

Public Policies for Human Development

Achieving the Millennium Development Goals in Latin America

Edited By

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9

Honduras

Maurizio Bussolo and Denis Medvedev

Introduction

Over the past ten years, Honduras has achieved important progress in terms of education attainment and provision of basic social infrastructure. This augurs well for the possibility of accomplishing the Millennium Development Goals (MDGs). Yet, compared with other countries in the Latin America and Caribbean (LAC) region, Honduras lags behind in growth and remains off track in terms of achieving the goal of halving poverty by 2015 (MDG 1). Without a significant acceleration in per-capita growth rates over the next decade, attaining the MDGs is likely to be very difficult because growth and MDG achievements reinforce each other. Improved health and educational outcomes can increase productivity, with positive synergies when service access improves simultaneously in different areas (health, education, water and sanitation). At the same time, growth and higher incomes can generate increased funding for services and raise service demand, creating a virtuous circle of growth and MDG achievement.

Improving service delivery is only one part of the challenge—it is also necessary to consider demand-side incentives and capabilities. In a stagnant economy with virtually no growth in per capita income, as Honduras has been in the last decade, large programmes aimed at expanding social services may not work as effectively as in a faster-growing economy. In fact, the need to finance investments in MDG-related services may crowd out investment and growth in other parts of the economy. Progress on the MDG front may also be slowed by the increasing marginal resource requirements as governments reach out to populations that are more difficult to reach physically due to geography (for example, populations residing in remote areas with underdeveloped infrastructure) and/or that are less capable of making use of services due to low incomes and a low level of initial MDG attainment. Inefficiencies in service delivery due to rapid scaling up may add to incremental resource requirements.

In this chapter, we explicitly consider the above mechanisms and, by using the MAMS framework that all country studies in this volume have used, provide estimates of the resources required to reach the MDGs and evaluate different strategies for their achievement. The chapter is structured as follows. The next section describes the current macroeconomic and MDGs performance in Honduras. A brief assessment of the forthcoming challenges for the expansion of social services and their (partial equilibrium) costs estimation are also provided. The third section describes the methodology and data. The subsequent section discusses alternative model-simulated scenarios. In particular, it contrasts a baseline simulation where Honduras continues on current trends and does not achieve the MDGs against a scenario where increased public social spending helps reach the full set of MDGs. The final section offers concluding remarks and policy recommendations.

Macroeconomic performance and existing progress towards the MDGs

Recent macroeconomic trends

Between 1990 and 2004, Honduras' real GDP grew at an average rate of 3.3 per cent per year, slightly faster than during the 1980s but barely above population growth. As shown in Table 9.1, this has resulted in virtually no improvement in real per-capita household consumption expenditure between 1990 and 2000. Growth in government expenditures, both recurrent and capital, has been constrained by the slow growth of the economy, current account financing needs and the public debt overhang. From the 1980s to 2004, total debt has hovered above 80 per cent of gross national income and servicing this debt cost about one third of total exports of goods and services. Thanks to the Highly Indebted Poor Countries (HIPC) initiative, the debt burden has lessened significantly after the country reached HIPC completion point in 2004. The debt situation is likely to continue improving, which should free up resources for the large infrastructure and social spending needs in order to meet the objectives of the Poverty Reduction Strategy (PRS) and the MDGs.

On top of this already limited room to manoeuvre, the government of Honduras also has had to respond to large adverse shocks such as the 1994 internal energy crisis¹, hurricane Mitch in 1998 and several cyclical declines in coffee prices. On the positive side, remittances sent by Hondurans working abroad have been a steadily increasing and important source of financing for the economy. In 2004, remittances represented about 10 per cent of GNI, up from the 4 per cent yearly average of the 1990s. The country has also joined the DR-CAFTA (Dominican Republic-Central American Free Trade Area) agreement with the US and the resulting increased integration with this important commercial partner is likely to provide increased export opportunities and potentially larger inflows of FDI.²

Table 9.1 Honduras: Macroeconomic performance, 1980-2004

	1980	1990	2000	2004
GDP at market prices (millions 2000 US\$)	3,393	4,313	5,963	6,798
Household consumption per capita (units, 2000 US\$)	680	633	652	714
Population (millions)	3.57	4.87	6.46	7.13
General government consumption (millions 2000 US\$)	617	727	944	877
Gross investment, public sector (millions 2000 US\$)	313	242	350	293
<i>Period averages</i>		1980-1990	1990-2000	2000-2004
GDP (growth rate)		2.4	3.3	3.3
Household consumption expenditure per capita (growth rate)		-0.7	0.3	0.6
Population (growth rate)		3.2	2.9	2.5
General government consumption (growth rate)		1.7	2.6	-1.8
Gross investment, public sector (growth rate)		-2.5	3.8	-4.4
General government Consumption (% of GDP)		13.5	11.3	13.5
Gross Investment, public sector (% of GDP)		7.7	8.3	5.8
Trade (% of GDP)		60.3	86.6	92.5
Agriculture, value added (% of GDP)		21.6	20.7	13.3
Total debt (EDT)/GNI		81.9	118.6	86.0
Debt service (TDS)/Exports of goods and services		26.9	26.8	12.0
Remittances received/GNI		0.6	3.9	10.0

Source: World Bank, World Development Indicators.

Table 9.1 further shows that Honduras openness has increased considerably, up to 90 per cent on average in 2000-04 from the already high average level of 60 per cent in 1980-90, and that at the same time, agriculture is becoming a smaller (but still relevant) share of the nation's GDP.

Progress towards the MDGs

Honduras is the third poorest country in LAC after Haiti and Nicaragua. In 2004, its per capita GDP reached a mere \$952 (at constant 2000 prices), compared with \$3,935 on average for the region as a whole. More than 64 per cent of the country's population lives below the national poverty line, while almost 45 per cent are in extreme poverty (Table 9.2). Measured on the basis of the international poverty line of \$1 PPP per person, per day, the poverty headcount rate is 26 per cent in 2004. Although these poverty rates are high by both international and regional standards, it should be acknowledged that Honduras has made important strides towards poverty reduction since 1990, particularly when considering the rather anaemic pace of growth in per-capita income and consumption. This suggests that growth in Honduras, albeit slow, has been quite pro-poor over the last decade and half. The performance on other MDGs has been similarly encouraging (Table 9.2), although nearly all indicators remain substantially below the averages for LAC.³

Table 9.2 Honduras: Progress towards the MDGs

MDG and related indicator	Honduras		
	1990	2004	2015 Target ^a
MDG 1: People living on less than \$1 (PPP) a day (% of population)	38	26	19
MDG 1: People living below the national poverty line (% of population)	84	65	42
MDG 2: Primary completion rate (% of relevant age group) ^b	65	76	100
MDG 4: Under-five mortality rate (per 1,000 live births)	59	31	24
MDG 5: Maternal mortality rate (per 100,000 live births)	280	108 ^c	70
MDG 7a: Access to an improved water source (% of population)	73	82	87
MDG 7b: Access to improved sanitation facilities (% of population)	66	77	83

Source: Sistema de Información de la Estrategia para la Reducción de la Pobreza (SIERP); available at www.sierp.hn.

^a These are the targets as defined in the UN Millennium declaration. The Government of Honduras, on the other hand, has set more or less ambitious targets for several indicators. For example, the water and sanitation coverage is to be expanded to 95 per cent of the population, significantly exceeding the MDG of improving access by one-half. Also, the child mortality rate target is set slightly above the MDG definition at 24 instances per 1000 live births.

^b Corresponds to the net completion rate.

^c 2000 value.

Several positive signs have been recorded for the education goal: the literacy rate among the young has increased from 79.7 per cent to 85.5 per cent between 1990 and 2001 and net enrolment rate for primary education reached 89.3 per cent in 2004. Additionally, no apparent gender gap is recorded in the data for primary education with boys and girls having almost identical access and completion rates. These positive trends are, however, not sufficient for the achievement of universal primary education completion.

