Public Policies for Human Development

Achieving the Millennium Development Goals in Latin America

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Introduction

The favourable international economic environment during 2002-07 generated an export boom in Bolivia, primarily in hydrocarbons, minerals and agricultural products. At the same time, however, the country went through a period of political instability that has weakened institutions, severely worsened the investment climate and reduced the room to manoeuvre for public policy making.

In 2006, Bolivia began implementing the National Development Plan (PND) called "*Bolivia digna, soberana, y productiva para vivir bien*" (A Dignified, Sovereign and Productive Bolivia for a Better Life) with policies aimed at reducing malnutrition and illiteracy (Ministerio de Planificación del Desarrollo, 2006b). The government also introduced a cash transfer programme as an incentive to keep children in public primary schools.[1] Further, the Policy for Social Protection and Comprehensive Community Development (PPS-DIC) which seeks to strengthen community organizations in municipalities with high poverty levels (Ministerio de Planificación del Desarrollo, 2006a), was also put in place.

The government has enhanced state participation in the production and marketing of strategic natural resources. It has also formulated a strategy for developing production by strengthening small-scale enterprises. In addition, Bolivia has received substantial external debt relief from bilateral and multilateral creditors.

The PND embraces the Millennium Development Goals (MDGs) among its core objectives. This study provides an empirical assessment of the feasibility of achieving the MDGs in Bolivia under alternative financing scenarios. The costs in terms of requirements for scaling up of public spending are estimated through an application for Bolivia of the computable general equilibrium (CGE) model called MAMS, which is described in Chapter 3. This model establishes the functional relationships between a series of determinants, including

some macroeconomic aggregates, and a series of indicators associated with the MDGs: the percentage of the population that begins primary education and completes it on time (MDG 2), the child mortality rate (MDG 4), the maternal mortality rate (MDG 5) and the percentage of the population with access to water and basic sanitation services (MDGs 7a and 7b, respectively). The scenarios simulated by using MAMS provide macroeconomic and labour-market outcomes that are subsequently imposed on household survey data, using the microsimulations method described in Appendix A2.1 of Chapter 2. This methodology makes it possible to estimate the simulated impact of enhanced public spending on education, health, and water and sanitation on poverty and income inequality.

Performance of the Bolivian economy

During the 1980s, Bolivia went through a severe crisis that also hit other countries in Latin America. During the crisis, the country witnessed a sharp increase in its public debt and a chronic fiscal deficit. Monetary financing of increasing fiscal deficits led to an episode of hyperinflation of unprecedented proportions, causing a collapse of investment and a contraction of the economy.[2]

In August 1985, a drastic economic stabilization programme was introduced, including fiscal austerity measures, a floating exchange rate, liberalization of the current account, and deregulation of the financial system, among other things. Deeper structural reforms were introduced at a later stage, including public finance reforms, renegotiation of external debt, and targeted interventions aimed at reactivating private sector activity, especially non-traditional agricultural and manufacturing export production.

Between 1985 and 1990, some economic recovery took place, according to the macroeconomic indicators of Table 5.1. GDP grew at an annual average of 2.2 per cent, almost at the same pace as population growth. Tax revenues reached 6.5 per cent of GDP per year, but even so, the fiscal deficit remained high at 5.9 per cent of GDP and had to be financed almost entirely by external borrowing. Consequently, external public debt remained high at more than 80 per cent of GDP. Exports averaged 14 per cent of GDP during the same period.

During the first five years of the 1990s, the Social Investment Fund (FIS) played a central role in the government's enhanced social policy strategy of increased investment in human resources. In that period, GDP grew at an annual average rate of 4.1 per cent, inflation fell to two-digit rates, and the rate of depreciation of the real exchange rate slowed to below 9 per cent (see Table 5.1). Tax revenues increased to 9 per cent of GDP but continued to be insufficient for covering all of the social spending. The fiscal deficit was cut to 4 per cent of GDP, but the dependence on external financing remained practically unchanged and external debt levels remained high at around 72 per cent of GDP.[3]

Table 5.1 Bolivia: main macroeconomic indicators, 1985-2006[a]

	1985-1990	1990-1995	1995-2000	2000-2005	2006
Prices (%)					
Annual inflation rate	1,384.9	12.2	6.4	3.4	4.9
Annual rate of devaluation	3,286.0	8.9	5.3	5.0	-0.6
Real sector					
GDP (millions of Bs)	9,642	23,487	43,054	61,470	89,434
GDP (millions of 1990 Bs)	14,261	17,061	20,856	23,871	27,137
Annual growth of GDP (%)	2.2	4.1	3.4	3.0	4.6
Fiscal sector[b] (% of GDP)					
Total income	27.4	32.2	31.7	30.2	40.9
Tax revenue	6.5	9.0	15.7	18.2	16.6
Total expenditures	32.9	36.2	32.5	31.7	31.8
Capital expenditures	6.5	8.9	7.5	8.6	10.6
Fiscal balance	-5.9	-4.0	-3.1	-5.9	4.6
Domestic financing	2.2	0.4	0.5	2.1	-5.0
External financing	3.7	3.6	2.6	3.8	0.4
External sector (% of GDP)					
Current account balance	-4.1	-3.7	-5.9	-0.4	12.5
Trade balance	-0.6	-3.9	-7.5	6.6	9.9
Exports	14.0	14.6	14.4	20.2	36.4
Imports	-14.6	-18.5	-21.9	-13.6	-26.5
FDI	0.7	2.5	8.8	4.4	2.2
Reserves (months of imports)	4.39	4.89	7.52	7.64	14.03
External debt	82.4	72.2	59.0	55.5	33.1
Total investment (% of GDP)	14.2	15.2	18.6	14.5	15.7
Public	7.6	8.9	6.8	5.5	8.3
Private	6.6	6.3	11.8	9.0	7.4

Source: Unidad de Análisis de Políticas Sociales y Económicas (UDAPE).

[a] Estimates for 1985-2005 are final; data for 2006 are preliminary.

[b] Data correspond to the finances of the non-financial public sector.

In addition, the current account of the balance of payments continued to show a deficit, partly financed through rising foreign direct investment (FDI) which increased by almost two percentage points of GDP.

Deeper, second-generation reforms were introduced in the second half of the 1990s and included measures for recapitalizing some strategic public enterprises

and decentralizing public service delivery, including education and health. At the same time, grassroots participation was promoted at the municipal level and the pension system was reformed.

