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Trade-offs and Payoffs of Investing in Human Development

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Summary. — We apply a general equilibrium model to quantify economic and social payoffs from investing in human development. The analysis revolves around scenarios of public spending that allow four developing countries to meet targets of the Millennium Development Goals (MDGs). Public spending rises significantly to meet the targets by 2015. The ultimate effect on aggregate demand depends on the macroeconomic trade-offs of the financing source. The supply effect is that production factors accumulate and productivity rises as larger numbers of better-educated workers become employed. The magnitude of the GDP growth gains and options to magnify them after 2015 are identified.

Key words — general equilibrium, macroeconomic analyses of human development, Millennium Development Goals, Latin America, Uganda and Yemen

1. INTRODUCTION

Member states of the United Nations resolved to pursue the achievement of the Millennium Development Goals (MDGs) in 2000. They set concrete targets to be met by 2015, aiming at a future of less poverty, hunger and disease, better education, gender equality, greater prospects of survival for children and mothers, and a more sustainable environment. Much progress has been made since then, but this has been uneven across and within countries (United Nations, 2012). Some countries have witnessed human development setbacks as a result of the global financial crisis (United Nations, 2011, Box 1.3).

Business as usual is not proving enough to achieve the pace of progress necessary to meet international agreed development goals by 2015 in many developing countries. Additional policies are needed. Studies for 27 developing countries, documented in Sánchez and Vos (2013) and Sánchez, Vos, Ganuza, Lofgren, and Díaz-Bonilla (2010) estimate that to be put on full track to meet a set of MDG targets by 2015, countries would have needed significant stepping up of public spending and more rapid and sustained economic growth. Achieving more rapid economic growth in the midst of a depressed world economy is proving a significant challenge for many developing countries. And, as these studies also show, given existing financing constrains, accelerated human development investments needed up to 2015 would overstretch countries' public finances with potential short-term macroeconomic hardships that might undermine the badly needed economic growth.

In defining the human development investments they should pursue, governments need to estimate not only public-spending requirements and the macroeconomic implications of financing them, but also the potential social and economic rewards. The aforementioned studies provide rigorous estimates for simulation periods until 2015, the year by which most MDG targets are expected to be met. Nonetheless, estimations of how soon long-term rewards of human development interventions can materialize and the degree of their significance are less known. Gains from investing in human development take time to materialize. Capital may be accumulated relatively quickly but it takes time for better education and health outcomes to translate into social outcomes and human capital that produces higher labor productivity (and economic growth), if only because children need to go through one or more educational cycles and improved child and maternal health care today will pay off in terms of healthier students and workers several years from now. Equally important, countries need to identify the set of policies that can give coherence to the multiple tasks of ensuring that such long-term rewards can effectively materialize, which implies also sustaining sound human development levels, economic growth, employment creation, and macroeconomic balances.

Understanding the potential long-term rewards of human development investments and complementary policies necessary to ensure that they will materialize and at what macroeconomic costs is crucial to define national development strategies. This understanding is relevant to the post-2015 development agenda, a process led by the United Nations to help define the future global development framework that will succeed the MDGs. Against this backdrop, this paper aims to answer two fundamental questions: What economic and social gains associated with investments in human development made in the context of pursuing MDGs can developing countries realistically expect? What other policies would contribute to ensure that such gains do materialize?

Finding coherent and rigorous answers to these questions requires the use of an economy-wide modeling framework. The aforementioned studies for 27 developing countries apply the *Maquette* for MDG Simulations (MAMS) in order to assess feasible financing strategies to achieve a number of MDG targets by 2015. MAMS is a dynamic–recursive, Computable General Equilibrium (CGE) model (Lofgren, Cicowiez, & Díaz-Bonilla, 2013). It is innovative in the sense

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that it comprises a set of basic human development objectives related to poverty reduction, primary education, maternal and child mortality, and access to safe water and basic sanitation.

Policy efforts to meet these human development objectives, which are not restricted to the social policy arena, involve the entire economy through a number of transmission mechanisms that can only be captured in a general equilibrium framework. For example, poverty reduction efforts that run from, say, cash transfers, require financing by the government and are expected to affect household consumption, all of which can trigger additional effects through production, employment, wages, and prices. Expansion of social services in education, health, and basic sanitation also requires additional spending efforts that may strain public and private budgets. Adjustments in taxes and public and private credit demand to finance those spending needs, in turn, will have repercussions throughout the economy. Better education and health outcomes are expected to yield, over time, positive spinoffs on productivity and incomes. This range of transmission mechanisms justifies the use of a CGE model such as MAMS to assess the impacts and costing of human development investments.

