



Costing MDG Achievement in Peru and Policy Implications: A Play in Three Acts

Gustavo Yamada and Juan Francisco Castro
Economics Department and Research Center
Universidad del Pacífico, Lima, Peru

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1. The MDG Framework and the Development Agenda

- In September 2000, all country members of the United Nations (UN) signed the Millennium Declaration, through which they committed to achieve, by the year 2015, a set of goals and quantitative targets related to poverty reduction, hunger, malnutrition, education, gender equality, infant and maternal mortality, among others, known as the Millennium Development Goals (MDGs).
- All donors and multilateral organizations are increasingly using this MDG framework to organize their aid programs. Many projects and policies are now screened against this background and should answer questions such as which MDG are addressing, how, and whether they are the most cost effective interventions to attack the problem.



1. The MDG Framework and the Development Agenda

- Most importantly, developing countries themselves should believe in the MDG framework and appropriate it (with adaptations to specific country circumstances) for short and long term planning and design of economic and social policies aimed at addressing the most basic development problems.
- Peru has shown its commitment to the achievement of MDGs. The “National Accord” with 31 state policies was signed by all political parties and civil society institutions in 2002. Policies on its Equity and Social Justice chapter match closely with the MDGs. The current Garcia Administration explicitly recognized MDGs as goals for Peruvian social sectors. It has quantified specific targets for its 5-year government period such as 10 p.p. reduction in national poverty (from around 50%) and 5 p.p. of reduction in child chronic malnutrition (from around 25%).



1. The MDG Framework and the Development Agenda

- Peru is lacking a well-established institutional framework to undertake long term policy planning, specially in the social sectors. An old-fashioned National Planning Institute was closed in the early 90s and has not been replaced yet (a Law creating the Strategic Planning Center was approved in 2003 but has not been implemented so far). There are plans to strengthen an Interministerial Commission on Social Affairs and pilot efforts to implement results-oriented budgets aimed at focusing policies and programs at producing tangible social improvements.
- The international cooperation and the Peruvian academia has helped to fill this gap from time to time. Our projects regarding MDGs in Peru have been sponsored by the local UNDP, in the context of producing the progress report for MDGs in 2004; the UNDP regional office and IDB headquarters, for a regional project on costing MDGs; and by the PEP research network.



2. The Analytical Contribution of the MDG Framework

- The wide range of aspects involved in the MDGs, reflects the shift towards a broadened concept of poverty, and the fact that all these issues must be taken care of simultaneously, point out the relevance of promoting a comprehensive approach and a coordinated strategy for reducing poverty.
- The MDG framework can be viewed as an important step towards a consensus regarding the minimum set of arguments that a social planner's loss function must include, specially when considering inter-temporal difficult choices between short term poverty alleviation and long term poverty reduction.



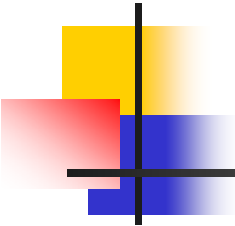
2. The Analytical Contribution of the MDG Framework

- Despite this, MDG assessment has been usually conducted on a sectorial basis, estimating the future path of each indicator as a function of its past evolution, or via structural models that account for a limited set of determinants, typically taking other MDG indicators as given. Thus, MDG prediction and costing could be biased because of the failure to consider the interactions among policy interventions and indicators.
- Therefore, it is crucial to consider synergies among MDGs in order to have a more precise estimation of costs involved and to identify better policy interventions. We have stressed this feature along the three research projects undertaken so far.

MDG Indicators for Peru

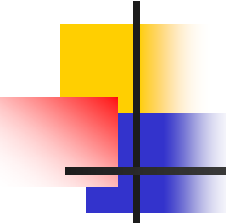
Indicators	1991	Base Year (2004)	2015 (Target)
MDG 1: Proportion of population below \$1 (PPP) per day	6.6	3.7	3.3
MDG 1: Proportion of population below \$2 (PPP) per day	26.1	17.4	13.0
MDG 1: Extreme poverty headcount ratio (% of population below the national extreme poverty line)	23.0	19.2	11.5
MDG 1: National total poverty headcount ratio (% of population below the national total poverty line)	54.5	51.6	27.3
MDG 2: Primary completion rate (% 11-17 year-old pupils that completed primary education).	75.1	89.5	100
MDG 2: Primary completion rate at normative age	22.7	56.8	100
MDG 3: Gender equality: ratio of girls to boys in primary education	98.54	95.0	100
MDG 3: Gender equality: ratio of girls to boys in secondary education	94.47	92.0	100
MDG 4: Under-five mortality rate	81	34	27
MDG 7a: Proportion of population with sustainable access to an improved water source	63	75	88
MDG 7b: Proportion of population with access to improved sanitation	54	56	78

Source: ENAHO 2004, ENNIV 1991, ENDES 2000.