Between 1995 and 2000, economic growth was volatile owing to the indirect impact of the Asian crisis which affected the economies of Bolivia's main trading partners, Argentina and Brazil. In 1999, for example, growth was only 0.43 per cent, which led to an increase in open unemployment and a reduction in labour income (Landa, 2003). Despite these trends, however, the average inflation rate for the five-year period was reduced to one digit and the rate of exchange-rate depreciation moderated (see Table 5.1). Tax revenue increased to 15.7 per cent of GDP and, along with greater fiscal austerity, made it possible to reduce the fiscal deficit to 3.1 per cent of GDP. Higher inflows of FDI helped strengthen the net international reserve position to a level sufficient to cover seven months of imports. The external debt ratio was reduced to 59 per cent of GDP, as a result of the debt relief received in the context of the Heavily Indebted Poor Countries (HIPC) Initiative.[4]

During the first five years of the present decade, a period of economic downturn, Bolivia experienced a severe institutional crisis and high political instability. This led to social conflict and a constitutional change of government in 2003. In response to social and regional demands, a political agenda was put forward that included the convocation of a Constituent Assembly, a referendum on regional autonomy, a referendum on the control of natural gas resources, and earlier than anticipated general elections. Economic recovery began in 2004 helped by favourable world market prices which gave a boost to export earnings of hydrocarbons, minerals and agricultural products. Helped further by the initiation of exports of natural gas to Brazil, exports rose to 20 per cent of GDP on average during 2000-05. At the same time, however, FDI dropped significantly as the programme of capitalization and privatization of public enterprises ended. The reduction in private capital inflows forced a reduction in the level of imports, resulting in a trade surplus and a decrease in the current account deficit. Inflation stayed low, providing proof of macroeconomic stability.

Government revenues grew as a result of improved tax collection and the introduction of a special tax on hydrocarbons. At the same time, however, the government substantially increased spending in response to social demands. In 2003, the non-financial public sector deficit jumped to around 8 per cent of GDP, of which 4 percentage points corresponded to the cost of the reform to the pension system. Between 2002 and 2005, the fiscal deficit remained high, but the degree of external indebtedness fell nonetheless to 55.5 per cent of GDP as a result of debt renegotiation and relief. The resources received through the HIPC Initiative were directed to municipalities to support the fight against poverty.[5] The potential impact of debt relief on public finances was weakened as much of public investment was financed through external borrowing.

In January 2006, the International Monetary Fund (IMF) cancelled the equivalent of $233 million of Bolivia's foreign debt. In July of that same year, the World Bank approved a debt cancellation of $1.5 billion. Additional debt relief of approximately $1.0 billion was also agreed upon with the Inter-American Development Bank (IDB) in the context of the Multilateral Debt Relief Initiative (MDRI). All of this together allowed the external debt ratio to be reduced to 33.1 per cent of GDP in 2006 (see Table 5.1). The debt was reduced even further later in 2007 when the relief from the IDB came into effect.

Trends and prospects for meeting the MDGs

The fourth official MDG Progress Report for Bolivia suggests that it is feasible to achieve several of the goals through the application of the PND. Particularly beneficial would be the social programmes for small farm holder communities targeted at municipalities with a high level of extreme poverty. The reports on the progress towards the MDGs and cost studies presented by the Ministry of Planning of Bolivia are used to describe the trends that are presented below (see Table 5.2).

MDG 1: Incidence of extreme poverty

The target is to reduce by half the percentage of the population with an income of less than one dollar per day at purchasing power parity (PPP) between 1990 and 2015. A similar poverty concept is used for monitoring poverty reduction in Bolivia, but the poverty incidence is measured using a national extreme poverty line that is based on a basket of basic food commodities.

In 1996, extreme poverty measured with the national line was estimated at 39 per cent, but increased to 45 per cent in the year 2000. The target is to lower the extreme poverty rate to 24 per cent by 2015.[6] When using the one-dollar-a-day threshold, 27 per cent of the population lived in extreme poverty in 2000, well short of the target of 14 per cent to be reached by 2015 (see Table 5.2).

Since the late 1980s, poverty fell with episodes of economic growth. Between 1999 and 2003, however, growth was dismal, affecting in particular, construction, manufacturing and services, sectors that are important sources of urban job creation. Agricultural incomes were also affected by a decline in the growth of internal demand. As a consequence, poverty increased (Jiménez and Landa, 2005).

The urban unemployment rate showed an upward trend, increasing from 4.4 per cent in 1997 to 7 per cent in 2000, surpassing 8.5 per cent in 2003, and staying around 8 per cent levels until 2006.[7] The high levels of unemployment that persisted during the last few years were accompanied by a reduction in the time spent looking for work (Canavire and Landa, 2005). Since people were spending less time looking for work, an increase in the share of the inactive

Table 5.2 Bolivia: indicators for monitoring MDGs and goals for 2015

	Starting year		Base year for MAMS		Target for 2015
MDG 1: Eradicate poverty					
Incidence of extreme poverty using national poverty line (%)[a]	41	(1996)	45	(2000)	24
Incidence of extreme poverty using one-dollar-a-day poverty line at PPP (%)	29	(1990)	27	(2000)	14
MDG 2: Universal primary education					
Net primary school enrolment rate (%)	n.a.	--	94	(2003)	100
Gross completion rate for eighth grade of primary (%)	52	(1992)	70	(2001)	99
Percentage of students who begin primary school and complete eighth grade[b]	n.a.	--	71	(2003)	--
MDG 4: Reduce child mortality					
Infant mortality rate (per 1,000 births)[c]	89	(1989)	54	(2003)	30
Coverage of pentavalent vaccine (%)	64	(1994)	80	(2003)	95
MDG 5: Reduce maternal mortality					
Coverage for hospital births (%)	27	(1995)	55	(2003)	70
Maternal mortality rate (per 100,000 births)	416	(1989)	230	(2003)	104
MDG 7: Ensure environmental sustainability					
7a. Potable water coverage (%)	57	(1992)	70	(2001)	78.5
7b. Sewage system coverage (%)	28	(1992)	40	(2001)	64

Source: UDAPE (2005b) and authors' estimates.

[a] The first data for the incidence of extreme poverty measured with the national line is for the year 1996. Extrapolating from this information, a value of 48 per cent was estimated for 1990 and the goal for 2015 was based on this.

[b] Estimated from the reconstruction of a cohort of students who registered in the first year of primary school.

[c] Deaths of children under one year of age.

n.a.: data not available.

population was recorded. The net loss of jobs, especially in manufacturing, caused a displacement of employment towards services and commerce, sectors with high participation in the informal sector (World Bank, 2005). Income inequality rose between 1997 and 2002. The Gini coefficient for per capita family income in urban areas increased from 0.51 in 1996 to 0.54 in 2002, while inequality in rural areas showed pronounced fluctuations.[8]

Economic growth in Bolivia has not been pro-poor. Exports of natural gas have only weak linkages with other production sectors and do not benefit small and medium-sized enterprises (PNUD, 2005). In the PND framework, initiatives have been developed to boost the processing of primary natural resource production and promote rural development, empowering small-farm holders through credit schemes. These measures could help make growth more supportive of poverty reduction.

MDG 2: Completion of primary education

Primary education in Bolivia has a cycle of eight years of education, rather than six years as is more common internationally. Consequently, the gross completion rate for eighth grade has been selected as the indicator for evaluating the goal of achieving universal primary education.[9] According to official estimates, this indicator increased from 55 per cent in 1992 to 70 per cent in 2001 (Table 5.2) and stood at 77.8 per cent in 2005.[10] Based on secondary education records for 2004, a somewhat lower rate is estimated; that is, for each cohort of 100 students who enrolled in primary school, 71 per cent of them had completed eighth grade.[11] In any case, if this trend continues, the primary school completion rate would be expected to near 90 per cent by 2015.

