

Public Policies for Human Development

Achieving the Millennium Development Goals in Latin America

Edited By

Marco V. Sánchez

Rob Vos

Enrique Ganuza

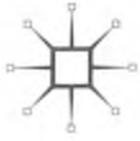
Hans Lofgren

and

Carolina Díaz-Bonilla

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8

Ecuador

Mauricio León, José Rosero and Rob Vos

Introduction

The social and economic development of Ecuador has been uneven in recent decades. Progress has been made on some dimensions of human development, but stagnation or deterioration has occurred in other areas. This chapter seeks to assess the feasibility of achieving the United Nations' Millennium Development Goals (MDGs) by 2015, using a dynamic general equilibrium framework. The general equilibrium focus is especially relevant considering that the achievement of these goals has dynamic effects on the economy as a whole. It creates changes in the skill composition of the labour force, for example, and produces endogenous growth effects, which may make it easier to achieve these goals. At the same time, however, the upfront public spending efforts needed to meet the goals could generate macroeconomic trade offs and hence obstacles to sustained growth and poverty reduction. The objective of the analysis is to generate results regarding the level of public spending that would be required to achieve the goals, to assess the viability of alternative forms of financing the required increase in public spending, and to identify possible tradeoffs.

This chapter has five additional sections. The next section briefly reviews the social and economic context of Ecuador since the 1980s. It examines the main social and economic policy reforms undertaken along with recent trends in the indicators that evaluate progress towards the achievement of the MDGs. It will also summarize the results of partial equilibrium analyses of the determinants of MDG-related outcomes in education, health, and access to drinking water and sanitation. The subsequent section presents the results of the dynamic computable general equilibrium analysis based on MAMS, as well as the main characteristics and assumptions made for applying the model to the Ecuadorian economy. The fourth section presents the results of the microsimulations that were conducted to estimate the impact of the policy simulations on extreme poverty. The last section summarizes the main conclusions and provides some policy recommendations.

Ecuador's challenge for achieving the MDGs: a problem of resource abundance?

Stabilization, growth, inequality and poverty

It may be argued that Ecuador has lost nearly two and a half decades in terms of its economic development. During about one-third of the years between 1980 and 2005, the country experienced economic crises characterized by declines in GDP per capita (see Figure 8.1), lowering the standard of living for its population. Since the debt crisis in the early 1980s, poor macroeconomic management, a series of exogenous shocks, and political instability have all contributed to the high degree of economic volatility.

During the 2000s, rapid economic recovery has been driven by the construction of a new oil pipeline for the transport of heavy crude and by the significant increase in the price of oil. Economic growth until the global crisis of 2008 was also supported by increasing remittances from Ecuadorian migrants living abroad. Remittances accounted for nearly 5 per cent of GDP by the middle of the first decade of the 21st century. The strong expansion of the oil sector has not been accompanied by a similar economic dynamism in the rest of the economy, however, which has increased the economy's dependence on oil (see Table 8.1).

Though Ecuador has not experienced periods of hyperinflation, the annual average inflation rate for the period analysed has been over 20 per cent. The economy experienced a financial and banking crisis in 1999, and in the midst of a very unstable political and economic situation, in January 2000, the decision was made to adopt the US dollar as the official currency in an attempt to stabilize the

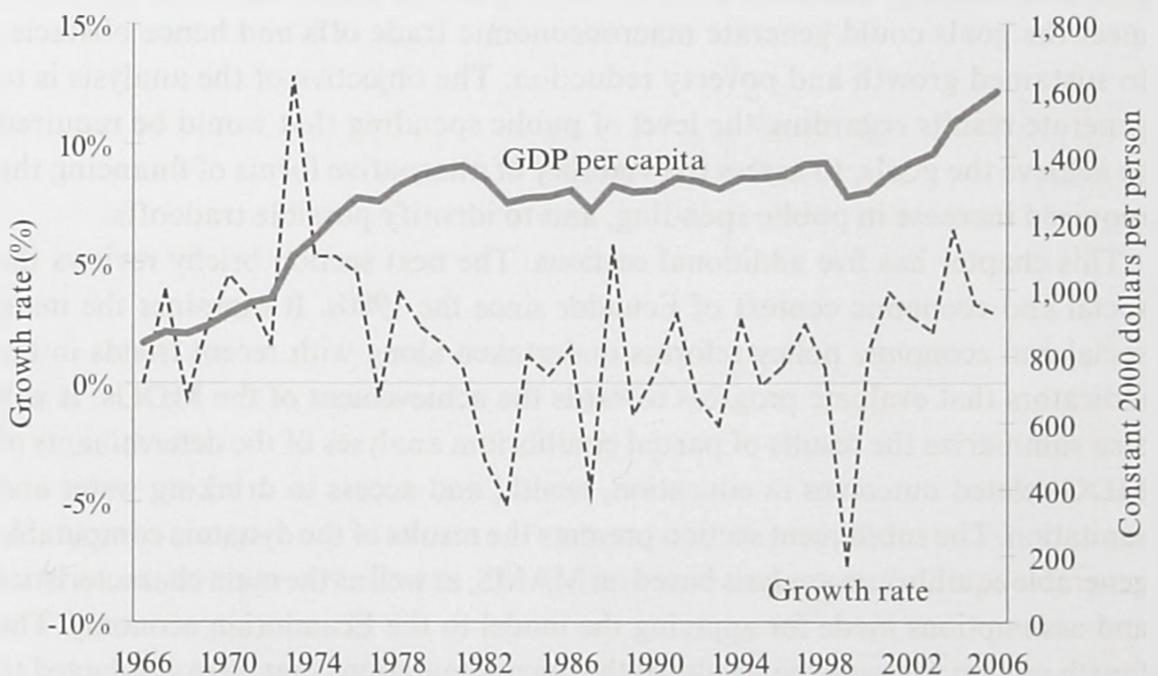


Figure 8.1 Ecuador: GDP per capita (constant 2000 dollars) and growth rate, 1966-2006
Source: Central Bank of Ecuador (BCE), Monthly statistical information.

Table 8.1 Ecuador: Economic growth by sector, 1994-2004 (Percentage)

	1994-1998	1998	1999	2000-2004	2005-2006
Total GDP	2.6	2.1	-6.3	4.8	4.5
Agriculture and Livestock	3.6	-5.0	13.0	4.2	3.2
Fishing	8.4	6.1	-6.7	-1.9	9.7
Mining and quarrying	-0.2	-1.6	1.4	7.2	2.0
Manufacturing	4.7	5.5	-5.2	1.6	6.3
Oil refinery	7.9	0.9	26.8	7.5	4.3
Electricity, gas, and water	1.3	8.5	23.0	1.7	0.0
Construction	1.0	-0.2	-24.9	11.9	5.0
Wholesale and retail trade	2.6	0.7	-11.2	3.4	4.9
Transportation and storage	3.8	4.2	0.0	2.2	3.9
Financial intermediation services	1.5	-16.9	-47.3	0.9	12.0
Other services	5.8	7.2	-3.2	4.4	5.2
Imputed banking services	1.0	-15.3	-33.0	1.6	7.6
Public administration and defence	-0.1	6.0	-5.6	3.7	2.6
Domestic services to households	3.1	3.0	3.4	3.1	-1.5
Other components of GDP	3.2	2.7	-4.5	7.9	7.2

Source: Central Bank of Ecuador, Monthly statistical information.

economy (Vos, 2000). The monetary “shock” initially generated a greater adjustment of prices, and inflation soared to 100 per cent in 2000. It took three years after the official dollarization of the economy to bring the rate of inflation down to one digit (see León and others, 2008). The slow convergence of the inflation rate with respect to international rates caused a significant appreciation in the real exchange rate; a trend which showed a mild reversal from 2003 (see Figure 8.2). Real wages recovered along with the appreciation of the exchange rate, as they did during the early 1990s when a macroeconomic stabilization programme was applied using the exchange rate as a nominal anchor, in the framework of a system with exchange rate bands. Also at that time, no major restrictions existed on the availability of foreign exchange, and the increase in real wages was a significant factor in the reduction of urban poverty, similar to the trends observed after 2000 (see Figure 8.2).

Growth in the oil sector, accompanied by the appreciation in the exchange rate, the recovery of real wages, and the very weak growth in labour productivity in non-oil tradable sectors are symptoms of the so-called “Dutch disease.” This syndrome has negatively affected the economic development of Ecuador since the early 1970s when oil exploitation began (see Vos, 1989, among others). Though oil resources have helped to promote public spending on infrastructure and social development, they have not been enough to reduce inequality and to promote sufficient competitiveness and productivity in the productive sector, thus limiting a process of greater diversification of the economy. Instead, because of the dependence on oil, the volatility of

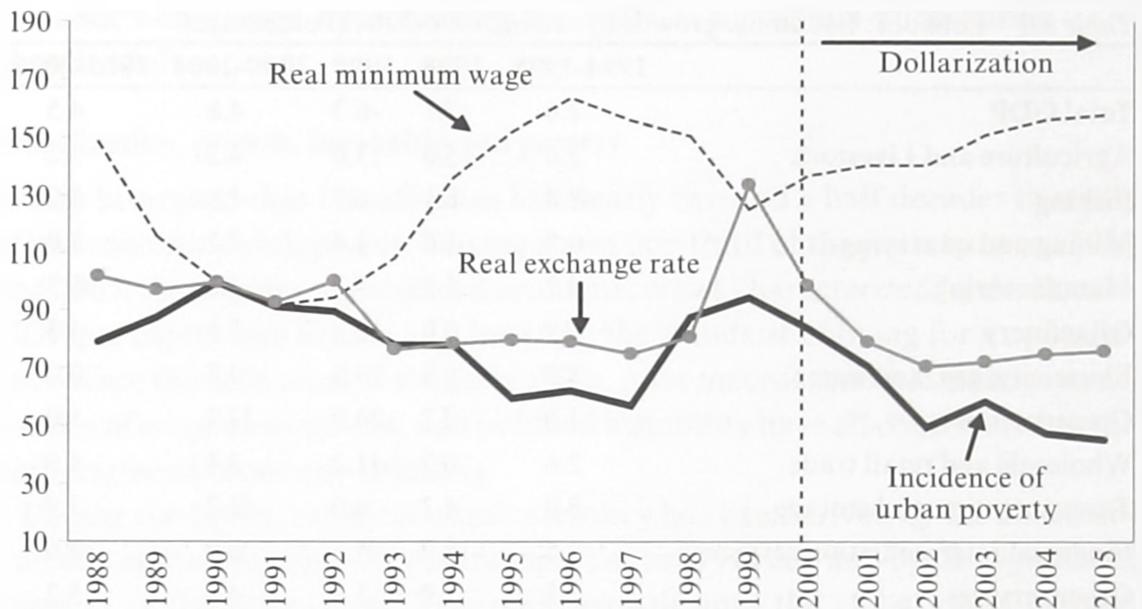


Figure 8.2 Ecuador: Incidence of urban poverty, minimum wage, and real exchange rate, 1988-2005 (Index 1990=100)

Source: INEC, Urban employment, underemployment, and unemployment surveys; Central Bank of Ecuador (BCE), Monthly statistical information.

international markets has been transferred to the national economy, while “pro-cyclical” macroeconomic policies have further intensified the cyclical ups and downs of the economy, increasing investment uncertainty. As seen in other cases, the inability to implement “counter-cyclical” macroeconomic policies has contributed to a lower pace of economic growth in the long term (Ocampo and Vos, 2008; United Nations, 2006).

