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Chapter 7

Tunisia

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INTRODUCTION

Tunisia has had one of the fastest growing economies in North Africa and the Middle East (MENA) since the 1990s. By 2010, gross national income per capita had increased to \$4,070, three times more than thirty years ago. Economic growth was driven by labour-intensive and export-oriented manufacturing activities, creating jobs for low and semi-skilled workers, including many females. Economic diversification, along with high inflows of workers' remittances, underpinned domestic demand growth.

Robust economic growth also strengthened government revenue, which in turn helped finance increased social spending. In Tunisia, almost all children attend school compared to only 80 per cent for the MENA region as a whole. Also, female labour participation is high compared to the rest of the region. More children also survive their first few years of life and also life expectancy is above average in comparison with both lower-middle-income and MENA countries. In 2005, only 3.8 per cent of the population lived in extreme poverty as measured against the lower national poverty line. Income inequality has also dropped steadily since the 1990s. As a result of these achievements, the middle class has expanded to nearly 81 per cent of the population.

It is not surprising therefore that Tunisia has made considerable progress towards the millennium development goals (MDGs). Up until 2010, the country was on track towards reducing extreme poverty, achieving universal primary education, reducing child mortality and providing the population with access to drinking water and basic sanitation. The 2008-2009 global crisis did not cause major setbacks as the government responded in a

timely manner with countercyclical spending policies to offset reductions in private expenditures on MDG-related services. The country is not on track to achieve the target of reducing maternal mortality by two thirds, however, but its achievement seemed elusive before the global financial crisis erupted. Meeting this MDG target by 2015 will require significant improvements in access to maternal care, especially in rural areas.

Despite the countercyclical fiscal response, GDP growth decelerated in 2008 and 2009. The economy regained some steam in 2010, but popular discontent with persistent high rates of (youth) unemployment, inequality in economic opportunities, related in part to important skill mismatches in the labour market, rising food inflation, perceptions of excessive government control and corruption, and lack of political freedom cause a social revolt and the toppling of the regime in early 2011.

The Tunisian revolution affected economic activity. GDP contracted and the fiscal deficit widened—owing to fewer fiscal receipts and higher social transfers—in 2011. Constitutional reforms paved the way for democratic elections, leading the international donor community to pledge loans and grants for political and economic reconstruction. Once social tensions have subsided, the economy may get back on more solid footing again.

As growth in Tunisia has been pro-poor in recent decades, the questions worth raising are whether the country is likely to remain on track towards meeting the MDG targets despite the economic consequences of the revolution, and, should that not be the case, what additional public spending efforts would be needed to achieve the goals. Additional questions are what would be the fiscally and economically most sound financing mechanism to cover the additional spending costs, and what would be the economy-wide repercussions of further scaling up the spending on MDG related services.

To answer these questions we use a model-based analysis applying the computable general equilibrium (CGE) model known as MAMS to Tunisian data. The salient characteristics of this model, especially the inclusion of a module of determinants to MDG achievement, are briefly explained in Chapter 1 of this volume and discussed in more detail in Lofgren and Díaz-Bonilla (2010a and 2010b).

The next section describes the main economic trends, along with economic reforms and macroeconomic policies implemented during the period from 1990 to 2008. It also provides a short discussion of the economic impact of the global financial crisis and the revolution on the Tunisian economy during 2009-2011. The subsequent section describes the key features of social policies and the progress made towards meeting the

MDG targets, as well as the prospects of achieving them by 2015. The main features of MAMS for Tunisia as well as the key policy simulation results are presented in the fourth section. A main finding is that, despite significant progress in past decades, the additional public spending requirements to meet the targets are substantial. Furthermore, the affordability of the extra fiscal costs will depend on the ability of the country to mobilize foreign resources that should gradually be replaced by domestic resources through fiscal reforms that permit to enhance the efficiency of tax collection and by this means broaden the tax base. The final section presents the main conclusions and policy recommendations, in particular regarding the best financing strategy to be followed by the Tunisian government if it is to keep fiscal and public debt sustainability and pursue the achievement of the MDGs without sacrificing economic growth.

REFORMS AND MACROECONOMIC POLICY, PERFORMANCE, AND VULNERABILITIES

Main economic reforms and policies

The structural adjustment program, whose implementation began in mid-1986, marked a turning point in economic policymaking since Tunisia's independence. The programme aimed at preserving macroeconomic stability and a balanced budget, opening the Tunisian economy to global markets, and reducing poverty and income inequality through greater coherence between social and economic policies. The reforms were expected to spur economic growth that would trickle down to the population through job creation and overall income growth. This policy orientation was sustained until the global financial crisis started to unfold.

The accession to the WTO in 1995 and the implementation of a number of bilateral and regional free trade agreements helped deepen Tunisia's integration into the world economy. The association agreement with the European Union (EU) in 2008 represents the major trade agreement signed by Tunisia. During the same period, the government committed to a host of programs and economic policy actions to enhance competitiveness, including reforms consolidating tax and financial legislations; deregulation of investment, trade and price regimes; rebalancing the roles of public and private sectors; modernisation of the administration of the financial and banking systems; infrastructure improvements; investment in human capital and upgrading of firms and production sectors.

Export sectors in duty-free processing zones have received generous fiscal incentives since the 1970s. Until the mid-1990s, capital-intensive domestic economic activities have been shielded against international competition through high import tariffs and a complex system of non-tariff barriers. Export incentives consistent with WTO and FTAs rules were maintained, however, in order to promote the development of labour-intensive light manufacturing sectors which spurred GDP growth and job creation during the 1990s and 2000s.

Prudent fiscal and monetary management helped control inflation, thereby contributing to fighting poverty and securing a stable macroeconomic environment. The average inflation rate was close to 5 per cent in the 1990s, declining to below 3 per cent in the period 2000-2007. In 2008, due to higher food and energy prices, inflation surged to 5 per cent, but tapered off again to 3.7 per cent in 2009 (International Monetary Fund, 2010).

Maintaining healthy public finances has not been easy because of an array of mandatory expenditures. The volatility of world market prices of key import commodities, notably oil and food, has also had a direct bearing on the government budget because of subsidies on those commodities, as well as on operating surpluses of state-owned companies. The phasing out of tariff protection on imports from the EU and other trading partners led to considerable reductions of revenues from duties. However, reforms to the value-added tax (VAT) system and better income and corporate profit tax collection mechanisms compensated for those revenue losses (Table 7.1).