Since the early 1990s, education reforms have promoted actions for increasing school infrastructure through teacher training programmes, bilingual education and other actions aimed at improving the quality of education (Ministry of Education, 2004). In recent years, education policies have sought to increase the internal efficiency of the system, by contributing to raising promotion rates in the first five grades of primary school to over 90 per cent. However, these rates are reduced when students get to sixth grade, due to the insufficient supply of school infrastructure in rural areas, the lack of continuity between the primary school cycles, and students dropping out in the last cycle of primary school.

Both educational infrastructure and the number of teachers have increased with enrolment. In 2002, teachers received an exceptional increase in salary to partially make up for past reductions in pay in real terms. The resources released as a result of the debt relief received under the HIPC II Initiative helped finance the related increase in public spending. Education spending increased to 6.2 per cent of GDP in 2004, up from 5.2 per cent in 1997.

Even though the Bolivian government spends more on education than many other Latin American countries, existing projections suggest that the country will not be able to achieve the target of universal primary education by 2015, as measured here, primarily because of the persistence of high drop-out rates in the last years of the cycle (UDAPE, 2005b).[12]

A cost-effectiveness study in the education sectors identified the obstacles Bolivia faces to meet education targets (De Jong and others, 2005). The study recommends improving access to education in rural areas, primarily through

the use of demand subsidies. It also recommends expanding school infrastructure, ensuring greater availability of trained teachers and enhancing school autonomy. The study also estimates that an additional 2 per cent of GDP per annum will need to be spent in order to meet the objective of universal primary education. A study by UDAPE comes to similar findings (Vera, 2006).

MDG 4: Reducing child mortality

The target for MDG 4 is to reduce the under-five child mortality rate by two thirds between 1990 and 2015. In order to monitor this goal, however, the infant mortality rate is used instead, since most child deaths in Bolivia occur among children under one year of age. The high infant mortality rates in Bolivia show that barriers to health access have not yet been overcome (see Table 5.2). Infant mortality rates are closely related to the deficient living conditions in which children are living (UDAPE and UNICEF, 2006a).

The infant mortality rate shows a sustained decline between 1989 and 2003, falling from 89 to 54 per 1,000 live births. Projections of UDAPE (2005a) suggest, however, that with existing trends the target will not be reached by 2015. In order to reach the target of 30 deaths per 1,000 live births, it will be necessary to ensure that all health care measures envisaged in the PND are effectuated.

The observed reduction in infant mortality can be explained primarily by increases in prenatal care coverage, hospital births, coverage of immunizations and by the reduction in the prevalence of diarrheal diseases and respiratory diseases (Ministerio de Salud y Deportes, 2004). An increase in the coverage of water and sanitation services also played a role in the decline of the disease prevalence.

Neonatal deaths happen most often during the first week of life, due to the deficiencies in care at the time of birth, neonatal asphyxia and infections that occur because of the malnutrition and poor health of the mothers. In 2003, only 55.3 per cent of all births took place in hospitals or health care centres, and in rural areas the rate is as low as 30.5 per cent. The lack of adequate prenatal care is one of the primary factors that explain why infant mortality is still high in Bolivia.

MDG 5: Reducing maternal mortality

The target for MDG 5 is to reduce maternal mortality by three quarters between 1990 and 2015. The third official MDG Report for Bolivia estimated the maternal mortality rate on the basis of data from the National Demographic and Health Survey (ENDSA). According to this survey, there were about 416 maternal deaths per 100,000 live births in 1989. The ENDSA for 2003 recorded a rate of 229, suggesting maternal mortality declined by 45 per cent between 1989 and 2003. Yet, the country is still far from the target of 104 deaths per 100,000 live births to be reached by 2015.

The Ministry of Health and Sports (MSD) identified various interventions that could improve health conditions and make it feasible to meet the target of reducing maternal mortality, including increasing coverage of health insurance, immunization programmes, family planning programmes and hospital deliveries (Ministerio de Salud y Deportes, 2004).

In effect, the proportion of births attended in hospitals increased by 37 percentage points between 1994 and 2005 to reach 65 per cent. Healthcare policies of the past 15 years have focused on overcoming economic barriers to the provision of services. In 1996, the National Maternal and Child Insurance (SNMN) programme was launched and two years later that of Basic Health Insurance (SUMI) was introduced, with an extended benefits package. The programme, called EXTENSA, expanded healthcare services in rural areas (UDAPE and UNICEF, 2006a). The Unique Health Insurance (SUS) system was designed in 2006 to expand free healthcare for the population between 5 and 21 years of age, but by mid-2008 it was yet to be implemented. In addition, the Expanded Immunizations Programme (PAI) included the pentavalent vaccine that strengthens the immune system against various diseases that afflict children under five (UDAPE, 2005b). The first two insurance programmes mentioned above and the PAI sought to reduce maternal and infant mortality, while the other plans were aimed at overcoming exclusion from health services.

The risk of maternal mortality increases when haemorrhaging or infections occur during delivery. Miscarriages, eclampsia and anaemia also increase the risk.[13] Even when pregnant women receive care at public health centres, complications in obstetric delivery explain two thirds of the maternal mortality in hospital centres (Ministerio de Salud y Deportes, 2004). In order to reduce infant and maternal mortality and meet the targets for MDGs 4 and 5, UDAPE estimates that it is necessary to increase hospital delivery coverage to at least 70 per cent in 2015. Public spending on health insurance systems has grown on average by 2.5 per cent per year, but in order to expand hospital delivery coverage to the levels required for reaching the mortality goals, it would be necessary to increase health spending by 3.5 per cent per year (Vera, 2006).[14]

MDG 7a and 7b: Increasing the coverage of drinking water and basic sanitation

In order to ensure environmental sustainability, the MDGs also seek to decrease the percentage of the population without access to drinking water and basic sanitation. In the case of Bolivia, the coverage of potable water and basic sanitation was 57 per cent and 28 per cent, respectively, in 1992. In 2001, these levels had risen to 70 per cent and 40 per cent, and it is estimated that they reached 72 per cent and 42 per cent in 2005. The target is to reduce the percentage of the population without access to potable water to 21.5 per cent (MDG 7a) and that without basic sanitation to 36 per cent (MDG 7b) by 2015.

Coverage of drinking water and basic sanitation increased during the 1990s, thanks to the investments made through the social investment funds (SIF), the Popular Participation Law,[15] and private investments in the sector. Beginning in 2001, the National Compensation Policy (PNC) was established in the context of the National Dialogue. This facilitated a greater allocation of resources for social spending by the poorest municipalities. The programmes implemented between 1992 and 2005 were framed within the National "Water for Everyone" Plan and the Ten Year Plan for Basic Sanitation (VSB, 2005). Despite these efforts, investments in the sector have been insufficient. Towards the middle of the current decade, the coverage of services stagnated and the services of providers became less efficient, causing discontent among the population and becoming a source of repeated social conflict.

In 2006, the Ministry of Water was created with a mandate to redefine the regulation of the sector and increasing the role of the government and civil organizations in the provision of basic services. In the context of the PND, further action is to be undertaken to increase services to the population, especially in suburban areas and small cities. According to UDAPE's evaluation for 2006, it is feasible to reach the water and sanitation goals. To that end, programmes are being designed to increase the coverage of these services to the required level.