Despite this progress, a number of studies question the quality of education received by many Honduran pupils and the efficiency public education spending. For example, World Bank (2001) cites a study assessing language and math skills in the third and fourth grades of education, where, out of twelve Latin American countries participating in that study, Honduras ranked last in language and next-to-last in mathematics. World Bank (2004) claims that recent expansion in public spending on primary education was accompanied by declining efficiency: even though spending on primary education per student increased from \$89 in 1998 to \$151 in 2002, two key education achievement indicators—the sixth grade completion rate and test scores—have been stagnant or decreasing over the same period. Finally, De Jong and others (2006)

report that only 10 per cent of third-graders in Honduras attain proficiency in language and mathematics.

In health, the under-five mortality rate decreased from 59 to 31 per thousand live births and the infant mortality rate was reduced from 47 to 23 per thousand between 1990 and 2005-06. While data inadequacies do not permit a precise assessment of the evolution of maternal mortality, the available survey results suggest that considerable progress has been achieved: the maternal mortality rate was reduced from about 280 (per 100 thousand) in 1990 to around 108 in 2000.⁴ The percentage of childbirths assisted by specialized personnel in health institutions follows a fluctuating but upward trend, rising from 45.6 per cent in 1990-91 to 61.7 per cent in the 2001. Although not large, there still exists a gap between the shares of urban (85.5 per cent) and rural (80.7 per cent) mothers receiving prenatal control. This gap is much larger for medically assisted childbirths: in 2001, 82.4 per cent of the childbirths in the urban areas took place in institutions with specialized sanitary personnel, as opposed to only 37.5 per cent in the rural areas.

The observed improvements in health indicators can be attributed to various measures adopted to promote the delivery and efficiency of health services—such as programmes aimed at expanding ambulatory and hospital care and at strengthening the country's epidemiologic capacity to respond to emerging and other infectious diseases. Honduras has also initiated a programme to improve maternal-infantile health, which includes preparing medical protocols to regulate the sector delivering specialized maternal-infantile health services, the expansion of the services of the Integral Care to Childhood (*Atención Integral a la Niñez*) network, and the implementation of a programme for the monitoring and analysis of maternal and child deaths. However, additional progress is likely to require an increase in the coverage of currently under-served rural areas and the provision of more advanced (and more expensive) medical services administered by highly skilled health professionals. The rapid pace of reductions in infant and child mortality rates between 2001 and 2005-06 bodes well for the achievement of MDG 4, but continued progress is conditional on maintaining the recent growth of public health expenditures, which expanded at an annual average rate of 11.7 per cent between 1999 and 2005 (measured in constant lempiras). If this growth is not sustained, additional inroads in improving health outcomes are likely to be minor.

National coverage of the population with access to potable water increased from 73 per cent to 82 per cent between 1990 and 2004, while sanitation coverage increased from 66 per cent to 77 per cent. However, large disparities in coverage are observed across rural and urban areas, and even across large and smaller cities. In addition, Honduras faces serious challenges in reaching its ambitious targets for enhancing coverage given of the high population growth and the low efficiency of delivery mechanisms. According to official forecasts,

reaching a 95 per cent coverage rate for water and sanitation in 2015 (a target which is above that set by the Millennium Declaration) means providing access to drinking water for an additional population of 2.6 million in total—1.2 million in rural and 1.4 million in urban areas—and supplying sanitation services to 3.5 million in total (of which 1.3 million would live in rural areas and the rest in urban ones). Although the size of the investments required is large, the government realizes the importance of starting these as soon as possible to start filling out existing gaps and taking advantage of the health and other benefits generated by universal access to these services.

How much will it cost to achieve the goals?

Concerned with the limited progress on many MDG indicators, the government of Honduras, in collaboration with civil society organizations and the international donor community, has commissioned a study to quantify the required additional resources and identify opportunities for increased efficiency in the allocation of public resources and external aid. In June 2004, a Consultative Group started planning and evaluating costs of programmes in six sectors: Education, Health, Agro-Forests, Water and Sanitation, Infrastructure, and Security and Justice. This Group also realized that no sector programme, no matter how comprehensive and well thought through, could succeed in a deteriorating economic environment and decided to include in the planning strategy some key cross-cutting issues, such as economic growth, macroeconomic management, trade and competitiveness, and decentralization and environmental management. The results of the various sector studies were merged in a single government document and its main costing estimates are summarized in Table 9.3.⁵

The first column of Table 9.3 shows the total recurrent and capital expenditures by the central government of Honduras in 2004 on the key MDG and infrastructure sectors. For the same year, their aggregate value represents almost 40 per cent of total government expenditure, and primary education and health are the sectors absorbing the largest shares of government resources. The third column represents the amounts the government should spend in 2015 if the sector plans designed to reach the targets of the MDGs and infrastructure plans were strictly followed; the rows labelled “Baseline” represent instead the amounts spent in a scenario where public MDG-related expenditure (in real terms) grows at the same rate as real GDP.⁶ The fourth column shows the total amount of spending for the whole period. This total amount was estimated by sector experts and it is represented in ‘real’ values; that is, the costs were evaluated at constant prices in 2004 lempiras. These costs can thus be interpreted as the costs required for the expansion of the volume of services delivered by the public sector: this expansion is shown by the growth rates of the last column. The methods used to cost the required interventions and investments vary slightly for each sector, but mainly consist of an estimation of the additional

Table 9.3 Honduras: Estimates of required infrastructure and MDG-related expenditures (millions of 2004 lempiras, unless indicated otherwise)

	2004	2004 GE	2015	2004- 2015	Gap	AYG
<i>Infrastructure</i>						
PRSP/MDG government Plan	2,219	9.2	6,693	69,528		16.3
Baseline	2,219	9.2	3,795	33,061	36,467	3.9
<i>Primary education</i>						
PRSP/MDG government Plan	4,978	20.7	14,528	149,396		15.6
Baseline	4,978	20.7	8,515	74,177	75,219	3.9
<i>Health</i>						
PRSP/MDG government Plan	3,733	15.5	11,101	102,282		13.1
Baseline	3,733	15.5	6,385	55,629	46,653	3.9
<i>Water and Sanitation</i>						
PRSP/MDG government Plan	690	2.9	1,658	18,927		13.1
Baseline	690	2.9	1,181	10,288	8,639	3.9

Source: Government of Honduras (2005) for the PRSP/MDG government plan, authors' estimates for the baseline as explained in the text.

Abbreviations: 2004 GE: 2004 as % of total government expenditure; AYG: Average yearly growth rate of expenditures.

demand due to the increased coverage rates and a growing population. The 'technology' of delivering services is assumed to be constant throughout the 10 years of the planning period and, further, possible economies (or dis-economies) of scale or externalities among investments are not considered.⁷ Table 9.3 shows that the yearly growth rates required to reach the MDGs are considerable and tend to be similar across sectors. According to these estimates, a baseline growth rate of service delivery of 3.9 per cent per year would be well below what is required.

The figures in Table 9.3 only refer to required public spending. However, in the case of the key MDG-related service sectors, the contribution of private services is not very large. For example, World Bank (2004) shows that providers of private education account for 5 per cent to 10 per cent of total enrolment at the primary level, and less than 20 per cent of enrolment at the tertiary level.⁸ Moreover, private schools are located almost exclusively in urban areas, implying that service delivery to the rural population is entirely public. Furthermore, most of private delivery of education serves the wealthier parts of the population.