Public finances also improved through better resource allocations, enhancement of private-public partnerships in infrastructure and other services previously provided solely by the state, and a reduction of fuel subsidies through the continued control of energy use and the progressive adjustment of prices to market conditions. This allowed reducing the budget deficit (excluding privatization and grants) to less than 3 per cent of GDP on average during 2000-2009, down from an annual average of almost 5 per cent in the 1980s—when social spending and generous increases in government salaries resulted in macroeconomic disequilibria. The government increasingly relied on domestic borrowing to finance its deficit, in spite of low national savings (Table 7.1). Recently, workers remittances have fallen as a consequence of the global financial crisis, the unfolding of the revolution in early-2011 and, more recently, the civil war in Libya, the main destination of Tunisian migrant workers. This substantially weakened the domestic resource base, as remittances had become to represent nearly half of national savings. Slower growth and stimulus measures taken to

Table 7.1
Tunisia: Selected fiscal indicators, 1995-2009

Per cent of GDP, unless otherwise indicated				
	1995	2000 ¹	2005	2009
Tax revenue	19.9	19.8	20.6	19.9
Structure of total tax revenue (per cent)				
Direct taxes (on income and profit)	23.9	30.0	36.5	39.8
Import taxes	22.8	12.1	6.4	4.5
VAT	26.5	33.2	29.1	29.1
Taxes on consumption	17.6	17.6	15.33	13.7
Other taxes	9.1	7.1	12.6	13.0
Deficit, borrowing and debt				
Overall deficit, excluding grants and privatizations	-4.5	-2.8	-3.2	-3.0
Overall deficit, including grants and privatizations	-4.1	-0.6	-2.6	-2.7
Government borrowing	4.1	0.6	-2.6	2.7
Foreign	2.9	0.0	0.8	0.0
Domestic	1.2	0.6	1.8	2.7
Government debt ²	58.4	58.1	58.3	42.8
Foreign ²	38.4	35.3	21.0	17.7
Domestic ²	20.0	22.8	37.2	25.0

¹ Data for deficit, borrowing and debt are for 1998.

² Debt stocks of the central government.

Source: National Institute of Statistics of Tunisia (INS in French).

counteract the impact of the global financing crisis pushed the government deficit back up to 3 per cent of GDP in 2009, from 1.2 per cent in 2008. During 2011, the deficit widened further owing to the effects of the revolution on the economy.

Before the crisis, fiscal discipline allowed for a sustained reduction of the government debt, which was brought down to under 43 per cent of GDP by 2009. Yet, it may have also prevented the country from enjoying higher and sustained economic growth, for instance, if more would have been invested in infrastructural improvements. Furthermore, fiscal reforms did little to deal with excessive government regulation in many activities, which is limiting competition in domestic markets.

Tight monetary policy has also led to a persistent overvaluation of the currency, making it more difficult for producers to compete with other developing country exporters, such as China. Even so, prior to the crisis and the revolution, export growth, tourism receipts, remittances from abroad, and foreign direct investment (FDI) have helped to improve the external

balance, and kept foreign government debt in check (Table 7.1). By 2010, the current account deficit had been brought down to less than 3 per cent of GDP, well below average for the period 1995-2007.

Growth and poverty reduction

Tunisia witnessed robust economic performance between 1990 and 2007, with total and per capita GDP growing at average annual rates of 4.8 and 7.2 per cent, respectively. Total GDP growth averaged 3.9 per cent per year during 1990-1995. With the maturing of the economic reforms, GDP growth accelerated to 5.6 per cent per year during the second half of the 1990s. However, GDP growth slowed visibly to 4.9 per cent per year during 2000-2007 and further to 4.5 per cent in 2008 and 3.1 per cent in 2009, owing to the global financial crisis. The economy recovered slightly in 2010, when output grew by 3.8 per cent. Up to this point, the growth outlook looked brighter than that of some other parts of the world.

It may seem paradoxical therefore that despite palpable economic growth and major social achievements and despite the government's ability to provide social protection during the global financial crisis, so much discontent and unrest erupted among the populace. However, not all shared in the gains from growth, as persistently high youth unemployment and growing discontent with overreaching government control and perceived corruption were among the factors that ignited political turmoil in late 2010 that resulted in the ousting of President Zine El Abidine Ben Ali in early 2011. The unrest led to instability, putting the economy in serious peril. GDP growth declined by 3 per cent in the first half of 2011. There was a mild recovery in the second half but GDP growth for the year posted nonetheless an estimated -0.6 per cent.

The satisfactory growth performance until 2007 had been driven by a development strategy that combined prudent macroeconomic management and direct government involvement in productive decisions through a complex system of incentives and ad hoc interventions. However, the effectiveness of this strategy to achieve higher growth has been challenged by high unemployment, vulnerability to external shocks, lack of competition in the service sectors, and unfavourable weather conditions (particularly the drought of 1990-1995). The global financial crisis uncovered several of these weaknesses and the situation has become more challenging with the revolution. Of particular concern is the high level of youth unemployment, which hovered at 25 per cent in late 2010.

The sectoral composition of GDP reveals four major trends during the 1990-2007 period. First, the services sector has become the mainstay of the economy, accounting for about 57 per cent of GDP. Recent growth is mainly attributable to the emergence of new sectors with high potential, including financial services, health, education, data processing, telecommunications and business services. Tourism has become a key driver of the economy. For example, in 2009, the sector contributed 5 per cent to GDP, 11.6 per cent to total current account receipts from abroad, and 12 per cent to total employment. Second, manufacturing output growth has outpaced that of the industrial sector at large. Even so, manufacturing's share in total GDP averaged only 17.6 per cent over the period, much less than in fast-growing emerging economies. Manufacturing's share in total employment is substantial, generating 32.3 per cent of all jobs in the economy, especially for low-skilled, mostly female workers in textiles and clothing. Third, export-oriented sectors, notably textile and electromechanical equipment industries, have been weakly integrated with the rest of the economy, thus limiting their contribution to growth and employment. Fourth, agriculture's contribution to GDP has been rather volatile. It averaged 13.4 per cent of GDP for the 1990-2007 period as whole, but settled to below 10 per cent in 2005-2009.

Private consumption remains the main driver of growth and occupies a central place in Tunisia's development strategy. Increasing at an annual average rate of 4.7 per cent during 1990-2007, private consumption accounted for 62 per cent of GDP in that period, much more than the contribution of exports, as further explained below. In fact, private consumption typically has contributed to offset reductions in foreign demand during international crises, such as, for example, the first Gulf war of 1991. Public consumption has also remained high at 15.6 per cent of GDP on average during 1990-2007, in spite of successive privatization plans initiated since the adoption of the structural adjustment programme. Continued expansion of government spending has supported the progress made towards the MDGs.