Income inequality has increased over the last 15 years (see Figure 8.3). According to Vos and León (2003), the factors associated with the structural reforms introduced in the 1990s, such as trade liberalization and financial liberalization, have tended to widen the income gap between skilled and unskilled workers. In addition, information on income poverty collected from employment surveys suggest that absolute poverty in urban areas increased during the years of high inflation and decreased in periods when inflation was reduced, when the economy recovered after the strong contraction of 1999, and when real wages increased. As mentioned previously, wage increases coincided with episodes of exchange rate appreciation (see Figure 8.2). Since dollarization in the year 2000, currency appreciation has been caused by the inflationary trends of the first years of dollarization, the rising price of oil, and a substantial increase in remittances received from Ecuadorans living abroad. In this sense, poverty reduction has not been the result of a more dynamic non-oil economy and broad-based employment growth, but rather that of a temporary favourable external environment, especially rising oil prices.

Information from living standards surveys suggest that rural poverty also declined after dollarization. According to this information, the rural poverty

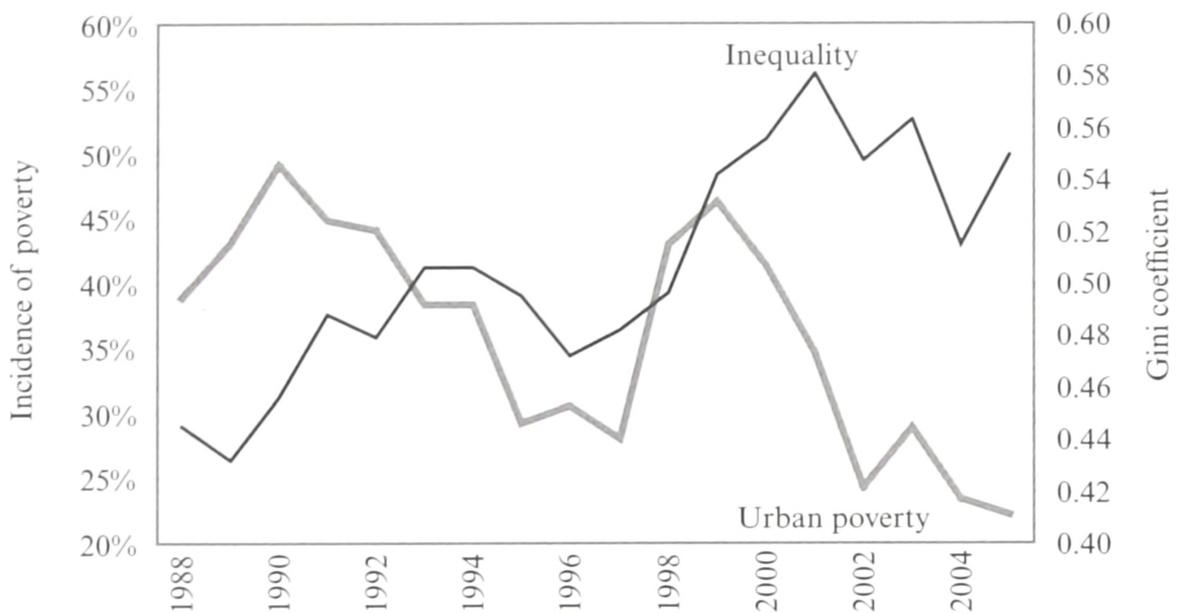


Figure 8.3 Ecuador: Incidence of poverty and inequality in urban areas, 1988-2005^a

Source: INEC, Urban employment, underemployment, and unemployment surveys.

^a The incidence of poverty is measured using per capita income data and a poverty line of 2 dollars a day per person. Inequality is measured by the Gini coefficient for income per capita.

rate measured by consumption fell from 75 per cent to 62 per cent between 1999 and 2006. The same source also confirms that there has been a decline in urban consumption poverty, though this is less pronounced than when measured in terms of income: specifically, from 36 per cent to 25 per cent in the same period. National consumption poverty fell from 52 per cent in 1999 to 38 per cent in 2006.¹

Progress towards the Millennium Development Goals²

MDG 1: Eradicate extreme poverty and hunger

The chapter on poverty in the *First Report on the Millennium Development Goals (MDG) of the Republic of Ecuador* (SODEM, 2005) uses a methodology based on the elasticity of poverty with respect to economic growth, for a given distribution of income. This methodology, originally developed by UNDP-ECLAC-IPEA (2003), aims to estimate the efforts that must be made in economic growth and redistribution in order to achieve the first target for MDG 1. This analysis considers the target of reducing the national level of extreme poverty from 15.5 per cent in 1999 to 7.7 per cent in 2015, using the poverty line of one dollar a day per person at purchasing power parity (PPP). The report, which looks at three different scenarios regarding assumptions of per capita annual GDP growth (1 per cent, 2 per cent, and 3 per cent), concludes that not even 3 per cent per year growth would be enough to reach the target and that, therefore, significant complementary redistributive efforts will be required. The Gini coefficient would have to be reduced from 0.539 in 1999 to 0.513, 0.522, and 0.533 in 2015, respectively, for each one of the three scenarios of economic growth in order to meet the target.

As indicated, economic volatility has an adverse impact on long-term growth in the sense that, as observed in other countries, there is increased uncertainty and risk for investment, which tends to affect both private and public investment in long term social and economic development projects (United Nations, 2006). Therefore, in order to achieve the target for reducing extreme poverty, the country would need to preserve economic stability, sustain rapid growth of per capita income at rates above 3 per cent per year, as well as achieve a redistribution of income towards the poor. These conditions pose quite a challenge since the country would have to look for ways to increase the pace of economic growth above long-term historic levels and be able to reverse the trend towards greater inequality of the last few decades.

In summary, with the existing trends and policies, the target of halving extreme poverty by 2015 would not be met. The greater economic stability achieved by macroeconomic policy since around 2002 has not been accompanied by a notable improvement in productivity. Also, trade liberalization has done little to dynamise the economy, while it did produce greater inequality. The country has improved its social protection system, and that helps attenuate, to a certain degree, the situation of extreme poverty, but efforts must be redoubled to increase productivity and find redistributive mechanisms that can effectively bring about more opportunities for the economic inclusion of poor groups.

MDG 2: Achieving universal primary education

According to information from the 1990 and 2001 population census, the net rate of enrolment in primary education was practically stagnant during 90 per cent of this period, which is worrisome. The average level of schooling of the population age 24 and older grew just slightly, from 6.7 years to 7.3 years; in other words, it grew by only 0.6 years in the entire last decade, when previously, the same progress had been made in 1.5 years. These indicators are aggravated by high drop-out and repetition rates, where the highest levels occur during first grade. On average, 14 per cent of the children enrolled drop out of first grade. In recent years there has been a significant improvement in access to education, however. In fact, according to the living standard surveys, the net primary school enrolment rate increased from 90.3 per cent to 94.3 per cent between 1999 and 2006. It should be noted, however, that only 67.4 per cent of the students finished primary education in 1990 and that the level of repetition and desertion remains high.

The econometric analysis of Vos and Ponce (2004) indicates that it is possible to achieve access to primary education for all girls and boys who live in the urban areas at a very reduced additional cost (between 0.1 per cent and 0.2 per cent of GDP per year), but only if resources are allocated to more “cost-effective” interventions. Possible interventions would include, increasing the number of trained teachers, increasing access to cash transfer programmes in

the poor urban sectors (Human Development Bonus),³ reducing the number of children per classroom, and promoting greater participation of schools and local authorities in decision-making related to education. In rural areas, adult literacy programmes and the universalization of the first year of basic education would also have a significant impact.

Unlike the Vos and Ponce (2004) study that focused on primary and secondary school *enrolment*, this study looks at the education target for primary school *completion*. To this effect, three different behaviours were modelled, which together determine the probability that a person might complete the educational cycle: that is, enter first grade, successfully complete the school year, and continue on to the next grade. The determinants of these three behaviours were analysed using logit probabilistic models, and the conclusion was that the primary school completion rate is a function of per capita household consumption, school infrastructure, and the quality of education (see León and others, 2008). While the dependent variable of these models differs from the one used in the Vos and Ponce study, the conclusions are similar. Increasing the number of trained teachers and having fewer students per classroom are considered measures that improve both quality of education and school completion. Finally, an increase in per capita household consumption can be induced through cash transfer programmes, like that of the Human Development Bonus (*Bono de Desarrollo Humano*), which have been shown to have a positive effect on school attendance among the poor in Ecuador (see Vos, León and Brborich, 2002; Schady and Araujo, 2005; Ponce, 2008). In addition to the kind of variables also considered in the Vos and Ponce study, the primary education completion model also includes as explanatory variables, the health status of children (approximated through the reduction in the child mortality rates) and the wage premium provided by education.

In addition to being consistent with the theories of human capital and modern empirical models of access to education (see, for example, Glewwe, 2002), the estimated functional relationship makes it possible to analyse the interaction between the progress made towards reaching the education and child mortality targets (MDG 2 and MDG 4, respectively),⁴ as well as the consequences of the changes in supply of education on the wage differential between workers with higher and lower skill levels. Table 8.2 summarizes the quantitative dimensions of the determinants for access to and completion of education, which served as a base for calibrating MAMS.

