Measuring IDA's Effectiveness

Key Results

How would an expansion of IDA reduce poverty and further other development goals? We first tackle the big picture impact on growth and poverty reduction and then focus in on what is probably the most important other development goal, education.

To estimate the impact of an expansion of IDA on growth and poverty we use an established model. We assume that IDA maintains its current allocation pattern. We find that an additional $billion of IDA each year would reduce poverty by 434,000 people each year: i.e. each $1billion lifts 434,000 people permanently out of poverty. Equivalently, to lift the headline-grabbing number of one million people per year out of poverty would cost $2.3billion. Assuming that US funds are matched 4-to-one by other donors, such a coordinated expansion of IDA would cost the US $460 million. Of course, even lifting a million more people each year out of poverty is modest relative to the scale of the problem – 1.2 billion poor people. The global poverty problem cannot be solved just by IDA. Nevertheless, on the evidence, IDA is probably more effective, dollar-for-dollar, than any other resource transfer. There is a good case for making it more commensurate with the magnitude of the problem by radically scaling it up.

Evaluations of IDA-financed projects show IDA to have a respectable rate of return. However, such evaluations inevitably miss the effects on the wider economy. Our analysis of IDA's contribution to growth find a rate of return of 41% - well in excess of

the project-level returns. This high return comes about because in good policy environments IDA `crowds in' other investment. Gross investment increases by nearly $2 for each dollar of IDA, and FDI increases by around 60 cents for each dollar. The effectiveness of IDA can also be measured through comparison with alternative vehicles for aid. To do this we also estimate the effects of a general expansion of ODA on its current allocation pattern. An additional $1 billion of ODA would reduce poverty by 284,000 people. Hence, IDA is around 50% more efficient in the task of poverty reduction than is the typical bilateral aid program.

The current effectiveness of IDA can be measured through comparison with its past effectiveness. IDA has been getting more efficient during the 1990s. Between 1990 and 1998 the poverty impact of IDA increased by nearly 60%. However, the cost advantage of IDA over bilateral programs is not just a recent phenomenon - in 1990 IDA was also far more effective than bilateral programs.

There is also evidence that aid is atypically effective if it is increased during periods when low-income recipients have incurred large income losses from terms of trade deterioration. By offsetting some of these losses, aid mitigates the output losses that are triggered by these shocks. The enhanced effectiveness of aid during conditions of severe negative shocks is approximately equal to the additional effectiveness achieved by switching aid from bad to very good policy environments. Last year IDA allocations were revised to compensate those good policy countries that had been adversely effected by the oil price increase. While this is too recent to be included in the estimates of the impact

of IDA, it is likely further to have enhanced its effectiveness. In view of the global economic downturn, the Bank is now forecasting further deteriorations in the terms of trade for developing countries, from already depressed levels. Hence, this would be a particularly timely moment for an expansion of IDA.

Turning to primary school enrollment, we first estimate the indirect contribution of IDA via its general effect on growth. For South Asia and Sub-Saharan Africa, we estimate that given the impact of aid on growth noted above, a one-off additional $1 billion would permanently increase enrollment by around 16,500 children. An additional $1 billion per year as a sustained flow would thus allow enrollments to increase by an additional 16,500 each year.

We then focus on the effect of an IDA program targeted on primary education. Given the average cost of primary schooling, $1 billion would purchase around 16 million school years. Thus a sustained flow of $1 billion would increase enrollment permanently by 16 million children. This is currently around a fifth of the children who are not enrolled in school in the IDA-receiving regions.

1. IDA Expansion and Poverty Reduction

Poverty-Efficient Aid

Recent research establishes two basic principles of effective aid allocation. The first is that aid should go to countries that are poor (an obvious enough point, though in fact a lot of aid in the past has gone to middle-income countries). The second principle is that – among poor countries – more assistance should be allocated to ones that have reasonably good economic policies. This is another common-sense proposition, and it is supported by evidence that the impact of aid on growth and poverty reduction is greater in a good policy environment. The kinds of policies that create a good environment for broad-based growth – private property rights, low levels of corruption, openness to foreign trade, macroeconomic stability – are the same policies that create a good environment for the effective use of donor assistance. Are there poor countries with good policies? Yes. There has been a worldwide wave of economic reform over the past decade, so that a growing number of low-income countries have reasonably good policies. Examples would be Uganda, Vietnam, Ghana, and India.