Exports are the second driver of growth owing to the strategy of development of export-oriented manufacturing industries. Exports contributed almost 44 per cent of GDP growth over the period 1990-2007, growing at 5 per cent per year, slightly above the pace of GDP growth. Fiscal incentives attracted foreign firms that helped develop a competitive manufacturing sector. Tunisian firms managed to increase their share in the European market and elsewhere. The diversification of markets and products has been crucial to export dynamics.

Gross fixed capital formation is the third driver of growth, with an average contribution to GDP estimated at 23.3 per cent from 1990 to 2007, a period during which it grew on average by 4 per cent per year. Public investment represented nearly 18 per cent of gross fixed capital formation in 2008, which is relatively high considering the several reforms undertaken to increase the role of the private sector in the economy. This has enabled the maintenance of capital stocks in adequate amounts to provide key social services for human development, though there is still ample scope for infrastructural development.

The impact of the global financial crisis was mainly transmitted through trade. In 2009, export and import values (in US dollars) declined compared to 2008, but the trade deficit fell from 8.9 to 8.5 per cent of GDP between 2008 and 2009 (International Monetary Fund, 2010). To contain the impact of the global crisis, the government deployed a fiscal stimulus package representing 1.4 per cent of GDP, and the Central Bank of Tunisia (CBT) devised a more accommodating monetary policy. The CBT reduced interest rates, implemented policies to increase credit and liquidity in the banking system, and doubled its capital to finance small and medium-sized enterprises so as to boost domestic investment. As part of its countercyclical response, the government allowed the budget deficit to rise in 2009, which helped push aggregate demand back up and GDP increased by 3.1 per cent, while most trading partners (especially in Europe) saw a much more protracted recovery.

The growth outlook for 2010 was conditioned by uncertainties on the expected global recovery that would particularly affect exports, tourism receipts and workers' remittances. The 2010 budget law maintained a supportive fiscal policy to ensure the economic recovery would not be undermined by an early withdrawal of stimulus measures introduced in 2009. As said, the economy managed to recover by 3.7 per cent in 2010, but the recovery was short-lived due to the unfolding of the revolution.

One last but critical aspect of Tunisia's growth model is that it has been pro-poor. Policies have been supportive and development programs have been put in place to provide infrastructure for agricultural development. More investment in education, health and birth control programs has helped increase the quantity and quality of human capital. The education strategy pursued in the first two decades after independence (the 1960s and 1970s) was very selective with respect to passing grades and graduation from primary school, resulting in a relatively competent civil service and workforce that has helped to boost growth and reduce poverty. The industrial development strategy based on light manufacturing and export

growth and the expansion of tourism have paid off in terms of employment creation, particularly for low-skilled workers.

Both poverty incidence and income inequality—as measured on the basis of data from the household expenditure surveys—have decreased more or less continuously since the 1980s. Different studies provide evidence that poverty and economic growth have been highly correlated.² Although in times of growth deceleration, it has been social policies that have helped keep poverty on the decline. Even though economic growth was faster in the early-1990s, the incidence of rural poverty increased by 2.7 points for the first time since 1980—while urban poverty declined slightly—as agricultural output contracted owing to three consecutive years of drought. After that period, poverty resumed its decline in both rural and urban areas. Poverty is reasonably expected to have increased in 2011 as the revolution took its toll on output and employment growth.

Economic vulnerabilities

Economic diversification and good macroeconomic management have helped Tunisia weather international price shocks. Exports from Tunisia are more diversified than those from most other MENA countries and comprise agricultural goods, energy, some mining products, services, and various manufactured products. However, world prices for key imported products, especially food and energy, have a strong influence on domestic consumer prices.

Policy responses to world price shocks have been timely. Since 1986, when a sharp fall in oil prices nearly precipitated a balance of payment crisis, the authorities have followed consistent stabilization policies and adopted gradual adjustment measures, including expenditure restraint, revenue measures, and control of monetary aggregates. The exchange rate has been managed flexibly, but the overall objective has been to maintain its stability. Vulnerability to capital flow volatility has been contained through the use of capital controls.

By various indicators, Tunisia is a moderately indebted country (see Table 7.1). However, domestic resource mobilization is critically constrained. As a consequence, any serious deterioration of the external balance would likely lead to higher external indebtedness and a deterioration of the external debt profile due to unfavourable term structures of interest rates. The factors that could undermine the external stance include a concurrent surge in imports from the EU, weak international demand for Tunisian

exports, adverse price shocks, lack of competition in domestic markets and less FDI and fewer workers' remittances.

SOCIAL POLICY AND PROGRESS TOWARDS THE MDGs

Public spending

Since independence, the Tunisian government has given importance to the social sector, with a view to improving the social conditions of the population. Total public spending on education and health, two key MDG-related sectors, has been subject to some fluctuations as a share of total spending (Table 7.2). Public spending on all levels of education has historically been high. It represented about 25 per cent of total government spending over the period 2006-2008.³ More than 91 per cent consists of current expenditures, however, leaving important deficits in education infrastructure. In 2009, capital spending on education increased sharply as a result of the fiscal stimulus package. The share of public spending allocated to the health sector declined sharply from over 10 per cent during the 1970s and 1980s to a mere 5.7 per cent in 2008. This was the direct result of a deliberate policy that encouraged the development of a private health system for which Tunisians have shown growing preference as they have witnessed improved healthcare results. Nonetheless, as further shown below, the country still needs public interventions to achieve health-related development goals, especially in reducing maternal mortality.

Public spending policies have also given priority to both increasing investments in irrigation, drainage and reuse of treated wastewater and

Table 7.2

Tunisia: Government spending on transfers and social services, 1990-2008

Per cent of total government spending					
	1990	2000	2006	2007	2008
Education	20.7	16.0	25.1	25.2	24.0
Health	6.6	5.2	6.1	6.3	5.7
Agriculture and water management	6.1	4.8	4.4	4.1	5.1
Electrification	4.1	4.6	n.a.	n.a.	n.a.
Food subsidies	8.8	5.6	2.8	2.7	7.6
Transfers and other subsidies (energy)	11.5	15.9	11.3	10.5	12.3

n.a.: data not available

Source: Authors' calculations based on data from INS.

mobilizing and distributing drinking water. Nonetheless, in 2008 the share of spending for these purposes was still below that of 1990. However, spending for the mobilization and distribution of safe drinking water is managed by a public enterprise and a large share of the cost of investments is recovered through user charges.