MDG 4: Reducing under-five child mortality

The infant mortality rate (for children under one year of age) has fallen continuously from 30.3 per 1,000 live births in 1990 to 17.3 in 2001. Likewise, the under-five child mortality rate was reduced from 42.3 to 24.8 deaths per each 1,000 live births during the same period. If these trends are maintained, the

Table 8.2 Ecuador: Elasticities of the MDG module of MAMS

	IF	MDG 4 ^a	QE ^b	WPI ^c	WP2 ^d	PCC	MDG 7a ^e	MDG 7b ^f	PCH	PCS
gentry – primary ^g	0.162	-0.035	0.111	0.059		0.126				
grd – primary ^h		-0.013	0.050	0.041		0.030				
grd – secondary ^h	0.080	-0.025	0.253	0.046						
grd – tertiary ^h	0.080	-0.025	0.253	0.046						
grdcont – secondary ⁱ	0.086	-0.019		0.034		0.087				
grdcont – tertiary ⁱ	0.821				0.203	0.097				
MDG 4 ^j	-0.194					-0.325	-0.400	-0.400	-0.989	
MDG 5 ^j	-0.194					-0.325	-0.400	-0.400	-0.989	
MDG 7a ^j	0.100					0.200				1.000
MDG 7b ^j	0.200					0.100				1.000

Source: León and others (2008).

Abbreviations: IF: Infrastructure; QE: Quality of education; WP: Wage premium; PCC: Per capita consumption; PCH: Per capita supply of health services;

PCS: Per capita supply of water and sanitation services

^a Under-five child mortality.

^b Number of teachers with training

^c Wage gap: secondary vs. no education

^d Wage gap: tertiary vs. secondary

^e Percentage of the population with sustainable access to drinking water.

^f Percentage of the population with access to basic sanitation services.

^g "gentry" represents the probability that a child (6 years old) will enter the first grade of primary school.

^h "grd" represents the probability of graduating from (passing) some grade of the respective educational cycle.

ⁱ "grdcont" represents the probability of graduating from the last grade of the respective cycle and continue on to the next.

^j "MDG" refers to the models estimated for the child mortality goal (4), the maternal mortality goal (5), the goal for water (7a) and that for basic sanitation (7b).

child mortality rate will reach 11.8 deaths for each 1,000 live births in 2015, or even earlier, a number that would surpass the target of reducing the 1990-value of that rate by two-thirds.

Despite this progress, large inequalities in health conditions remain. The probability that an infant of poor parents will not survive his or her first year of life is 1.6 times higher than the probability for an infant born to non-poor parents, while the probability that an indigenous infant will die is twice as high as that of non-indigenous infants. The Vos and others study (2005) on the determinants of child mortality in Ecuador shows that these disparities are caused by a lower level of education among mothers, less knowledge about reproductive health (such as the importance of breast feeding), limited access to professional prenatal care and care during the birth process, and the difficulty of accessing basic sanitation services.⁵ This study shows, furthermore, that the millennium goal for child mortality could be reached by making access to immunization universal and by improving the access to health services for poor and indigenous people through an expansion of the Free Maternal Care Programme. Such a “cost-effective” allocation of resources would demand an additional cost for the health sector of \$7.2 million per year between 2004 and 2015, which would be the equivalent of an additional annual effort of no more than 0.02 per cent of GDP.

For the purposes of this study, a more limited econometric analysis of the determinants of child mortality was conducted, which focuses on health policy interventions that would come into play in MAMS. A child mortality model is estimated under the assumption that the highest probability of dying during the first five years is concentrated in the first year of life (see León and others, 2008). As in the education model, a logit model was estimated. According to this analysis, public investment in health (used as a proxy for the coverage and quality of maternal and infant healthcare services), per capita household consumption (which approximates the access to these services), and the provision of water and basic sanitation services are key determinants (see Table 8.2).⁶

MDG5: Improving maternal health

While some doubts exist about the quality of the information sources on maternal mortality, available data suggest that the number of deaths has declined. According to INEC’s vital statistics, the maternal mortality rate fell from 203 per 100,000 live births in 1971 to 117 in 1990, and further to 52 in 2002. A linear continuation of this decreasing trend would be enough to achieve the MDG target for this indicator (which is to reduce the rate by 75 per cent between 1990 and 2015). However, according to other sources of information, the maternal mortality rate is still at around 87 deaths per 100,000 live births.

Due to the lack of sufficient observations on maternal deaths in the survey on demographics and maternal and infant health, it is difficult to conduct an

econometric analysis of the determinants of maternal mortality. Public health experts generally consider improvement in access to professional care before, during, and after delivery, as well as the general level of sanitation conditions, as key factors for lowering maternal mortality in developing countries. As mentioned previously, these factors have also been decisive for reducing child mortality rates in the country. Therefore, this study used the assumption that the interventions aimed at reducing child mortality have a similar impact in lessening maternal mortality.

MDG 7: Improving the provision of basic drinking water services and waste treatment services

According to the Population and Housing Census, the percentage of the population with access to piped-in drinking water increased from 60.8 per cent to 77 per cent between 1990 and 2001. The percentage of the population with access to sewage elimination services also increased from 37.1 per cent in 1990 to 44.9 per cent in 2001. Rural, indigenous, and Afro-Ecuadorian residents have less access to these basic services. The MDG target for drinking water supply would be achievable long before the year 2015 if coverage keeps increasing at the pace of the last decade. Meeting the target for access to basic sanitation services, in contrast, would require a greater public policy effort. Ecuador's self-established targets are more ambitious than the international ones. According to these, access to drinking water and sanitation services should have reached at least 89 per cent and 73 per cent, respectively, by the year 2015. Reaching these targets would require additional efforts over and above existing policies.

No econometric studies of the determinants of access to sanitary services are available for Ecuador, nor are there studies on the cost-effectiveness of public investment towards achieving the targets for water and sanitation. For the purposes of this study, a simple probabilistic model was estimated that relates access to drinking water and sanitation to public investment and per capita consumption (see Table 8.2 for results and León and others, 2008 for methodological aspects).

Brief overview of social and economic policy reforms⁷

Public policy related to the achievement of the MDGs has relied primarily on social programmes. In practice, however, the millennium goals have not featured as key priorities in the policies conducted by the various ministries that deal with social issues.⁸ Furthermore, the level of public social spending (excluding the social security system)⁹ is one of the lowest in Latin America, fluctuating between 4 per cent and 5 per cent of GDP during the 1980s and 1990s. Per capita spending on education fell sharply from the early 1980s to recover only from the year 2000 onwards, although most of the recovery is explained by increased teacher salaries. During the 1980s and 1990s, public spending in

health was only 1 per cent of GDP (and 2 per cent when health spending by the social security system is included). However, the ongoing expansion of the low-cost immunizations programme and some other relatively cost-effective programmes—along with the process of urbanization and the reduction of fertility rates—have helped to improve health indicators.

Economic policy, for its part, has never been managed with a clear and explicit vision of fighting poverty. Rather, as mentioned earlier, macroeconomic policy has responded strongly “pro-cyclical” to external shocks, influenced in particular by the volatility in oil prices. More structural economic reforms, such as the liberalization of finance and trade, were introduced primarily with the expectation of improving efficiency in production and, therefore, accelerating economic growth. Poverty would be reduced, in the best-case scenario, as a result of the expansion of the economy as a whole.

Certain changes in social and economic policy were introduced in the mid-2000s, however, that could mark a turning point towards more accelerated progress in the attainment of the MDGs. For example, the Fund for Stabilization, Social and Productive Investment, and Reduction of Public Debt (FEIREP) was reformed in 2005. This fund was financed out of the surplus of oil revenues, that is all revenues obtained when oil prices rose above the reference price defined in the pro forma government budget. Twenty per cent of the fund went to the oil stabilization fund, 10 per cent to investment projects in health and education, and 70 per cent towards public debt repayment. With the reform, FEIREP was transformed into the Special Account for Social and Productive Reactivation of Development in Science and Technology and for Fiscal Stabilization (CEREPS) and with a different distribution of the resources: 35 per cent going towards the production stimulus projects and the servicing of public debt (which includes up to 10 per cent for productive infrastructure), 15 per cent for education and culture, 15 per cent for health and sanitation, 5 per cent for road maintenance, 5 per cent for environmental clean-up, 5 per cent for science and technology projects, and 20 per cent towards the oil stabilization fund. In addition, in 2006 the government increased its share in private oil company profits earned at oil prices over 15 dollars a barrel. These resources would also contribute to the funding of CEREPS, and it is estimated that they would amount to about 3 per cent of GDP. In summary, these reforms aim at mobilizing substantial resources for the financing of public investments in MDG-related services. With sustained high oil prices, the necessary investments will be affordable. Furthermore, CEREPS should also provide the mechanism to put an end to the “pro-cyclical” macroeconomic policies, by imposing a “counter-cyclical” automatic stabilizer and a tool for smoothing social spending over time.

In 2008, however, the Constituent Assembly established during the administration of President Rafael Correa decided to eliminate the oil funds and incorporate these resources into the central government budget. At the same time,

the government has maintained the cap on growth in current spending. With these decisions, oil resources are now largely used for investment in road and energy infrastructure, which in the medium term are expected to contribute to increased productivity of the economy as a whole. In addition, public spending on health and education has practically doubled under this arrangement. One reason for eliminating the oil funds, including CEREPS, was that, while rising oil prices had allowed large quantities of resources to accumulate in the funds in the world markets, the resources were restricted in terms of their ability to be aimed at investment projects. The reforms lifted these restrictions.

In the social policy arena, a series of measures were implemented in the 1990s with the explicit goal of contributing to the achievement of the millennium goals. For example, the unconditional cash transfer programme (*Bono Solidario*) created in 1998 sought to compensate the poor for the rising price of energy. In 2003, the programme was converted into a programme of conditional cash transfers (the *Bono de Desarrollo Humano*, mentioned earlier) aimed at increasing access to schools and the retention of students in the school system, on one hand, and at improving health conditions for children, on the other. A recent evaluation of the impact of the monetary transfers, conducted by the Technical Secretariat of the Social Cabinet and the World Bank indicates that the programme has generated a significant increase in enrolment rates. In fact, the probability that a child who lives in a household that receives the cash transfer is enrolled in a school is 10 percentage points higher than the probability for a comparable child whose family does not receive the Bond (Schady and Araujo, 2005).¹⁰ In this sense, the transfer programme has reinforced the school meals programme, which dates back to 1990s and provides schools with breakfasts and lunches not only to provide nutrition to children, but also with the aim of improving enrolment and retention rates. Several local governments have also implemented free textbook programmes and adult literacy programmes. Finally, the Ministry of Education and Culture has begun a programme aimed at universalizing the first year of the ten-year cycle of basic education, as well as a nation-wide programme to provide free textbooks.