Table 9.4 disaggregates the social spending figures of Table 9.3 by different types of inputs. The provisioning of general public infrastructure and drinking water and sanitation have a much higher investment component—more than 60

Table 9.4 Honduras: The structure of social spending on MDG-related services, 2004

	Expenditure		Employment		
	Millions of lempiras	% of total	Thousands of workers	% of total	
Public infrastructure	Intermediates	685	31		
	Labour	114	5		
	Unskilled ^a	30	1	3.2	36
	Semi-skilled ^b	21	1	2.2	25
	Skilled ^c	63	3	3.5	39
	Investment	1,419	64		
	Total	2,219	100	8.9	100
Water and sanitation	Intermediates	96	14		
	Labour	168	24		
	Unskilled ^a	168	24	2.5	100
	Semi-skilled ^b				
	Skilled				
	Investment	427	62		
Total	690	100	2.5	100	
Health	Intermediates	965	26		
	Labour	2,625	70		
	Unskilled ^a	872	23	10.6	55
	Semi-skilled ^b	381	10	3.6	19
	Skilled ^c	1,372	37	5.0	26
	Investment	143	4		
Total	3,733	100	19.3	100	
Primary education	Intermediates	280	6		
	Labour	4,544	91		
	Unskilled ^a	1,216	24	16.4	27
	Semi-skilled ^b	1,514	30	21.8	36
	Skilled ^c	1,815	36	22.8	37
	Investment	154	3		
Total	4,978	100	60.9	100	

Source: SAM and MAMS for Honduras.

^a Workers with incomplete secondary education.

^b Workers with incomplete tertiary education.

^c Workers with complete tertiary education.

per cent of total costs—than other social sectors. In contrast, recurrent spending, especially on labour inputs, is the major cost component in the delivery of education and health services.

The data in the “employment” column of Table 9.4 shows that unskilled workers (those who have not completed secondary education) form a large part of total employment in MDG-related sectors, even those usually considered to be

relatively skill-intensive, such as education and health services. This could be part of the explanation of the low quality of service delivery and a reflection of the low performance on test scores of students, as observed earlier. Consequently, without substantial changes in the current input structure, it may be difficult for these sectors to produce the targeted outcomes. In particular, the existing low share of adequately trained teachers and health workers could signal likely shortages in the supply of such workers when scaling up MDG-related spending and could result in faster-than-average wage growth for skilled workers.

The costing approach summarized in Table 9.3, while providing detailed information on each sector, does not account, however, for important feedbacks and indirect effects captured in a general-equilibrium setting. In particular, the partial-equilibrium setting does not account for possible synergies across MDGs. Additionally, unit costs are most likely not constant. More likely, marginal costs may increase the closer one gets to achieving the MDG targets. Reaching two thirds or even three quarters of the relevant population may be relatively easy; however, getting further improvements in school completion rates or reduction of child mortality rates may become more costly as one gets closer to 100 per cent completion or when mortality is already low. The last uncovered fraction of the population usually are poorer, are harder to reach, live in remote communities, and much more may be required than a mere expansion of service supply to satisfy their needs. The MAMS model, as explained in Chapter 3, accounts for the likelihood of increasing marginal costs.

Model and data

Similar to the other studies in this volume, this chapter uses the *Maquette* for MDG Simulations (MAMS) model to provide a quantitative assessment of the economy-wide effects of alternative policies to achieve selected MDGs (see Chapter 3). MAMS does not explicitly track the progress of MDG 1 and we adopt the macro-micro approach explained in Chapter 2 (Appendix A2.1), according to which the labour market results from MAMS simulated scenarios are applied to the full distribution of household survey data using the micro-simulation methodology. The data for the micro-simulations come from the 2004 *Encuesta Permanente de Hogares de Propósitos Múltiples* (EPHPM) survey, which allows us to identify employment and wages by skill and sector. The microsimulation approach in this chapter allows for four main avenues of escaping poverty: moving from agricultural employment to non-farm activities where the wages tend to be higher, upgrading individual skills (through schooling), changes in relative wage changes, and an economy-wide income growth component that equally benefits all households.

The data requirements of MAMS are substantial. The previous section already mentioned the sources of information for the current degree of MDG

achievement and the required expansion in public service delivery to reach the targets by 2015. However, many other data are needed to estimate and calibrate MAMS. These include a social accounting matrix (SAM) that provides a breakdown of public activities by the relevant MDG sectors (primary education, health, and so on) and the accounting framework of the model, detailed data on education including graduation, drop-out, and repetition rates by cycle, the volumes of workers and students at each education level, and various elasticity parameters. The following discussion briefly touches upon each of these data components.

The starting point to construct the SAM, along the lines of the accounting requirements of MAMS (see Chapter 3), was a macroeconomic SAM for Honduras at 2004 values, constructed by the authors from national accounts data. In order to disaggregate the SAM, we rely on various sources including detailed information on public expenditure by activity provided by the Ministry of Finance, wage data from the household survey (2004 EPHPM), trade and protection statistics from UN COMTRADE and UN TRAINS, and to a lesser extent an earlier 1997 SAM described in Cuesta (2004). The data on labour volumes comes from the household survey, while the data on stocks of students was obtained from the World Bank's database, EDSTATS. The repetition, graduation, and drop-out rates were obtained from background information for the education indicators published by the Honduran information system for the poverty reduction strategy, SIERP.

Since no econometric estimates are available for the key elasticities (MDG or otherwise) of MAMS for Honduras and their estimation is problematic due to data constraints, the MDG elasticities used in this chapter have been chosen from a range of values identified in other studies in this volume based on the authors' judgement. For example, the elasticity of MDG 4 (child mortality) with respect to a 1 per cent increase in household per capita consumption is approximately -0.4, while the elasticity of MDG 7a (access to clean water) with respect to a 1 per cent increase in household per capita consumption is 0.1. The non-MDG elasticities have been selected from a comprehensive review of econometric and CGE literature in Annabi and others (2006).

Although the lack of precise econometric estimates of these key elasticities likely introduces a degree of imprecision in the model results with respect to Honduras' reality, we believe this approach is justified for three main reasons. First, our elasticity values are within a plausible range (established in the existing CGE literature) and are close to the elasticities used in the other Central American country cases in this volume. Second, the conclusions of this study are not meant to be taken as definitive statements about the precise resource scale-up requirements to reach the MDGs in Honduras. Instead, the purpose is to highlight the relative importance of various determinants of MDG outcomes and, within a consistent economy-wide framework, discuss the relative merits

of various sources of financing and the implications of a targeted pursuit of MDGs on the rest of the economy, as well as the several macroeconomic trade-offs involved. Third, moderate changes to the elasticities used in this chapter do not change any of the qualitative conclusions and do not have excessive impacts on the numerical results. Thus, while the exact quantitative findings of this study may be subject to revision if better elasticity estimates become available, the qualitative conclusions should remain applicable.

MDG simulations and results

Baseline scenario

Our baseline scenario defines a benchmark against which other scenarios will be compared. Under the assumptions, of this scenario real GDP per capita grows at 1.8 per cent per year—consistent with the World Bank, IMF, and Government of Honduras growth projections, but much faster than the 0.5 per cent average annual growth recorded over the 1990-2004 period (see Table 9.5).⁹ No targeted MDG policies are implemented in the baseline scenario; instead, the level of government service provision in public infrastructure, water and sanitation, health, and education sectors is assumed to grow exogenously at 3.9 per cent per annum (the same rate as real GDP). Spending in the general government sector is also set to grow exogenously at the same rate, so that both public consumption and investment remain fixed as a share of real GDP throughout the model's time horizon (that is, 2004-15).

