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Economics of quality schooling

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Introduction

The case for public expenditure on education is based on its contribution to the good of society over and above the benefits received by the individual educated. These benefits can be economic, the benefits of a larger pool of educated labour that allow for rapid economic development, and social, including the benefits of more committed law abiding citizens and the relief of poverty.

Governments around the world have committed themselves to achieving the goals of *Education for All* (EFA). However, for many countries this is a major challenge. EFA will require substantial improvements in school enrolment rates, school completion rates, gender parity, and learning outcomes for all students. These improvements will be difficult to achieve when key educational resources—teachers, support staff, buildings, equipment, textbooks—are already scarce and under intense pressure from population growth and increased school participation rates. How can countries better organise and plan their educational systems to give EFA a chance of being achieved?

Economic analysis can help education and policy makers who are facing difficult decisions by analysing the benefits and costs of using scarce educational resources under competing alternatives.

Key questions are how much should governments spend on education, who and what should their spending be directed to, and how can they ensure that their spending is effective. Data from the World Education Indicators (WEI) and the various OECD indicators show that there is considerable variation on these matters¹. Some of the issues are considered in this paper:

1. The level of public expenditure on education and its distribution in relation to need
2. Where expenditure can yield most benefits
3. The incentives and system level organisation and guidelines to ensure that expenditures are used effectively

Level and distribution of expenditures in relation to need

Table 1 provides selected data on educational expenditure and finance for countries participating in the World Education Indicators (WEI) and OECD collections. There are variations across countries that can only in part be explained by the differences in their level of income per head. They reflect the political and social history of the countries and may not be easily changed. However it is reasonable to note the differences and to ask why they should persist into the future.

Countries in the OECD tend to spend a greater proportion of their much higher GDP per head on education than do the lower income countries which participate in the WEI exercise. The income levels of rich countries make it possible to spend not only more and proportionately more.

Private finance is a higher proportion of spending in the WEI countries than the OECD countries. This may reflect shortages in the provision of publicly-funded education places in WEI countries, as well as high private rates of return to education investments. Private

¹ WEI countries are Argentina, Brazil, Chile, China, Egypt, India, Indonesia, Jamaica, Jordan, Malaysia, Paraguay, Peru, Philippines, Russian Federation, Sri Lanka, Thailand, Tunisia, Uruguay and Zimbabwe but only a subset supply data on the majority of items. The 30 members of the OECD are mainly high income countries.

finance for education is a very low proportion of spending in most European countries and the only a few OECD countries such as Korea, Japan, USA and Australia have a considerable level of private finance.

Countries also vary considerably in the extent to which public funds are provided to non-government providers of education. It is notable that India has a much higher allocation of public funds to the private sector than the average for WEI countries and that Australia has a high allocation relative to other OECD countries.

Table 1. Expenditure and finance, 2003 or 2004

i. Expenditure by level of education and source of funds as percent of GDP						
Country	Primary, secondary and post-secondary non-tertiary education					
	Public	Private	Total			
India	2.6	0.9	3.5			
WEI mean	3.0	0.5	3.1 *			
Australia	3.4	0.7	4.1			
OECD mean	3.6	0.3	3.9			
Country	Tertiary education					
	Public	Private	Total			
India	0.7	0.2	0.8			
WEI mean	0.8			
Australia	0.8	0.8	1.5			
OECD mean	1.1	0.4	1.4			
Country	All levels of education					
	Public	Private	Total			
India	3.3	1.2	4.5			
WEI mean	4.0	m	m			
Australia	4.3	1.5	5.8			
OECD mean	5.2	0.7	5.9			
ii. Distribution of total public expenditure on education by destination of funds (%)						
Country	Primary, secondary and post-secondary non-tertiary (%)			Tertiary education (%)		
	Direct public expenditure on public institutions	Direct public expenditure on private institutions	Indirect public transfers and payments to the private sector	Direct public expenditure on public institutions	Direct public expenditure on private institutions	Indirect public transfers and payments to the private sector
India	72	28	0	79	21	0
WEI mean	91	8	2	85	5	10
Australia	77	20	3	65	n	35
OECD mean	87	11	3	72	11	17

Source: UNESCO 2006

Note: * Means are unweighted averages for the countries reporting; in some cases this causes the total to differ substantially from the sum of its elements

m data not reported as appears inconsistent with other sections of the table

The first section of Table 2 shows the variation in spending across levels of education. In the richer countries of the OECD spending per student rises a little with the level of schooling, with a more major increase for tertiary education where the spending is more than twice that for primary education. Across the WEI countries the spending rises across levels of schooling but sharply for tertiary where spending is about four times the level of primary. The pattern

for India is different. There is a marked jump in spending for upper secondary schooling and then a further jump for tertiary with spending at tertiary level six times that of primary.

