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countries from relying exclusively, for reasons of "competitiveness", on direct product taxes for environmental purposes?

Is it possible to devise WTO mechanisms that would encourage participation in, and compliance with, such an understanding?¹⁶

In this context, should the 1970 GATT Working Party Report be reconsidered with a view to condoning some form of border adjustment for both consumption- and production-related ecotaxes? If so,

(a) are BTAs to be considered legitimate if no cross-border externalities exist?

(b) how should BTAs be applied in the event of domestic economic distortions, e.g. if products are subsidized and eco-taxed at the same time or if producers, behind import barriers, use more environmentally damaging inputs (e.g. high-sulphur coal) than would be available abroad?

(c) should there be, thus, additional rules governing the environmental efficiency of the individual products, processes and technologies used?

BTA's rank high on the environmental policy agenda in many countries, in particular in western Europe. They seem to offer an easy solution to policy makers confronted with both ecological and fiscal constraints. However, while appealing from the perspective of policy implementation, such schemes may pose economic, ecological and trade problems. It is important that these be discussed before current blueprints are actually implemented.

¹⁶ A reference point may be the WTO Agreement on Technical Barriers to Trade which, in order to promote the use of international standards, relies on the (rebuttable) presumption that domestic regulations conforming to such standards do not create an unnecessary obstacle to international trade and, thus, do not contravene one of the Agreement's basic requirements.

Rainer Thiele*

The Role of the Private and Public Sector in Human Capital Formation

While there are strong equity and efficiency reasons for subsidizing education in developing countries, the prevailing dominance of governments in the financing and provision of educational services can be questioned. There is some evidence supporting the conclusion that a partial cost recovery through user fees may reduce the rationing of services which is still a pressing problem in many low-income countries, and that private providers tend to be more cost-efficient than their public counterparts.

While it is now widely accepted that developing countries should pursue a market-oriented development strategy, there is still considerable debate about the proper role of the state in such an approach. The formation of human capital is one important field where governments are supposed to take at least partial responsibility but where the exact delineation between the state and the private sector is controversial.¹

Human capital is mainly built up through formal education and work experience,² but certain basic health and nutrition expenditures are also likely to augment the stock of human capital.³ This paper focuses on formal school and university education

because this is the part of human capital formation in which governments are most heavily involved. To demonstrate the importance of investments in education, the paper begins with a review of the social returns these investments promise. It is then discussed why and how the state must intervene in order to secure that the social returns can be realized, and whether there is a potential for greater private sector participation compared to the status quo which in

¹ See, for example, Christopher Colclough: Education and the Market: Which Parts of the Neoliberal Solution are correct?, in: World Development, Vol. 24, 1996, pp. 589-610.

² Gary Becker: Human Capital. A Theoretical and Empirical Analysis with Special Reference to Education, National Bureau of Economic Research, New York 1964; Jacob Mincer: Schooling, Experience, and Earnings, National Bureau of Economic Research, New York 1974.

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Table 1
Social Returns to Investment in Education by
Region and Level, latest year
 (percentages)

Country	Education level		
	Primary	Secondary	Higher
Sub-Saharan Africa	24.3	18.2	11.2
Asia ¹	19.9	13.3	11.7
Europe/Middle East/North Africa ¹	15.5	11.2	10.6
Latin America/Caribbean	17.9	12.8	12.3
OECD	14.4	10.2	8.7
World	18.4	13.1	10.9

¹ Non-OECD.

Source: George Psacharopoulos: Returns to Investments in Education: A Global Update, in: World Development, Vol. 22, 1994, pp. 1325-1343.

many countries is characterized by more or less free and publicly provided educational services. The analysis is illustrated by the case of Chile where comprehensive reforms of the educational system took place during the 1980s which, by and large, are regarded as successful and may thus provide insights for other potential reformers.⁴

Returns to Education

According to the human capital model,⁵ education can mainly be viewed as an investment which increases expected future productivity and earnings. In general, social returns to education are reported to be fairly high (Table 1).⁶ They are highest for primary education and largely decline with the level of the country's per capita income, thus indicating diminish-

ing returns to human capital formation. The lowest return measured for higher education in OECD countries (8.7 percent) approaches the long term opportunity cost of physical capital, i.e. at the margin the profitability of human and physical capital has reached virtual equilibrium.