Additional government financing needs are determined by the required increases in current and capital expenditures on MDGs and the rest of the public

Table 9.5 Honduras: Macro variables in the baseline scenario, 2004-2015

Variable	Units	2004	2010	2015	Annual growth rate
Real GDP at market prices	(billions of LCU)	136	173.9	206.1	3.9
Private consumption	(% of GDP)	85	86	86	4.2
Government consumption	(% of GDP)	12	12	12	3.9
Investment	(% of GDP)	26	26	26	4.2
Private	(% of GDP)	21	21	21	4.2
Public	(% of GDP)	5	5	5	3.9
Exports	(% of GDP)	42	41	39	3.4
Imports	(% of GDP)	66	66	66	4.1
Real GDP per capita	(thousands of LCU)	18,972	21,420	23,186	1.8
Exchange rate	LCU per USD	1.00	0.99	0.97	-0.3
Foreign debt-to-GDP	(%)	68.2	23.6	21.0	
Debt service-to-exports	(%)	2.3	0.8	0.8	

Source: MAMS for Honduras.

sector. The balance between government income and current public spending is cleared by a flexible direct tax rate on household income. Because the skill intensity of the “commodities” produced by the public sector is higher than the economy-wide average (see Table 9.4) and demand for skilled labour grows faster than supply (the evolution of factor prices will be discussed in more detail below), the share of public expenditure in nominal GDP rises from 17 per cent in 2004 to 18.4 per cent in 2015. This requires an increase in direct tax revenue from 4.6 per cent to 5.9 per cent of GDP, accomplished via an increase in the direct tax rate from 4.1 per cent to 5.1 per cent. The fact that direct tax rates must rise in the baseline in order to maintain a constant share of public expenditure to real GDP thus limits the fiscal space available to the government for scaling up spending to meet the MDGs.

The evolution of foreign debt follows the forecast in the joint Debt Sustainability exercise by the World Bank and the IMF. The debt path takes into account the significant easing of Honduras’ debt burden under the HIPC initiative, reducing the debt-to-GDP ratio by a factor of more than three. This also more than halves the foreign debt service obligations (as a share of exports), creating important fiscal space for the government’s pursuit of MDG objectives. For simplicity, foreign grants are fixed at zero in the baseline.

A flexible foreign exchange rate assures equality between inflows and outflows of foreign currency. It should be noted that the assumption of a flexible exchange rate is not a good representation of the actual exchange-rate regime of Honduras, which has a managed (crawling) peg system controlled through a series of mini-devaluations. However, the distinction of fixed versus flexible exchange rates in the MAMS model is just a matter of convenience, since there is no money in the system and all prices are determined relative to a fixed *numéraire* (i.e., the consumer price index, CPI). Furthermore, the real exchange rate movements implied by the model are quite mild and are certainly within the historical range under the current peg system. In the baseline, the real exchange rate appreciates by approximately 3 per cent between 2004 and 2015, which is caused by shifts in consumer demand towards more manufactured and service goods which also have higher import intensities.¹⁰

Beyond the major macro indicators, the main variables of interest in the baseline are the levels of MDG attainment and the behaviour of the labour market. Largely due to the fact that the growth of social spending on MDGs falls short of the requirements identified by the sector studies commissioned by the Government of Honduras (2005), the education, health, and water/sanitation MDGs are not attained in the baseline (see Table 9.6). Comparing the MDG levels in 2015 with the targets listed in the fifth column of the table reveals that MDG performance under baseline assumptions varies across different goals: among the non-poverty MDGs, the biggest improvements (more than 60 per cent distance to target) are observed for the education goal. Progress towards

Table 9.6 Honduras: MDG achievement in the baseline scenario, 2004-2015

MDG indicator	Units	2004	2015	Distance	
				2015 target	to target in 2015 (%)
Poverty headcount (npl)	(%)	65	58	42	28
Poverty headcount (ipl)	(%)	26	21	19	76
Primary completion rate	(%)	76	91	100	63
Under-5 mortality rate	(per 1,000 live births)	31	29	24	16
Maternal mortality rate	(per 100,000 live births)	108	102	70	17
Access to safe water	(%)	82	84	95	14
Access to sanitation	(%)	77	79	95	15

Source: MAMS for Honduras and authors' calculations for distance to target.

Abbreviations: npl: national poverty line; ipl: international poverty line of \$1 (PPP) a day.

other goals is much more modest, with improvements in MDGs 4 and 5 covering only 16 per cent and 17 per cent of total distance to the MDG goals, respectively, while water and sanitation fare slightly worse at 14 per cent and 15 per cent of total distance to target.

Despite the acceleration in growth from the historical averages, the poverty targets—at both the national and the international poverty lines—remain elusive (the top two rows of Table 9.6).¹¹ The main reason growth in Honduras' baseline scenario is not more pro-poor is the widening inequality: the Gini coefficient rises by 0.7 base points to 0.599, while the Theil index increases by 2.3 base points to 0.716. This increase in inequality is at odds with the historical trend of declining inequality in Honduras and is driven by rising skill premiums, which causes the incomes of unskilled workers to rise less than the economy-wide average.¹² In order to explain these labour market dynamics, we need to consider impact of the progress in education on the labour markets.

The demographic distribution of Honduras is heavily skewed towards younger age groups—almost 45 per cent of the total population is 16 years old or younger. Any education policy aimed at keeping children in school and encouraging them to continue their education at the next level is bound to have large distributional and temporal effect on the labour force in Honduras—first, as enrolment, completion and continuation to the next education cycle rates rise, the relative share of unskilled labour will decline in favour of more skilled categories, and second, increasingly larger parts of the labour force will leave the labour market (to go to school) and return after having completed their education (see Table 9.7).

Due to the success of previous education policies, secondary school enrolment in Honduras is large relative to the stock of labour with completed secondary education (almost 70 per cent of semi-skilled employment in 2004). Furthermore, the improvements in primary education in the baseline scenario encourage more young adults to continue their education at the secondary level. The

Table 9.7 Honduras: Labour market dynamics in the baseline scenario, 2004-2015

	2004	2015	Annual growth rate (%)
<i>Employment (thousands)</i>			
Unskilled workers	1,787	2,372	2.6
Semi-skilled workers	492	666	2.8
Skilled workers	172	222	2.4
<i>Labour incomes (thousands of LCU)</i>			
Unskilled workers	23.5	26.8	1.2
Semi-skilled workers	54.5	64.6	1.6
Skilled workers	125.1	167.7	2.7

Source: MAMS for Honduras.

combination of these two factors causes semi-skilled labour to grow slightly faster than unskilled labour (Table 9.7). At the tertiary level, the base year rates of continuation from secondary school are low (around 15 per cent) and cannot rise very rapidly without additional financial infusions into the tertiary school system. This causes the stock of skilled workers (that is, those with some tertiary education) to grow at the slowest rate among the three educational groups, while demand for the services these workers provide rises much more quickly. As a result, wages of skilled workers grow faster than those of other workers. The upward pressure on wages of semi-skilled workers is mitigated by the fact that, over time, stronger increases of wages for jobs for semi-skilled and skilled workers creates additional incentives for students to continue their studies. This factor stimulates some additional growth in the supply of (semi-)skilled labour at the margin, but not sufficiently enough as to meet the growing demand for skills in the baseline scenario for Honduras.

MDG scenarios (with aid financing)¹³

Our second set of scenarios explicitly targets the attainment of MDGs 2, 4, 5, 7a and 7b through the expansion of service delivery in the primary education, health, water and sanitation, and public infrastructure. In order to target the MDGs, we use the growth rates in various categories of government expenditure provided by the sector studies as a starting point. These rates are subsequently adjusted by the model to account for cross-MDG synergies and other general-equilibrium effects. We assume a constant rate of improvement in the water and sanitation, health, and education targets, and use the information above to calculate the required volume of public expenditure necessary to attain these goals over the model horizon (2005-15). In the education sector, the growth rate of primary school expenditure is such that graduation rates reach 100 per cent by 2010,¹⁴ while expenditure on secondary and tertiary schooling is roughly remains at baseline levels. Since the sector studies referenced in the earlier sections explicitly considered improvements in infrastructure as a key part of the government's MDG strategy, our MDG simulation also

incorporates faster growth in public infrastructure spending. As a best-case benchmark scenario, we consider the possibility that all of the additional MDG expenditures are financed by foreign donors—that is, domestic taxes are fixed at the baseline levels and any budgetary shortfall is made up by flexible foreign grants. The MDG results and the government expenditure required to reach all but MDG 1 are shown in Table 9.8.