Collier and Dollar (2001, 2001a) formalize this idea and show that the allocation of aid that has the maximum effect on poverty is a function of the level of the poverty of a country and of its policies. The specific policy measure that they use in that work is the World Bank's Country Policy and Institutional Assessment, which has 20 different components covering macroeconomic policy, structural issues, public sector management and governance, and issues of social inclusion. The Collier-Dollar model is published in two refereed academic journals, but because it is very recent it is currently the only such model available.

Has Aid Allocation Changed During the 1990s?

The approach here is to examine how the allocations of ODA and IDA have changed between 1990 and 1998. Furthermore, we can make use of the estimates from Collier and Dollar (2001) to gain some sense of the quantitative impact of changes in aid allocation. In other words, if aid has become more efficient, what kind of an impact on poverty reduction are we talking about?

Table 1, column 1 shows a regression explaining the allocation of total ODA across more than 100 countries. The regression includes the log of per capita GDP, that log squared, the log of population, and that log squared. Thus, we are controlling for per capita income and for population in a flexible way, so that we can isolate the relationship between aid and policy after adjusting for these differences in income and size. There is a slope coefficient for the CPIA measure of policy, and a separate slope coefficient for the CPIA in 1997-98. For total aid, there was a small and insignificant relationship between aid and policy in 1990, and a strong positive relationship in 1997-98. Thus, during the 1990s there was a shift in the allocation of aid in favor of good policy. The shift can be summarized in Figure 1, which shows the responsiveness of aid to a 1 point change in the CPIA measure: 8% in 1990 and 71% in 1997-98.

What about IDA? Table 1, column 2 shows an analogous regression for IDA disbursements. Already in 1990 there was a relationship between IDA and policy, and it

strengthened significantly over the decade. The responsiveness of IDA to a 1 point change in the policy index was 36% in 1990, and 119% in 1997-98 (Figure 2).

Another way to summarize these changes is to look at the amount of aid that has gone to poor policy countries, in 1990 and 1997-98. We take all of the IDA eligible countries and, for 1990 and 1997-98 separately, we divide them into three groups based on the CPIA measure of policy. (Policy is persistent in many countries, so that these groups are similar in 1990 and 1997-98; but they are not identical. Uganda, for example, was in the middle group in 1990 and in the top group in 1997-98.) Table 2 shows the average aid and average IDA per capita for the top and bottom thirds in 1990 and 1997-98. It is interesting that in 1990 there was significantly more IDA per capita for the good policy countries ($4.7 per capita) than for the poor policy ones ($2 per capita); however, the opposite was true for the total volume of aid (which includes IDA): $44 per capita for poor policy countries and $39 per capita for good policy ones). Thus, in 1990, IDA's effort to channel funds to good-policy countries was essentially undone by the allocation of other assistance in favor of poor policy countries.

It can be seen than by 1997-98 the overall allocation of aid modestly favored the good policy countries. For IDA, the allocation in favor of good policy countries was stronger than in 1990.

It should be noted that much of the improved allocation of aid between 1990 and 1998 came about through sharp cuts in aid to countries with poor policies combined with

modest cuts or even increases in aid to countries with good policies. For example, the following countries had cuts of at least 50% in their aid per capita: Kenya, Nigeria, Pakistan, Togo, and Zaire (now DR Congo). On the other hand, countries such as Bolivia, Uganda, and Ghana had only modest changes in aid per capita between 1990 and 1998.

Measuring Aid Effectiveness

So, we have found two things about the allocation of aid in the 1990s. First, the allocation of IDA was more efficient than the allocation of total ODA, both in 1990 and 1997-98. That is, IDA is better targeted to countries that are poor and that have reasonably good policy. Second, both the allocations of ODA and of IDA have improved during the 1990s: there is a sharper relationship between aid and policy at the end of the decade than at the beginning. Can we get a sense of the quantitative importance of these changes in aid allocations?