The rate-of-return estimates shown in Table 1 have to be interpreted with some caution, because they are not controlled for differences in ability, socioeconomic background and quality of education and thus could be biased. Empirical evidence on how the inclusion of these variables affects estimated returns to schooling is scarce and mostly concentrated on the United States. Using a sample of identical twins with different education to control for differences in genetic ability, Ashenfelter and Krueger⁷ found no bias in the estimated returns to schooling. Card and Krueger⁸ found that in the United States people educated in states with high quality schools exhibit higher returns to additional years of schooling, but that, holding school quality constant, differences in parental income or education do not affect return estimates. From a survey of the empirical literature, Card and Krueger⁹ conclude that unobserved ability and family background factors together only account for 10-15 percent of the observed correlation between earnings and education. The relative importance of the quality and the quantity of education for future earning prospects is still an open research question, mainly because the measurement of school quality has proved to be difficult and controversial.¹⁰

Altogether, the existing evidence points towards reasonably high social returns to schooling. This

³ The latter comes about through two different channels. First, better health and nutrition directly increase labor productivity, especially when the health and nutritional status is low and for activities like small-scale agriculture that use little capital. Cf. T. Paul Schultz, Aysit Tansel: Measurement of Returns to Adult Health: Morbidity Effects on Wage Rates in Côte d'Ivoire and Ghana, World Bank, Living Standards Measurement Study Working Paper No. 95, 1993; John Strauss: The Impact of Improved Nutrition on Labor Productivity and Human Resource Development: An Economic Perspective, in: Per Pinstu-Andersen (ed.): The Political Economy of Food and Nutrition Policies, Baltimore, London 1995. Second, improved health and nutrition tends to increase school enrollment of children and their cognitive achievements, thereby raising postschooling productivity. Cf. Gere Behrman: The Impact of Health and Nutrition on Education, in: World Bank Research Observer, Vol. 11, 1996, pp. 23-27.

⁴ Tarsico Castañeda: Combating Poverty: Innovative Social Reforms in Chile During the 1980s, International Center for Economic Growth, San Francisco 1992.

⁵ Gary Becker (1964) op.cit.; Theodore Schultz: Investments in Human Capital, in: American Economic Review, Vol. 51, 1961, 1, pp. 1-17.

⁶ Education may, of course, also have an intrinsic value for the individual which is independent of any future reward. Cf. Nicholas Barr: The Economics of the Welfare State, second edition, London 1993.

⁷ Orley Ashenfelter, Alan B. Krueger: Estimates of the Economic Return to Schooling from a New Sample of Twins, in: American Economic Review, Vol. 84, 1994, 5, pp. 1157-1173.

⁸ David Card, Alan B. Krueger: Does School Quality Matter? Returns to Education and the Characteristics of Public Schools in the United States, in: Journal of Political Economy, Vol. 100, 1992, 1, pp. 1-40.

⁹ David Card, Alan B. Krueger: School Resources and Student Outcomes: An Overview of the Literature and New Evidence from North and South Carolina, in: Journal of Economic Perspectives, Vol. 10, 1996, 4, pp. 31-50.

¹⁰ See, for example, David Card and Alan B. Krueger, op.cit., and Eric A. Hanushek: Measuring Investment in Education, in: Journal of Economic Perspectives, Vol. 10, 1996, 4, pp. 9-30, for a recent debate on this issue. Hanushek argues that standard measures of schooling quality based on inputs such as pupil-teacher ratios are not linked to future labor market performance. He therefore proposes an alternative measure based on student cognitive achievements. Card and Krueger, by contrast, detect a positive correlation between school inputs and earnings.