Model for assessing the MDG strategy: an application for Bolivia

The CGE model that this study uses for evaluating the MDGs is described in detail in Chapter 3. This model, MAMS, permits the construction of a baseline scenario and scenarios in which several of the MDGs are met.

The baseline scenario reproduces trends of key macroeconomic aggregates as observed up to 2006. The business-as-usual scenario assumes that public expenditures grow at the same rate as observed in recent years. The model is calibrated in the baseline such as to achieve a constant real growth of GDP (at market prices) of 3.56 per cent per year during the entire simulation period of 2000-15. This growth rate reflects the performance of the hydrocarbon and mining sectors and takes into account investment projects in the framework of export contracts signed with Argentina and Brazil.[16] Spending on education and health are assumed to increase by 3 per cent and 2 per cent per year, respectively, based on past trends, while spending on water and basic sanitation, as well as infrastructure, is assumed to increase by 2.35 per cent annually. The model assumes that world market prices will increase at trend rates, with the price of imports rising faster than that of exports.[17] The baseline scenario also takes into account the amount of debt relief the country has received in the context of the HIPC Initiative during 2001-05, as well as that received through the MDRI which became effective in 2006. The debt relief received from the IDB in 2007 is not considered, however.[18]

In the MDG scenarios, the assumptions mentioned are maintained, but public spending (recurrent and investment spending) adjusts endogenously to reach the goals as a result of which GDP growth can also be affected. Increased public spending can be financed alternatively through foreign aid (donations), direct taxes, external borrowing or domestic borrowing.

Various macroeconomic closure rules and factor market rules exist for solving for the general equilibrium of the baseline scenario (for more detail, see Chapter 3). Initially, direct tax rates adjust to finance any imbalance in the government current account, keeping the flow of domestic and external borrowing and foreign grants fixed.[19] It is important to mention that this type of macroeconomic adjustment departs from reality in the sense that taxation rates have hardly been modified in Bolivia at all during the last decade, while public investment has been paid for primarily through external financing. On the other hand, consistent with the actual functioning of Bolivia's currency market, the exchange rate is flexible to balance the demand and supply of foreign exchange.

Investment is assumed to be a fixed share of aggregate demand, and the marginal propensity to save of households and firms adjusts to bring savings in line with investment. The model allows changes in the rate of unemployment to achieve equilibrium in the labour market. When wages fall below a 'reservation' (minimum) wage at which workers are not willing to work, the market adjusts through a rise in unemployment. When wages are above the reservation level, the labour market clears through wage adjustment. In contrast, the model assumes full employment of capital.

These closure rules are maintained for all simulations, except for the alternative financing scenarios. According to the latter, emerging fiscal imbalances are no longer financed through direct-tax revenue but rather by flows of, respectively, foreign grants, domestic borrowing or external borrowing.

The model has been estimated using a number of data sources. Many of the model's parameters are directly derived from the Social Accounting Matrix (SAM) for Bolivia. The SAM was built on the basis of national accounts data for the year 2000 provided by the National Statistical Institute (INE).[20] Further, information from the Fiscal Programming Unit (UPF) was used along with balance of payments statistics and financial and monetary statistics from the Central Bank of Bolivia. The SAM specifies key production sectors along with disaggregated accounts for social service delivery, including a breakdown of education and health services by public and non-governmental (private) providers.[21] Overall accounting consistency of the SAM was achieved using the cross-entropy balancing technique proposed in Robinson and others (2001).

Parameters and elasticities not derived from the SAM were directly estimated or derived from other studies. For example, the link between MDG achievement and the provisioning of services of education, health, and water and sanitation

is established through logistical functions, according to which, when the level of provision of these services increases and as the indicators approach the targets set for 2015, the contribution of an additional unit of spending decreases. In order to obtain intermediate values for these logistical functions, a series of elasticities needs to be estimated. Owing to limited social sector and household level data, not all of these could be estimated directly and it was necessary to use other studies and estimates derived from the information and assessments of the relevant social sectors.[22]

The elasticities for the determinants of the infant mortality rate and those for water and basic sanitation coverage were obtained from municipal-level data. These indicators were elaborated based on two population censuses (1992 and 2001), administrative records for health and sanitation and budget data from the General Accounting Office.[23] Variation in infant mortality rates across municipalities was tested econometrically in relation to coverage of water and sanitation coverage, municipal per capita consumption, health spending, and public spending on infrastructure for the years 1992 and 2001.[24] Per capita consumption, sector spending, and spending on public infrastructure were tested as determinants of access to drinking water and sanitation.

In the case of primary education, annual series were obtained for enrolment, repetition and graduation rates. These outcomes were related in econometric regressions to per student education expenditures, public spending on infrastructure and per capita household consumption. The regression estimates for the education model were not found to be very robust statistically; hence, they were subject to further scrutiny and sensitivity analysis in the calibration of MAMS, ensuring feasible and plausible outcomes.

In addition to the elasticities associated with the MDG functions, elasticities of substitution between domestic and imported products were estimated through available series provided by INE. Elasticities of substitution for household production and household consumption are based on assumptions, along the lines of other studies of applied CGE analysis for Bolivia (Jemio and Wiebelt, 2003). In addition, the model uses exogenous growth rates for the population and labour force obtained on the basis of household survey data and demographic projections.

Analysis of policy simulations

Baseline scenario

Detailed results on required financing for all scenarios are found in Appendix A5. The baseline presents a plausible trajectory for the economy, even though outcomes for the external sector deviate somewhat from those observed mainly because the SAM could not be constructed for a more recent base year.[25] For example, the baseline of the model underestimates the actual

export performance during the 2000s. The model predicts a 4 per cent annual increase in exports, but in reality exports grew by 15 per cent per year between 2003 and 2006. The model also only partially captures the surge in world market prices for minerals in that period.

Exports increase more strongly than imports in the baseline, resulting in an appreciation of the exchange rate by 0.3 per cent per year, which in turn mitigates the initial impact on the current account deficit. Ultimately, foreign savings fall from 8.2 per cent to 7.5 per cent of GDP between 2000 and 2015.[26] Private and government consumption fall as a share of GDP, though government consumption grows according to the aforementioned assumptions. At the same time, the debt relief in the context of the HIPC Initiative and the MDRI allows external borrowing to stay within the limits of debt sustainability.[27]

Under the baseline trends and assumptions, none of the selected MDGs would be achieved by 2015 (see Figure 5.1).[28] In this scenario, by 2015 the percentage of students that begin primary school and complete it would rise to 93 per cent; infant mortality would fall to 40 infants per 1,000 live births (the target being 30); maternal mortality is reduced to 159 per 100,000 live births, which is higher than the target of 104; and the coverage for water and sanitation increases, but stays, respectively, around 2 and 7 percentage points short of the target. A comparison of the scenarios where one or several goals are met with the baseline scenario indicates how much it would cost to close these gaps in order to reach the goals in what follows.