One important step towards universalizing access to reproductive health services was the passage of the Free Maternal and Child Care Law in 1998. The law includes a wide range of benefits such as: prenatal controls, deliveries, caesarean sections, obstetric emergencies, family planning, care for healthy newborns and newborns with pathologies, and care for children under five in the prevailing childhood diseases (UNFPA-CONAMU, 2004). By providing these free services to the low-income population, steps have been taken on both the supply side and the demand side that have a significant influence on infant mortality, as pointed out previously. However, the application of the Free Maternal and Child Care Law has been affected by the increasing *de facto* “privatization” of health care in Ecuador (Vos and others, 2005),¹¹ as visible from the

reduction of physician's work shifts in the public sector to only four hours and an expansion of hours in private sector medical centres. The shift to private practices as well as a reduction in the use of health services in general resulted from the cost-recovery policy implemented in the health sector at the same time the law was enacted. All of this has affected both the supply and the demand of public health services and, therefore, its current coverage and functioning are exiguous for reaching the millennium goals in health.

Another effort aimed at improving the health of the population is the Universal Health Insurance Programme enacted by the administration of President Alfredo Palacios in 2006. This programme was initially directed at the poorest 40 per cent of the population, and it has been implemented in the municipalities of Ecuador's three largest cities: Quito, Guayaquil, and Cuenca. The expectation is that these programmes will increase the demand for health services, especially among the poorest groups, while reducing their out-of-pocket expenses and improving their health status. This is also expected to reduce maternal and infant mortality. However, a better system of health insurance does not, in and of itself, guarantee a better supply of services, so the effectiveness of the programme will also depend on whether maternal and infant care is improved at the same time.

Finally, the Ministry of Urban Development and Housing has begun the PRAGUAS project with the goal of providing drinking water and sewage systems to poor areas. In addition, since the mid 1990s, the Central Government has been transferring 15 per cent of the current income to the municipalities for investment, including investment in water and basic sanitation. Local governments also have access to the resources of Ecuador's Solidarity Fund and to loans from the Ecuadoran Development Bank for the same purposes.

In spite of these favourable changes, social policy has been negatively affected by the instability of resources available for investment in human development, due to economic volatility and ongoing changes in the management of social reforms. There is still much to do, therefore, to improve efficiency in public spending and ensure more equitable access to social services (see World Bank and Inter-American Development Bank, 2004; Vos and others, 2003). The achievement of these millennium goals requires a better integration of social and economic policies with a long term vision and mechanisms that prevent volatility in social investment. The high prices of oil and CEREPS were providing an opportunity to confront this challenge. The flexibilization of the use of oil resources is now allowing more resources to be allocated to public investment in basic infrastructure. It also keeps excessive quantities from accumulating in oil funds. However, there is a risk of not being able to activate a "counter-cyclical" mechanism with sufficient resources when the world market conditions are less favourable. An unfavourable situation of this type would undoubtedly mean that the achievement of the MDGs would be delayed.

General equilibrium analysis of the achievement of the millennium goals

While a partial equilibrium analysis provides useful information about the budgetary efforts needed to achieve the millennium goals, such an analysis does not take into consideration interactions between the goals or the relationship between these goals and the performance of the economy (and vice versa). To avoid this restriction, this study has used a dynamic general equilibrium model called MAMS, which is detailed in Chapter 3. This model allows the quantification of macroeconomic effects and the fiscal costs required by various scenarios aimed at reaching the millennium goals. It provides a general economic framework that relates the achievement of the goals—through financing mechanisms and policies—to the effects that these mechanisms have on the various sectors of the economy and, therefore, on the adjustment of the labour market, relative prices, public resources, and household income, which in turn have an effect on the achievement of these goals. The next section will present the most important aspects of the calibration of the model for the case of Ecuador, the assumptions of the baseline scenario, and the main results in this scenario and 16 other scenarios where the millennium goals are met through simulation.

Aspects related to the calibration of MAMS for Ecuador

The MAMS was calibrated with a Social Accounting Matrix (SAM) for Ecuador. The base year for the SAM is 2001, the year when the Ecuadorian economy stabilized significantly in the context of dollarization. Thus, the SAM takes into account the new structure of transaction flow between sectors and agents that emerged after the 1999 crisis. The SAM was constructed especially for the purposes of this study, following the accounting structure required in MAMS, as presented in Chapter 3.¹² The novelty of the matrix lies in the detailed disaggregation of social services: education (public and private, and by cycle), health (public and private, and with separate levels of care in the case of public health), the public provision of water and sanitation, other public infrastructure services, and other government services. At the same time, 17 other production sectors are distinguished (covering various sectors in agriculture, mining, industrial and services), next to three types of labour: unskilled workers, with incomplete primary and secondary education; semi-skilled workers, with complete secondary education and incomplete tertiary education; and skilled workers, with some level of completed tertiary education.

The SAM provides the accounting structure and point of departure for the calibration of the model. The initial values of the endogenous variables and many of the parameters are determined on the basis of the SAM, as are the exogenous variables, including employment and population data, which are specified in satellite tables to the SAM for Ecuador. To complete the solution of the base year (2001) of the model, however, it was necessary to estimate a

number of elasticities through partial equilibrium methods. The functions referring to the millennium goals, using the elasticities reported in Table 8.2, were calibrated in such a way that they replicated the levels observed in the social indicators associated with them for the year 2001. In the same way, the calibration of the logistical function of MDG achievement requires the estimation of certain elasticities that define the magnitude of the change of the determinants of those goals (for example, per capita consumption, the quality of education, and others) in a way that is consistent with reaching the related targets in 2015. A methodological note about the estimation of these elasticities is presented in León and others (2008, Annex 5). Finally, the elasticities that define substitution for production and consumption and the income-expenditures relationship of households were taken from prior studies (Kouwenaar, 1988; De Janvry and others, 1991; Jaramillo, 1992; Vos and León, 2003).¹³

Assumptions and results of the baseline scenario

Once the model was calibrated in the base year, a baseline scenario was simulated defining the trajectory of the economy from 2001-2015, under the assumption that no additional public policy effort is made to achieve the millennium goals. The scenario assumes that public social spending changes at the same pace of the trends observed in past and recent years, and that other exogenous variables stay constant or change according to prior trends. In the particular case of Ecuador, the scenario assumes that the export price for crude oil and the import price for refined petroleum products increase between 2001 and 2005, following the trends observed, and that they do not fluctuate in subsequent years.

The macroeconomic closure rules in the baseline scenario are the following. In the case of the *government*, an endogenous adjustment of the current account balance (or government savings) is assumed. The difference between government investment spending and its financing (through income, in the case of a current account surplus, and through a fixed level of internal and external borrowing) is covered by adjusting income tax rates. For the *external sector*, a flexible adjustment of the real exchange rate is assumed, while the capital account variables of the balance of payments are fixed. This rule is quite realistic for Ecuador's dollarized economy, in which all adjustment falls on domestic prices, and external prices are fixed, leaving the real exchange rate to either appreciate or depreciate. Finally, *private investment* adjusts to balance total savings, once the government investment spending has been determined.

The baseline scenario shows that if external conditions and policies do not change, there will be more progress in human development, but it will be insufficient for achieving the millennium goals (see Table 8.3). The percentage of children who complete primary school on time is almost five points less than what is required to reach the established target for MDG-2 by 2015. The indicator does show a significant increase, however, which is explained by an increase

in the quality of education (measured by the per student supply of education services) and per capita household consumption, to such an extent that this increase compensates for, and even outweighs, the effect of the decrease in the wage premium on education and scant public investment in infrastructure (see Figure 8.4). These results in education are consistent with the trend observed in the last five year period and the effects of recent programmes aimed at stimulating demand for education—in particular, the Human Development Bonus.

Table 8.3 Ecuador: MDG achievement in the baseline scenario, 2001-2015

MDG and associated indicator	2001	2005	2010	2015	Target for 2015
MDG 1: Percentage of the population living on less than 1 dollar a day.	15.5	14.77	10.59	9.4	7.7
MDG 2: Completion rate for primary education	71.9	82.7	91.4	95.4	100.0
MDG 4: Child mortality rate (per 1,000 live births)	24.8	20.7	17.6	15.7	14.3
MDG 5: Maternal mortality rate (per 100,000 live births)	96.9	67.2	46.6	36.0	29.3
MDG 7a: Access to drinking water (% of population)	77.0	79.1	81.6	83.6	89.0
MDG 7b: Access to sanitation services (% of population)	44.9	50.0	56.0	60.9	73.0

Source: MAMS for Ecuador and microsimulations for MDG 1.

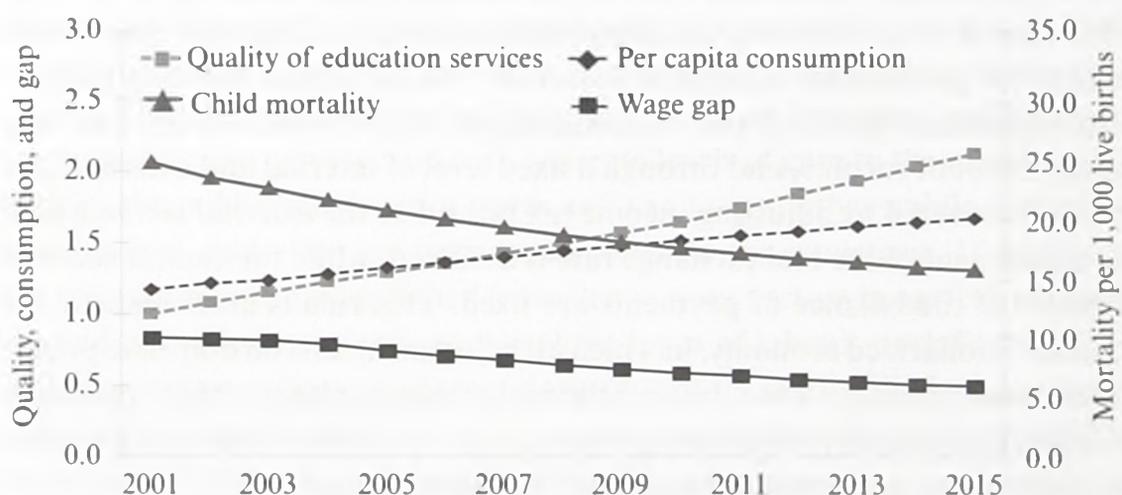


Figure 8.4 Ecuador: Trends in the determinants of the primary education goals in the base scenario, 2001-2015^a

Source: MAMS model for Ecuador.