Since only a relatively small proportion of people participate in tertiary education in most WEI countries, this distribution of spending implies a high level of subsidy to groups who are probably already well advantaged.

The sharp rises in spending per student are partly reflected for India in the ratios of pupils to teaching staff shown in the second section of Table 2. There is a marked fall in the ratios for senior secondary and then for tertiary. This however is less evident for other WEI countries and for the OECD countries the ratio of students to teachers is higher at tertiary level than at secondary level. The extra expenses at that level are not directed at teacher numbers but to other resources. The Indian data on teacher salaries in Table 2 also indicate that upper secondary teachers have considerably higher salaries on average than primary teachers. To the extent that teacher salaries reflect teacher quality this, along with lower pupil-teacher ratios, implies that teaching resources are particularly heavily concentrated in upper secondary education.

The third section of Table 2 shows that for the WEI and the OECD that class sizes are larger than student teacher ratios, implying that not all teacher time is deployed in the class room in face to face teaching. In India the class sizes are similar to the teacher ratios at primary level. This suggests that primary teachers are provided with relatively little time for preparation, planning and professional development.

The final section of Table 2 is perhaps the most interesting. It shows teachers salaries in US dollars adjusted for local purchasing power (PPP) and also the salaries expressed as a percentage of GDP per capita. The existence of a large rural population with very low per capita incomes affects the way such data can be interpreted. A useful statistic for all countries would be the ratio of teacher salaries to the average for other professional or skilled workers, but data for this is not easily compiled.

In the OECD countries the salaries of teachers tend to be somewhat above per capita income, but not as much as in low-income countries. They do not vary much over the levels of schooling. In some countries like Australia there is relatively little increase in salaries with experience or high-level performance, seen as affecting the capacity of schools to retain teachers. In lower income countries, with a wide distribution of income, teacher salaries are high relative to per capita income.

India is notable for having a very high level of teachers' salaries compared to per capita income. This means that for a given share of the GDP devoted to education India can employ many fewer teachers than can countries where teacher salaries are low relative to GDP per capita. This could be taken to indicate that India invests in relatively well paid teachers rather than in more teachers, but that needs separate analysis.

Table 2. Use of resources, 2003 or 2004

i. Annual expenditure on educational institutions per student relative to GDP per capita, %							
	Pre-primary education	Primary education	Secondary education			All tertiary education	Primary to tertiary education
			Lower secondary education	Upper secondary education	All secondary education		
India	3	13	13	41	25	77	20
WEI mean	9	13	15	18	16	58	18
Australia	...	18	24	27	25	40	24
OECD mean	18	20	23	28	26	43	26
ii. Pupils to teaching staff by level of education							
	Pre-primary education	Primary education	Lower secondary education	Upper secondary education	All secondary education	All tertiary education	Tertiary (A) & advanced research programmes
India	40.5	39.9	37.1	27.5	32.4	22.2	22.2
WEI mean	23.3	24.3	23.9	20.7	20.1	17.8	...
Australia	...	16.4			12.3	...	15.5
OECD mean	14.8	16.9	13.7	12.7	13.3	15.5	16.3
iii. Average class size in public institutions by level of education							
	Primary public institutions		Lower secondary public institutions				
India		40					39
WEI Mean		28					35
Australia		24					24
OECD mean		21					24
iv. Teachers' salaries in US dollars (PPP)							
Country	Teachers' salaries in US dollars (PPP)			Teachers' salaries in US dollars (PPP) as a percentage of GDP per capita			
	Starting salary	Salary after 15 years of experience	Salary at top of scale	Starting salary	Salary after 15 years of experience	Salary at top of scale	
	Primary education			Primary education			
India	11,547	18,927	...	402	658	...	
WEI mean	7,622	9,645	13,128	145	183	206	
Australia	29,712	43,991	43,991	92	136	136	
OECD average	25,727	35,099	42,347	95	130	157	
	Lower secondary education			Lower secondary education			
India	14,024	20,999	22,826	488	730	794	
WEI mean	8,886	10,990	15,623	167	206	275	
Australia	30,062	44,139	44,139	93	136	136	
OECD average	27,560	37,488	45,277	97	132	159	
	Upper secondary education (general programmes)			Upper secondary education (general programmes)			
India	17,036	22,610	26,943	592	786	937	
WEI mean	9,992	12,110	16,307	192	228	292	
Australia	30,062	44,139	44,139	93	136	136	
OECD average	28,892	40,295	48,197	102	142	170	

