The Costs of Attaining the Millennium Development Goals*

Summary: Using two different approaches, the World Bank estimates that, if countries improve their policies and institutions, the additional foreign aid required to reach the Millennium Development Goals by 2015 is between $40-$60 billion a year. This estimate is consistent with other agencies' estimates of the costs of achieving individual goals, such as those for education and health. By itself, this additional aid will not be sufficient to attain the goals, as many countries will have to reform their policies and improve service delivery to make the additional spending effective.

The World Bank's approach to estimating the costs of attaining the Millennium Development Goals (MDGs) is based on two findings from research and experience in development. First, financial assistance is one of many inputs required to reach the goals. In particular, given the weak links between public spending on, say, health and health outcomes, overall policy reforms, and improvements in service delivery would be at least as important as financial assistance. Second, foreign aid is effective in countries where the policy and institutional environment is conducive to poverty reduction. Thus, if additional financial assistance were available, it should be allocated to those countries that have, or are developing policy and institutional environments in which foreign aid will be effective. These two findings imply that we should be extremely careful in interpreting the resource estimates of the cost of attaining the MDGs. The estimates should not be taken as an amount of money which, if available, would guarantee that the MDGs will be reached. Money is not the only input, or even the most important input. If the aid goes to countries with poor policies and institutions, it is likely to be wasted. The question we are asking, therefore, is the following: If the necessary changes in policies and institutions are forthcoming, how much additional financial resources will be needed to achieve the 2015 goals?

In that spirit, we approach the costs of reaching the MDGs through two routes. In the first route, we focus exclusively on the first goal, namely, reducing income poverty by half between 1990 and 2015. Inasmuch as income poverty is linked to the other targets, such as infant mortality and primary enrolment, achieving this goal will go some way towards achieving the others. The link is stronger the more the actions to promote growth are associated with those to promote human development. If we estimated the costs by adding the costs of achieving each of the goals independently, there would be some double-counting. However, achieving the human-development-related goals will require additional effort that goes substantially beyond what is required for the poverty goal.

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Millennium Development Goals (1990-2015)

1. Eradicate extreme poverty and hunger
   - Halve the proportion of people with less than one dollar a day.
   - Halve the proportion of people who suffer from hunger.
2. Achieve universal primary education
   - Ensure that boys and girls alike complete primary schooling.
3. Promote gender equality and empower women
   - Eliminate gender disparity at all levels of education.
4. Reduce child mortality
   - Reduce by two thirds the under-five mortality rate.
5. Improve maternal health
   - Reduce by three quarters the maternal mortality ratio.
6. Combat HIV/AIDS, malaria and other diseases
   - Reverse the spread of HIV/AIDS.
7. Ensure environmental sustainability
   - Integrate sustainable development into country policies and reverse loss of environmental resources.
   - Halve the proportion of people without access to potable water.
   - Significantly improve the lives of at least 100 million slum dwellers.
8. Develop a global partnership for development
   - Raise official development assistance.
   - Expand market access.
   - Encourage debt sustainability.

In the second route, we take a parallel track, and estimate the costs of attaining the health, education and environmental goals, noting that the achievement of these goals will go a long way towards reducing income poverty. Both routes yield approximately the same estimate for the costs of reaching the MDGs, namely, around $40 to $60 billion in addition foreign aid. As we have argued, to simply add these latter estimates to the former which was focused on the income poverty goal would involve substantial double counting. At the same time they are not alternative estimates of what is necessary to reach the complete set of goals. Nevertheless, taking into account that we have to deal with broad ranges for the estimates, the fact that the two estimates are similar gives some reassurance. We would suggest that, given that some additionality is required, the upper part of the $40-60 billion range is likely to be of greater relevance. We should note however, that greater improvements in policy than those assumed, as well as improvements in other policies by rich countries, such as those for trade, would work to reduce the required resources. The estimate in the Zedillo report of the United Nations of $50 billion in additional financing, embraced by UK Chancellor of the Exchequer Gordon Brown, lies in the middle of this range.