^a Quality of education services is measured using an index of the supply of education services per student enrolled in primary schools. Per capita consumption is expressed in thousands of dollars, child mortality in deaths per 1,000 live births and the wage gap refers to the gap in earnings between semi-skilled and skilled workers.

The mortality rate among children decreases from 24.8 deaths per 1,000 live births to 15.7 between 2001 and 2015, closely approaching the target (MDG 4), and contributing also to improvement in the MDG 2 target (see Table 8.3 and Figure 8.4). The maternal mortality rate would decline from 96.9 to 36.0 per 100,000 live births; but in spite of this, there remains a gap of almost seven points above the stipulated target (see Table 8.3). The trends in both mortality indicators are explained primarily by an increase in per capita household consumption, an increase in the per capita consumption of total health services, and by a slight improvement in access to water and sanitation (see Figure 8.5). Thus, the baseline scenario does not reproduce the child and maternal mortality outcomes that would result from projecting past trends linearly forward, according to which the health targets would be achieved by 2015. The results of the baseline scenario can be considered more realistic since, in practice, neither type of mortality behaves in a linear fashion, much less when they are relatively low.

The model simulates a slight improvement in access to drinking water (MDG 7a), from 77 per cent in 2001 to 83.6 per cent in 2015, though it misses the target by slightly less than 6 percentage points (see Table 8.3). Likewise, access to sanitation services (MDG 7b) increases from 44.9 per cent in 2001 to 60.9 per cent in 2015, leaving a gap of 12 percentage points that would have to be overcome in order to meet the MDG target. The insufficient expansion of the per-capita supply of water and sanitation services, in the order of 2.6 per cent per year, is the main reason why both goals are not met.

Finally, the goal for reducing extreme poverty (MDG 1) is not met, according to the methodology of microsimulations which is introduced in the next

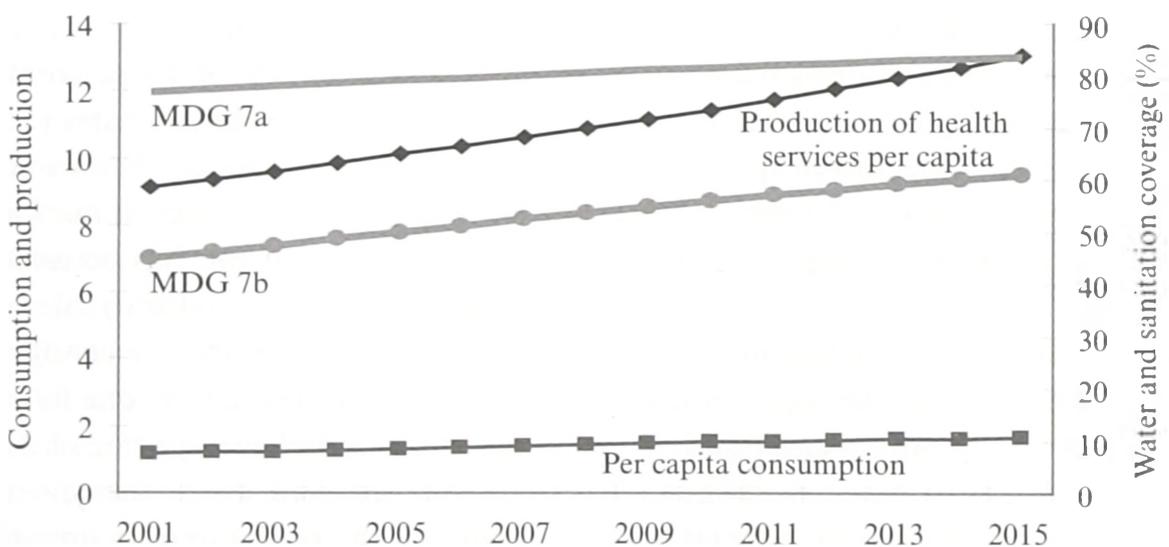


Figure 8.5 Ecuador: Trends in the determinants of the health goals in the baseline scenario, 2001-2015^a

Source: MAMS model for Ecuador.

^a Per capita consumption is expressed in thousands of dollars, MDG 7a and MDG 7b are the percentage of the population with access to drinking water and sanitation, respectively, and per capita production is expressed in dollars per person and refers to the supply of health services.

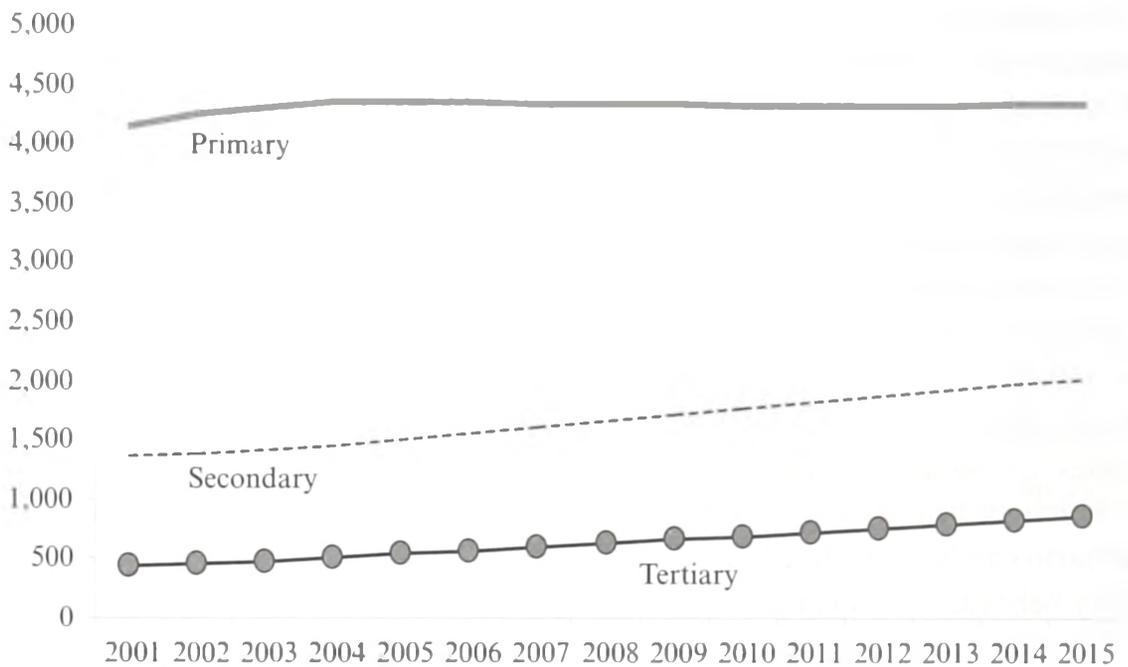


Figure 8.6 Ecuador: Labour supply in the base scenario, 2001-2015 (Thousands of people)
Source: MAMS model for Ecuador.

section. While the percentage of people living on less than one dollar a day is reduced from 17 per cent in 2001 to 9.4 per cent in 2015, it does not reach the target of 7.7 per cent. The significant—but insufficient—reduction in extreme poverty is explained primarily by an increase in per capita household consumption and a redistribution of income generated for the reduction in the previously mentioned wage gaps between skilled and unskilled workers. It is worth mentioning that improvements in education in the baseline scenario cause significant changes in the structure of the labour market.

The total labour supply increases to an annual average rate of 1.4 per cent, while the supply of semi-skilled and skilled workers grows at higher rates (2.9 per cent and 2.9 per cent respectively). In contrast, the supply of unskilled workers grows at a pace of 0.3 per cent per year (see Figure 8.7). The labour market is adjusted through wages or unemployment depending on the gap between unemployment in 2001 and the parameter for the minimum (or natural) rate of unemployment for each labour factor. Based on this process and the changes observed in the labour supply and demand, the following occurs: on one hand real labour income per employed person grows at an annual average rate of 2.2 per cent less than the economy as a whole. On the other hand, due to the adjustments in the supply and demand by type of worker, the real labour income of unskilled and semi-skilled workers grows by 4.1 per cent and 0.3 per cent per year, respectively, while that of skilled workers actually falls by 1.9 per cent per year (see Figure 8.7).

The real wage of unskilled workers increases because of the relative decline of their labour supply, which occurs because: 1) a growing number of people

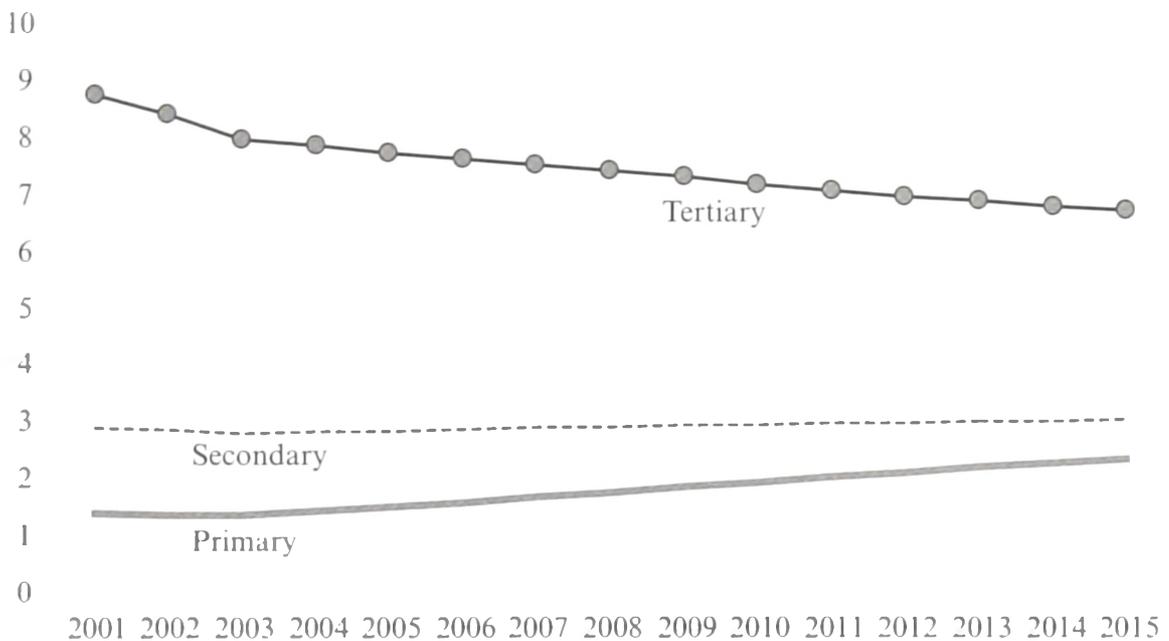


Figure 8.7 Ecuador: Average real wage by type of worker in the baseline scenario, 2001-2015 (Thousands of dollars)

Source: MAMS model for Ecuador.

are remaining in the educational system; and 2) they are acquiring higher skill levels. For these reasons, the unemployment rate of these workers decreases until it arrives at its natural rate. In the same way, the greater demand of semi-skilled workers (with secondary education) initially exerts pressure on the real wages of these workers, which, therefore, tend to rise. Once the supply of these workers grows—in other words, once an entire cohort complete secondary education successfully and enters the labour market—the upward pressure on their wages is mitigated and unemployment of this factor is reduced until it reaches its natural rate in 2015. Finally, the greater supply of skilled workers with tertiary education exceeds demand, causing a decline in real wages for this type of worker. However, since these wages cannot be reduced below the minimum wage, the unemployment rate of skilled workers increases until it reaches the level of 25.7 per cent in 2015. In this way, the wage gaps between skilled and unskilled labour tends to be reduced (see Figure 8.7).