Note: Teachers with minimum level of training, PPP is purchasing power parity

This relatively (not absolutely) high cost of teachers partly explains why the actual access to education in India is relatively low, given that the proportion of GDP spent on education is not markedly low. Table 3 shows that only 70 per cent of 5 to 14 year olds are in school in India compared with an average of 90 per cent for the WEI countries and virtually 100 per cent for the OECD countries. Over 90 per cent of the population is enrolled for 4 years in India compared with an average of 8 years for WEI countries and higher (11 years) for the OECD countries.

The third section of Table 3 shows that female participation in education is similar to males at most levels and higher in tertiary education in most countries. Part of the apparent disadvantage of males in tertiary education in OECD countries may be explained by their higher rate of entry into jobs that involve workplace training (e.g. through apprenticeships). In contrast to the prevailing pattern the rate of female participation in education is lower in India in upper secondary education and in tertiary education.

Table 3. Who receives education 2003 or 2004

i. Students in public and private institutions as a percentage of the population in that age group						
Country	Enrolment rates					
	Ages 3-4	Ages 5-14	Ages 15-19	Ages 20-29	Ages 30-39	Age 40+
India	2	70	37	7	n	N
WEI mean	20	90	54
Australia	42	99	82	33	14	6
OECD mean	66	98	81	25	6	2

Full-time and part-time students

ii. Number of years and age range at which over 90% are enrolled in primary and secondary education			
Country	Ending age of compulsory education (in years)	Number of years at which over 90% of the population is enrolled	Age range at which over 90% of the population is enrolled (in years)
India	14	4	6-11
WEI mean	14	8	
Australia	15	12	5-16
OECD mean	16	11	

iii. Female enrolment as a percentage of total enrolment, by level of education						
Country	Pre-primary education	Primary education	Lower secondary education	Upper secondary education	All secondary education	All tertiary education
India	49	47	44	41	43	40
WEI Mean	49	48	49	50	49	52
Australia	49	49	49	47	48	54
OECD Mean	49	49	49	50	49	53

Using expenditure to good effect

Detailed economic analysis led by Hanushek (2006) has shown that it is very difficult to establish a relationship between levels of educational expenditure and student performance. An implication of this is the need for incentives to use expenditure more effectively and this is discussed below. First though it is worth noting some of the findings from detailed reviews by the OECD (2005) and Gustafsson (2003) of the evidence on the relationship between education resources and student performance.

Particular resource use: competent teachers, class size

The OECD (2005) review of teacher policy reviewed a large body of research on student learning to draw three broad conclusions. First, the largest source of variation in student learning is attributable to differences in what students bring to school—their abilities and attitudes, and family and community background. Such factors are difficult for policy makers to influence, at least in the short-run. Second, of those variables which are potentially open to policy influence, factors involving teachers and teaching are the most important factors. In particular, the broad consensus is that “teacher quality” is the single most important factor. Third, while there is a positive relationship between student learning and readily measurable teacher characteristics such as qualifications, knowledge and teaching experience, these do not capture differences in teacher quality.

Based on recent meta-analytic integrations of the estimates from different studies Gustafsson concludes there are indications of positive effects of resources:

- i. small class sizes for early years of primary schools especially for disadvantaged students
- ii. teacher competence

The most telling evidence on class sizes came from the STAR experiment in the US where students were randomly assigned to small classes of 13-17, to regular classes of 22-26 and to regular classes with an assistant. These class sizes are far lower than the average in low income countries so there must be doubt as to the applicability of the findings to lower income countries.