The government has sustained the food subsidies, granted since the 1970s, in order to keep domestic food prices down. However, as a result of reforms implemented in the 1990s and 2000s, food subsidies are no longer universal but only apply to basic food items. Even so, food subsidies increased to 7.6 per cent of total government spending in 2008, up from 2.8 per cent in 2006, as a result of the rise in international food prices. The government has also managed to sustain transfers and other subsidies, including for social security, as a significant share of total government spending. These amounted to 12.3 per cent of total government spending in 2008, but are expected to increase over the longer term owing to the demographic transition that is underway.

Poverty reduction policies

Since independence, social policy has been aimed at raising the purchasing power of the population, reducing unemployment and poverty, enhancing skills through better education and health systems, and improving access to social services and gender equality. In the period 1990-2008, mean incomes rose as a result of collective bargaining of wages that led to reforms to remuneration scales, revisions to the minimum wage and amendments to the labour code. The purchasing power of the minimum wage has been protected through successive nominal wage adjustments and the control of inflation. Indeed, the real purchasing power of wages increased by about 2 per cent per year during 1990-2006.

The government has also intervened intensively to limit the negative repercussions of economic deregulation on vulnerable social sectors with the help of a package of social protection instruments. Welfare transfers doubled between 1996 and 2005 to adopt such social protection policies, costing an estimated average of 0.4 per cent of GDP per year (Bibi and Chatti, 2007). Also, as said, the government has continued to subsidize food consumption, even though reducing these subsidies was one of the objectives of the structural adjustment program. The government has also implemented public works projects to provide jobs to unemployed poor workers.

The improvements in wages and other incomes and transfers no doubt have improved living conditions. Not only has the poverty rate declined, as shown further below, but the share of poor housing shrunk from 2.7 to 0.8 per cent between 1994 and 2004, and there has been a notable increase in homeownership. The coverage of drinking water, basic sanitation, and electrification also expanded greatly, particularly in rural areas.

The education system, while still showing deficits, has become more accessible to the poor, providing them greater opportunities to improve their living conditions. The government is also providing almost universal healthcare to the population, applying differentiated fees for the use of services. Family planning and birth control programs, which Tunisia embarked on as early as the beginning of the 1960s, very unusual for a Muslim country, have played a critical role in moderating population growth over the last three decades; it decelerated from around 3 per cent at the beginning of the 1960s to around 1 per cent in recent years. This may also have contributed to poverty reduction.

Progress towards MDG targets

Consequently, Tunisia has made considerable progress towards the MDG targets (see Table 7.3 for selected MDG indicators). Nonetheless, not all the targets would be met by 2015 if pre-revolution public spending policies would continue unchanged, as further shown below. Progress in reducing maternal mortality has been insufficient. It is the area where Tunisia faces one of its biggest challenges. Areas where progress has been remarkable include poverty reduction, increasing primary completion rates for boys and girls and reducing child mortality. Using the international \$1.25 a day poverty line (in purchasing power parity), the extreme poverty target has already been met. The fast MDG progress achieved before the global financial crisis and the revolution prompted the government to set more ambitious goals and targets, including by adding one for improving the quality of education. But where progress has been lagging, the government has acknowledged the gaps that persist at the sub-regional level. Some regions have experienced remarkable strides in development, but others are still lagging behind (United Nations Development Programme, 2004).

Despite sustaining high levels of public spending on education and reforms to the schooling system, the goal of education for all has not yet been achieved. Although the share of students who do not complete primary education is small, it has not declined as much as expected. However, the education reform adopted in July 1991 yielded good results, guaranteeing

Table 7.3
Tunisia: MDG achievement and targets for 2015

<i>MDG and related indicator</i>	<i>1990 (or circa)</i>	<i>2005 (or circa)</i>	<i>2015 target</i>
MDG 1: Poverty headcount ratio (per cent of population)			
National poverty line	6.7	3.8	3.4
US\$1.25-a-day poverty line (PPP)	5.9	2.5(2000)	3.0
MDG 2: Enrolment rate (per cent)			
Children aged 6 years	96.3	99.2 (2008-09)	100.0
Children aged between 6 and 11 years	88.1	97.7 (2008-09)	100.0
MDG 4: under-five mortality rate (per 1,000 live births)	37.3	22.1 (2002)	16.6
		18.4 (2007)	
MDG 5: maternal mortality rate (per 100,000 live births)	74.8	54.8 (2000)	18.7
MDG 7a: Access to clean water (per cent of population)	75.0	97.8 (2004)	100.01/
MDG 7b: Access to basic sanitation (per cent of urban population)	59.9 (1994)	70.4 (2002)	100.01/
		78.3 (2004)	

¹ A national, full coverage target is used in the table and the policy scenario analysis presented below. The international target of reducing by half the proportion of the population without coverage (from base year) would be 98.9 per cent for clean water and 89.2 per cent for basic sanitation in both urban and rural areas.

Source: INS (various publications), World Bank (2007) and United Nations Development Programme (2004).

nine years of basic education for all children aged 6 to 16, reducing the dropout rate and improving access to schooling for children aged 6 to 12. The enrolment rate for both boys and girls aged 6 passed from around 96.3 per cent in 1990-1991 to 99 per cent in 1999-2000 and 99.2 per cent in 2008-2009 (Table 7.3). For children aged 6 to 11, the net enrolment rate went up from 88.1 per cent in 1990-1991 to 97.1 per cent in 1999-2000 and 97.7 per cent in 2008-2009. This implies that repetition and dropout rates have also come down and that gender disparities in access in primary education have been significantly reduced.⁴ Nonetheless, the quality of education is perceived to have declined with the increase in enrolment.

By 2007, Tunisia's under-five mortality rate was 18.4 deaths per 1,000 live births, just shy of its 2015 target of 16.6 (Table 7.3). The rate had fallen substantially as a result of the health system's modernization and increased coverage as well as other improvements in living conditions, including the steady decline in income poverty. The country will likely meet the under-five mortality target through additional efforts to address child healthcare

deficiencies in rural areas. In contrast, the country has made much less progress in reducing maternal mortality. According to the United Nations Development Programme (2004), maternal mortality will only reach 33.6 per 100,000 live births by 2015 if past trends continue and are linearly extrapolated into the future; this is well short of the target of 18.7. The main reason behind the lack of progress is the poor quality of emergency healthcare and deficient road and transport infrastructure in the rural areas. Reducing maternal mortality will require additional resources aimed at improving the regional coverage of health centres.