Table 2
School Enrollment by Education Level

	Primary				Secondary				Tertiary		Primary net enrollment	
	Total		Female		Total		Female		1970	1992	1975	1992
	1970	1992	1970	1992	1970	1992	1970	1992				
Low- and middle-income	79	102	63	94	24	45	17	39	6	8	n.a.	92
Sub-Saharan Africa	50	67	41	60	7	18	5	16	1	2	n.a.	47
East Asia and Pacific	88	117	n.a.	113	24	52	n.a.	46	4	5	n.a.	96
South Asia	67	94	50	82	25	39	14	29	n.a.	n.a.	n.a.	n.a.
Middle East and North Africa	68	97	50	89	24	56	15	51	10	15	65	86
Latin America and Caribbean	95	106	94	105	28	45	26	54	15	18	77	89
High-income economies	106	103	106	103	73	93	71	95	36	51	88	97

Source: World Bank: World Development Report, Washington, D.C., various issues.

would not be the case if instead of the human capital model the screening hypothesis¹¹ provided the adequate explanation for the observed positive education-earnings relationship. According to this view, education is only a device to signal one's superior ability to prospective employers who are imperfectly informed about the different abilities of workers. At its extreme, the screening hypothesis implies that there are no social returns to education because schooling does not increase productivity. Given the empirical finding of a small impact of ability and family characteristics on earnings differentials, there is, however, only a very limited potential importance of the screening hypothesis. Moreover, education seems to be a very time-consuming and costly device to screen for the ability of workers, if it does not also augment their skills. The screening hypothesis is, therefore, unlikely to be a substitute for the human capital model in explaining the demand for educational services.

The Rationale for Government Intervention

Finding a positive return on investment in education does not automatically call for state intervention. As long as individuals are able to capture most of the social benefits from education, the free market delivers an efficient allocation. Several market imperfections and additional distributional considerations, however, justify an active role of the government:

□ Education is no public good, but it generates positive externalities.¹² Literacy, for example, lowers

transaction costs among individuals and brings external benefits for fertility control and for child health and nutrition. These externalities are most substantial at the primary education level. Research activities which are often associated with higher education may also be responsible for significant externalities, to the extent that their services are freely available to firms and households. Both kinds of externalities provide a rationale for public subsidies.

□ Since parents decide on behalf of their children about school attendance, principal/agent problems could occur in the family.¹³ Whereas rates of return to schooling compare the returns to the pupil with the costs to the parents, the important issue is the perceived balance between costs and benefits to the parents of sending their children to school. Since the returns to schooling only partly accrue to the parents, they may underinvest in schooling. This problem tends to be magnified where there are cultural biases against the enrollment of population groups like girls. The principal/agent relationship between parents and children is one of the reasons behind the idea of compulsory education up to a certain age, which is now common practice almost everywhere.¹⁴ To enforce such regulation, additional subsidies may be regarded as a necessary carrot.

□ Underconsumption of education can also be the result of incomplete information about the quality of education on the part of the consumer.¹⁵ If information is costly to acquire, this problem tends to be higher

¹¹ Kenneth Arrow: Higher Education as a Filter, in: Journal of Public Economics, Vol. 1, 1993, pp. 193-216; Michael Spence: Job Market Signalling, in: Quarterly Journal of Economics, Vol. 87, 1973, pp. 355-374.

¹² These externalities are not captured in the rate-of-return figures in Table 1, implying a downward bias of the estimates.

¹³ Christopher Colclough, op. cit.

¹⁴ Another main reason for compulsory education is that governments consider it as a merit good which has to be consumed even if its consumption is in conflict with individual preferences. Cf. Richard A. Musgrave: The Theory of Public Finance: A study in Public Economy, New York 1959.

for low income groups, i.e. it has an equity and an efficiency dimension. Information failure is best addressed through government programs to disseminate information and to regulate quality. Regulation could be concerned with the professional qualifications of teachers, minimum physical facilities and basic standards of curricula. Only if consumers systematically underestimated quality despite public information and regulation there would be a case for a subsidy.