The Poverty Goal: Reduce income poverty by half in 2015

Throughout this exercise, as well as in all the Bank's work on the MDGs, we interpret the goals as applying to each country, rather than only to the global population. We estimate the additional aid required to reach the income poverty goal as follows. First, we identify those countries that are either "on track" to reach this goal using currently-available resources, or countries where additional aid will not make a big difference, since foreign aid is so small compared to the size of their economy (labeled "On Track" countries in Table 1). The remaining 65 countries, "uphill" countries, are the potential recipients of this additional aid. Next, applying the second finding above, we subdivide uphill countries into those with adequate policies and institutions, and those without. Such classification and the related cutoff are always a matter of judgment. We use a composite performance indicator to distinguish between countries with adequate policies that can make effective use of additional funds immediately, and those with less satisfactory policies that would have to be improved if the funds were to be used effectively. This leaves 43 of the uphill countries that could effectively absorb more aid

today, and 22 that would need to improve their policies and institutions before they could benefit from additional aid[1].

The third step is to estimate, for the 43 uphill countries with adequate policies, the additional aid required to reach the poverty goal. We employ a very simple method: first, we calculate the GDP growth rate required to achieve the necessary reduction in poverty[2]; then we calculate the investment required to achieve this GDP growth rate; finally, we calculate the additional aid (given domestic savings rates) required to finance this investment[3]. This procedure yields an estimate of an additional $39 billion per year required for these countries to reach the income poverty goal.

For the remaining 22 countries, we assume that additional aid would be forthcoming only if they improve their policies and institutions. If these countries are able to bring their policies and institutions up to the average of the better-performing countries, then an additional $15 billion per year would be needed to assist these countries in reaching the poverty goal[4]. Thus the additional aid ranges from $39 billion to $54 billion depending on whether the worse performers do not or do improve their policies. If they do not, then the income poverty goal will not be achieved in those countries. The upper end of this range represents an approximate doubling of current levels of ODA ($57 billion in 1999)[5].

Table 1: Additional aid levels required to halve income poverty

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[1] Clearly, this dichotomy oversimplifies, but the key point is that the use of additional aid to reach the goal will depend on the quality of policies and institutions. Using other classifications of policies does not change the broad numbers very much.

[2] This calculation assumes that the distribution of income in the country remains unchanged for the fifteen-year period. Experience shows that (pre-tax-and-transfer) distributions of income generally change quite slowly. Inequality varies substantially across countries, however, and this variation is reflected in the different growth-poverty elasticities across countries. That is, a high-inequality country will generally require more growth to achieve the same poverty reduction as a low-inequality country.

[3] This procedure does not distinguish between private and public investment. If these countries are successful in improving their investment climate, the amount of additional foreign aid needed will decrease. First, such an improvement would work to increase private investment which, in terms of growth, can substitute for aid. Second, the overall productivity of capital in the economy will increase, reducing the amount of additional investment (and hence foreign aid) needed to generate the same growth rate. Note we are presenting the analysis explicitly here in a way which allows for potential improvements in the policy environment and productivity of the economy.

[4] We assume that it will take about five to seven years for these countries to bring their policies and institutions up to the average of the better-performing countries.

[5] Like all model-based estimates, our results depend on the assumptions. In particular, the estimates depend on productivity of capital (expressed in terms of the incremental capital-output ratio, or ICOR) in each country. While we used historical evidence to calibrate this parameter, sensitivity analysis reveals that the additional aid required to meet the income poverty goal could be different if the ICORs were higher or lower. For example, if all countries had an ICOR that was one standard deviation above the mean, the additional aid required would be $115 billion; if they had an ICOR one standard deviation below the mean, the additional aid required would be $12 billion. While neither of these figures is realistic, they remind us of the fact that the calculations in this paper should be treated as representing a range rather than precise point-estimates. And we should recognize that reducing ICORs is generally associated with improving (deteriorating) economic policies.