With almost 98 per cent of the population having access to safe drinking water, Tunisia has made a remarkable progress towards achieving nearly full coverage (Table 7.3). The target will likely be met if ongoing investments to improve the water distribution network in disadvantaged regions are completed rapidly and illegal urbanization gets under control. Official statistics also confirm that considerable progress is being made in terms of access to basic sanitation services. However, meeting the target will be more challenging considering the gap was at more than 21 per cent of the urban population in the mid-2000s and was likely much larger for the rural population, though this could not be confirmed due to lack of data. There are stark regional variations in access to sanitation compared to access to safe drinking water: coverage varies from 10 per cent in some cities of the south to 96.3 per cent in the governorate of Tunis. Meeting the sanitation target will also depend on ongoing investments that are expected to expand the sanitation network. However, households tend to request a connection only when the number of private residences is large enough to reduce the cost of installation and operation. Thus, meeting the sanitation target will also depend on urbanization policies and the creation of awareness among households that connecting to a sanitation network is important for health purposes.

Due to past progress, the identified shortfalls towards the MDG targets are generally small, except for maternal mortality. Countercyclical spending policies enabled the country to remain on track in making progress towards the MDG targets amid the global financial crisis. Nonetheless, GDP growth is expected to suffer a setback in 2011 as the revolution affects social spending.

POLICY SCENARIO ANALYSIS

A number of scenarios were generated through the MAMS framework to assess the impact of the economic deceleration caused by the revolution on MDG progress, under continuation or disruption of pre-revolution

countercyclical public spending. The analysis also provides answers to two additional questions: what additional public spending requirements should be met to close the remaining MDG gaps? How could these spending requirements be financed without inflicting damage to the economy at large?

Modelling framework and calibration

The MAMS framework is a dynamic-recursive computable general equilibrium (CGE) model, which is explained briefly in Chapter 1 and in greater detail in Lofgren and Díaz-Bonilla (2010a and 2010b). As for most CGE models, the accounting consistency and framework of MAMS and its main structural parameters are provided by a 83 x 83 social accounting matrix (SAM), which was built and adapted for MAMS in millions of 2005 dinar using the Official National Accounts from CBT and the Employment Survey from the National Institute of Statistics.

While it shares standard features of most economy-wide models, MAMS is more atypical in that it includes a special MDG module, which specifies the main determinants of MDG achievement. Different indicators monitor MDG achievement and are derived as a function of the determinants of the various areas of human development. The model allows for targeting specific values in achieving universal primary education (MDG 2), reducing under-five and maternal mortality (MDGs 4 and 5) and increasing access to safe water and basic sanitation (MDGs 7a and 7b, respectively).⁵ The net primary completion rate is the indicator used for universal primary education and it is constructed by the model using student behavioural patterns in terms of promotion rates and other indicators.⁶ Through logistic functions for the “production” of (public and private) social services, each determinant becomes relatively less effective the more progress towards the MDG targets is made. There are various determinants but the relevant policy variable relates to public spending on the delivery of the related social services.

To calibrate the MDG module, a set of initial elasticities for each MDG indicator or student behaviour parameter with respect to the determinants is specified. The model recalculates the initial elasticities in consistency with the shape of the logistic functions. In view of data limitations, elasticities estimated for other Arab countries were used as starting points and these were subsequently adjusted through sensitivity analysis until, given all other information being used in the calibration of the model, a continuation of past MDG trends was generated. This is explained in more detail in Chemingui and Sánchez (2011). The final elasticity values used in

the calibration are presented in Table 7.4. The determinants are presented in the columns. Spending (per capita or per student for education) and, in the case of education, student behaviour indicators are presented in the rows. The under-five mortality rate (MDG 4) is a proxy for the health status of the potential student population, household consumption per capita is a proxy for the capacity to pay for social services, and the level of other public infrastructure—in sectors other than education, health, and water and sanitation—is a proxy for the effective distance to school or health centres and hospitals. In this application for Tunisia, another synergy is that access to drinking water and sanitation (MDGs 4 and 5) can improve the health of children and mothers-to-be, although the impact is small.

Finally, for each MDG indicator or student behaviour parameter a set of so-called MDG-scenario parameters also provide starting points to project an outcome for an expected year (2010 for student behaviour parameters

Table 7.4

Tunisia: Elasticities of the MDG indicators and student behaviour parameters with respect to determinants

<i>MDG or student behaviour indicator</i>	<i>Spending per capita or per student</i>	<i>Other public infras- tructure</i>	<i>Household consumption per-capita</i>	<i>MDG 4</i>	<i>MDG 7a</i>	<i>MDG 7b</i>	<i>Wage incentives</i>
Non-education MDGs							
MDG 4: child mortality	-0.485	-0.010	-0.100		-0.020	-0.020	
MDG 5: maternal mortality	-0.864	-0.010	-0.100		-0.005	-0.005	
MDG 7a: drinking water	0.100	0.000	0.010				
MDG 7b: basic sanitation	0.644	0.000	0.100				
Primary education							
Net intake rate	1.100	0.000	0.250	-0.110			0.110
Promotion rate	0.867	0.150	0.250	-0.087			0.087
Secondary education							
Promotion rate	0.200	0.150	0.300	-0.017			0.017
Graduation and continuation	0.100	0.150	0.300	-0.020			0.030
Tertiary education							
Promotion rate	0.137	0.150	0.250	-0.014			0.014
Graduation and continuation	1.230	0.100	0.750	-0.015			0.030

Source: Chemingui and Sánchez (2011).

associated with MDG 2, given the primary cycle lasts 6 years,⁷ or 2015 for all other goals), given the set of values for determinants under which—it is believed—the projected outcome could be achieved. To estimate the MDG-scenario parameters, we use unit cost estimates and financing gap studies from the World Bank (2003), for water and sanitation; the World Bank's Road Costs Knowledge System (ROCKS) database, for public infrastructure; and the World Health Organization (WHO), for mortality rates. The student behaviour related determinants were estimated using data from the UNESCO database. We found that public spending per student would barely have to change to achieve MDG 2 and this is consistent with observed progress. Health spending per capita would have to be about 43 per cent larger between 2005 and 2015 to achieve MDGs 4 and 5, whereas spending in water and sanitation per capita in 2015 would have to be about 23 per cent above the value observed in 2005—likely due to existing gaps, especially in the rural areas. Lastly, we found that other public infrastructure—not directly linked to education, health, and water and sanitation—would have to increase by about 19 per cent from 2005 to 2015 in order to achieve the MDGs under study. All these—partial equilibrium or sectoral—requirements are taken and re-estimated by MAMS in a general equilibrium setting in which they take different values.⁸