We are going to develop a measure of the poverty efficiency of a particular allocation of aid through the following thought experiment. Suppose that the world gave another $1 billion of aid. Its impact would depend on how it is allocated among countries. We are going to consider two allocations:

- Proportional to total ODA; and
- Proportional to IDA.

And we are going to do the experiment in 1990 and in 1997-98. Collier and Dollar (2001) develop a formula for estimating the marginal impact of aid on poverty in

different countries (based on how poor they are, the quality of their policies, and the amount of aid that they are getting). In 1990 those marginal efficiencies varied enormously among countries, reflecting the fact that aid was allocated fairly indiscriminately. Another $1 billion allocated in proportion to 1990 ODA would have lifted an estimated 105,000 people out of poverty (Figure 3). That is a low level of efficiency, corresponding to a marginal cost of poverty reduction of about $10,000 per person. An additional $1 billion of aid allocated proportional to 1990 IDA would have had nearly three times as much impact (an estimated 277,000 people permanently lifted out of poverty). IDA was more efficient in 1990 because – within an overall inefficient aid regime – IDA was relatively focused on the poor countries with good policy, where an additional dollar of aid had a large marginal impact.

The same thought experiment carried out for 1997-98 reveals the good news that aid overall has become much more efficient: an additional $1 billion allocated in proportion to 1997-98 ODA would lift an estimated 284,000 people out of poverty. The marginal efficiency of an additional IDA billion dollars increased to 434,000 people lifted out of poverty. These specific point estimates should be treated with caution (they have large standard error attached to them). But what is quite robust is the differential: IDA is significantly more productive than ODA in general, and the productivity of aid rose dramatically between 1990 and 1997-98.

The Rate of Return on IDA

The rate of return on IDA is implied by the coefficient of aid in the growth regression. Recall that a key finding is that this coefficient depends upon the level of policy. Hence,

the coefficient has to be calculated using the weighted-average policy level of IDA countries. Because IDA is well-targeted on countries with good policies, the rate of return, is a remarkably high 41%. This is well above the direct rate of return on IDA projects. How, indeed, can the return on IDA be so high? The answer is that in countries with good policies aid can be shown to `crowd in' other investment. Collier and Dollar (2001b), estimate a gross investment function. They find that in the best policy environments aid raises gross investment by almost twice as much as the value of the aid itself. Collier and Dollar (1999) extend the analysis to FDI. They show that in good policy environments, aid increases FDI by 60 cents for each dollar of aid. One of the routes by which this happens is through greater investor confidence – in good policy environments the risk ratings are linked to aid flows.

The Return on IDA during Negative Shocks

Collier and Dehn (2001) analyze how large negative terms of trade shocks effect the aid-growth relationship. They find that while such shocks are highly damaging for growth, additional aid substantially mitigates these losses. The difference in the return on aid during severe negative shocks and normal times is roughly commensurate with the large difference in the returns on aid in the worst and the best policy environments. Collier and Dehn show that for the period 1970-94 global aid allocations were insensitive to severe negative shocks. These opportunities for particularly high impact were being missed. Recently, the Bank has begun to take into account severe negative shocks in IDA allocations – responding to the oil price hike of 2000. In view of the present global economic downturn, we will investigate the scope for more active use of IDA in this regard.