	Current ODA levels 1999 ($ billions)	Additional ODA required
"On Track" countries	33	--
"Uphill" countries	24	54
Adequate policies and institutions	19	39
Weak policies and institutions	5	15*
Official development assistance	57	54*
Total aid (% of high-income OECD GNP)	0.25	0.49

*assuming improved policies and institutions

There is an analogy between the two scenarios presented here and the HIPC initiative. The HIPC initiative pledged to reduce the debt to all low-income countries, estimated the total cost of this debt-reduction, but then made access to debt-reduction conditional on an adequate policy and institutional framework (as reflected in the Poverty Reduction Strategy Paper). To reach the MDGs, similarly, we calculate that as much as an additional $54 billion would be needed, but access to this financing should also be conditional on adequate policies and institutions. Until the poor-performing countries improve their policies and institutions, the additional cost will be only $39 billion, although in this case the goal would not be reached for all countries. While the other 33 "on track" countries are likely to meet the goals, substantial inroads into poverty in these countries would flow from an increase in their aid to GDP ratios.

These calculations assume that, with the exception of foreign aid, all other international exchanges continue as "business as usual." Specifically, we assume that private capital flows, already quite small in these countries, will not increase as a share of GDP. If instead private capital flows increased by one percentage point faster than GDP, the difference in the aid requirement would be negligible. If private capital flows in the weak-policy countries rose to the average of those with adequate policies, the additional aid required to meet the income poverty goal would be reduced by $0.5 billion.

We also assume that the world trading system will remain essentially unchanged—becoming neither more protectionist nor more open. If the Doha summit produces tangible results, they should include providing greater market access for developing countries. For developing countries as a group, the benefits of this increased market access will be much larger than financial transfers through official development assistance over the period to 2015. Unfortunately, these gains would not substitute for development assistance in helping *all* countries reach the MDGs. The reason is two-fold. First, Africa plays such a small part in world trade (and already has preferential access in certain areas) that the geographic distribution of trade-related benefits favors the high-trading, lower and middle-income countries. A general-equilibrium-model simulation of reducing protection by half worldwide yields a welfare gain in 2015 of about $200 billion for developing countries as a whole. But only $2.4 billion of that accrues to Sub-Saharan Africa, and another $3.3 billion in South Asia outside India. While small, these gains are

not trivial: when combined with the price changes and distributional effects of trade reforms, they would lift an additional 10 percent of Africans out of poverty[6].

Secondly, these low-income countries are too poor to benefit fully from multilateral trade liberalization without aid. To take advantage of market access, they require hefty investments in trade-creating infrastructure, transportation, and telecommunications, as well as investments in trade-related government institutions, such as better customs and tax administration, and overall management of public investment. These in turn require development assistance—"aid for trade". In short, even though it will undoubtedly benefit developing countries by stimulating growth and reducing global poverty, reducing trade barriers is not sufficient to eliminate the need for aid in those countries with the largest income-poverty MDG gap.

Finally, there is the question of whether this $39 - $54 billion in aid, even if accompanied by improvements in policies and institutions, would strain the "absorptive capacity" of recipient countries. There are different ways to look at absorptive capacity. One way is to examine whether there are diminishing returns to aid. One piece of recent research on the growth impact of additional aid calculates that, for countries which have policies and institutions that are among the best of developing countries, a "saturation point"—the point beyond which the growth impact is zero—is reached when aid is around 30 percent of GDP. By contrast, the saturation point for countries with extremely weak policies and institutions is calculated to be around 6 percent of GDP. Applying these estimates to our estimates, we find that for four of the uphill countries with adequate policies the saturation point would be reached. On average, the additional aid will leave the uphill countries with aid-to-GDP levels that are 35 percent of their saturation point. In short, for most uphill countries with adequate policies, absorptive capacity is unlikely to be a problem.

To be sure, these estimates may understate the effect of the absorptive capacity constraint. If there are diminishing returns to aid throughout, the amount of additional aid required to meet the income poverty goal would be higher. However, improvements in donor policies could mitigate this effect. Much of the diminishing returns to aid is the result of congestion effects—too many projects absorbing the limited technical and managerial talent in developing countries. A shift by donors towards simplified and harmonized aid modalities could therefore be an important element in reaching the goals.