Baseline scenarios

Three alternative baseline scenarios were generated, starting from 2005, the base year, and ending in 2015, the MDG target year. These scenarios are regarded as “countercyclical”, “pro-cyclical” and “pre-revolution”. The first two scenarios take observed growth rates for real GDP and government consumption in 2006-2010. Subsequently, they project that GDP growth decelerates markedly in 2011, presumably as a result of the revolution, followed by a steady recovery until GDP growth reaches 5.5 per cent in 2015 (Figure 7.1). In these two scenarios, economic growth also decelerates in 2008 and 2009 because of the global crisis but public spending continues to increase at rates of 4.6 and 7.0 per cent respectively. These two scenarios are different because government consumption grows at the GDP growth rate in the period from 2010 to 2015 in the pro-cyclical scenario, whereas the 7.0 per cent growth rate seen in 2009 for government consumption is kept unchanged until 2015 in the countercyclical scenario. In MAMS, public investment shifts to ensure that government capital stocks grow at the same pace as the services that are produced.

The “pre-revolution” baseline scenario is designed under the same government consumption assumptions as the countercyclical scenario but it maintains the pre-revolution 3.8 per cent GDP growth rate of 2010 throughout 2011-2012. From 2013 to 2015, GDP grows as in the other two baseline scenarios. This scenario helps to determine the likely impact of the revolution on the MDGs, when compared to the countercyclical scenario, under the assumption that this is fundamentally transmitted through a GDP growth deceleration. The less GDP grows—as in the countercyclical scenario—the lower the number of jobs created and the less the consumption per capita households can afford, which has a direct effect on the MDGs (see Table 7.4).⁹

For all three baseline scenarios it is assumed that consumption and other components of recurrent spending grow at a given rate per year, which is one of the closure rules of the model. As said, government investment spending depends on the demand for capital in the public services sector which, in turn, depends on the level of government consumption. Other closure rules used to generate the baseline scenarios are as follows. Government investment spending is financed through current savings and fixed levels of borrowing (domestic and external) and tax rates. Any

Figure 7.1
Tunisia: Real GDP and government consumption in
alternative baseline scenarios, 2006-2015

Source: Central Bank of Tunisia and authors' assumptions based on a plausible scenario for 2011-2015.

remaining imbalances are covered by foreign transfers from abroad (that is, foreign aid), which basically assume their true value in 2006-2010 as observed trends for the levels of borrowing and tax revenues were used to calibrate the model. The real exchange rate adjusts endogenously to clear any imbalances in the demand and supply of foreign exchange through its impact on exports and import demand. Private savings rates adjust to ensure that private investment is equal to total savings, given an assumed fixed ratio of private investment to GDP.

The model distinguishes three types of workers: those who have not completed secondary education (unskilled), those with at least completed secondary education (semi-skilled), and those who have completed some degree in tertiary education (skilled). In all scenarios, if the unemployment rate for each type of worker exceeds a minimum unemployment rate, the real (consumption) wage is equivalent to a “reservation wage” and the market for that type of worker reaches equilibrium through adjustments in the unemployment rate. If the unemployment rate is equal to the minimum rate, the labour market for that type of worker reaches equilibrium through adjustments in the real wage. For other factors (capital and natural resources), equilibrium is given by flexible wages (or rents).

The three baseline scenarios by and large reflect the actual aggregate functioning of the Tunisian economy during the period 2006-2010 and project this through 2015—based on available data.¹⁰ One of the most interesting results is that while there would be notable progress towards meeting the MDGs under these scenarios, most targets would not be achieved, with the greatest shortfalls in maternal mortality and basic sanitation (Figure 7.2). The MDG gaps would be slightly wider under the pro-cyclical baseline scenario, as one would expect. The comparison of results between the countercyclical scenario and the pre-revolution scenario shows the impact of the revolution on the MDGs would only be modest if pre-revolution public spending is not disrupted. The small impact is explained by GDP growth, which is only, on average, 0.3 percentage points higher in the pre-revolution scenario.

MDG-financing scenarios

A set of alternative policy scenarios was simulated in which public spending is scaled up to the level needed to achieve the MDG targets for primary education, child and maternal mortality, and water and sanitation and with different assumptions about how the additional spending is financed.¹¹ In

Figure 7.2
Tunisia: MDG indicators under the alternative baseline scenarios, 2005-2015

Source: Authors' estimates based on application of MAMS for Tunisia.

these scenarios, government spending in MDG-related sectors becomes endogenous and no longer increases at a given growth rate as in the baseline scenarios.¹² It is subsequently assumed that the uncovered government budget deficit is financed endogenously through, alternatively, foreign transfers from abroad (ftr), domestic borrowing (db), direct tax increases (tax) or foreign borrowing (fb). The baseline assumed uncovered budget deficits were financed through foreign aid. Another difference with the baseline closure rules is that the model becomes savings-driven in the MDG-financing scenarios; that is, private investment adjusts endogenously, even as a share of GDP, to maintain balance between total savings and total investment. This closure allows us to see if the MDG strategy triggers crowding out effects on private investment.

The additional public spending requirements to meet the MDG targets, as measured here, include what the government should have spent in 2006-2010 to be fully on track in meeting the targets, and the additional spending the government will have to incur in 2011-2015 to meet the targets.¹³ As with the MDG gaps seen in the baseline scenarios (Figure 7.2), meeting the goals for reducing child and maternal mortality would be the most costly, as the additional public spending requirement would be more than 3 per cent of GDP per year, followed by additional costs for achieving the primary education goal (Table 7.5). Taking the countercyclical baseline scenario as the benchmark, public spending would need to increase between 5.7 to 6.2 per cent of GDP per year to meet the MDG targets, depending on the financing source. New spending requirements would include about 2 per cent of GDP for investment to account for deficits in infrastructure in the social sectors.