Figure 1. Response of ODA to Better Policy

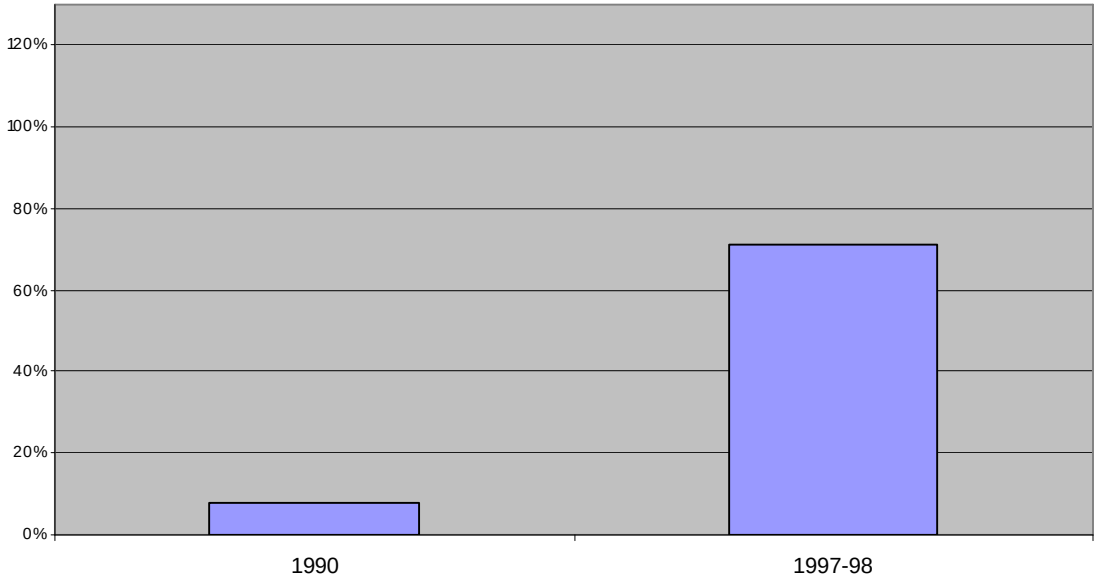
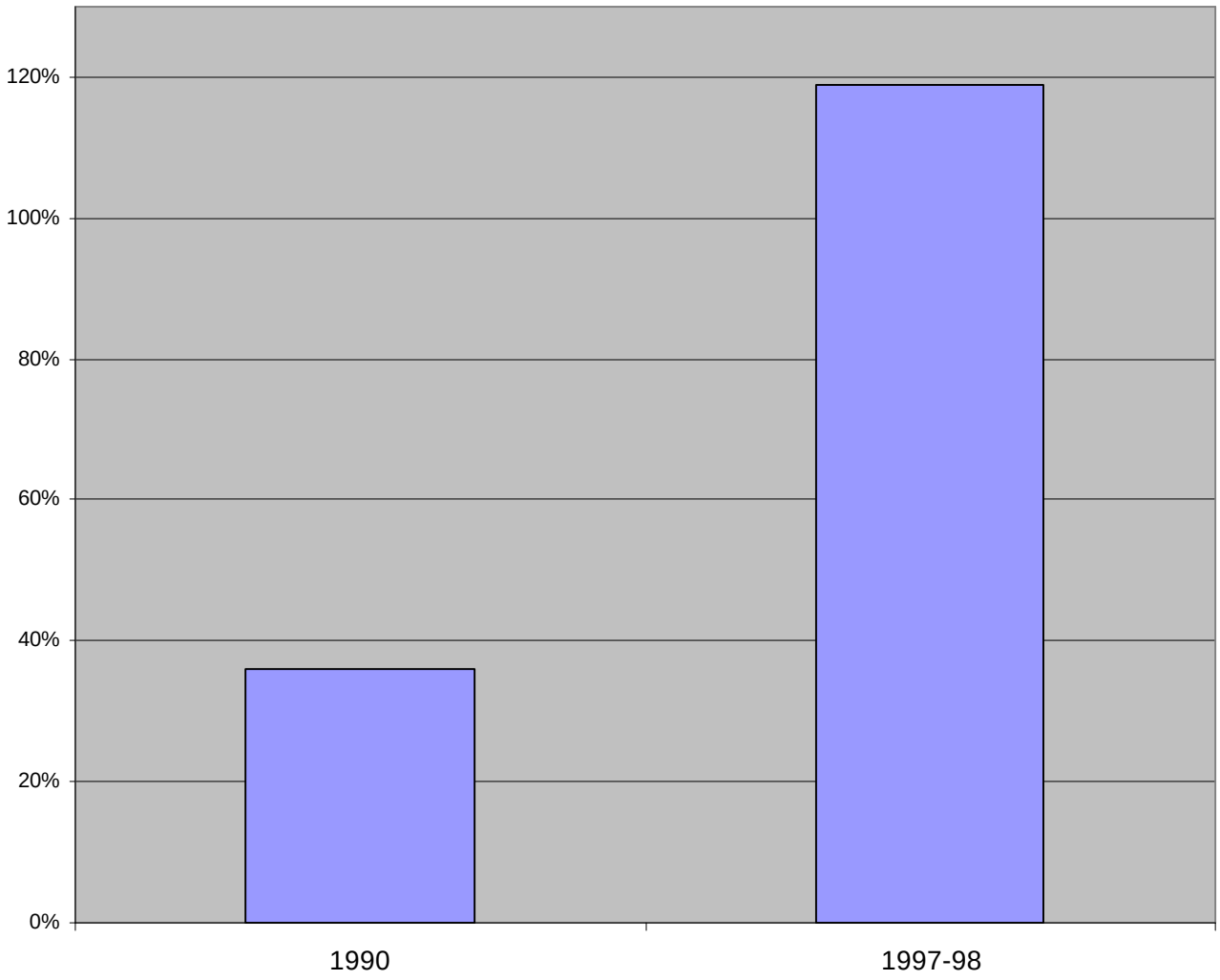