Scenarios for achieving the MDGs separately

According to the model, the additional public expenditure needed (as compared to the base scenario) to meet the target of getting all children to enrol in primary school and to complete it on time, would be the equivalent of 1.3 per cent of GDP per year, if financed with external resources, or 1.8 per cent of GDP per year, if financed through domestic resource mobilization, and if none of the other MDGs are being pursued at the same time (see Table 5.3). Most of this percentage corresponds to government final consumption expenditures (0.9 or 1.1 percentage points, depending on the source of the financing, respectively). Other costs relate to additional investments in infrastructure and specific programmes to promote school retention.

Furthermore, the simulation results suggest that meeting MDG 2 would be least costly in terms of required additional public spending when financed through foreign grants or external borrowing. In the case of foreign aid, for example, Bolivia would need to receive additional amount of donations of 4 per cent of GDP per year between 2005 and 2010 to meet MDG 2, but this amount would gradually fall to 0.2 per cent of GDP in 2015. Each year on average 2.5 per cent of GDP would need to be mobilized in the form of foreign aid to achieve MDG 2 during 2000-15. This source of funding would ensure

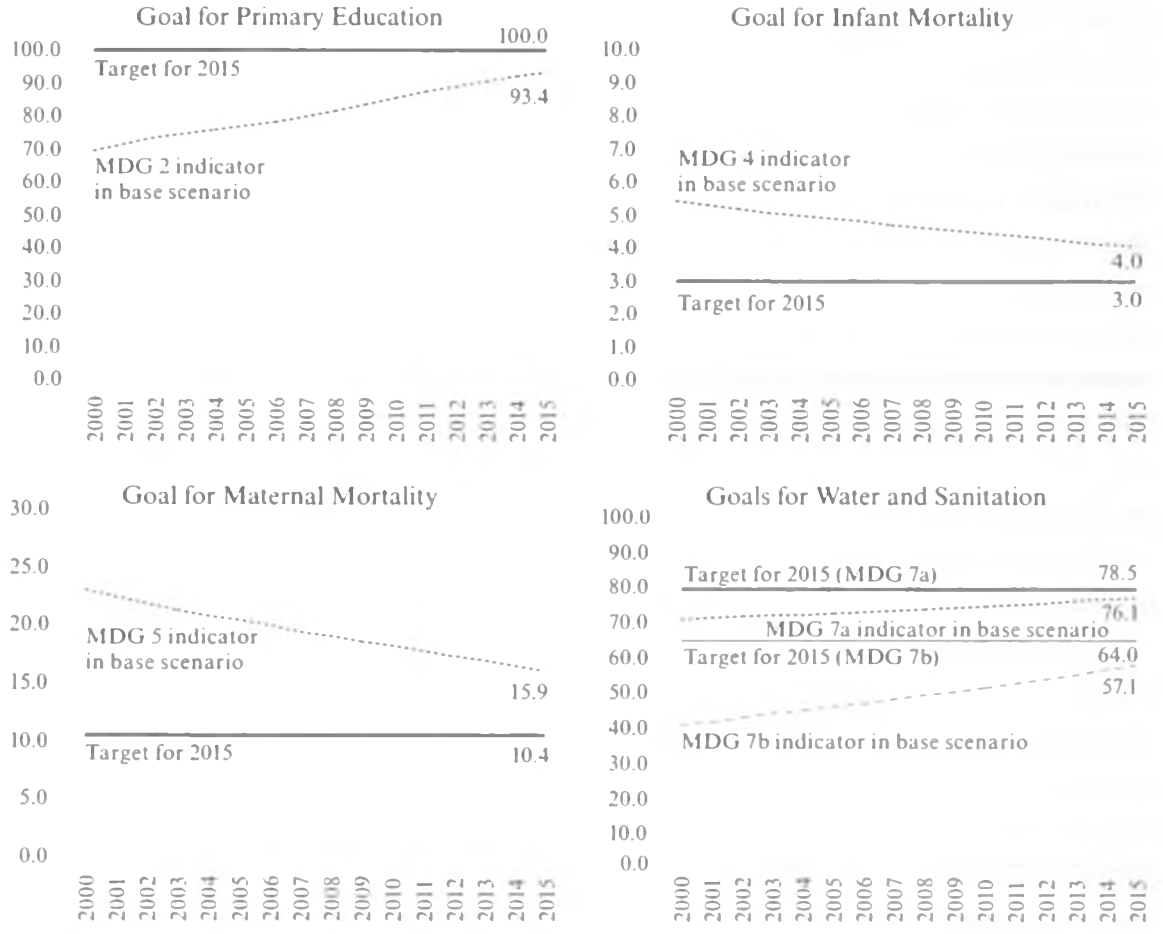

Figure 5.1 Bolivia: Projection of MDG indicators in the baseline and targets for 2015

Source: MAMS model for Bolivia.

fiscal sustainability. Financing through external or domestic borrowing would increase public debt to unsustainable levels (respectively, 66.3 per cent and 70.5 per cent of GDP by 2015). If the additional spending is financed by increasing direct-tax rates, total government revenue should increase by 2.5 per cent of GDP compared with the baseline during the period of 2005-10.

Achieving the goal of primary education through foreign grants would allow an increase in public investment and consumption spending in primary education, without elevating the fiscal deficit. At the same time, in this scenario, the GDP growth rate would reach 3.7 per cent per year, slightly higher than the baseline growth rate. In other words, this financing option would not generate a trade-off with growth effects as it would with the alternatives. As in the case in the external borrowing scenario, increased foreign aid would cause an appreciation of the exchange rate which in turn would discourage exports. Consequently, in this scenario, domestic demand becomes a more important source of economic growth. The resulting Dutch-disease effects are reflected in a reduction in the exports-to-GDP ratio and this also explains why the required aid inflows (2.5 per cent of GDP per annum) exceed the required financing to back the additional public spending of 1.3 per cent of

Table 5.3 Bolivia: Annual additional public spending required to meet the MDGs separately, under different financing scenarios, 2000-2015 (Percentage of GDP)

	Financing scenarios with:			
Millennium Development Goals	**foreign grants**	**direct taxes**	**external borrowing**	**domestic borrowing**
Universal primary education	1.3	1.8	1.3	1.8
Reducing infant and maternal mortality	1.0	1.1	1.0	1.1
Increased access to drinking water and basic sanitation	0.1	0.1	0.1	0.1

Source: MAMS for Bolivia.

GDP per annum to achieve MDG 2. A similar outcome is also obtained in the scenario in which all MDGs are achieved simultaneously, as discussed further below.

In order to meet only the targets for reducing infant and maternal mortality, annual public spending would need to scale up by 1.0 per cent of GDP, on average, during 2000-15, if financed with external resources. It would need to increase by 1.1 per cent of GDP per year if paid for by additional domestic resource mobilization (see Table 5.3). Most of the additional resources would be needed for investments in health infrastructure and equipment; the larger share of these investments would need to be made between 2005 and 2010 in order to timely achieve the targets for MDGs 4 and 5. The macroeconomic trade-offs are similar as in the case of increased spending to achieve the education target, but weaker as the health targets can be achieved with a smaller rise in public spending.