Additional spending requirements are about 1.5 per cent of GDP higher using the pro-cyclical baseline scenario as the benchmark. This suggests continued efforts to maintain countercyclical spending policies may pay off in comparison with what the government would have to spend later on, at an incremental marginal cost, if it disrupts spending in response to GDP deceleration. Furthermore, continuously undertaking countercyclical spending policies would mean that additional public spending requirements

Table 7.5

Tunisia: Additional annual public spending requirements to meet the MDG targets in alternative financing scenarios¹

Deviation from baseline scenario, per cent of GDP												
	<i>Countercyclical</i>				<i>Pro-cyclical</i>				<i>Pre-revolution</i>			
	<i>ftr</i>	<i>tax</i>	<i>fb</i>	<i>db</i>	<i>ftr</i>	<i>tax</i>	<i>fb</i>	<i>db</i>	<i>ftr</i>	<i>tax</i>	<i>fb</i>	<i>db</i>
Primary education	1.7	1.8	1.7	1.8	2.3	2.4	2.3	2.5	1.6	1.7	1.6	1.8
current	1.4	1.4	1.4	1.5	1.7	1.8	1.7	1.8	1.3	1.3	1.3	1.4
capital	0.3	0.4	0.3	0.4	0.6	0.7	0.6	0.7	0.3	0.4	0.3	0.4
Health	3.2	3.4	3.2	3.5	3.6	3.9	3.6	3.9	3.0	3.2	3.0	3.3
current	2.0	2.1	2.0	2.2	2.2	2.4	2.2	2.5	1.9	2.0	1.9	2.1
capital	1.2	1.2	1.2	1.2	1.3	1.4	1.3	1.4	1.1	1.2	1.1	1.2
Water and sanitation	0.8	0.9	0.8	0.9	1.2	1.3	1.2	1.3	0.7	0.8	0.7	0.8
current	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
capital	0.6	0.7	0.6	0.7	0.7	0.8	0.7	0.8	0.6	0.6	0.6	0.6
Total	5.7	6.1	5.7	6.2	7.1	7.6	7.1	7.8	5.3	5.7	5.3	5.9
current	3.6	3.7	3.6	3.9	4.2	4.5	4.2	4.6	3.4	3.5	3.4	3.7
capital	2.1	2.3	2.1	2.3	2.6	2.9	2.6	2.9	2.0	2.2	2.0	2.2

¹ Additional public spending is defined in the text.

References: fb=foreign borrowing; db=domestic borrowing; tax=direct taxes; ftr=foreign grants

Source: Authors' estimates based on application of MAMS for Tunisia.

would only increase marginally owing to the revolution—by around 0.4 per cent of GDP per year. Additional public spending requirements would be larger under the domestic-resource mobilization scenarios—potentially by up to 0.7 per cent of GDP per year under the assumptions of the pro-cyclical scenario.

The injection of public spending triggers a real exchange rate appreciation in all MDG-financing scenarios (Table 7.6). For low- and even middle-income countries like Tunisia, large-scale investments in MDG sectors could meet severe skilled-labour constraints in the short to medium run, in spite of the high levels of education of the population and high rates of youth unemployment. Public expenditures targeted at meeting the MDGs in the form of expanding basic social services in health and education would put intense pressure on a pool of teachers, doctors and other trained workers that is likely to be limited. Constraints on skilled labour could then lead to upward pressure on the skill premium for such workers, which in turn would increase the overall labour costs for the public sector and the cost of achieving the MDGs.¹⁴ As a result, “non-tradables” such as MDG-related services become relatively more expensive than “tradables” as public spending is scaled up and this translates into a real exchange rate appreciation. This penalizes export sectors regardless of the financing mechanism of public spending, which in the case of Tunisia affects GDP growth, though

Table 7.6
Tunisia: Real macroeconomic indicators in alternative financing scenarios, 2006-2015

Deviation from baseline scenario, percentage annual growth												
	<i>Counter-cyclical</i>				<i>Pro-cyclical</i>				<i>Pre-revolution</i>			
	<i>ftr</i>	<i>tax</i>	<i>fb</i>	<i>db</i>	<i>ftr</i>	<i>tax</i>	<i>fb</i>	<i>db</i>	<i>ftr</i>	<i>tax</i>	<i>fb</i>	<i>db</i>
Consumption – private	0.1	-0.5	0.1	-0.6	0.0	-0.8	0.0	-0.9	0.1	-0.5	0.1	-0.6
Consumption – government	1.3	1.4	1.3	1.4	2.0	2.2	2.0	2.2	1.3	1.4	1.3	1.4
Fixed investment – private	-0.1	-0.4	-0.1	-0.3	-0.1	-0.5	-0.1	-0.4	-0.1	-0.4	-0.1	-0.3
Fixed investment – government	2.5	3.0	2.7	2.9	1.9	1.9	1.9	2.0	2.8	3.0	2.8	3.0
Exports	-1.2	-1.0	-1.2	-0.8	-1.7	-1.4	-1.7	-1.0	-1.1	-1.0	-1.1	-0.8
Imports	0.1	-0.4	0.1	-0.5	0.0	-0.8	0.0	-0.7	0.1	-0.4	0.1	-0.5
GDP at market prices	-0.2	-0.3	-0.2	-0.3	-0.2	-0.4	-0.2	-0.3	-0.2	-0.3	-0.2	-0.3
Total factor employment (index)	0.1	0.0	0.1	0.0	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.0
Total factor productivity (index)	-0.2	-0.3	-0.2	-0.3	-0.3	-0.4	-0.3	-0.4	-0.2	-0.3	-0.2	-0.3
Real exchange rate (index)	-0.5	-0.3	-0.5	-0.2	-0.6	-0.2	-0.6	-0.2	-0.5	-0.2	-0.5	-0.2

References: fb=foreign borrowing; db=domestic borrowing; tax=direct taxes; ftr=foreign grants

Source: Authors' estimates based on application of MAMS for Tunisia.

this trade-off is more pronounced when foreign resources are used as the financing mechanism, owing to the inflow of foreign exchange associated with them. Hence, in the MDG-financing scenarios, exports grow less than in the baseline and only when foreign resources are used to finance the new public spending would imports increase slightly more than in the baseline (that is, merely 0.1 percentage points per year). As a result, trade volumes in the MDG-financing scenarios increase at a slower pace compared to the baseline scenarios. In MAMS, trade openness is represented by the ratio of trade volumes to GDP and is one of the determinants of factor productivity. Thus, the deceleration of GDP growth in the MDG-financing scenarios is also explained by a reduction in factor productivity relative to the baseline. Higher factor employment in the MDG sectors is insufficient to revert the reduction in GDP. The productivity gains from greater MDG achievement do not materialize during the simulation period.