Figure 2. Response of IDA to Better Policy



2. IDA Expansion and Primary School Enrollment

As the international development goals emphasize, poverty reduction is more than simply increases in poor households' incomes. It also involves improvements in human capital, including better education and health. Thus one of the goals is that of universal primary enrolment by 2015. We now estimate the implications of IDA expansion for that goal.

Indirect Effects from Growth

The previous section quantified the effect on poverty reduction of an additional $1 billion of IDA – 434,000 people would be permanently lifted out of poverty. The mechanism through which this would occur is economic growth. The additional aid, if properly targeted to countries with good policies, would increase growth in those countries, raising average incomes, thereby enabling nearly half a million people to escape from poverty.

This same growth would also have a favorable effect on primary enrolment. Economic growth increases the demand for education while, at the same time, enabling governments to spend more on education supply thanks to higher tax revenues. The net result is captured by the coefficient on per-capita income growth in regressions where primary enrolment is the dependent variable. Table 3 , from Filmer (2001) presents one set of such regressions. The coefficient on (ln) GDP per capita in column V, 0.181, represents our best estimate of this coefficient (it lies in the middle of the range of estimates found in the literature).

We can apply this coefficient to the growth generated by an additional $1bn of IDA. Recall that the return on IDA estimated from growth regressions is 41%. The impact of $1bn of IDA is thus to raise GDP permanently by $410 million. The combined GDP of South Asia and Sub-Saharan Africa (the recipients of IDA) is around $900 billion, so growth would increase by around 0.05%. We then calculate the growth-induced increase in enrollments from the elasticity, the increase in the growth rate, and the current enrollment levels (Table 4). About 16,500 children would be in primary school each year as a result of the additional $1 billion.

Effects of Targeted Increases in Education Spending

The above calculation assumes that the additional $1 billion of IDA will be spent by recipient countries in the same way their current budget is allocated. However, donors have been attempting to influence that allocation, especially in favor of health, education and other poverty-sensitive sectors. An alternative question to ask, therefore, is: By how much will primary enrolment increase if *all* the additional $1 billion of IDA were spent on education?

Before proceeding further, we should emphasize that, on average, the link between *public* spending on education and education outcomes (such as primary enrolment) is notoriously weak. The reason is that public-sector efficiency can vary enormously, both across countries, and within countries over time (and across programs). Hence, the aggregate results presented here should be treated with caution. We supplement these

with some country-specific data for four African countries, in which we have greater confidence.

Table 5 presents the basic enrolment data and the median spending per primary student in all six regions. If we focus on Africa and South Asia—the major recipients of IDA funds—the median spending per student is between $58 and $67. Taking the average of these figures, we estimate that $1 billion could sustain about 16 million students in primary school. The key word here is "sustain" since the unit cost used represents the current, actual spending per pupil. It may not represent the additional cost required to enroll a child in school. Nevertheless, it is worth noting that these 16 million students represent about 20 percent of the children currently not enrolled in primary school in the two regions.