Finally, to meet the goals in the area of water and basic sanitation separately, public spending in the sector would only have to increase modestly as a share of GDP: around 0.1 points per year. Achieving these goals, however, involves concurrence with private sector investments.[29]

Scenarios for achieving the MDGs simultaneously

According to the predictions of the MAMS scenarios, in order to meet all of MDGs 2, 4, 5 and 7 simultaneously, rather than separately, the government would have to spend an additional amount of between 1.7 per cent and 2.8 per cent of GDP per annum during 2000-2015 (see Table 5.4), but most scaling up of public spending is needed during 2005-2010. This seems affordable, but the viability of the MDG strategy will further depend on the trade-offs caused by financing strategy.

If the attainment of all of the goals is financed through direct taxes, tax revenue would need to increase to 26 per cent of GDP between 2005 and 2010, almost 5 additional points with respect to the baseline scenario. Government savings grow as a result of the increase in direct taxes; however, less available income causes a reduction in private consumption of around 4 percentage

Table 5.4 Bolivia: additional public spending required annually in order to achieve MDGs for education, health, water and sanitation, simultaneously, under different financing scenarios, 2000-2015 (Percentage of GDP)

	Financing scenarios with:			
	foreign grants	**direct taxes**	**external borrowing**	**domestic borrowing**
Final consumption expenditures				
Primary education	0.7	0.8	0.7	0.8
Health	0.4	0.5	0.4	0.5
Water and sanitation	0.0	0.0	0.0	0.0
Investment spending				
Primary education	0.3	0.6	0.3	0.6
Health	0.3	0.7	0.6	0.7
Water and sanitation	0.1	0.2	0.1	0.2
Total public spending	1.7	2.8	2.0	2.8

Source: MAMS for Bolivia.

points of GDP in the same period. When additional public spending is paid for through domestic borrowing, government savings would turn negative (on average -4 per cent of GDP per year in the 2005-10 period). Domestic public debt would already surpass 50 per cent of GDP by 2010—and would level off at 80 per cent of GDP by 2015—which would be considered well above critical debt sustainability levels. Financing the increased spending through taxation or domestic borrowing would only generate a mild appreciation of the exchange rate compared with the baseline, only moderately slowing the rate of export growth.

The external financing scenarios show a different picture. If donations are used, they could increase and surpass 4.4 per cent of GDP per year between 2005 and 2010 when most spending would need to be scaled up—after which they would decline gradually, reaching little less than 2 per cent of GDP by 2015. With external borrowing, on the other hand, the government must borrow an equivalent of 6.7 per cent of GDP per year for the 2005-10 period—though the percentage would gradually go down to 5.0 per cent by 2015, but that strategy would not be viable since the accumulated external debt would reach 75 per cent of GDP by the end of the whole simulation period, surpassing by far the limits of sustainability. Using external resources, as opposed to internal resources, would generate a more marked exchange rate appreciation. Between 2005 and 2010, for example, there would be more than 13 per cent appreciation with respect to the baseline. This would affect the current account and the capacity to export, forcing the country to mobilize additional foreign resources to finance a widening trade deficit, in amounts exceeding those required to source the increase in public spending for the MDGs.

Microsimulation results for extreme poverty

The analysis of the previous goals is based directly on the results of simulations with MAMS. The goal of reducing extreme poverty, however, was analysed after application of the microsimulation methodology. As explained in Chapter 2 (see, specifically, Appendix A2.1), sequential changes in the labour market produced by MAMS' scenarios are linked with household survey data in order to evaluate the variations in income distribution and measure extreme and total poverty using national and international (one- and two-dollar-a-day) poverty lines. The 2000 household survey used was conducted in the context of the project Improving Surveys for the Measurement of Living Conditions (MECOVI).

The population that lives on less than one dollar a day falls from 27.1 per cent in 2000 to 23.9 per cent in 2015 in the baseline scenario; that is to say, the target for MDG 1 of halving extreme poverty is not met. Similarly, the target is also not met when using the national poverty line, since the degree of poverty reduction is of a similar magnitude as in the case of applying the international poverty line (see Tables 5.2 and 5.5). The scenarios for achieving the MDGs for education, health and basic sanitation do not achieve much more poverty reduction. Only the scenarios with external financing reduce extreme poverty slightly more (by 0.7 percentage points during 2000-15).

The insufficient decrease in poverty is caused in part because inequality remains high in the baseline scenario. Both the Gini coefficient of labour income and per capita household income remain virtually unchanged (see Table 5.5). The poverty reduction that would be achieved under any of the scenarios is largely explained by changes in the overall level of employment and changes in average remunerations. Poverty reduction falls short of the target because the increase in remuneration for unskilled workers is negligible and insufficient to take many of them out of extreme poverty (see Table 5.6). In addition, the supply of unskilled and semi-skilled workers increases relatively more than the supply of skilled workers, so at going wages, workers who join the labour market or find new jobs have limited possibilities of getting out of poverty. The growth pattern under both the baseline and MDG scenarios mainly generates employment for unskilled workers at low wages and pushes up the relative remuneration for skilled workers, thus preventing a reduction in income inequality.

In the MDG scenarios, the supply of services of education, health, and water and sanitation increases. This causes a stronger increase in average labour incomes as compared with the baseline, but the real wage increase remains stronger for skilled workers, given the relatively high skill intensity of the delivery social services. However, also when pursuing the MDGs, the average wage increase remains insufficient to meet the target for reducing extreme poverty.

Similarly, the reduction in unemployment is not significant enough to reduce poverty because the open unemployment rate is relatively low (5 per cent), and

Table 5.5 Bolivia: results of the microsimulations in the baseline and all MDGs scenarios, 2000-2015

	2000	2005	2010	2015	2000	2005	2010	2015
	National poverty lines							
	Total poverty (%)				Extreme poverty (%)			
Baseline scenario	66.4	65.1	62.8	60.6	45.2	43.8	41.5	39.4
All MDGs with foreign grants	66.4	64.0	60.9	59.2	45.2	42.9	40.0	38.4
All MDGs with direct taxes	66.4	64.6	62.5	60.5	45.2	43.4	41.5	39.5
All MDGs with external borrowing	66.4	64.0	60.9	59.3	45.2	42.9	40.0	38.4
All MDGs with domestic borrowing	66.4	64.7	62.5	60.5	45.2	43.5	41.6	39.5
	International poverty lines							
	1 dollar a day (PPP) (%)				2 dollars a day (PPP) (%)			
Baseline scenario	27.1	27.0	26.0	24.7	43.3	42.8	41.0	39.0
All MDGs with foreign grants	27.1	26.5	24.8	24.0	43.3	42.0	39.3	37.8
All MDGs with direct taxes	27.1	26.9	25.9	24.7	43.3	42.3	40.9	39.0
All MDGs with external borrowing	27.1	26.6	24.8	24.0	43.3	42.0	39.2	37.8
All MDGs with domestic borrowing	27.1	26.9	26.0	24.7	43.3	42.5	41.0	39.0
	Gini Coefficient							
	Labour income				Per capita household income			
Baseline scenario	0.59	0.60	0.60	0.60	0.62	0.62	0.62	0.62
All MDGs with foreign grants	0.59	0.60	0.60	0.59	0.62	0.62	0.62	0.61
All MDGs with direct taxes	0.59	0.60	0.60	0.60	0.62	0.62	0.62	0.62
All MDGs with external borrowing	0.59	0.60	0.60	0.59	0.62	0.62	0.62	0.61
All MDGs with domestic borrowing	0.59	0.60	0.60	0.60	0.62	0.62	0.62	0.62

Source: MAMS for Bolivia and microsimulations based on 2000 household survey data.

given that unemployment is concentrated among unskilled workers and given their low remunerations and the high degree of informality in the sectors where they work, the increase in the employment rate has little impact on poverty.