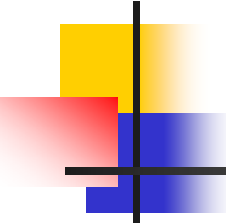
Act I: Connecting MDGs and Costing Their Potential Achievement in a Partial Equilibrium Context

- Up to 2003, attempts to simulate and cost MDG achievement in Latin America were focused on MDG1 (monetary poverty). UNDP, ECLAC, and IPEA (2002) was a regional project with cross-country comparisons of different combinations of economic growth paths and income redistributions schemes consistent with achieving MDG1 in LAC.
- Beltran, Castro, Vasquez and Yamada (2004) was a first attempt to build on the work of UNDP (2002) to incorporate the other MDGs, in the case of Peru, and simulate their future trajectories simultaneously. We used microeconomic estimations based on household data and administrative records to capture the potential impact of interventions in education, nutrition, infant and maternal health, in addition to other socioeconomic variables, including household income (main link between the macro environment and the private demand for social sectors).



Act I: Connecting MDGs and Costing Their Potential Achievement in a Partial Equilibrium Context

- With these empirical coefficients, we ensembled a simulation model which linked all social sectors to capture potential synergies between indicators. For instance, education improvements influenced with some time lag the nutrition and health indicators through the parents' educational levels.
- This simulation model was capable of estimating the future value of MDG indicators, with and without further policy interventions. All the simulations showed the need for further policy interventions to increase the chance to meet the MDGs on time, even with rather high economic growth rates. A limitation of this first model was the assumption of exogenous macroeconomic scenarios of economic growth.
- Under a moderate scenario with an average growth rate of 5% per year for total GDP up to 2015, the Peruvian government would need to invest a total of 1.4% of GDP per year in order to increase the chance of achieving the first five MDGs.



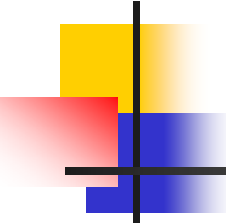
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- Specifically, 0.7% of GDP each year should be devoted to additional social investments and the remaining 0.7% of GDP per year would go to short-term income transfers aimed at improving directly the income distribution through programs such as conditional cash transfers, which also monitor human capital accumulation for long-term poverty reduction .
- The model also showed that an optimistic scenario for the Peruvian economy with a 7% average rate of growth continuously until 2015 would make likely the achievement of the poverty goal (MDG1) without requiring any significant program of direct cash transfers. However, all other additional policy interventions previously identified in the social sectors will still be needed to increase the chance to meet the other social MDGs, demanding 0.5% of GDP in additional resources every year.



Act I: Connecting MDGs and Costing Their Potential Achievement in a Partial Equilibrium Context

- Besides the aggregate cost estimates, based on an integral model with synergies among sectors, one critical finding of this first work was the extremely important role played by the increased access to water and sanitation facilities for health, nutrition and education improvements. Other policy interventions identified with relatively low costs were: prenatal controls, literacy programs, school breakfasts and the enhancement of basic health clinics.
- Our work did not want to replace proper impact evaluation at the micro level when assessing specific interventions, but tried shed light on the potential interventions to look at for policy guidance from a MDG perspective and the aggregate cost for the society in embarking in an active campaign for MDG achievement.



Act I: Connecting MDGs and Costing Their Potential Achievement in a Partial Equilibrium Context

- Thanks to the opportunity opened by a UNDP-WB-IDB regional project to assess MDG costing in a general equilibrium context, we were able to confirm some of our initial findings and explore further issues. Castro and Yamada (2006) used a computable general equilibrium (CGE) model developed by Loftren and Bonilla (2006) and adapted for microsimulations by Vos (2005), in order to assess whether the MDG achievement in the Peruvian case would cause any macroeconomic disruptions which would make it unfeasible to pursue.
- The model required a specially constructed Social Accounting Matrix (SAM) and standard technical coefficients with Peruvian data, in order to calibrate a CGE model for the economy. Loftren and Bonilla added an MDG block so that the model was capable of finding future trajectories for social MDGs in a general equilibrium context. However, average outcomes were produced and a representation of the income distribution was needed. Therefore, microsimulations with actual Peruvian income distribution data (ENAH0 2004) were done to estimate the potential evolution of poverty up to 2015.



Act II: Connecting MDGs and Costing MDG Achievement in a General Equilibrium Context

- This CGE model showed that in a base scenario with economic growth of 4.8% per year (this time, fully consistent in a general equilibrium context), the additional government spending needed to increase the chance to meet the social MDGs would be 0.95% of GDP on average every year. This cost would be 40% higher if goals were pursued individually without taking advantage of inter sector synergies explained before. However, this economically feasible scenario did not allow the potential fulfillment of the national poverty goal.
- This model also worked out in much greater detail the economics and mechanisms behind the enrolment and graduation through the education cycles, concluding that an expansion of educational services would help guarantee a 96% of completion of the primary cycle with only one year of delay by 2015. Given fiscal discipline commitment in Peru, enshrined by the Prudence and Fiscal Responsibility Law, the main financing mechanism of these additional social investments would have to be higher tax revenues, increasing the tax burden ratio accordingly.