□ Recent studies have found a positive link between equity and growth.¹⁶ The empirically most significant channel through which this link occurs is that higher inequality lowers school enrollment and simultaneously increases fertility and that, in turn, school enrollment ratios are positively and fertility is negatively related to growth.¹⁷ Perotti argues that the crucial variable to establish this link is secondary education because it has much higher opportunity costs in terms of foregone income than primary education. There is thus a case for subsidizing secondary education, provided that further empirical studies confirm the positive effect of a more equal human capital endowment on economic growth.

□ Finally, poverty would prevent many households from purchasing private education because credit markets do not make it possible to borrow against future earnings when human capital is the only collateral.¹⁸ In the absence of support, the poor would, therefore, not be able to realize a prospective increase of their productivity by means of investment in human capital. The first-best policy of improving access to educational services would be to correct for the imperfections in credit markets. The state could act as a guarantor for loans made by private institutions or it

Table 3
Private and Social Returns by
Education Level, latest year
(percentage)

	Primary	Secondary	Tertiary
Private returns	29.1	18.1	20.3
Social returns	18.4	13.1	10.9

Source: George Psacharopoulos: Returns to Investments in Education: A Global Update, in: World Development, Vol. 22, 1994, pp. 1325-1343.

could provide loans itself. In cases where this policy option does not prove successful, e.g. because the poor are too risk averse or administrative costs are too high, targeted subsidies are the alternative.

Altogether, public subsidies and other state interventions are justified on equity and efficiency grounds. In reality, governments all over the world are heavily involved in the regulation, financing and provision of education. Primary schooling is compulsory and practically free in most countries, and higher levels of education are also strongly subsidized. This corresponds with significant progress in school enrollment at all levels of education and across all regions (Table 2). On average, the low- and middle-income countries now come fairly close to universal primary (net) school enrollment. Only Sub-Saharan Africa still clearly misses this mark. Another fact which detracts from the positive overall picture is that in some regions female pupils have less access to education, although their education is crucial for improvements in fertility control and child health and nutrition.

The distributional effects of educational expenditures do not meet the stated objectives. At all levels of education, private returns are considerably higher than social returns because of public subsidization (Table 3). But since higher education is most strongly subsidized and since only few people from poor households in developing countries reach this level, the average impact of educational subsidies is regressive. There are some exceptions with slightly progressive overall expenditures (e.g. Indonesia, Malaysia, Chile), but even in these countries spending on higher education is strongly regressive.¹⁹ The widespread redistribution from the poor to the rich can be explained by the theory of interest groups.²⁰ Interest groups are much more easily organized among (mostly urban) upper income people than among (mostly rural) lower-income people, because the former tend to be more concentrated, better informed and politically more active.

¹⁵ Nicholas Stern: Comment on 'Social Sector Pricing Policy Revisited' by Jimenez, in: Proceedings of the World Bank Annual Conference on Development Economics, Washington, D.C. 1990.

¹⁶ Alberto Alesina, Roberto Perotti: Income Distribution, Political Instability, and Investment, in: European Economic Review, Vol. 40, 1996, pp. 1203-1228; Roberto Perotti: Growth, Income Distribution, and Democracy: What the Data Say, in: Journal of Economic Growth, Vol. 1, 1996, 2, pp. 149-187; Torsten Per'sson, Guido Tabellini: Is Inequality Harmful for Growth? Theory and Evidence, in: American Economic Review, Vol. 84, 1994, pp. 600-621.

¹⁷ Cf. Roberto Perotti, op. cit. This mechanism is derived from a model of endogenous fertility which regards the investment in education and child-bearing as substitutes in the utility function of women. Cf. Gary S. Becker, Kevin M. Murphy, Robert Tamura: Human Capital, Fertility and Economic Growth, in: Journal of Political Economy, Vol. 98, 1990, 5, pp. 512-537.

¹⁸ Nicholas Barr, op. cit.

¹⁹ See Emmanuel Jimenez: Social Sector Pricing Policy Revisited: A Survey of Some Recent Controversies, in: Proceedings of the World Bank Annual Conference on Development Economics, Washington, D.C., 1990 and the case of Chile below.