The results of the MDG scenario show that a large, sustained increase in government spending relative to the amount spent in the baseline is required in order to reach the targets by 2015. In all instances, the required growth in current spending is more than twice the baseline growth, and investment in various sectors needs to grow by more than three times the baseline rates.¹⁵ At the same time, comparing the growth rates in government expenditure with the results of sector studies (see Table 9.3) reveals the importance of cross-MDG complementarities

Table 9.8 Honduras: Trajectory towards the MDGs and government spending in the MDG scenario, 2004-2015

MDG and spending indicators	Units	2004	2010	2015	Annual growth rate (%)
Poverty headcount (npl)	(%)	65		55	-1.4
Poverty headcount (ipl)	(%)	26		19	-3.0
Primary completion rate	(%)	76	93	100	2.5
Under-5 mortality rate	(per 1,000 live births)	31	28	24	-2.2
Maternal mortality rate	(per 100,000 live births)	108	92	70	-3.9
Access to safe water	(%)	82	88	95	1.3
Access to sanitation	(%)	77	86	95	2.0
<i>Government consumption</i>					
Primary education	(% of GDP)	3.6	6.0	4.4	7.7
Secondary education	(% of GDP)	1.4	1.2	1.2	3.9
Tertiary education	(% of GDP)	1.1	1.0	0.9	3.9
Health	(% of GDP)	2.6	3.4	4.3	10.3
Water and sanitation	(% of GDP)	0.2	0.3	0.4	12.9
Public infrastructure	(% of GDP)	0.6	0.9	1.5	15.1
<i>Government investment</i>					
Primary education	(% of GDP)	0.1	0.5	0.0	37.6
Secondary education	(% of GDP)	0.0	0.0	0.0	3.9
Tertiary education	(% of GDP)	0.0	0.0	0.0	3.9
Health	(% of GDP)	0.1	0.3	0.3	17.7
Water and sanitation	(% of GDP)	0.3	1.2	1.6	22.7
Public infrastructure	(% of GDP)	1.0	5.0	8.4	27.7

Source: MAMS for Honduras.

Abbreviations: npl: national poverty line; ipl: international poverty line of \$1 (PPP) a day.

in assessing the costs of reaching multiple MDGs. In our modelling approach, spending on public infrastructure facilitates access to MDG-related services (and hence higher MDG achievement); therefore, lower sector-specific expenditures are needed with higher levels of infrastructure spending. Additionally, progress in the coverage of drinking water and sanitation exerts a positive influence on health and thus allows for savings in the production of health services; in turn, a healthier student population more easily achieves completion of educational cycles. For example, the growth rate of current spending on water and sanitation is lower than the required growth identified by the partial-equilibrium studies (compare the 12.9 per cent in Table 9.8 with the 13.1 per cent of Table 9.3). The required growth in spending on health, and to a larger extent that on primary education, is also significantly lower than the estimates of the sector studies—reflecting the positive “multiplier” effect of several cross-MDG synergies.

The education sector results deserve more detailed examination owing to the critical importance of the education system as a source of new labour market entrants. Because of the increased rates of enrolment, graduation, and continuation to the next education cycle, the 2015 labour force in the MDG scenario is 2 per cent below the 2015 level for the baseline scenario. Furthermore, the structure of the labour force also changes across the two scenarios: in the MDG simulation, the volume of unskilled labour reaches a level in 2015 which is 3 per cent below that of the baseline, while the stocks of semi-skilled and skilled labour are, respectively, 1.9 per cent and 1.8 per cent higher. The decrease in the number of unskilled workers is driven by the dynamics discussed in the earlier sub-section: as more children enter (and graduate) the secondary school system, fewer individuals enter the unskilled labour market either as out-of-system entrants (those who have never been to school) or secondary dropouts. As the supply of unskilled workers falls, returns to their labour rise (see Table 9.9).

At the same time, the pursuit of MDGs creates additional demand for the services of semi-skilled and skilled workers. This occurs through two channels. First, as mentioned earlier, MDG-related services are more skill-intensive than most other sectors of the economy, which raises the relative demand for skills when these sectors grow faster than the economy-wide average. Second, large inflows of foreign grants lead to faster growth in private income and consumption (as discussed in more detail below), which raises demand for more skill-intensive products which tend to have higher income elasticities. As a result, wage growth for semi-skilled and particularly for skilled workers accelerates significantly relative to the baseline (Table 9.9). In fact, the effects of the increased demand for skills turns out to be stronger than the supply-side effects, and the skilled-unskilled wage gap widens slightly between the baseline and the MDG achievement scenario (compare Table 9.9 with Table 9.7). At the same time, higher wages for semi-skilled and skilled workers also imply higher production costs for the economy as a whole, affecting macroeconomic performance.

The behaviour of the macro variables is summarized in Table 9.10. We have already mentioned that per capita GDP grows substantially faster than in the baseline scenario due to increased public spending financed by foreign grants. Higher private incomes (due to faster growth in real wages) translate into faster growth in private consumption and investment. As a consequence of large foreign grant inflows, the real exchange rate appreciates much more rapidly than in the baseline. While the real appreciation erodes the competitiveness of Honduran producers and reduces export growth by 1.1 percentage points per year, it also benefits consumers by making imports cheaper. Import growth is also bolstered by the fact that part of the intermediate inputs for the supply of MDG-related services tend to be more import-intensive than the economy-wide average (for example, infrastructure and water and sanitation are intensive in

Table 9.9 Honduras: Labour market dynamics in the MDG scenario, 2004-2015

	2004	2015	Annual growth rate (%)
<i>Employment (thousands)</i>			
Unskilled workers	1,787	2,301	2.3
Semi-skilled workers	492	679	3.0
Skilled workers	172	226	2.5
<i>Labour incomes (thousands of LCU)</i>			
Unskilled workers	23.5	30.2	2.3
Semi-skilled workers	54.5	73.9	2.8
Skilled workers	125.1	220.9	5.3

Source: MAMS for Honduras.

Table 9.10 Honduras: Macroeconomic performance under the MDG scenario, 2004-2015

Variable	Units	2004	2010	2015	Annual growth rate
Real GDP at market prices	(billions of LCU)	136	181.2	224.9	4.7
Private consumption	(% of GDP)	85	83	81	5.1
Government consumption	(% of GDP)	12	15	15	7.5
Investment	(% of GDP)	26	31	34	8.2
Private	(% of GDP)	21	21	21	5.5
Public	(% of GDP)	5	10	14	14.9
Exports	(% of GDP)	42	32	30	2.3
Imports	(% of GDP)	66	68	69	6.1
Real GDP per capita	(thousands of LCU)	18,972	22,321	25,296	2.7
Exchange rate	LCU per USD	1.00	0.89	0.86	-1.4
Foreign debt-to-GDP	(%)	68.2	19.3	15.9	
Debt service-to-exports	(%)	2.3	1.0	0.9	

Source: MAMS for Honduras.

the use of capital goods, which have higher import content than food products). Due to faster growth in public service provision, the share of government consumption in total absorption rises by one third relative to baseline scenario, while the share of public investment in total absorption doubles. At the same time, it should be noted that growth in public consumption and investment is significantly below the average growth in MDG services, reflecting the fact that government services not directly related to MDG production continue to grow at baseline rates.

A major general-equilibrium effect of improved primary education performance is the growth penalty of a smaller total labour force, at least during the transition phase when unskilled workers who would otherwise have entered the labour market stay in school.¹⁶ Although per capita GDP grows faster than in the baseline scenario, it is significantly below what would be expected had the labour supply been growing at the baseline rates. Therefore, additional government education expenditure growth is necessary to offset the lower growth in consumption per capita. Obviously, a better educated labour force would contribute to stronger growth rates in the future. However, in the initial transition phase, Honduras is faced with an important trade-off similar to that faced by poor households who have to decide whether to send their young members to school and forgo their incomes or get them to work but deprive them of potentially higher earnings in the future.