Results discussed thus far are derived from a baseline scenario in which real GDP grows at an annual average rate of 4 per cent—one percentage point higher than the average rate of the last 12 years—but, one percentage point lower than the average recorded between 2000 and 2007. It is assumed that government consumption (total and by sector) grows at the same pace as real GDP and that private borrowing (external and internal) and government borrowing increase by an average of 2.5 per cent per year.

Assumptions about the growth of the public sector and the macroeconomic closure of the government do not adhere strictly to the fiscal rules established by the Organic Law for Fiscal Responsibility, Stabilization, and Transparency

enacted in June 2002 and reformed in July 2005. According to this law, government current spending cannot grow by more than 3.5 per cent annually in real terms¹⁴ and the fiscal deficit (without including income from oil exports) must be reduced by 0.2 per cent of GDP each year until it is eliminated. In addition, the law establishes that the total public debt must be reduced until it represents 40 per cent of GDP, a percentage that then would become the ceiling. In spite of all of this, the baseline scenario sufficiently approximates what is established in the fiscal rule during the period in question (see León and others, 2008). Government tax revenue decreases from 3 per cent of GDP in 2001 to 1.5 per cent in 2015 (see Table 8.5 below). Government savings decreases from 2.4 per cent to 1.3 per cent of GDP and external savings goes from 2.9 per cent to 2.5 per cent of GDP. Internal public debt is reduced from 13.2 per cent to 8.8 per cent of GDP, and the external public-debt ratio from 53.7 per cent to 45.7 per cent. The horizon of the fiscal rule comes in sight, however, since the total public debt-to-GDP ratio must be reduced until it reaches 40 per cent in 2010. The time horizon of this study is 2015 and, therefore, it can be said that, while its trends are moving in the directions established by the fiscal rule, the baseline scenario implies a more expansionary fiscal stance for a longer period of time.

The results of the baseline scenario further show that private investment grows by 4.3 per cent per year between 2001 and 2015, while government investment actually declines by 0.5 per cent per year. Private consumption, exports, and imports grow at an annual average rate of 4 per cent, 3 per cent, and 3.2 per cent respectively. The external deficit (and, hence, foreign savings) is slightly reduced, consistent with trade performance and the reduction in public debt, which in turn reduces debt service payments. In line with observed trends, the baseline scenario projects a tendency towards an appreciation of the real exchange rate.

In summary, under the assumptions of the baseline scenario, without changes in public policy, the country would get closer to the MDG targets but none of them would be fully met. Public spending will thus need to be scaled up in order to meet the targets.

Assumptions and results of the scenarios for achieving the millennium goals

Using the baseline scenario as a reference point, 16 policy scenarios were simulated wherein public spending (current and investment spending) associated with the previously mentioned millennium goals—except for the goal of reducing extreme poverty—increases in order to achieve one or two of the goals separately, or all of them simultaneously.¹⁵ The results of these scenarios are contrasted with those of the baseline scenario in order to reach conclusions about: (i) the macroeconomic viability of achieving the goals; (ii) the cost and the most effective options of financing; and (iii) the macroeconomic tradeoffs that may emerge with possibly undesirable effects on economic growth. For the MDG scenarios, public expenditures are scaled up to the level required to meet

the MDGs in 2015, using the behavioural functions of the MDG determinants. The closure rules are the same as those of the baseline scenario, except that the government rule is adjusted in the case of the alternative financing scenarios of domestic borrowing, external borrowing or financing through foreign aid. In those cases, the direct tax rates are fixed and the alternative financing sources are made endogenous.

The costs of achieving the millennium goals

As shown in Table 8.4, the simulation results show that the additional cost for achieving the targets for education, mortality, and water and sanitation would be around 1.5 per cent of GDP per year, on average, for the period of 2005-2015. It also shows that the cost tends to increase towards the end of the period, when it comes to represent 2.7 per cent of GDP. This incremental cost is due to the assumption that there is a decreasing effectiveness of the interventions and decreasing marginal returns to other determinants the closer one gets to the targets. The cost analysis shows that it is more difficult to get the “last” group of children to enter and complete primary school. Likewise, the lower the child mortality rate, the higher the cost for reducing it further. Therefore, it is highly relevant to consider the requirements at the end of the period since they reflect the probable cost of maintaining the level reached in education and health after 2015.

Table 8.4 also shows that synergies exist when the attempt is made to reach all of the goals at once; in fact, the additional cost at the end of the period (2.7 per cent of GDP) is less than the sum of the cost of reaching the goals separately (3.4 per cent of GDP). The “savings” are obtained in particular in the form of lowering the required additional costs in health (0.6 per cent) and, to a lesser extent, in education (0.1 per cent of GDP). The reduction of child mortality has a positive impact on the achievement of the education goal, and better access to drinking water and sanitation services accelerates the achievement of the mortality goals. The effects of the simultaneous achievement of all of the goals also have an influence on the economy as a whole (among others, the contraction of the wage differential among workers with higher education reduces the cost for the production of education and health services).

It is worth noting that these results occur without taking into consideration improvements in efficiency such as efficiency in the delivery of social services or efficiencies that could come from reallocating the budget towards more “cost-effective” interventions than those that exist. Since there is ample scope for improving the efficiency of public spending, the estimates given can be considered the upper limit of the additional costs required.¹⁶

Financing alternatives

The MDG strategy is more costly when using more domestic resources (taxes or domestic borrowing) as compared to the external borrowing scenario. The

Table 8.4 Ecuador: Simulated additional costs for achieving the MDGs separately and simultaneously, at the end of the period simulated and average for period as a whole (Percentage of GDP)^a

	Public spending in the base year	Additional public spending needed to achieve the following MDGs:			
		Only the primary education goal	Only the mortality goals	Only the water and sanitation goals	All MDGs
<i>The end of the period (2015)</i>					
<i>Primary education</i>	1.1	1.2	0.0	0.0	1.1
Current spending	1.0	1.2	0.0	0.0	1.1
Public investment	0.1	0.0	0.0	0.0	0.0
<i>Health</i>	2.0	0.0	1.6	0.0	1.0
Current spending	1.6	0.0	0.9	0.0	0.6
Public investment	0.4	0.0	0.7	0.0	0.4
<i>Water and sanitation</i>	0.3	0.0	0.1	0.5	0.5
Current spending	0.0	0.0	0.0	0.0	0.0
Public investment	0.3	0.0	0.0	0.5	0.5
<i>Annual average for the period (2005-2015)</i>					
Total	3.4	1.2	1.7	0.5	2.7
<i>Primary education</i>	1.1	0.8	0.0	0.0	0.8
Current spending	1.0	0.7	0.0	0.0	0.7
Public investment	0.1	0.1	0.0	0.0	0.1
<i>Health</i>	2.0	0.0	0.6	0.0	0.4
Current spending	1.6	0.0	0.3	0.0	0.2
Public investment	0.4	0.0	0.3	0.0	0.2
<i>Water and sanitation</i>	0.3	0.0	0.1	0.3	0.3
Current spending	0.0	0.0	0.0	0.1	0.1
Public investment	0.3	0.0	0.0	0.3	0.3
Total	3.4	0.8	0.7	0.3	1.5

Source: MAMS for Ecuador.

^a Additional costs are estimated as the difference between estimated public spending in each scenario for reaching the MDGs and the public spending recorded in the baseline scenario. The results presented correspond to scenarios where the public spending is financed through domestic resources (direct taxes or borrowing). The additional costs tend to be around 0.2 percentage points of GDP less in the scenarios where the spending is financed through external resources (aid or borrowing).

difference is 0.2 percentage points of GDP. Domestic resource mobilization also tends to slow economic growth somewhat as compared with the foreign financing scenario (see Table 8.5). Using higher direct taxes produces a situation with lower household consumption, which means less private spending on education and health. In order to compensate for that effect and still make sure the goals are reached by 2015, there must be an additional increase in

public spending on education and health. In the case of financing the MDG scenario through domestic borrowing, the amount of domestic credit available for financing private investment is reduced and hence private investment is less than in the other scenarios (see Table 8.5). This scenario also would generate the lowest GDP growth with respect to the baseline scenario, though the difference is not very large.

The real exchange rate appreciates in all scenarios, even in the baseline scenario, given the increase in spending on non-tradable activities associated with the MDGs. Nevertheless, the level of currency appreciation is greater when external borrowing is used to finance the additional public spending required to reach the goals (see Table 8.5). This erodes the competitiveness of exports, particularly of non-traditional exports, a situation that further increases the dependence of the economy on oil and agricultural export production. Because of the limited time horizon of the simulation period (through 2015) and given time lags in education, productivity gains from higher levels of human development are insufficient for stimulating the production of exports with a higher technological content.