The Scope for Cost Recovery

While the case for the subsidization of education seems clear, it remains to be answered whether the state should take full responsibility in the financing and provision of educational services or whether private contributions should also play a role. With respect to financing, most countries guarantee more or less free access to primary and secondary schooling. As the situation in Sub-Saharan Africa illustrates, where net primary enrollment is below 50 percent despite mostly compulsory education, low or zero prices for education in combination with constrained budgets can lead to rationing and/or deterioration in quality. Under such circumstances, it is possible to improve welfare even at low levels of education by raising user fees and using the revenues to finance the expansion of a previously rationed service (e.g. building new schools in order to reduce travel time for rural children) or to improve the quality of a deteriorated service (e.g. upgrading the qualification of teachers).

The impact of increased user fees on revenue depends on the price elasticity of demand and whether there is excess demand for education. According to estimates obtained by World Bank researchers,²¹ demand for education tends to be inelastic so that a positive impact of user fees on revenue can be expected. There is also limited empirical evidence that people who are presently not sending their children to school have a positive willingness to pay for a higher-priced but improved service. Gertler and Glewwe,²² estimating utility functions based on revealed preferences, find that in rural Peru the willingness to pay for a reduction of

travel time to the next school by two hours exceeds the marginal cost of the improvement for all income groups, and that rural people from all income groups in Ghana would be willing to pay the marginal costs of improvements in school quality.

With respect to equity, the net impact of user fees is indeterminate.²³ In circumstances where the initial rationing system favored high-income households, some increase in user charges could be progressive provided that the resources so gained were spent upon additional provision, thereby increasing total enrollment. Since in many countries the poorest communities are least well served with educational services the expansion and qualitative improvement might indeed benefit them, even if financed by fees. This implication follows, however, only when there is excess demand for education. Where enrollments are constrained because of deficient demand, cost increases would cause enrollments to fall, particularly among children from poorer households. Furthermore, empirical evidence from Peru²⁴ indicates that the lowest income groups exhibit higher demand elasticities than do the richer groups. For "ordinary" goods this would imply that negative welfare effects of price increases are lower for low-income groups. But if education, especially at the primary level, is viewed as a good for which adequate substitutes are missing, say because of the importance of externalities, high demand elasticities among the poor do not indicate a better ability to switch to cheaper alternatives but a greater tendency to withdraw from its purchase in response to price increases. Hence, if the objective is to avoid substantial withdrawal of the poor, it is likely that user fees have to be complemented by targeted subsidies, e.g. through fee exemptions.

Targeting has its own difficulties.²⁵ If one wants to approximate the ideal of horizontally and vertically efficient targeting, i.e. to include all those who are needy and to exclude all those who are able to pay the fees, administrative costs are high because a strict means-test based on income or wealth of parents is required. By contrast, less demanding forms of targeting, such as geographical targeting where subsidies are concentrated on poor regions, lower administrative costs but bear the risk of significant deviations from horizontal and vertical efficiency.

The arguments in favor of cost recovery are strongest for higher education, both on equity and efficiency grounds. Equity problems of user fees tend to be less severe because the majority of students at the tertiary level comes from richer households. With

²⁰ Gary S. Becker: A Theory of Competition Among Pressure Groups for Political Influence, in: *The Quarterly Journal of Economics* 88, 1983, pp. 371-400. Another political economy model which is often used to explain redistributive outcomes is the median voter model. Cf. James M. Buchanan, Gordon Tullock: *The Calculus of Consent*, Ann Arbor 1962. According to this model, redistribution is likely to flow to the median voter. In developing countries, where the income distribution appears to be skewed to the left, i.e. where the median is below the mean, the median voter model would predict a progressive redistribution. As this prediction contradicts the evidence, interest group effects seem to dominate in all those countries where educational subsidies favor the rich.

²¹ See Emmanuel Jimenez, *op. cit.*

²² Paul Gertler, Paul Glewwe: The Willingness to Pay for Education in Developing Countries: Evidence from Rural Peru, in: *Journal of Public Economics*, Vol. 42, 1990, 3, pp. 251-275; Paul Gertler, Paul Glewwe: The Willingness of Households to Pay for Improvements in School Quality: Evidence from Ghana, World Bank, Conference on Public Expenditures and the Poor: Incidence and Targeting (Mimeo), 1992.

