a small school, individual contributions are more likely to be noticed and appreciated; and
- * communities usually know that the unit costs of running their small schools are high, and are keen to protect their schools against closure.



Small schools often attract more community funds than do large schools. This helps them to be more stable.

(d) Where is the Balance?

Even within a single country it is impossible to make general rules or determine the optimum size of schools. Conditions vary too widely, and cases have to be considered separately. Demographic considerations, which determine the distances pupils have to travel each day, are particularly important.

However, it is worth noting some specific examples. The box below reports on studies in Canada, the USA and Australia.

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* At What Size of School are Unit Costs Lowest?
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* Research in several countries has shown that schools achieve
* economies of scale (i.e. lower unit costs) as they grow. However, at a
* certain point they encounter higher unit costs if they continue to grow.
* At what point are unit costs lowest?
*
* At the secondary school level, two North American studies are
* available. Research in Ontario (Canada) found an optimum size of
* 4,000 pupils. But in Winsonsin (USA), the cut-off was said to be
* around 1,700.
*
* Neither of these studies found conclusive evidence at the elementary
* level. However a third study of Prince Edward Island (Canada)
* reported that increasing the size of an elementary school from 100 to
* 200 pupils would reduce operating expenditures by $70 while a further
* increase to 300 pupils would realise savings of $140 per pupil. And a
* fourth study in Pennsylvania (USA) reported an optimum size of 600.
*
* A fifth study of New South Wales (Australia) looked at different
* types of cost. Administrative costs showed economies of scale up to
* the 100 pupil level. However, they then stayed constant and increased
* in schools with over 600 pupils. Maintenance costs also showed
* economies of scale, but were mostly exhausted by the 200 pupil level.
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* However, these studies should be interpreted with caution.
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* 1. They all exclude transport costs, so do not necessarily imply that
* smaller schools should be closed.
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* 2. They are specific to the contexts investigated. The fact that they
* show so much variation emphasises that there is no such thing as
* an optimum size in all countries of the world — or even an
* optimum size for all schools in a single country.
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* 3. They refer to a specific point in time; and conditions change.
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