Changes in private consumption, together with the labour market dynamics discussed in the preceding paragraphs, determine the effects of the foreign-grant-financed strategy of scaling up MDG-related spending on poverty and inequality. As shown in Table 9.8, the poverty headcount at the national poverty line falls by 3 percentage points, while the incidence for the one-dollar-a-day poverty declines by 2 percentage points. The poverty reduction is sufficient to meet MDG 1 as defined through the international poverty line, but not in the case of the national poverty line when the reduction falls 42 per cent short of the target covered in this scenario. The degree of poverty reduction is mitigated by the increase in income inequality caused by the wage dynamics described earlier: the Gini coefficient rises by 0.5 percentage points relative to the baseline scenario (in 2015), while the Theil index increases by nearly 2 percentage points. Figure 9.1 sheds more light on this issue by plotting a growth incidence curve for Honduras under the baseline and the MDG achievement (foreign-grant financed) Scenarios. While most of the increase in inequality takes place in the richest part of the distribution (as expected from the results of Table 9.9), all but the poorest parts of the population experience less than the average income gains. Thus, although the growth is beneficial to the extreme poor, it is hardly pro-poor overall.

The financing requirements to reach the MDGs are very large. Foreign grants—the only means of financing the pursuit of MDGs in the current scenario—rise



Figure 9.1 Honduras: Growth incidence curve for the baseline and MDG scenarios
 Source: MAMS for Honduras and microsimulations based on the 2004 EHPM.

to 14.2 per cent of GDP by 2015. In per capita terms, this increase translates to \$215 for each resident of Honduras. Over the entire model horizon (2004-15), Honduras is likely to require \$13.7 billion in order to finance its pursuit of MDGs through foreign grants.

Pursuit of individual MDGs and the role of cross-complementarities

The results and discussion in the previous sections have emphasized the fact that cross-MDG complementarities are a key feature of MAMS. This aspect follows the existing empirical evidence that access to clean water and sanitation improves health indicators and that improved health is beneficial for completing primary school. It also implies that simply costing each intervention and adding up the individual components could lead to serious double-counting. We have seen evidence of this in the previous section, where the required growth rates in MDG service provisions were lower than those suggested by partial equilibrium sector studies. In order to assess the effects of ignoring these complementarities, this section discusses three sensitivity-type simulated scenarios—each of them targeting one set of MDGs (water and sanitation, health, and education) without deliberately targeting the achievement of others. In each scenario, public infrastructure growth is maintained at the level required for MDG achievement (that is, infrastructure spending grows at the same rate as the full MDG scenario).

Table 9.11 shows the results of implementing a scenario where only MDGs 7a and 7b are targeted. Despite the fact that growth in government expenditure categories other than infrastructure and water-sanitation is kept at baseline

Table 9.11 Honduras: MDG performance and government spending when targeting MDG 7a-b only, 2004-2015

MDG and spending indicators	Units	2004	2010	2015	Annual growth rate (%)
Poverty headcount (npl)	(%)	65		56	-1.4
Poverty headcount (ipl)	(%)	26		19	-2.9
Primary completion rate	(%)	76	81	94	1.9
Under-5 mortality rate	(per 1,000 live births)	31	30	29	-0.5
Maternal mortality rate	(per 100,000 live births)	108	103	97	-0.9
Access to safe water	(%)	82	88	95	1.3
Access to sanitation	(%)	77	86	95	2.0
<i>Government consumption</i>					
Primary education	(% of GDP)	3.6	3.3	3.1	3.9
Secondary education	(% of GDP)	1.4	1.3	1.2	3.9
Tertiary education	(% of GDP)	1.1	1.0	1.0	3.9
Health	(% of GDP)	2.6	2.4	2.3	3.9
Water and sanitation	(% of GDP)	0.2	0.3	0.4	13.0
Public infrastructure	(% of GDP)	0.6	1.0	1.6	15.1
<i>Government investment</i>					
Primary education	(% of GDP)	0.1	0.1	0.1	3.9
Secondary education	(% of GDP)	0.0	0.0	0.0	3.9
Tertiary education	(% of GDP)	0.0	0.0	0.0	3.9
Health	(% of GDP)	0.1	0.1	0.1	3.9
Water and sanitation	(% of GDP)	0.3	1.2	1.7	22.7
Public infrastructure	(% of GDP)	1.0	5.3	8.9	27.7

Source: MAMS for Honduras.

Abbreviations: npl: national poverty line; ipl: international poverty line of \$1 (PPP) a day.

levels, significant improvements are seen across all MDGs. In education, 74 per cent of total distance to target is covered, compared with 63 per cent in the baseline scenario. For MDGs 4 and 5, the comparable achievements are 27 per cent and 28 per cent versus 16 per cent and 17 per cent in the baseline scenario. Finally, the poverty headcount rates based on, respectively, the national and international poverty lines, are respectively 2.8 per cent and 1.6 per cent lower than in the baseline scenario. The achievements in terms of the provision of water and sanitation services remain the same as in the full MDG scenario due to the fact that no other MDG enters the production function for water and sanitation. However, public spending in water and sanitation must grow at a slightly faster rate than in the full MDG achievement scenario because the spill-over effects from increased household consumption per capita are smaller due to slower overall economic growth.

Table 9.12 presents a second set of results, for the scenario where we target only the health MDGs. Because the expenditures required to achieve the health targets exceed those needed for improved water and sanitation coverage (and consequently more foreign financing is obtained), the poverty results improve slightly from the MDG 7a-b simulation. Education performance is also improved over the previous simulation, due to the more direct impact of health on primary completion rates. However, both current and capital expenditure in the health sector have to rise more rapidly in this scenario than in the full MDG achievement, since the positive spill-over effects of reaching the water and sanitation goals are now forgone. In fact, total expenditure on health over the 2004-15 period in this scenario is 2 per cent above what would be required under the full MDG achievement scenario (equivalent to a 2.5 billion lempiras increase in costs).

Table 9.12 Honduras: MDG achievement and government spending when targeting MDGs 4-5 only, 2004-2015

MDG and spending indicators	Units	2004	2010	2015	Annual growth rate (%)
Poverty headcount (npl)	(%)	65		55	-1.4
Poverty headcount (ipl)	(%)	26		19	-2.9
Primary completion rate	(%)	76	81	94	1.9
Under-5 mortality rate	(per 1,000 live births)	31	28	24	-2.2
Maternal mortality rate	(per 100,000 live births)	108	92	70	-3.9
Access to safe water	(%)	82	83	85	0.3
Access to sanitation	(%)	77	79	81	0.5
<i>Government consumption</i>					
Primary education	(% of GDP)	3.6	3.2	3.0	3.9
Secondary education	(% of GDP)	1.4	1.3	1.2	3.9
Tertiary education	(% of GDP)	1.1	1.0	1.0	3.9
Health	(% of GDP)	2.6	3.6	4.5	10.6
Water and sanitation	(% of GDP)	0.2	0.2	0.2	3.9
Public infrastructure	(% of GDP)	0.6	0.9	1.6	15.1
<i>Government investment</i>					
Primary education	(% of GDP)	0.1	0.1	0.1	3.9
Secondary education	(% of GDP)	0.0	0.0	0.0	3.9
Tertiary education	(% of GDP)	0.0	0.0	0.0	3.9
Health	(% of GDP)	0.1	0.3	0.4	18.1
Water and sanitation	(% of GDP)	0.3	0.3	0.3	3.9
Public infrastructure	(% of GDP)	1.0	5.2	8.7	27.7

Source: MAMS for Honduras.

Abbreviations: npl: national poverty line; ipl: international poverty line of \$1 (PPP) a day.