It should be said that the baseline scenario incorporates the increases in the world market price of oil that took place during the 2000s and which lifted some of the country's financial constraints. The model assumes that this price would stay high during the period of the simulation, which could be considered very optimistic since these prices have fluctuated a great deal historically. At the same time, however, results show that the current situation could favour the achievement of the millennium goals. It would require policies that allow public consumption to remain stable at adequate levels over a prolonged period of time. The fiscal responsibility law and the oil stabilization fund, as well as the subsequent reforms, could provide an adequate framework to do this, if decision-makers implement policies in a consistent way. Furthermore, while trying to protect social spending, this fiscal framework also aims at reducing the burden of public debt. The sustainable level of external debt in the current fiscal policy framework is 40 per cent of GDP (World Bank and Inter-American Development Bank, 2004). The scenarios simulated here suggest that this critical level could be exceeded by a substantial margin in either of the two cases where the new public spending required for reaching all the goals—except that of extreme poverty—is financed through external or internal debt, as shown in Table 8.5.

In the domestic borrowing scenario, internal public debt would increase to almost 30 per cent in the year 2015 from an initial level of 13 per cent in the base year (see Table 8.5). Public domestic debt in Ecuador has been low historically because of the lack of a developed bonds market. However, the model assumes that this market exists; therefore it allows domestic borrowing to increase at a given interest rate. It is quite likely that the real cost of the financing strategy is

Table 8.5 Ecuador: Selected macroeconomic results of some scenarios simulated with MAMS, 2001-2015

Variable and scenario	2001	2005	2010	2015
<i>Real exchange rate (2001=100)</i>				
Base	100.0	95.8	94.1	92.7
Achieving the goals with direct tax financing	100.0	95.7	93.8	92.3
Achieving the goals with external borrowing	100.0	95.3	92.8	90.6
Achieving the goals with domestic borrowing	100.0	95.7	94.0	92.7
<i>GDP (annual growth rate)^a</i>				
Base		4.1	3.6	2.9
Achieving the goals with direct tax financing		4.2	3.6	2.7
Achieving the goals with external borrowing		4.1	3.6	2.7
Achieving the goals with domestic borrowing		4.1	3.4	2.5
<i>Private consumption (annual growth rate)^a</i>				
Base		4.6	3.9	3.1
Achieving the goals with direct tax financing		4.3	3.3	2.8
Achieving the goals with external borrowing		4.6	3.8	3.0
Achieving the goals with domestic borrowing		4.5	3.7	2.9
<i>Private investment (annual growth rate)^a</i>				
Base		3.6	3.4	3.0
Achieving the goals with direct tax financing		3.2	2.8	2.6
Achieving the goals with external borrowing		3.6	3.5	2.8
Achieving the goals with domestic borrowing		1.7	0.4	1.4
<i>Exports (annual growth rate)^a</i>				
Base		4.3	3.4	2.3
Achieving the goals with direct tax financing		4.2	3.1	2.1
Achieving the goals with external borrowing		3.5	2.1	1.7
Achieving the goals with domestic borrowing		4.1	2.7	1.8
<i>Domestic public debt (% GDP)</i>				
Base	13.2	11.7	9.9	8.8
Achieving the goals with direct tax financing	13.2	11.7	9.9	8.8
Achieving the goals with external borrowing	13.2	11.7	9.9	8.8
Achieving the goals with domestic borrowing	13.2	12.3	16.3	29.2
<i>External public debt (% GDP)</i>				
Base	53.7	48.8	44.4	42.4
Achieving the goals with direct tax financing	53.7	48.8	44.3	42.3
Achieving the goals with external borrowing	53.7	49.2	49.7	61.7
Achieving the goals with domestic borrowing	53.7	48.8	44.7	43.3
<i>Income taxes (% GDP)</i>				
Base	3.0	0.2	0.5	1.5
Achieving the goals with direct tax financing	3.0	0.9	3.1	4.7
Achieving the goals with external borrowing	3.0	0.2	0.5	1.5
Achieving the goals with domestic borrowing	3.0	0.2	0.5	1.5

Source: MAMS for Ecuador.

^a Variable expressed in real terms after deflating for the consumer price index.

being underestimated since, given the poor development of the domestic capital market, the government could only issue bonds at high interest rates. Even so, higher debt levels are a problem in both financing scenarios since public debt rises to slightly over 70 per cent of GDP in 2015, a situation that would be very difficult to manage even with the current price of oil. Furthermore, given that Ecuador has declared several moratoriums with its international lenders in the past, there would be serious restrictions on the possibility of financing new public spending through external borrowing in the context of the international financial markets.

In a scenario where spending would be financed through higher taxes, these restrictions could be avoided, but at the cost of lower growth in investment and private consumption. MAMS suggests that to reach the goals, income tax revenues would have to increase around three percentage points of GDP in 2015 as compared to the tax level recorded in the baseline scenario (see Table 8.5). On the other hand, the advantage of this type of scenario is that there would be a significant reduction of public indebtedness. Ecuador has a great deal of room to manoeuvre for implementing further tax reforms, particularly a reform aimed at improving the collection of direct taxes. According to the data used in MAMS, direct tax revenue is only 1.5 per cent of GDP in the base year, which is low by any international standard. However, tax reforms are politically difficult to implement in Ecuador, especially if they affect high-income groups. Thus, the challenge of the government would be to convince elites to contribute part of their wealth to human development and the long-term benefit of the country. At the same time, the high price of oil offers certain additional fiscal flexibility to mobilize the resources that would be necessary to undertake such a distributive effort in order to achieve the MDGs.

Analysis of the poverty reduction goal

Using the results of the MAMS scenarios for the simulated changes in the level and composition of employment and the average level and distribution of labour earnings, the microsimulations technique described in Chapter 2 (see Appendix A2.1) was applied to analyse the distributive impact and the impact on poverty in these scenarios. The technique was applied using data from the 2001 INEC Employment, Underemployment, and Unemployment Survey.

As indicated in the previous section, extreme poverty falls in the baseline scenario, but the reduction is not sufficient for achieving the goal outlined for MDG 1 (see Table 8.3). The results of the microsimulations also show that achieving the goals for education, mortality, and water and sanitation do not lead to any greater reduction in poverty by the year 2015.

The supply of skilled workers exceeds demand in all of the scenarios, producing a reduction in the wage gap for that type of worker. On the other hand,

unskilled workers are the ones who gain the most from the strategy of achieving the goals, as their average labour income increases almost 4 per cent per year. The sum of these effects translates into a substantial reduction in income inequality of more than 10 per cent between 2001 and 2015 (measured by the Gini coefficient for per capita household income). This, combined with moderate growth in per capita income of around 2 per cent per year, results in a considerable reduction of extreme poverty, though not enough for reach the goal by 2015.

These trends are already present in the baseline scenario. The scenarios for reaching the millennium goals do not change the aggregate labour market outcomes very much, in part because the effect of better educational performance on the labour supply is just beginning to be felt at the end of the period of analysis. Also, the results in the labour market are very similar in the various financing scenarios for reaching the goals, though it must be said that the increase in the real average wage is relatively higher when external borrowing is used, because of the effect of the currency appreciation. This situation does not translate into a greater reduction in poverty because employment does not expand quite as much in this case.¹⁷ In summary, the extreme poverty target is not met in any of the financing scenarios and the remaining shortfall from the target is similar in all of them, though it is very slightly larger in the case of domestic borrowing where, as explained, GDP and real wages grow less than in the other scenarios (see Figure 8.8).

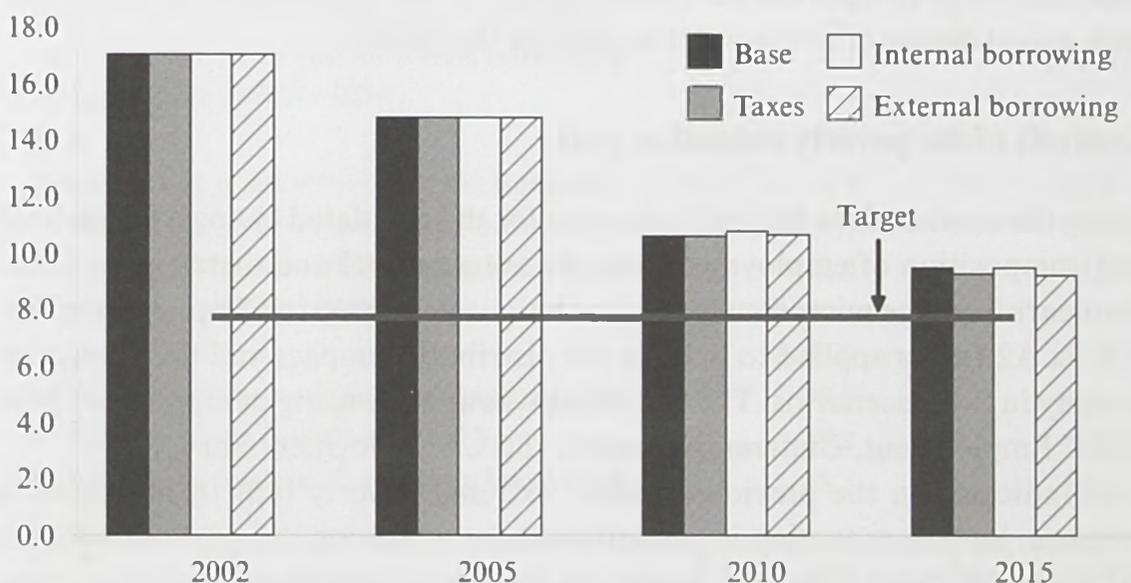


Figure 8.8 Ecuador: Incidence of extreme poverty in the baseline and MDG scenarios under alternative financing options^a

Source: MAMS for Ecuador and microsimulation methodology.

^a The incidence of poverty is measured using per capita income data and a poverty line of 1 dollars a day per person.

MDG achievement, macroeconomic tradeoffs and policy recommendations

In order to achieve the MDGs, Ecuador must give higher priority to the goals and ensure these are fully integrated in economic and social policies of all ministries and other government institutions. This must occur in the framework of a government policy that is based on public management by results and a real strategy for human development and poverty reduction that integrates social and economic policy in a coordinated fashion, eliminating the historic volatility in social spending.