Act II: Connecting MDGs and Costing MDG Achievement in a General Equilibrium Context

- This CGE model also indicated that an alternative scenario of 7% economic growth would make more likely achieving the national poverty goal. Moreover, the additional private investment undertaken by the households in social development, induced by the rise in private income, would reduce the fiscal effort required for pursuing the social MDGs. The average additional investments would amount to 0.49% of GDP per year, figure almost identical to the one estimated in Beltran et.al. (2004) in a partial equilibrium context.



Act III: Accounting for the feedback between education, economic growth and poverty reduction

- In the last twenty years the positive role played by improvements in education attainment (human capital accumulation) in contributing to economic growth has been revisited both at the theoretical level (Lucas, Romer and others) and empirical work (Barro, Xala-i-Martin and others). Since these two issues are neatly connected in the MDG framework through MDG2 (education) and MDG1 (monetary poverty), it was a natural step further to link them analytically and empirically within the MDG structure. Yamada, Castro, Beltrán and Cárdenas (2007) have focused on this issue in detail (discussing different levels of educational attainment beyond primary), leaving the other MDGs aside.
- For this, we built a model that accounts for the potential feedback between schooling performance, the accumulation of human capital and long run GDP growth, and link these results with poverty incidence.



Act III: Accounting for the feedback between education, economic growth and poverty reduction

- The model proposed comprises four different blocks:
 - (i) a macro block (which connects educational attainment with aggregate GDP growth via the accumulation of human capital using an extended version of Lucas(1988) model);
 - (ii) an education block (which involves specific functional forms relating education indicators with a set of determinants based on results that stem from micro-econometric estimations using Peruvian household data);
 - (iii) a poverty block (which links GDP growth and changes in the Gini coefficient with the incidence of monetary poverty in line with the accounting model proposed in UNDP et. al. (2002)); and
 - (iv) a costing and resource constraint block (which specifies cost functions for specific policy interventions identified in (ii), and links these to a planner budget constraint).



Act III: Accounting for the feedback between education, economic growth and poverty reduction

- With this, we pursued a dual objective: (i) estimate the gains, in terms of potential increased GDP growth and poverty reduction, that could stem from intervention leading to improvements in enrolment and graduation rates within the education sector; and (ii) discuss which type of educational services are to be considered if we seek improvements in enrolment rates per se, vs. improvements in households' income generation potential, being the latter a critical element to be taken into account when designing intervention in the educational sector.
- Our simulations revealed that with additional funds which amount, on average, to 1% of GDP each year, expansions in the provision of educational services in all three levels could add, by year 2015, an extra 0.95 and 1.70 percentage points in terms of long-run GDP growth and permanent reduction in poverty incidence, respectively.



Act III: Accounting for the feedback between education, economic growth and poverty reduction

- Regarding the second objective, our results showed that in order to engineer interventions in the educational sector so as to transfer households the necessary assets to attain a larger income generation potential in the long run, we need to extend the original set of MDG indicators to account for access to higher educational levels besides primary. In fact, the gains (in terms of added GDP growth and poverty reduction) would only marginal if we limit ourselves to the provision of education services related to the primary cycle.



3. Conclusions, main policy implications and avenues for further research

- The three research efforts discussed above provide some important policy implications regarding MDG achievement in Peru and the potential costs involved.
- Under a moderate GDP growth scenario of 5% per year up to 2015, partial and general equilibrium analysis reveal that additional resources required to foster MDG achievement (in terms of primary education, nutrition, infant and maternal health and access to improved water and sanitation services) would be between 0.7% and 0.95% of GDP each year. Such a growth rate, however, would not suffice to reach MDG1 when measuring poverty using the national poverty line.
- In fact, a 7% sustained GDP growth rate proves to be an important pre-condition to cut national poverty by half by year 2015. This result repeats itself in all three “acts” and even in the one that relies on a microsimulation methodology to account for the full distribution of income.



3. Conclusions, main policy implications and avenues for further research

- In addition, and as confirmed by the results provided in the first two “acts”, growth itself would not allow to achieve the rest of MDGs: even under this more optimistic growth scenario, additional policy interventions (providing more education, health and water and sanitation services) are required, and these imply additional resources that amount to 0.5% of GDP each year.
- Finally, the third “act” suggests an answer to the question of whether the MDG framework can provide, by itself, an engine to foster and sustain the so yearned 7% growth rate. The answer is yes: education, and we believe MDG2 plays a crucial role in this sense by providing social planners with a target aimed at enhancing households’ permanent income generation potential.



3. Conclusions, main policy implications and avenues for further research

- In addition, this analysis has revealed that for a middle income country like Peru, education matters but not only at the primary level. Secondary and tertiary levels deserve policy priority too because of their potential role in enhancing economic growth. Therefore, and if access to these additional levels of education is secured in a progressive (more equitable) way, Peru's prospects of reducing poverty would be greatly improved.
- Given the above, further research could be devoted to the implementation of our last model within a general equilibrium framework that should also account for the evolution and interrelations between MDG indicators related to nutrition, health and access to improved water and sanitation. In this way, we would be able to account for the synergies between MDG indicators in a more comprehensive manner and be in a better position to understand how policy actions taken today will impact on tomorrow's poverty.