Improved outcomes with smaller classes in the early years of schooling may be due to a more effective socialization of students to the school environment in smaller classes (Gustafsson 2003). It is reasonable to expect that the socialization effect is stronger for educationally disadvantaged groups, acquiring skills and habits which make it possible for students to cope with the requirements of life in school. Socialization appears to be an important contributing factor to student success within the school environment as a means of promoting engagement, particularly in the early years of schooling.

On teacher competence Gustafsson (2003 p.102) sums up that:

there are important relations between different indicators of teacher competence and student achievement. This seems to be true for teacher education, experience, measured knowledge and skills, and in-service training.

Gustafsson cites Darling Hammond that the teacher competence involves being able to take the perspective of the learner and to use a broad repertoire of approaches skilfully, to undertake teaching that is purposeful and diagnostic and that responds to students' needs as well as curriculum goals.

In this context it is worth noting the conclusions of a recent yet unpublished review in Australia that found that high performing schools tend to allocate a considerable proportion of experienced competent teachers to the early years of primary and secondary schooling.

Complementary with these forms of analysis is the increased attention given to early childhood development. An illustration of the issues can be found in the work of Heckman (2006). Heckman a Nobel Prize winner in economics has researched the effects of early childhood intervention for less advantaged students. Two of the key findings from this are:

- the pay off to investment in early childhood is far larger than intervention for older disadvantaged persons
- the early intervention needs to support both cognitive and non-cognitive abilities

Heckman says that much policy discussion is focussed on cognitive test score measurement, even though cognitive test scores miss important aspects of human development. Cognitive and non-cognitive ability are both important in explain schooling, crime and a variety of other outcomes. Non-cognitive ability is neglected in much public policy discussion regarding early childhood, although it is clearly important for later educational, economic and social success.

System level and school organisation

The research on class size and teacher competence do not say anything about overall school or system organisation. Schooling and the use of resources can be more effective in particular settings. OECD (2004) *What Makes Systems Perform* reports a study which examined the Programme of International Student Assessment (PISA) 2000 results against key features of the education systems of six countries which had good quality results on PISA—though with varying degrees of equity: Canada, England, Finland, France, Netherlands and Sweden. The countries all had addressed:

- monitoring schools for weaknesses
- giving support to schools, teachers and students where most needed
- formulating at system level standards and expectation and
- devolving responsibility for achieving specified goals

The more successful countries placed social and cultural disparities at the centre of innovation strategies including assessing and supporting the performance of individual students. Success is related to support for teachers and schools in the context of an integrated rather than a differentiated school structure. Especially notable was that Finnish and Swedish schools tend to have a wide social mix, sustained to the classroom:

Finnish classrooms are heterogeneous in terms of student's abilities and backgrounds. This demands efficient learning in small groups with teachers ready to arrange new groups where necessary. Research appears to indicate that in Finland mixed ability classes have greatly advantaged lower-achieving students, while higher achieving students are not greatly affected by changes in the composition of a learning group (OECD 2004 p.41).

The executive summary of the OECD (2007) *No more failures, Ten Steps to Equity*. provides further elaboration of many of these points. They classify their recommendations under the headings of design of the system, practices within the schools and resourcing. The ten steps are:

Design

1. Limit early tracking and streaming and postpone academic selection.

2. Manage school choice so as to contain the risks to equity.
3. In upper secondary education, provide attractive alternatives, remove dead ends and prevent dropout.
4. Offer second chances to gain from education.

Practices

5. Identify and provide systematic help to those who fall behind at school and reduce year repetition.
6. Strengthen the links between school and home to help disadvantaged parents help their children to learn
7. Respond to diversity and provide for the successful inclusion of migrants and minorities within mainstream education.

Resourcing

8. Provide strong education for all, giving priority to early childhood provision and basic schooling.
9. Direct resources to the students with the greatest needs, so that poorer communities have at least the same level of provision as those better-off and schools in difficulty are supported.
10. Set concrete targets for more equity, particularly related to low school attainment and dropouts.