Efforts must be redoubled in order to achieve the MDGs

The dynamic general equilibrium analysis presented indicates that without better-targeted public policies, none of the millennium goals will be reachable. The scenarios simulated for achieving the goals of education, mortality, and water and sanitation show that their achievement would require a significant increase in public spending and that the government would face significant macroeconomic tradeoffs in managing the financing of the additional expenditures. Apparent conflicts between different objectives of fiscal management must be resolved. If the current fiscal rules are not strictly adhered to as directed by the Organic Law for Responsibility, Stabilization, and Fiscal Transparency, public debt would reach unsustainable levels, requiring the government to generate undesirable levels of primary surplus in the future. At the same time, fiscal rules prevent the accumulation of domestic and external public debt and the kind of increased government current spending required to finance the achievement of the goals. Financing the spending through foreign donations is not a viable scenario either, since Ecuador does not qualify as a Highly Indebted Poor Country or as an otherwise aid-eligible low-income country. In order to make progress towards reaching the millennium goals, the limits imposed by fiscal rules would have to be applied with some flexibility, but preserving economic stability within the limited policy space of a dollarized economy.

Tax reform is required

According to the analysis of this chapter, the most feasible scenario for achieving the MDGs simultaneously would be to finance the public spending required through increases in direct income taxes. Direct tax revenue would have to be raised by three percentage points of GDP from current levels, up to 4.6 per cent of GDP in the year 2015. This strategy would also demand the elimination of the current restriction on increasing current spending. Obviously, the tax reform that must be sought in order to create the additional fiscal space necessary could face political opposition. However, the current income tax burden is very low and the additional cost for reaching the goals does not appear to be prohibitive.

These are important arguments for justifying such a tax reform. Since income inequality is very high in Ecuador, it is most reasonable to suggest that the burden of such a reform should fall on the high-income groups.

“Counter-cyclical” stabilization mechanisms and the financing of the strategy

Oil resources could contribute significantly to the achievement of the millennium goals, especially if they complement the financing sources considered here—primarily tax reform. The use of these resources will also allow a “counter-cyclical” mechanism to be established that will counteract economic volatility and protect social spending in times of crisis. The high price of oil today presents an opportunity to create the fiscal space necessary for implementing this kind of macroeconomic management. The resources accumulated in the stabilization fund must be used prudently with a view towards stabilizing social spending in the medium term and keeping it at an adequate level. Fiscal policy is extremely important, since monetary and exchange policy are not as relevant in a dollarized economy. CEREPS and other oil funds were eliminated in 2008 in order to increase flexibility in the use of oil funds. This has allowed more resources to be directed at public investment in basic infrastructure and has prevented an excessive accumulation of resources in these funds. There is a risk, however, of not being able to activate a “counter-cyclical” mechanism, with sufficient funding, that is aimed at confronting more adverse conditions in the world markets. Therefore, establishing this mechanism, while maintaining flexibility in the allocation of the resources for financing public investment in a way that is consistent with existing “counter-cyclical” fiscal rules, should be considered a priority in order to keep adverse external shocks from working against the achievement of the MDGs.

More fiscal space through efficiency in public social spending

The general equilibrium perspective applied in this study looked at the interactions and synergies between the achievement of the various goals, and it is clear that fewer resources are needed if public action is directed at achieving all of the goals simultaneously. Achieving the under-five child mortality goal has a significant influence on the achievement of the goal for primary school completion. In the same way, achieving the goals for water and sanitation increases the likelihood of achieving the previously mentioned mortality goal. Likewise, interventions aiming at achieving the goal of reducing extreme poverty will contribute to the attainment of all of the other goals. According to the estimates of this study, the synergies can generate a savings in costs of approximately one percentage point of GDP per year with respect to a hypothetical situation in which the objective is only to reach one or two goals at a time.

According to the analysis, in order to achieve the goals examined here—with the exception of the target for extreme poverty—public spending must increase

gradually to a point of 2.7 per cent of GDP at the end of the projected period (2015). On average, this additional cost is estimated at 1.5 per cent of GDP per year during the period from 2005-2015. This estimate of additional costs takes into account the general equilibrium effects of the adjustments in the economy as a whole generated by increased government investment and an improvement in human development. However, it does not include the possibility of improving efficiency in the delivery of social services, in order to be more effective in allocating resources at a lower cost, in spite of the fact that this is feasible for Ecuador. In education, this would mean strengthening the cash transfer programme (Human Development Bonus), as well as looking for ways to improve teacher skill levels and education infrastructure and to facilitate greater autonomy in the delivery of teaching services. While these changes are in progress, it would be possible to reduce costs by minimizing absenteeism among teachers and avoiding the current situation where each teacher is assigned a large number of students. In health, on the other hand, cost-effective interventions include working towards universal coverage of the immunization programme and the expansion of the Free Maternal and Infant Care Programme. Meanwhile, according to Vos and others (2005), more structural changes in financing (for example, through a system of universal medical insurance) and the reorganization of public medical services could lead to cost savings in the sector. This study assumes that increased public social spending will result in a direct improvement in the access to education and health services, facilitating the achievement of the MDGs, but it has not included the possible cost savings that would result from greater efficiency in the delivery of social services. In this sense, it is possible that the MDGs could be achieved at a lower cost than the one estimated here, as long as successful efforts are made to achieve greater efficiency along the lines suggested.

Increasing social spending is not enough

This study has found that, while a sufficient increase in social spending could result in the achievement of the goals for primary education, child and maternal mortality, and water and sanitation, and that this would generate a certain redistribution of income, the goal for reducing extreme poverty measured by income would not be achieved. This is true when the assumption is of an economy that grows between 3 per cent and 4 per cent per year, which means that the growth of per capita income is less than 2 per cent per year. With this growth rate, which is higher than the levels Ecuador has actually experienced in the last few decades, income inequality would need to be reduced further. This could be achieved if the economy increases its capacity to absorb the growing supply of labour, primarily that of workers with higher educational levels. The greater availability of skilled workers could have favourable repercussions on productivity, but it is not a sufficient condition for reducing poverty. In the

case of Ecuador, greater diversification of the economy must be sought and, in order to attack extreme poverty, productivity must be improved and more economic activities that provide employment for the poorest citizens must be promoted. In this sense, programmes that favour this kind of redistribution and also provide incentives for equity in access to credit and to productive assets (an agrarian reform or the implementation of a microfinance programme, for example) should be created and strengthened. At the same time, it will be important to overcome deficiencies in existing physical infrastructure in order to facilitate greater economic integration of the various regions of the country. To the extent that these interventions help improve productivity and the productive capacity, they could also limit (and possibly prevent) the adverse impact the real exchange rate appreciation could have on the competitiveness of exports, something that would be expected in a context of the application of a strategy focused only on increased social spending.

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Notes

- 1 There is a significant methodological difference in how urban and rural areas are identified in the 1999 and 2006 surveys, which affects the ability to compare this information with precision.
- 2 Data in this section come from the First MDG Report of the Republic of Ecuador (SODEM, 2005).
- 3 The Human Development Bonus programme is a conditional cash transfers programme which, in principle, only pays out if the boys and girls that belong to beneficiary households attend school. However, no mechanism has been put in place to verify school attendance, making the transfer unconditional in practice. However, see also further below in the sub-section of social policy reforms.
- 4 Also the interaction between the goals for education and extreme poverty (MDG 2 and MDG 1, respectively) is considered, if per capita consumption is taken as a proxy of changes in the incidence of poverty.

- 5 This study applies a combination of two models for Ecuador: one, a multinomial model of the determinants of access to health services for maternal and infant care and the other, a survival model applied to children under one year of age. In both cases, the problems of endogeneity and multicollinearity are corrected.
- 6 The study by Vos and others (2005) did not find a statistically significant relationship between access to drinking water and sanitation and the infant mortality rate, however. The authors point out that this result could be explained by the influence of other variables such as the area of residence (urban/rural) and the education level of the head of household, which, in turn, are determinants of the access to drinking water and sanitation. They also conclude that while access to potable water and sanitation does not appear to be a direct determinant of infant mortality, it is at least a conditioning factor for the statistical significance of other determinants.
- 7 This section analyses the main social and economic policy reforms through 2006. Therefore, it does not cover the changes introduced in 2007 by the government of President Rafael Correa.
- 8 The National Secretariat for the Millennium Goals (SODEM) was created in 2005 as a ministry-level body with the objective of promoting a policy agenda aimed at achieving the millennium goals. This body was eliminated two years later, however, and its functions were transferred to the National Secretariat for Planning (SENPLADES).
- 9 Spending on social security benefits is also low in Ecuador, since less than 20 per cent of the population is covered by the social security system.
- 10 A more recent study by Ponce (2008, Chapter 2) confirms these results, though with certain qualifications. It indicates, furthermore, that the positive impact occurs in spite of the fact that in practice there is no system to verify that all of the beneficiaries of the Human Development Bond are complying with the conditions (in other words, that they actually attend school). Therefore, the impact of the cash transfer is greater among beneficiaries who believe that the conditionality could be applied at some point to the cash transfer. The third chapter of the same study does not find a significant impact on the quality of education as measured by test scores. In other words, the programme helps to improve access to education, but not necessarily the quality of the education.
- 11 De facto “privatization” refers to the growing relative participation of private medical personnel and services in the last decade (Vos and others, 2005).
- 12 The construction of the SAM was part of an institutional effort through which integrated social and economic accounts are continuously generated based on the methodology of the national accounts systems of the United Nations (INEC-ISS-SIISE, 2003). The methodology of the construction of the matrix is described in León and others (2008, Annex 2) and can also be found on the web page of the Ministry of Social Development Coordination (*Ministerio de Coordinación del Desarrollo Social*) (<http://www.meds.gov.ec/content/view/121/72/>).
- 13 According to these studies, the substitution elasticities between domestic production and imports (Armington), as well as those that define the transformation of products for the domestic and international markets, are relatively low, in the range of 0.4-1.5 in both cases. The substitution between the factors, and between the factors and intermediate goods is even lower, defined by elasticities in the range of 0.2 – 0.95. The range of income-consumption elasticities is the smallest (0.8-1.3).
- 14 The July 2005 reform restricted the fiscal rule only to current spending. Initially, the rule was applied to the primary government budget deficit.
- 15 The achievement of each of the goals in education, mortality, and water and sanitation is simulated separately, and then the simultaneous achievement of all of these goals is

- simulated. These four scenarios, in turn, are simulated using four alternative financing strategies (foreign donations, internal borrowing, external borrowing, and increased taxes), so that a total of 16 scenarios are simulated. The scenarios where financing occurs through foreign donations are not analysed here since Ecuador is not eligible to receive substantial quantities of foreign aid.
- 16 Vos and Ponce (2004) and Vos and others (2005) offer recommendations aimed at achieving greater effectiveness in public spending on primary education and maternal and infant health at a smaller cost.
 - 17 A more detailed analysis of the results of the microsimulations is presented in León and others (2008, Annex 6).

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