We emphasize that we are working to achieve the MDGs country-by-country. This strategy is different from an aid allocation scheme designed to maximize global poverty reduction.

The Education, Health and Environment Goals

[6] This is not enough to offset the increase in population growth, so the number of people living in poverty in Africa would still rise during the period.

As mentioned earlier, we approach the costing exercise using two routes. The first route was to estimate the cost of attaining the poverty goal, recognizing that by reducing poverty, we would also be making substantial progress towards the other goals. In the second route, we put to one side the income poverty goal, and estimate the costs of attaining the health, education and environmental goals, but note that the achievement of these goals will go a long way towards reducing income poverty. We calculate the costs of each of these goals individually. They are closely connected, however, and advances in one will, over time, benefit the other.

Education goal: Universal primary education by 2015

The additional costs of achieving universal primary education by 2015 can be inferred by examining the average (per-pupil) costs of primary education today, and multiplying this cost by the number of primary school-age children not in school. Since this unit cost varies substantially across regions (and across countries within regions), the resulting global estimate varies between $10 billion and $15 billion, depending on whether regional, national or global averages are used. These figures are also close to those obtained by UNICEF in their "minimum global estimate" of $9.1 billion. There is also a suggestion that an international norm of 13 percent of GDP per capita be used as the expenditure on each primary school student. This yields an overall cost of $28 billion, a relatively high estimate.

These estimates represent the sustaining cost of children already in school; they do not necessarily reflect the additional cost required to enroll a child in school. The latter will vary across countries even more than average cost. To help assess these additional costs, we calculate the costs, given some of the complementary policies (including demand-side interventions and increased domestic financing) required to increase enrollment in four Sahelian countries. These calculations yielded an incremental cost of $62 per student, which is close to the sustaining costs in Africa and South Asia. If we extrapolate from these country studies to the population at large in Africa and South Asia, and apply appropriate multipliers to other regions, the implied incremental cost would also be about $10 - $15 billion. This estimate is, of course, not the final word. Currently on-going work aims to calculate the additional cost in all countries that are at risk of not meeting the education goal. Nevertheless, using different methods (average sustaining cost, incremental reform costs, and norms), and taking into account the uncertainty in each of these estimates, we conclude that the annual cost of achieving the education goal will be at least $10 billion and possibly as high as $30 billion.

It is important to note that these estimates are based on the notion that the additional education aid goes to countries that have undertaken the policy reforms associated with increasing primary enrollment. While this may be a different set of countries from those with an adequate overall policy environment, this estimate is consistent in spirit with that for reaching the income poverty goal, namely, that additional aid is predicated on there being a policy and institutional environment where the aid is effective.

Health goal: Reduce infant mortality by two-thirds by 2015

For the health goals, we can identify specific inputs that contribute to reduction in infant mortality, say, and then estimate the costs of delivering these inputs. For instance, oral rehydration therapy, vaccinations, and promotion of breast feeding have all been shown to reduce infant mortality. Similarly, for the goal of reducing infectious diseases, there are specific interventions, such as insecticide-treated bednets for malaria, and the DOTS strategy for tuberculosis, for which unit cost estimates exist. Applying these unit costs to the treatment population could lead to both an over- and an under-estimate of the costs of reaching the health goals. It could be an over-estimate because the diseases are inter-related: tuberculosis spreads much more rapidly in the presence of AIDS; AIDS has an impact on infant and maternal mortality; and malaria kills a large number of young children. At the same time, it could be an under-estimate because of the many "weak links in the chain" going from public health spending to health outcomes. Given the possibility of both an over-estimate and an under-estimate, the overall estimate using this approach may not be far off. In any event, we calculate it to be between $20 and $25 billion per year for all the health-related goals. Again, these unit cost estimates only apply when the policy and institutional environment is conducive to additional health spending being effective. Also, as noted earlier, other factors contribute to health outcomes. In particular, women's sanitation and safe water have been found to influence infant mortality strongly. To the extent that countries make progress on these dimensions, that amount of additional resources needed for health interventions will be lower.