As mentioned above, the aggregate analysis assumes that the cost of increasing primary enrolment is equal to the cost of maintaining enrolment—an assumption that flies in the face of the evidence that improvements in education quality and a substantial increase in capacity are necessary for increasing primary enrolment. These quality and capacity enhancements are, however, highly country-specific. As a first cut at such an estimation, we look at the cost of improving quality and increasing capacity in four African countries, Burkina Faso, Guinea, Niger, and Senegal (Table 6). In the Table, we present estimates of the incremental costs of improving education quality and recruiting teachers to a sufficient extent to reach the international development goal of universal primary enrolment by 2015. The calculation also assumes an increase in the allocation of

the government's own resources towards primary education. The resulting "financing gap" is an estimate of the difference foreign aid can make in achieving universal primary enrolment. The annual average is about $200 million for these four countries combined. In other words, an additional $200 million per year can help these four countries achieve universal primary enrolment by 2015.

The total number of children who will be enrolled in primary school in the four countries is about 3.1 million (see Table 7). Thus, an annual additional expenditure of $200 million will enable 3.1 million children to enroll in primary school, meaning the per-student cost is about $62, which is close to the sustaining cost as well. In other words, an additional $1 billion per year could bring primary education to an additional 16 million students in low-income countries.

References:

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Table 1
Explaining the Allocation of ODA and of IDA
1990 and 1997-98

	(1) *Log (ODA)*	*(2)* *Log (IDA)*
Log (GDP p.c.)	5.08	5.13
	(4.31)	(1.32)
$[\text{Log (GDP p.c.)}]^2$	-0.37	-0.38
	(4.79)	(1.33)
Log (pop)	1.20	1.52
	(5.04)	(2.32)
$[\text{Log (pop)}]^2$	-0.02	-0.03
	(3.14)	(1.62)
1997-98 dummy	-2.03	-2.20
	(4.78)	(1.62)
CPIA	0.08	0.36
	(1.08)	(1.80)
CPIA (1997-98)	0.63	0.83
	(4.56)	(1.78)
R^2	0.74	0.69
No. of Obs.	218	113

Table 2
ODA and IDA Per Capita

	ODA		*IDA*	
	1990 ($)	***1997-98 ($)***	***1990 ($)***	***1997-98 ($)***
Good Policy (Top one-third based on CPIA)	38.8	28.0	4.7	6.5
Poor Policy (Bottom one-third based on CPIA)	44.1	16.4	2.0	2.3

Note: Population-weighted averages.

Table 3: Regression results. Dependent variable is primary net enrollment rate (ln). Model with expenditures expressed as a share of GDP Countries with GDP per capita under $10,000					
	(I)	(II)	(III)	(IV)	(V)
	All	All	1995	1995	5 year country specific differences
GDP per capita (ln)	0.239	0.208	0.243	0.213	0.181
	(7.08)**	(5.45)**	(3.53)**	(2.80)**	(4.13)**
Primary expenditures as a share of GDP (ln)	0.031	0.024	-0.012	-0.021	0.003
	(1.36)	(1.07)	(0.17)	(0.32)	(0.17)
Population of primary age (ln)	0.041	0.247	0.048	0.232	-0.339
	(0.54)	(2.27)*	(0.39)	(1.30)	(2.87)**
Population (ln)	-0.017	-0.249	-0.031	-0.237	0.334
	(0.23)	(2.29)*	(0.25)	(1.37)	(2.84)**
Percent of population rural	0.000	0.000	0.000	0.002	0.000
	(0.17)	(0.08)	(0.11)	(0.40)	(0.17)
1=1975	0.021	0.034			
	(0.13)	(0.23)			
1=1980	0.104	0.125			0.176
	(0.89)	(1.09)			(2.17)*
1=1985	0.112	0.130			0.159
	(0.98)	(1.17)			(1.78)
1=1990	0.128	0.134			0.144
	(1.13)	(1.19)			(1.54)
1=1995	0.141	0.162			0.155
	(1.24)	(1.43)			(1.65)
1=EAP		0.095		-	
		(0.64)		-	
1=LAC		-0.067		-0.179	
		(0.48)		(1.15)	
1=MENA		-0.097		-0.273	
		(0.58)		(1.52)	
1=ECA		0.154		-0.017	
		(1.06)		(0.08)	
1=SA		0.124		0.000	
		(0.57)		(.)	
1=SSA		-0.256		-0.406	
		(1.64)		(2.44)*	
Constant	2.322	3.344	2.330	3.368	0.000
	(5.24)**	(5.77)**	(2.87)**	(3.60)**	(0.02)
Observations	180	180	51	51	138
R-squared	0.50	0.55	0.55	0.63	0.46
Absolute value of t-statistics in parentheses					
significant at 5% level; ** significant at 1% level					