²³ Christopher Colclough, *op. cit.*

²⁴ Paul Gertler, Paul Glewwe, *op. cit.*

²⁵ Nicholas Barr, *op. cit.*

Table 4
Cost-effectiveness of Private and Public Schooling

Country	(1) Ratio of private to public test scores	(2) Ratio of private to public unit costs	(3) Ratio of relative cost to relative score [(2):(1)]
Colombia	1.13	0.69	0.61
Dominican Rep. ¹			
O-type	1.31	0.65	0.50
F-type	1.47	1.46	0.99
Philippines			
Math	1.00	0.83	0.83
English	1.18	0.83	0.70
Filipino	1.02	0.83	0.82
Tanzania	1.16	0.69	0.59
Thailand	2.63	0.39	0.15

¹ F-type schools are authorized to give Ministry of Education examinations. O-type schools are not so authorized.

Source: Emmanuel Jimenez, Marlaine Lockheed: Public and Private Secondary Education in Developing Countries: A Comparative Study, World Bank Discussion Paper No. 309, 1995.

respect to efficiency, social returns of tertiary education are lower and externalities are likely to be less prevalent than at lower education levels. Given that in many countries eligible children are either excluded from participation in primary schools or attend schools of very poor quality, equity and efficiency would be better served by diverting public resources from the top to the base of the education system.

The main equity and efficiency costs of user fees at the tertiary level arise from the extent to which they prevent bright children from low-income households from continuing to pursue their studies. This can be avoided by making credit available to all those who gain access to higher education. Loan programs have two main weaknesses. First, evaluations of loan schemes from a number of countries reveal that default risks are high so that the programs often do not become self-financing.²⁶ Second, administrative costs can be high, particularly in countries without well-developed banking sectors. A credit scheme may be complemented by scholarship programs for particularly deserving students in order to secure access even of those talented children from poor households who are too risk averse to participate in loan programs.

Private versus Public Provision

The question whether the state should take a prominent role in the provision of educational services is answered in the affirmative by most governments. Public schools enroll approximately 90 percent of primary and 70 percent of secondary school students

in developing countries.²⁷ There are two basic arguments in favor of a greater participation of the private sector in education:

□ First, the removal of restrictions on the private sector is expected to increase the quantity of educational provision, thereby mobilizing funds which otherwise would not be available and liberating some public resources for other uses. This argument points towards a complementary role of the private sector in reducing excess demand for education.

□ Second, it is argued that the cost-effectiveness of private schooling is higher than that in the public sector.²⁸ Case studies for five countries (Colombia, Dominican Republic, the Philippines, Tanzania, Thailand) show that private school students at the secondary level generally outperform public students on standardized maths and language tests (Table 4, column 1) and that unit costs of private schools are lower than that of their public school counterparts (Table 4, column 2). Taken together, this implies that the same amount of learning can be achieved at lower costs in private schools (Table 4, column 3). This finding holds after taking account of the fact that, on average, private school students come from more educated backgrounds. As a main explanation for their results the authors mention a greater school-level autonomy in private schools for a wide range of decisions affecting student achievements, such as selecting teachers, adopting the curriculum and choosing textbooks. The autonomy enables private school to be responsive to the parents to whom they are accountable and for whose children they compete. This second argument for private sector participation goes further than the first one in providing a rationale for some privatization of existing educational services, i.e. for a substitutional role of the private sector. It also points towards measures to make public schools more cost efficient, e.g. by forcing them to compete with existing private schools or by giving them more autonomy with respect to the allocation of their budgets.

The Case of Chile

In Chile, public education policy was profoundly changed as one essential part of the comprehensive social sector reform in the 1980s.²⁹ The educational reforms are an example of how to achieve impro-

²⁶ Christopher Colclough, *op. cit.*

²⁷ Emmanuel Jimenez, Marlaine E. Lockheed: Public and Private Secondary Education in Developing Countries: A Comparative Study, World Bank Discussion Paper No. 309, 1995.