Another estimate of a related goal is that proposed by the Commission on Macroeconomics and Health of the WHO. Their overall estimate of an additional $22 billion in foreign aid lies within this range. It too was calculated by estimating the unit costs of the specific interventions required to reduce avoidable deaths (around $30 - $40 per person per year), and assuming an increase in the national budgetary contribution to health by about 1.5 percent of GDP. Inasmuch as the Commission considered a broader set of health problems than those in the MDGs, the two estimates are not completely comparable. Nevertheless, given the similarity in approaches, it is not surprising that they arrived at similar numbers.

Environment goal: Universal access to water and sanitation by 2015

We estimate the costs of achieving the environment goals (essentially water and sanitation) by looking at a range of estimates, one for achieving universal coverage ($30 billion a year), another for reaching basic levels of coverage ($9 billion). These estimates should be approached cautiously, because there are some who believe that enough resources exist to achieve universal access to water supply—it is just the institutional arrangements that prevent it from being achieved. Similarly, some of the improvements in access to sanitation are likely to be achieved through the implementation of policies in the pursuit of the health goal of reducing infant mortality. Finally, the "City without Slums" program has estimated the cost of providing secure land tenure and upgrading

slums to be $3.5 billion annually. Taking these estimates and their caveats together, we estimate that the cost of reaching the environment goal is between $5 and $21 billion.

The above three estimates yield a rough breakdown of the additional costs of achieving the social goals as follows:

Education	$10 - $30 billion
Health:	$20 - $25 billion
Environment	$ 5 - $21 billion
Total:	$35 - $76 billion

Thus, the second route of calculating the additional costs of reaching the MDGs leads to a range of estimates that encompasses those from the first route (the cost of reaching the poverty goal only was $39 - $54 billion). Especially since the second route was roughly consistent with estimates for individual goals obtained by other agencies (UNICEF and WHO in particular), we conclude that a global estimate of the additional aid required to attain the MDGs is somewhere between $40 billion and $60 billion a year.

While we have taken the two sets of estimates as alternative ways of costing the MDGs, we should note that they are not wholly substitutable. Since the contribution of growth to reducing infant mortality and increasing primary enrolment, while statistically significant is also numerically small, the overall estimate of the costs of achieving the MDGs is probably near the upper end of the range. At the same time, improvements in policies and advances in market access could take us to the middle of the range.

Furthermore, lest we read too much into the fact that these two approaches yielded roughly similar estimates, it should be noted that they represent somewhat different perspectives on the process of achieving the goals. The first approach considers economic growth as the main driver, and estimates the additional costs by calculating the additional savings required to finance the investment that will lead to the desired income growth. The second approach looks at the specific interventions required to achieve the goals of education, health and the environment. To the extent that improvements in education, health and the environment lead to faster economic growth—and there is substantial evidence that they will—the second approach can also be associated with a growth-driven strategy to achieve the goals. Similarly, the additional growth in the first approach increases public resources that could, and will, be spent on education, health and environmental interventions such as those in the second approach. Thus, the ultimate differences between the two approaches may not be so great, but the fact that they start from different premises should not be overlooked.

Finally, we must reiterate the point made at the beginning, namely, that additional financing is one of many inputs required to reach the MDGs. Money alone will not guarantee that we will reach the goals. Policies and institutions are fundamental to

progress on poverty reduction in all its dimensions. When countries have the appropriate policies and institutional arrangements that will make additional aid effective, then money can play an important if not critical role in accelerating progress towards the goals. What is needed to realize this international commitment is for all members of the global community to accelerate their efforts: for the 22 or so uphill countries to improve their policies and institutions; for the developed countries to relax trade barriers and better coordinate aid; and for donors to increase financial aid by about $40 - $60 billion annually.