The microsimulations demonstrate that reducing extreme poverty requires policy actions that go beyond expanding social programmes. It is necessary to adopt complementary measures in order to improve the overall level of productivity in the economy allowing for higher wages, among others by improving production conditions in low-productivity sectors, enhancing the accumulation of human capital and removing infrastructural bottlenecks. The MDG strategy and the PND pursue such objectives, but these will take time to produce the desired outcomes. In the case of investment in human capital, for instance,

Table 5.6 Bolivia: rate of growth in employment and labour income by type of worker in the baseline scenario and all MDGs scenarios under different forms of financing, 2000-2015

	Baseline scenario	Financing with:			
		foreign grants	direct taxes	external borrowing	domestic borrowing
Employment	2.2	2.2	2.3	2.2	2.3
Unskilled workers	2.1	2.0	2.2	2.0	2.2
Semi-skilled workers	2.4	2.5	2.5	2.5	2.5
Skilled workers	1.9	2.1	2.0	2.1	2.0
Real income per worker	1.4	1.9	1.5	1.9	1.5
Unskilled workers	1.5	1.9	1.4	1.9	1.4
Semi-skilled workers	0.9	1.0	0.8	1.0	0.8
Skilled workers	1.8	2.2	2.1	2.2	2.1

Source: MAMS for Bolivia.

most of the desired impact on productivity likely will take effect beyond 2015, given the time lags involved in enhancing the overall educational level of the labour force.

Conclusions and policy recommendations

Achieving all MDGs in Bolivia by 2015 is a major challenge. In a 'business-as-usual' scenario the goals are not achieved. Scaling up public expenditures to meet the targets for education, health, water and sanitation in itself is not sufficient to produce the employment and income effects needed to also achieve the target of halving extreme poverty by 2015.

The model simulations analysed here suggest that the goals for achieving universal primary education, reduce infant and maternal mortality, and enhanced access of the population to water and basic sanitation would be reachable if public spending is increased by between 1.7 per cent and 2.8 per cent of GDP per year during 2005 and 2015, depending on the financing scenario. Achieving all these goals simultaneously would be less costly than in the hypothetical where they would be pursued in uncoordinated fashion, as there are important synergy effects between the MDGs to take advantage of.

Financing through direct taxes would require increasing tax revenue by between 4 and 5 GDP points per year between 2005 and 2010 when most spending needs to be scaled up. This amounts to nearly 3 percentage points of GDP on average for the whole period up to 2015. Raising taxes would negatively affect private consumption, part of which is also important to achieve the different goals. If financing is through domestic borrowing, the fiscal deficit would increase substantially and domestic public debt would increase to an unsustainable level of over 80 per cent of GDP in 2015.

Financing through external borrowing produces less trade-offs with GDP growth and private demand as in the scenarios with domestic resource mobilization, but would also induce chronic fiscal deficits and intensify the existing external debt dependence. The required additional external borrowing in this scenario would be in the order of 4 per cent of GDP between 2005 and 2010, or around 2 per cent of GDP in the whole period to 2015, and external debt would increase to over 75 per cent by 2015, surpassing the limits of debt sustainability. Alternatively, the annual flow of grants from external donors would need to increase by around 4.4 per cent or 3 per cent of GDP per year during 2005-10 or up until 2015 in order to finance the scaled-up public spending to meet the MDGs. Both forms of external financing would cause a marked appreciation in the exchange rate eroding export competitiveness and which would further increase external financing needs over and above those needed to finance the public spending increase that is required to achieve the MDGs.

Bolivia thus would need additional external support to embark on a more viable strategy towards achieving some of the MDGs. This will require allocation of the additional resources towards universalizing access to social services and improving their efficiency. There is a particular need to provide demand incentives to enhance access to education services in rural areas, to improve teacher performance, and to expand the supply of schools that provide secondary-level education. In the area of health, it is necessary to consolidate immunization programmes and expand primary health care services, provide health centres with the necessary equipment, and enhance preventive health programmes in order to reduce the prevalence of diseases and reduce maternal and infant mortality. In addition, public and private investment in water and sanitation must be stepped up further to enhance coverage, especially in rural areas and small municipalities.

Achievement at the same time of the targeted reduction in extreme poverty would require additional, aggressive policies promoting productive development in Bolivia and boosting factor productivity to facilitate more substantial increases in labour income. In this sense, the PND should give priority to measures that strengthen linkages between the modern economy (gas and mining sectors) and other sectors, not only through transfers (tax on hydrocarbons, departmental royalties, or national dialogue account) but also through projects that support the development of non-traditional activities that can also find a niche in world markets. Removing infrastructural deficits in transportation and communications systems and improving business support services will also be critical in order to achieve significant increases in factor productivity. Greater progress in social and human development may be expected to facilitate increases in productivity in the future. The PND is promoting a Policy for Social Protection and Comprehensive Community Development aimed at supporting communities in rural areas as well as small-scale producers in urban areas. The challenge is to follow through on these promises and cautiously deal with the short-term macroeconomic trade-offs that scaling up of public spending may generate.

Table A5.1 Bolivia: flows of financing in the baseline and MDG scenarios, 2000-2015 (Percentage of GDP)

Financing and savings variables	Base scenario	MDG Scenarios with: foreign grants	direct taxes	external borrowing	domestic borrowing	foreign grants	direct taxes	external borrowing	domestic borrowing
		MDG 2				*MDGs 4 and 5*			
Direct and indirect taxes	20.9	20.5	23.6	20.5	20.6	20.8	22.1	20.8	20.9
Government savings	2.4	0.2	3.1	-0.2	-0.5	1.7	3.0	1.6	1.6
Foreign savings	7.7	10.4	7.7	10.8	7.7	9.0	7.7	9.1	7.7
Domestic borrowing (flow)	1.6	1.6	1.6	1.6	5.2	1.6	1.6	1.6	3.1
External borrowing (flow)	2.1	2.0	2.1	4.9	2.1	2.1	2.1	3.4	2.1
Foreign grants (flow)	0.0	2.5	0.0	0.0	0.0	1.2	0.0	0.0	0.0
Domestic public debt (stock)	20.4	19.9	20.2	19.9	39.8	20.2	20.3	20.2	26.9
External public debt (stock)	37.3	34.8	36.8	51.4	36.8	36.4	37.2	42.4	37.2
		MDG 7				*MDGs 2, 4-5 and 7*			
Direct and indirect taxes	20.9	20.9	21.0	20.9	20.9	20.5	24.7	20.5	20.7
Government savings	2.4	2.3	2.5	2.3	2.3	0.1	3.9	-0.4	-0.7
Foreign savings	7.7	7.8	7.7	7.9	7.7	11.0	7.7	11.5	7.7
Domestic borrowing (flow)	1.6	1.6	1.6	1.6	1.7	1.6	1.6	1.6	6.3
External borrowing (flow)	2.1	2.1	2.1	2.3	2.1	2.0	2.1	5.5	2.1
Foreign grants (flow)	0.0	0.1	0.0	0.0	0.0	3.1	0.0	0.0	0.0
Domestic public debt (stock)	20.4	20.4	20.4	20.4	21.0	19.8	20.2	19.8	44.1
External public debt (stock)	37.3	37.2	37.3	37.9	37.3	34.4	36.8	53.7	37.0

Source: MAMS for Bolivia.