Table 4: Effect of Aid-induced Growth on Primary Enrolment

	Primary Enrolment Rate	Total Primary School-age Children (millions)	Additional Primary School Children (thousands)
South Asia	0.807	157.9	11,532
Sub-Saharan Africa	0.555	98.3	4,937
Total			16,469

Table 5:: Background data						
	Total: Number of primary school children (million)	Total: Number of children out of school - of primary age (million)	Median: Net Enrollment Rate (Percent)	Median: Spending per student ($)	Median: Spending per student expressed as a percent of GDP per capita (percent)	Median: GDP per capita (S)
EAP	222.5	8.0	96.1	111.8	10.4	2,309
ECA	20.1	2.7	86.6	174.1	14.3	1,424
LAC	61.0	6.6	90.7	219.9	10.2	3,394
MENA	45.3	8.1	80.2	107.9	7.5	1,631
SA	124.6	33.3	80.7	67.2	15.2	468
SSA	53.6	44.7	55.5	58.8	15.2	413
All	**527.1**	**103.4**	**85.3**	**110.6**	**12.3**	**1,406**

Table 6 : Incremental Resources for Achieving Universal Primary Education by 2015: Selected Countries (in 1999 US$m)
[Gross primary enrolment rate in parentheses next to country]

	OPTION 1 (No-Change Policy)	**OPTION 2** Improvements in Education Quality (a)	**OPTION 3** Improvements in Education Quality + Teacher Salary Adjustments (b)	**OPTION 4** Improvements in Education Quality + Teacher Salary Adjustments + Ensuring Appropriate public budget support for Education (c)
Burkina Faso (40%)				
Level of Spending in 2015	225	291	186	186
Public Resources in 2015	91	91	91	117
Financing Gap in 2015	134	200	95	69
Yearly average 2000-2015				49
Guinea (55%)				
Level of Spending in 2015	58	67	88	88
Public Resources in 2015	35	35	35	38
Financing Gap in 2015	23	32	53	50
Yearly average 2000-2015				39
Niger (30%)				
Level of Spending in 2015	252	238	131	131
Public Resources in 2015	76	76	76	85
Financing Gap in 2015	176	162	55	46
Yearly average 2000-2015				41
Senegal (62%)				
Level of Spending in 2015	335	470	372	372
Public Resources in 2015	181	181	181	279
Financing Gap in 2015	154	289	191	93
Yearly average 2000-2015				62
Total for Four Countries				
Level of Spending in 2015	870	1066	777	777
Public Resources in 2015	383	383	383	519
FINANCING GAP IN 2015	487	683	394	258
Yearly average 2000-2015				191

(a) Improvement in primary education quality : i) Teachers recruited with 10 years of general education plus 1 year of pre-service training, ii) Pupil teacher ratio of 45:1, iii) Resources beyond teacher salaries (administrative and support services, textbooks for pupils and teaching guides for the teachers, in service training activities, student assessment) to represent 40 % of the teacher salary bill. These improvements in conjunction with direct measures to reduce repetition (use of sub-cycles of study with non repetition within each sub-cycles) are expected to bring repetition rates below 10 % in 2010.

(b) Recruitment of new teachers according to a salary scale in which teacher remuneration to represent about 4 times the country's per capita GDP.

(c) The model assumes at least 40% of HIPC resources, and 50 % of education budget for primary schooling.

Table 7: Enrollments in Four African Countries

	No. of children	Enrolment rate	Additional no. of children enrolled for UPE
Burkina Faso	1244003	0.4	746401.8
Guinea	1223956	0.55	550780.2
Niger	1770072	0.3	1239050
Senegal	1509360	0.62	573556.8
Total			3109789