In our final scenario only the education MDG is targeted (see Table 9.13). Even though the education goal does not have any explicit links to any of the other MDGs, the other indicators show improvements over the seen in the baseline scenario due to the positive influence of expansion in infrastructure. Poverty reduction is slightly less pronounced in comparison with the health-only scenario because the total amount of foreign-grant inflows is lower, which in turn limits the growth boost of additional MDG spending. Unlike earlier simulations, in the scenario that targets only the achievement of MDG 2, the growth of public spending on education is actually *less* than what is observed in the full MDG scenario. This occurs despite the loss of positive externalities from health and despite the “growth penalty” of slower growth in the labour force due to improvements in the education system. The main reason is that the education system itself produces most of the factors required for improved

Table 9.13 Honduras: MDG performance and government spending when targeting MDG 2 only, 2004-2015

MDG and spending indicators	Units	2004	2010	2015	Annual growth rate (%)
Poverty headcount (npl)	(%)	65		56	-1.3
Poverty headcount (ipl)	(%)	26		19	-2.8
Primary completion rate	(%)	76	93	100	2.5
Under-5 mortality rate	(per 1,000 live births)	31	30	29	-0.5
Maternal mortality rate	(per 100,000 live births)	108	103	98	-0.9
Access to safe water	(%)	82	84	85	0.3
Access to sanitation	(%)	77	79	81	0.5
<i>Government consumption</i>					
Primary education	(% of GDP)	3.6	6.1	4.5	7.6
Secondary education	(% of GDP)	1.4	1.3	1.2	3.9
Tertiary education	(% of GDP)	1.1	1.0	1.0	3.9
Health	(% of GDP)	2.6	2.4	2.3	3.9
Water and sanitation	(% of GDP)	0.2	0.2	0.2	3.9
Public infrastructure	(% of GDP)	0.6	0.9	1.6	15.1
<i>Government investment</i>					
Primary education	(% of GDP)	0.1	0.5	0.0	37.3
Secondary education	(% of GDP)	0.0	0.0	0.0	3.9
Tertiary education	(% of GDP)	0.0	0.0	0.0	3.9
Health	(% of GDP)	0.1	0.1	0.1	3.9
Water and sanitation	(% of GDP)	0.3	0.3	0.3	3.9
Public infrastructure	(% of GDP)	1.0	5.2	8.8	27.7

Source: MAMS for Honduras.

Abbreviations: npl: national poverty line; ipl: international poverty line of \$1 (PPP) a day.

educational attainments (semi-skilled and skilled workers), while the demand for skills is lower than in the full MDG scenario due to less spending on other skill-intensive MDG-related sectors. As a result, the education system is able to re-orient its “production structure” more towards more productive tertiary-educated employees—enough so that the total costs are lower even though the unit costs of hiring workers with tertiary education is higher.

Alternative financing scenarios

A crucial feature of the MDG scenario presented in the previous section is the assumption that foreign grants will provide all of the financing required to scale up public spending for the MDGs. Given the very large expenditure increases needed to meet the goals, one might ask whether Honduras is likely to secure the necessary amounts of foreign aid and, if not, what effects this might have on the MDGs and the rest of the economy. To test the sensitivity of our results to alternative financing closures, we explore two alternative financing scenarios: one where the required financing is raised through domestic taxation and one where the financing needs are met through domestic borrowing. We do not consider a foreign borrowing scenario—as most other country studies of this volume do—as it will drive up the external debt-to-GDP ratio to likely unsustainable levels.¹⁷ In both of the alternative financing scenarios below, we continue to scale up government spending such that MDGs 2, 4, 5, 7a-b are simultaneously met by 2015.

We begin by allowing the government to vary household direct tax rates in order to obtain the necessary financing.¹⁸ Since the required increase in public spending in this scenario is financed by increasing the tax rate on household income, slower growth in private consumption translates into less progress in poverty reduction. The 2015 poverty headcount at the national poverty line is at 61.9 per cent (3.5 percentage points higher than the projected headcount rate in the baseline scenario), while the proportion of population living on less than \$1 PPP per day is 23.2 per cent (2.4 percentage points above the baseline scenario and 4.3 percentage points above the simulated estimate in the foreign grant-financed MDG scenario). At the same time, the indices of inequality (Gini and Theil) remain largely unchanged in this scenario compared with the simulation where financing is obtained through foreign grants. Thus, slower aggregate income growth is the main reason for less poverty reduction.

The behaviour of the main macro variables is summarized in Table 9.14. Although the annual growth rate of real GDP is 0.2 percentage points lower than in the foreign grants scenario, it is still 0.6 percentage points above the baseline scenario. However, private consumption and investment are penalized much more severely. In order to raise the necessary financing, the direct tax rate must rise to 19 per cent in 2015, up from 5 per cent in the baseline. This increases the share of direct taxes in GDP to 22 per cent and results in significant crowding

out of private spending by the public sector: household consumption grows almost a full percentage point slower than in the baseline scenario, and the same is true of private investment. Less growth of private consumption also dampens the demand for imports, which results in much less appreciation of the real exchange rate (both compared to the foreign grants and baseline scenarios).

Table 9.15 shows the behaviour of macroeconomic variables under the flexible domestic borrowing closure. In this scenario, the crowding out occurs first and

Table 9.14 Honduras: Macroeconomic performance when scaled-up MDG spending is financed by domestic taxes, 2004-2015

Variable	Units	2004	2010	2015	Annual growth rate
Real GDP at market prices	(billions of LCU)	136	179.4	220.2	4.5
Private consumption	(% of GDP)	85	76	73	3.3
Government consumption	(% of GDP)	12	16	17	7.7
Investment	(% of GDP)	26	29	32	6.8
Private	(% of GDP)	21	18	17	3.2
Public	(% of GDP)	5	11	15	14.9
Exports	(% of GDP)	42	39	38	3.9
Imports	(% of GDP)	66	63	63	4.4
Real GDP per capita	(thousands of LCU)	18,972	22,093	24,773	2.5
Exchange rate	LCU per USD	1.00	0.99	0.99	-0.1
Foreign debt-to-GDP	(%)	68.2	22.7	19.9	
Debt service-to-exports	(%)	2.3	0.8	0.7	

Source: MAMS for Honduras.

Table 9.15 Honduras: Macroeconomic performance when scaled-up MDG spending is financed by domestic borrowing, 2004-2015

Variable	Units	2004	2010	2015	Annual growth rate
Real GDP at market prices	(billions of LCU)	136	172.0	196.0	3.4
Private consumption	(% of GDP)	85	87	89	4.0
Government consumption	(% of GDP)	12	17	19	7.6
Investment	(% of GDP)	26	19	18	0.2
Private	(% of GDP)	21	8	1	-19.7
Public	(% of GDP)	5	11	17	14.9
Exports	(% of GDP)	42	38	36	2.1
Imports	(% of GDP)	66	63	64	3.3
Real GDP per capita	(thousands of LCU)	18,972	21,179	22,050	1.4
Exchange rate	LCU per USD	1.00	0.97	0.94	-0.6
Foreign debt-to-GDP	(%)	68.2	23.2	21.5	
Debt service-to-exports	(%)	2.3	0.9	0.9	

Source: MAMS for Honduras.

foremost on the investment side, as evidenced by the negative growth rate of private investment through the model horizon. As a result, real GDP growth is a full 0.5 percentage points per year lower than in the baseline scenario and, due to overall slower growth in the economy, private consumption growth is also below baseline rates. Domestic debt stocks rise substantially, from 25 per cent of GDP in the baseline scenario (in 2015) to 130 per cent of GDP. Such an increase in domestic debt is unlikely to be feasible in Honduras; in addition, this simulation assumes that the Honduran government will be able to continue paying the relatively low 3.1 per cent interest rates on its bonds regardless of the size of domestic debt. In reality, this condition is unlikely to hold, which means that either additional borrowing or higher taxes would be required in order to finance the higher borrowing costs.