Notes

1 The programme includes the "Juancito Pinto" cash transfer, of 200 Bs per year (about US$ 25) to all students enrolled in first through eighth grades in the public schools.
2 In 1985, inflation reached a level of 8,170.5 per cent. Between 1981 and 1985, the economy shrank at a pace of nearly 2 per cent per year. Later, in 1986-87, foreign debt came to represent more than 90 per cent of GDP.
3 The fiscal deficit has been affected by the costs of the reform to the pension system which is estimated at about 4 per cent of GDP. If there are no further adjustments to the system, those costs should start going down in 2011.
4 Bolivia entered the HIPC Initiative in 1997. In 2001, with the elaboration of the Bolivian Poverty Reduction Strategy (BPRS), the country's participation in the expanded HIPC-II Initiative was approved.
5 The HIPC Initiative established that the resources freed by the debt relief should be directed to poverty reduction programmes, based on the contents of the BPRS.
6 The Third Progress Report on the MDGs defined the specific target for extreme poverty reduction based on an extrapolation of values between 1996 (initial year) and the goal for 2015, establishing it at 24 per cent. However, according to PND projections, extreme poverty incidence could fall to 20 per cent by 2015.
7 Unemployment data from 2000 come from the capitals of the nine departments and the municipality of "El Alto", largest cities in the country. The longest unemployment series were available only for these geographic areas. According to the 2001 Census, 55 per cent of the Bolivian population live in these cities.
8 Measuring income in the rural areas is more difficult because of the high percentage of production going directly to self consumption among small producers. Inequality in income distribution fluctuates between 0.6 and 0.65 and is at least as high as what is seen at the national level (Landa, 2003).
9 The gross completion rate for primary school is defined as the ratio of the total number of students promoted to the eighth year of primary school in a given year over the total population with the official age for attending this grade (13 year-olds). This rate does not restrict the age of those who finish eighth grade.
10 Information in the Fourth MDG Progress Report.
11 This percentage corresponds to the survival rate in the system at the eighth grade level of primary school and includes the students who repeat the grade and enroll again. When these students are excluded, the rate drops to 58.1 per cent. Similar estimates of the promotion rates per grade have been obtained by Zambrana (2005).
12 In 2003, the Ministry of Education projected the indicators in education and estimated the spending necessary to reach the MDGs for the sector.
13 According to 2003 ENDSA data, blood haemoglobin tests reveal that one third of all women of child-bearing age have anaemia and 7 per cent have moderate to severe anaemia, something that tends to affect a higher percentage of pregnant women and women with lower levels of schooling, especially in the western regions of the country.
14 The cost estimates are based on a procedure designed by UDAPE and presented in Vera (2006) and include, among other actions, interventions related to the strengthening of health insurance programmes, networks, quality control, expansion of coverage, universal health insurance and nutrition (for children and mothers).
15 The Popular Participation Law of 1994 allocated 20 per cent of the fiscal revenue of more than 300 municipal governments—whose competencies in local social service administration had been broadened—primarily to the areas of education, health and provision of water.

16 The growth rate is consistent with the medium- and long-term projections made by UDAPE and the Central Bank. The projections, however, do not consider the nationalization of hydrocarbons and the installation of projects in strategic sectors (mining, hydrocarbons and electricity), measures that are part of the PND of the government of President Evo Morales. The PND foresees reaching an investment rate of nearly 24 per cent of GDP per year through 2010, more than doubling the rate achieved in 2004 (11.2 per cent). The growth projection also does not account for the renegotiation of contracts with foreign companies nor does it take into consideration the effects of the global economic crisis that started in 2008.

17 In the last few years, the prices of minerals and hydrocarbons stayed high in international markets, which translated into a surplus in the Bolivian balance of trade starting in 2004. The assumptions of the model, looking towards the horizon of the year 2015, recognize the possibility of a tendency toward more accelerated growth in the prices for imported goods.

18 The debt relief from the IDB was still in the process of being approved when this study was undertaken.

19 In a strict sense, Bolivia does not have a direct tax on personal income. Rather, it has a regime that complements the value added tax and taxes the labour income of persons. In MAMS for Bolivia, however, the tax is treated as a levy on household income.

20 An input-output matrix, the integrated economic accounts table, and complementary matrices with information of transfers, interest payments and other inter-institutional transactions were used to build the SAM.

21 The disaggregation of this sector was carried out using data from national accounts and from health sector financing, as well as reports from non-governmental organizations linked to the sector and public and private health care funds. The production of private education services was estimated based on the distribution of enrolment and the directories of private establishments, among others.

22 Various national and international agencies drew up projections and costs based on partial equilibrium models. Those developed by Ministerio de Educación (2004), Ministerio de Salud y Deportes (2004), De Jong and others (2005) and UDAPE (2006a) were particularly useful. For the water and sanitation sector, the estimates of costs and coverage presented in Salguiero and Castrillo (2002) and VSB (2005) were used.

23 The municipal data on sectoral spending show incomplete coverage, which is why they are only taken as a reference and in several cases yielded estimated elasticities that were not statistically robust.

24 For maternal mortality, elasticities were defined based on infant mortality results. The elasticities are lower than those estimated for infant mortality, which leads to the assumption that decreasing the number of maternal deaths could become more difficult in the future.

25 The SAM was built for the year 2000 and its estimates are influenced by the impact of the economic crisis starting in 1999.

26 Because of export revenues, modifications in the tax on the hydrocarbons sector, and to some degree low budgetary spending, Bolivia's government has recorded a fiscal surplus in the last few years.

27 The HIPC initiative defines the debt sustainability threshold as a value of the debt that is no more than 150 per cent of exports. Since the model does not reproduce this indicator, the Andean Community indicator is used, which defines debt as unsustainable when it surpasses 50 per cent of GDP.

28 With some differences due to differing methodologies, the results of this study resemble the projections drawn in the Third Report on the MDGs (UDAPE, 2005b).

29 The National Plan for Basic Sanitation 2001-10 estimated that to achieve the MDGs in the sector, a total investment of $2,408 million would be required through the year 2025. Because of natural population growth, an additional $65 million to $85 million per year would be required (less than 1 per cent of GDP), including public and private financing, in order to cover water and sanitation needs.

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