These features of a school system could be seen to be developed and promoted within a system of public education. Point 2 on managing school choice to contain risks to equity could refer to choice among government operated schools. However, in many countries there is a significant private sector and in recent times a strong move to encourage choice within the public system and between public and private schools. This is seen to provide parents with what they want and to put market pressures on the schools to use resources in the ways that have been identified to have most effect. This is the next issue considered.

Market incentives

Hanushek's findings regarding expenditure and student performance draw attention to the need for incentives and guidelines so that resources are spent effectively.

One way of promoting more efficient use of resources is to increase the degree of choice and market pressures on education.

It is argued that:

- competition among schools for students will help reduce inefficiencies in the delivery of education, and hence improve educational outcomes; and
- choice would serve to give more control over educational decisions to parents who in turn would choose good schools for their children.

When choices exist, it is believed that schools will look beyond their own walls at what others—their potential competitors—are doing and either match or differentiate from them, thus improve quality at the school as well as the system level.

School choice has always existed for some groups in society. Higher income groups have always been able to choose between a public and private school. Choice has also existed for those who could afford to move to a particular school neighbourhood. Persons of low income and those in rural areas have limited choice.

The experiences of offering choice and diversity in school education of a range of advanced countries are documented in *Demand Sensitive Schooling* OECD (2006). Experiences across a number of OECD countries confirm that better educated, middle-class parents are more likely to avail themselves of choice and send their children to the best school they can find. With a higher intake of more advantaged students the school's performance will often climb,

improving further the status of the school. There is though the danger of an increasing gap between highly-performing and under-performing schools. The gap between the schools can also increase because the parents who exercise choice by taking their children out of a particular school are often the most critical, and therefore, the school loses those with the most effective voice for improvement from within. It can leave some schools with a greater concentration of disadvantaged students than before choice was introduced (Lamb 2007).

The equity argument in favour of choice, on the other hand, is when this means extending to **all** the choices that privileged parents have always exercised. Choice can potentially allow poorer families access to good schools outside their neighbourhood by breaking the link between housing and schooling and thus decrease segregation. However even in rich countries few poorer families may exercise the choice.

Choice proponents point to the achievements of pupils in private schools as evidence that choice delivers better outcomes. However, this is by no means clearly established and varies across countries.

Information to support the market

The assumption that parents will choose good schools assumes that parents have the information necessary for making this decision. Information is increasingly available about schools' characteristics and their students' performance on government and school websites and in the media. Parents from higher socio-economic background usually are able to access such information and analyse it better when making decisions about schools for their children than parents from lower socio-economic backgrounds. Concerns about the difficulty some parents were having in making informed decisions about the choice of schools for their children have recently prompted the English government to pilot a programme of school choice advisors for parents.

Strong system organisation and a regulatory framework

The market may be suitable for middle class and wealth groups but clearly will not satisfy the education objectives of a large part of the population. Indeed the operation of the market could further disadvantage some groups. However the past experiences of centralised prescription and examinations have also not been found to be effective.

The issue then is to develop a system which does have incentives to use resources effectively, and to direct more of them to where they are most needed. At the same time there is a need to be able to identify and quickly remedy areas of poor performance. The four features identified by the OECD mentioned earlier indicate the matters that the central authorities in any system need to address include:

- monitoring for weaknesses
- giving support t where most needed
- setting system level standards and expectations, and
- devolving responsibility where appropriate

Similar broad findings were reported by Wößmann (2003) using data from the Third International Mathematics and Science Study (TIMSS). He concluded that student performance was likely to be highest in school systems that combine externally-set funding and performance standards, with school autonomy areas such as personnel management where school-level knowledge is important.

The first and third points identified by OECD (2004) require a statement of desired outcomes for schools, some measures of particular needs or disadvantage of schools and assessment of students so that both good performance and weaknesses can be identified.

Giving support where most needed also requires the sorts of data that is required for the first and third issues. It also means having research information available on effective use of resources and resourcing models to allocate funds to good effect.

The last point on devolution implies that decisions should where possible be left to the principal and teachers and that good performance of increased responsibilities should be rewarded. The degree of devolution possible will be affected by the level of competence of teachers and principals and the resources that they have to support the tasks that might otherwise have been handled centrally.

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