²⁸ *Ibid.*

²⁹ Tarsico Castañeda, *op. cit.*

Table 5
Distribution of Overall Spending on Education
by Income Group, 1974-1986

(percentages)

	Poorest 30 percent	Middle 30 percent	Richest 40 percent
1974	28.6	24.1	47.3
1980	33.1	26.4	40.5
1986	37.5	28.0	34.5

Source: Tarsicio Castañeda: *Combating Poverty: Innovative Social Reforms in Chile During the 1980s*, International Center for Economic Growth, San Francisco 1992.

Table 6
Redistributive Impact of Expenditures on
Different Levels of Education, 1985

(percentages)

Type of education	Poorest 30 percent	Middle 30 percent	Richest 40 percent
Preschool	45.0	35.0	20.0
Primary	47.0	30.9	22.1
Secondary			
Scientific/humanistic	36.6	34.6	28.8
Technical/vocational	37.2	37.1	25.5
University education	11.1	15.6	73.3
Government university transfers	9.9	14.6	75.5
Student loans	22.3	29.1	48.6

Source: Tarsicio Castañeda: *Combating Poverty: Innovative Social Reforms in Chile During the 1980s*, International Center for Economic Growth, San Francisco 1992.

vements both with respect to equity and efficiency. Although total public expenditures on education were moderately reduced from slightly above to slightly below 3.5 percent of GDP, overall spending on lower levels of education was increased from about 2.0 percent to 2.5 percent of GDP. This was made possible by a sharp reduction in public spending on universities by roughly 40 percent. Universities now receive an increasing part of their income from tuition fees. Equity problems resulting from the withdrawal of subsidies are mitigated by a loan program. Altogether, the reallocation of spending from the top to the bottom has led to a shift from a regressive to a progressive impact of educational expenditures (Table 5). Redistribution towards the poor is most significant for preschool and primary education (Table 6). It is modest for secondary education, while spending on universities still mainly favors higher-income groups.

Student loans are better targeted than government university transfers, but even in this case about half of the money goes to the richest 40 percent of the students. Further improvements in targeting subsidies towards poor university students should thus be possible.

In order to enhance the efficiency of the educational system, the Chilean government decentralized public education and encouraged involvement by the private sector. The transfer of schools to municipalities was accompanied by greater local autonomy in administering material resources and maintaining schools. The growing role of private education is likely to be one reason for the enormous increase in secondary and tertiary enrollment. Secondary enrollment increased from 39 to 72 percent between 1970 and 1992, compared with an increase from 33 to 54 percent for the whole group of upper-middle-income countries,³⁰ and enrollments in higher education doubled in the 1980s despite the steep fall in public funds.³¹ Furthermore, the way of financing education was reformed. The government moved from the old system of giving money to schools and universities based on historical allocations for teacher salaries and other costs to a new system of channeling resources based on attendance, i.e. to a kind of voucher system.³² Under this system, if public education institutions want more resources, they have to increase their enrollment or to reduce the number of dropouts and, therefore, compete with the private sector. The success of this policy is, for example, reflected in the fact that Chile's dropout rates in primary and secondary schools have become the lowest in Latin America.³³

Concluding Remarks

This paper assessed the private and public role in the educational systems of developing countries. It was argued that while there are strong equity and efficiency reasons for subsidies and other regulations, particularly at the primary education level, the prevailing dominance of governments in the financing and provision of educational services can be questioned. The limited existing evidence leads to the (tentative) conclusion that a partial cost recovery through user fees may ease off the rationing of services which is still a pressing problem in many low-income countries, and that private providers tend to be more cost-efficient than their public counterparts. The reforms in Chile are an example of how both efficiency and equity improvements can be achieved by means of greater private sector participation and a more careful targeting of subsidies.

³⁰ World Bank: *World Development Report*, Washington, D.C. 1995.

³¹ Christopher Colclough, *op. cit.*

³² Tarsicio Castañeda, *op. cit.*

³³ *Ibid.*