The majority of existing applications of MAMS with country datasets focus on assessing financing strategies to achieve MDGs by 2015, without looking beyond that target year in terms of determining whether there are economic payoffs from past MDG investments and what conditions countries should meet to maintain sound human development standards. This paper addresses such longer-term perspective and in doing so it makes some necessary extensions to MAMS and applies it with datasets for Bolivia, Costa Rica, Uganda, and Yemen. Uganda and Yemen are low-income countries and Bolivia is a lower-middle income country, according to the World Bank's country classification by income. These countries have relied heavily on foreign aid to finance human capital investments. Costa Rica, being an upper-middle income country, is less likely to receive foreign grant aid from donors to support its government budget.

We describe MAMS and the extensions made to one of its functional specifications in Section 2. The subsequent section addresses data and model calibration issues that are relevant to understand how MAMS is applied using datasets for the four countries. A baseline scenario generated for each of these countries is also described in Section 3. Section 4 focuses on the analysis of policy scenarios that are compared with the baseline scenario to quantify potential gains from human development investments and to identify certain conditions that, once met, would contribute to secure these gains and magnify their impact over time. The final section concludes and elaborates implications for policy.

2. MODELING FRAMEWORK

MAMS is used to simulate various scenarios of human development investments and their financing. The use of a dynamic–recursive CGE model such as MAMS is justified because the pursuit of a strategy toward the achievement of development goals will likely have strong effects throughout the economy. Such strategy would affect demand and supply in the different markets (goods and services, factors, and foreign exchange), and the related adjustments may imply important trade-offs throughout the period for achieving the development goals and beyond. There can also possibly be synergies between the different goals to be taken into account. Such synergies may influence the required expansion of services (for example, greater coverage of safe water supply may reduce the need for health service expansion) or the speed at which the various MDGs are achieved.

The strategy adopted to finance the required public spending to pursue development goals also affects the outcomes. For example, foreign financing may induce real exchange rate effects while financing through domestic taxes could reduce private consumption demand, among other things, and domestic borrowing could crowd out credit resources for private investment. No doubt, increased public spending is essential for meeting human development goals, but adjustments in the real exchange rate, real wages, and other relative prices may raise the unit costs for meeting these goals along with the costs for other sectors, or discourage exports, thereby widening the external deficit that needs to be financed, and so on. Productivity gains accruing exclusively from reaching higher human development standards will take some time to materialize and are thus unlikely to immediately trigger their full impact on economic growth.

MAMS takes into account these complex interactions. It is particularly a useful tool to assess the short-run macroeconomic trade-offs of financing human development goals and see if these would offset economic and social gains that can potentially be reaped in the longer-run. As explained in length in Lofgren *et al.* (2013), the model has been built from a fairly standard CGE framework with dynamic–recursive features but compared to other CGE models it innovatively incorporates a special module which specifies the main determinants of non-poverty MDG achievement and the direct impact of enhanced public expenditures on MDG-related infrastructure and services (see Table 1). It considers specific targets for achieving the non-poverty goals of universal primary education (MDG 2), reducing under-five and maternal mortality (MDGs 4 and 5) and increasing access to safe water (MDG 7w) and basic sanitation (MDG 7s). The indicator used for MDG 2 is not just enrollment but the net (on-time) primary completion rate, which is a function of student behavior (enrollment, promotion, graduation)—since most developing countries have already achieved decent levels of enrollment in primary education. A target is set for completion on time, without repetition, for the relevant age cohort for primary school. Student behavior, in turn, depends on the quality of education (service delivery per student), household consumption per capita (as indicator of living standard), income

Table 1. *Determinants of non-poverty MDGs*

MDG	Service delivery	Household consumption per capita	Wage incentives	Public infrastructure	Other MDGs
2: Primary education	×	×	×	×	4
4: Under-five mortality	×	×		×	7w, 7s
5: Maternal mortality	×	×		×	7w, 7s
7w: Access to safe water	×	×		×	
7s: Access to basic sanitation	×	×		×	

Source: Lofgren *et al.* (2013, p. 223, Table 4.15).