Conclusions and policy recommendations

Despite significant progress on many MDG indicators, Honduras is unlikely to reach the MDG targets for poverty reduction, primary education, and water and sanitation by 2015. Furthermore, unless the recently observed rapid increase in the funding of health services is sustained, the health MDGs are also likely to remain elusive. In order to attain the full set of MDG targets, Honduras needs to expand its social spending significantly, and complement greater public investment in human development with policies aimed at accelerating economic growth.

The general equilibrium approach of this chapter explicitly considers the mechanisms through which service delivery and other determinants of MDG achievements interact, capturing the roles of the demand and supply sides of MDG services. Using the MAMS model, the potential advantages and disadvantages of various strategies for pursuing MDG attainment have been assessed. Our simulation results show that significant cost savings can be realized from pursuing the MDGs together, rather than one or two at a time, due to the presence of important cross-complementarities across targets. In addition, investment in infrastructure is required to support growth and create a positive environment for MDG achievement.

An additional advantage of using the MAMS framework is the ability to analyze competition over scarce resources between MDG services and other sectors as well as the interactions between MDG service provision and the rest of the economy via the labour market. Our simulations show that the focused pursuit of the MDGs considerably raises the demand for semi-skilled and skilled workers, and success is critically dependent upon the ability of the education system to deliver the needed graduates. Although the wages for all categories of workers are likely to rise with the expansion in MDG service delivery, skilled and semi-skilled workers are likely to gain much more than the unskilled.

The application of the MAMS model for Honduras has also enabled assessing the role of alternative MDG financing scenarios on the macro aggregates and the government budget balance. Under the assumption that MDG financing is entirely covered by flexible foreign aid, the per-capita level of foreign grants would need to increase to \$215 by 2015 and the total cumulative amount of required aid would total \$13.7 billion over 2004-15. As a consequence of these large inflows, the real exchange rate would appreciate much more strongly than under a baseline scenario, eroding the international competitiveness of Honduran exports. Although this might be unproblematic if foreign aid could continue to flow infinitely into the future, it may not be realistic to make the economy vulnerable to a possible sudden cessation of aid which could set off a difficult adjustment period as entry and exit of firms into export markets tends to be asymmetric.

Despite the risks of such Dutch-disease effects, our simulation results show that foreign-grant financing of MDG achievement is likely to be the best strategy for Honduras. We cannot assess how likely Honduras is to obtain all of the needed resources from foreign donors. However, given that it just recently reached HIPC completion point, it is unlikely to be able to borrow the required funding (and even if it could, the stock of foreign debt would skyrocket to 92 per cent of GDP). Raising the resources needed to fund the MDG strategy domestically could generate an important trade off: while the non-poverty targets are still likely to be reached, poverty reduction is much smaller—in 2015, the headcount rate (at the national poverty line) would be 1 percentage point higher compared with the baseline scenario if financing is obtained through domestic borrowing and 3.5 percentage points higher if the funds are raised through increases in direct taxes. Furthermore, raising the funds through domestic borrowing implies taking on a tremendous domestic debt burden (130 per cent of GDP), which is unlikely to be sustainable or even feasible to raise in domestic capital markets. Our results imply that Honduras should attempt to raise the resources domestically only if it is unable to attract foreign donors, and then be aware this could go at cost of lesser growth and poverty reduction.

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Notes

- 1 The country is highly oil dependent and the recent sustained increases in oil prices have strained government finances and do not bode well for the future.
- 2 There are plenty of reasons to be cautious about DR-CAFTA's potential to provide increased export opportunities for Honduran producers. One reason is that the overall level of US protection faced by Honduran exporters is very low, and the agreement primarily locks in the existing CBA (Caribbean Basin Initiative) and GSP (Generalized System of Preferences) preferences rather than open new US sectors for competition. In addition, one of the sectors likely to experience the most marked increase in import competition is non-export crops, which is the largest employer of farm labour in Honduras. This is likely to depress growth of farm wages and reduce the pace of poverty reduction in rural areas. On the other hand, increased investment inflows could result in new opportunities and facilitate transition to higher value-added activities. For a more detailed discussion of the economy-wide consequences of DR-CAFTA accession for Honduras, see Medvedev (2008).
- 3 For a comparison between Honduras' MDG indicators and the region's, see Table A2.1 in Chapter 2 of this volume.
- 4 Surveys aimed at measuring maternal mortality rates were administered in 1990 and 1997, and the national statistical institute (INE) estimated the rate for the year 2000.
- 5 Government of Honduras - Grupo Consultativo, "Avanzando en la planificación sectorial de mediano plazo. Plan Pluriennial de Ejecución de la ERP", Tegucigalpa, Honduras, May 2005.
- 6 The macro assumptions of the model, including baseline growth, will be discussed in more detail below.
- 7 For details on the sectoral estimates see Government of Honduras (2005).
- 8 However, private schools account for approximately half of enrolment at the secondary level.
- 9 The GDP growth projections are obtained from the Joint IDA/IMF Debt Sustainability Analysis completed in 2006.
- 10 Demand for manufacturing and services grows faster than demand for agriculture mainly because the income elasticities of the former are above those of the latter.
- 11 All poverty estimates are the result of microsimulation analysis, as discussed in the previous section. In order to evaluate poverty at the international poverty line of \$1 at PPP, we took the monthly poverty line (\$32.74 in 1993 prices at PPP exchange rates) and converted it into a local currency equivalent by multiplying it by the consumption PPP exchange rate and the ratio of the consumer price index (CPI) in 2004 to the CPI in 1993.
- 12 Labour markets are assumed to be strictly segmented by skill. Within the same skill level, labour markets are characterized by full factor mobility across activities (sectors) such that a single economy-wide, skill-specific wage clears the market. The labour market closure used in this chapter assumes no change in the degree of resource utilization, or a fixed rate of unemployment. On the one hand, this assumption may be reasonable given that the official unemployment rate in Honduras has been fluctuating around 4 per cent over the last five years. On the other hand, however, unofficial estimates place the unemployment rate as high as 28 per cent, in which case the assumption of an unchanged unemployment rate would be much less realistic. Real wages in Honduras have been stable over the same period (Gindling and Terrell, 2006), which provides indirect evidence of significant labour market rigidities. In this case, unless we expect significant institutional improvements that make the Honduran labour market more competitive

- (not very likely given the historical performance of the economy, particularly in the baseline scenario), the fixed unemployment rate assumption seems appropriate.
- 13 Other financial options will be discussed further below.
 - 14 This requirement is due to the length of the primary education cycle and the definition of MDG 2. If the target is defined as reaching (close to) 100 per cent primary school completion in 2015 and the length of the primary education cycle is 6 years, achievement of MDG 2 implies that 100 per cent of children of primary school age must enter the first grade in 2010 and complete grades 1 through 6 at 100 per cent rates by 2015.
 - 15 Note that investment growth in education is reported for the 2004-10 period, since the primary education system is assumed to reach its full potential by then and investment spending in the 2011-15 period is directed only towards maintaining the 2010 ratio of capital stock per student (rather than increasing the capital stock per student, as is the case during the 2004-10 period)..
 - 16 The model version used here does not allow for changes in labour force participation rates between 2004 and 2015. As wages for unskilled workers rise (because unskilled labour becomes scarcer—see Table 9.9 and the accompanying discussion) more unskilled workers may choose to enter the labour force. However, this effect could be mitigated by difficulties in finding employment, which could include formal barriers to labour mobility (such as prohibitive hiring costs), specificity of human capital required for certain tasks, and location challenges (e.g. moving from remote rural areas to cities).
 - 17 Financing the pursuit of MDGs through foreign borrowing would require the foreign debt-to-GDP ratio to rise to 92 per cent in 2015. This is roughly equivalent to Honduras' debt burden in 2000, shortly after its entry into the HIPC initiative.
 - 18 Also the growth rates of public consumption and investment (in real terms) do not change with the choice of financing as long as full MDG achievement is imposed.

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