GDP growth is slightly less when the new public spending is financed through domestic borrowing or increased taxation as these financing options also penalize private spending (Table 7.6). On one hand, the government takes a (larger) share of private savings to finance the budget when borrowing domestically, thus crowding out private investment and, as a result, private consumption and imports. On the other hand, increased taxation reduces the amount of disposable income households can spend to consume, which subsequently reflects also in reduced private spending and imports. Due to the macroeconomic trade-offs it triggers and the fact that productivity gains will take some time to materialize, the MDG strategy cannot be expected to stimulate the Tunisian economy in the short term, where post-revolution reconstruction, including restoration and renovation of infrastructure and institutions, and growth and employment recovery (especially for critical groups) should become priorities. Not only would GDP growth be less when domestic resource mobilization is used to meet the MDG targets, compared to the other scenarios, but the reduction in private spending in education and health services in the domestic-financing scenarios has to be fully compensated by more public spending to meet the targets. Domestic borrowing mainly, but also increased taxation to a lesser extent, would magnify additional public spending requirements to meet the MDGs in a range of 0.3 to 0.5 per cent of GDP per year (see Table 7.5).

Domestic borrowing or increased taxation would not only be less desirable financing mechanisms for Tunisia, they would be less feasible in view of the relatively higher public spending requirements. Domestic resources are not easily mobilized through domestic savings, which is fairly low in Tunisia, and is likely to remain so in coming years. It is also likely that the revolution

has weakened the domestic financing base. During the biennium 2011-2012, unemployment is expected to reach dramatic levels, particularly for youth, and remittances' inflows are unlikely to increase substantially. One of the reasons the domestic debt is small—as a percentage of GDP—is that the domestic bond market is not deep enough to allocate domestic savings in amounts that are commensurate to development financing.

Tax revenue was nearly 20 per cent of GDP in 2009 (Table 7.1), a relatively high rate by developing country standards, and one that the Tunisian government will probably not be able to raise in the short run. From 1995 to 2009, tax collection essentially remained unchanged as percentage of GDP. Further tax increases are likely to be politically infeasible and economically undesirable at a time when the country is in the midst of forming and consolidating a new political regime and reviving the economy. Improving tax collection should be a priority, but achieving this will require some time.

According to the simulation results, tax revenue would need to increase by more than 6 percentage points of GDP by 2015 in order for the government to be able to finance MDG-spending requirements under the tax-financing scenario that uses the countercyclical baseline as the benchmark (Table 7.7). This accounts for both the extent to which tax revenue should have increased but did not increase in 2006-2010 in order to have fully financed MDG-spending requirements, and the tax revenue that the government would additionally have to raise to continue financing MDG spending until 2015. Tax revenue would have to be about 4 percentage points of GDP higher if, before undertaking the MDG-financing strategy, public spending declines in 2011 in tandem with GDP—as under the pro-cyclical baseline scenario.

These are macroeconomic constraints that Tunisia will likely face if the government opts to finance newly required MDG spending through domestic borrowing or increased taxation. As explained above, these are

Table 7.7
Tunisia: Additional annual foreign aid and tax revenue requirements to finance the cost of the MDGs,¹ 2011-2015

Deviation from baseline scenario, per cent of GDP		
<i>Benchmark</i>	<i>Tax revenue (tax financing scenario)</i>	<i>Foreign aid (ftr financing scenario)</i>
Countercyclical baseline	6.4	6.4
Pro-cyclical baseline	10.6	8.7
Pre-revolution baseline	6.1	6.2

¹ Additional foreign aid and tax revenue requirements are defined in the text.

Source: Authors' estimates based on application of MAMS for Tunisia.

financing options that would also hurt private spending in MDG-related sectors, making it more costly for the government to ensure MDG targets will be met on time, compared to the situation where financing is through resources from abroad. Against this backdrop, Tunisia may have to rely on foreign resources to reconstruct its political system, spur economic growth and finance development goals. The international donor community has pledged help in reaction to ongoing political changes and constitutional amendments that are expected to pave the way for a full-blown election.

According to the simulation results, Tunisia would need at least an additional 6 per cent of GDP per year in foreign aid to be able to finance additional MDG-spending requirements (Table 7.7). This accounts for both foreign aid that Tunisia should have received but did not receive in support of the MDGs in 2006-2010, and additional foreign aid required to continue financing MDG spending until 2015. The estimate of foreign-aid requirements is notably higher under the foreign-aid scenario that uses the pro-cyclical baseline scenario as the benchmark. Using the simulation results, we estimate that foreign-aid requirements to achieve the MDGs under study would be in the range of \$2.7 to \$3.9 billion per year—depending on the projected trends of MDG spending and GDP growth under the baseline scenarios.¹⁵ In late May 2011, the G8 group promised

Figure 7.3
Tunisia: Government debt in the baseline and
foreign-borrowing (fb) scenarios, 2005, 2009, 2015

Source: Authors' estimates based on application of MAMS for Tunisia.

\$20 billion in loans and grants for post-revolution reconstruction in Tunisia and Egypt, another Arab country that has recently witnessed a revolution. Should this help materialize and be directed in part to MDG sectors, it would be quite feasible for Tunisia to meet the MDG targets by 2015.

Non-concessional loans and other borrowing from abroad would be at the cost of debt accumulation, but it is perhaps the only other feasible option for Tunisia to mobilize resources for MDG financing—perhaps along with receipts from the sale of confiscated assets belonging to members of the ousted dictatorship. Following the trend of 2005-2009, the government debt decreases in the baseline scenarios and is little more than 30 per cent in 2015 (Figure 7.3). The government debt rises to almost 62 per cent of GDP under the foreign-borrowing scenario that takes the countercyclical baseline as its benchmark. That is, the debt by 2015 would be only 6 percentage points of GDP higher than in 2005, which makes this option, or at least borrowing from abroad in lower amounts, a plausible financing mechanism. Under the pro-cyclical spending reference path assumptions, whereby, as seen, MDG-spending requirements are relatively more, the government debt would reach almost 74 per cent of GDP in 2015, turning foreign indebtedness into a less realistic option considering debt sustainability objectives of the country. The simulation results also show that, to meet the MDG targets, government foreign indebtedness increases by only 3 percentage points of GDP from 2005 to 2015, when the effects of the revolution are not accounted for.

CONCLUSIONS AND POLICY RECOMMENDATIONS

The policy scenario analysis performed in this chapter sheds light on the prospects and challenges Tunisia faces to meet the MDG targets. It shows MDG progress would be sustained up until 2015 if public spending in social sectors continues to grow at pre-revolution rates, even if growth deceleration during the revolution is taken into account. Even so, targets for primary education, child and maternal mortality, and water and sanitation would not be met by 2015. The main gaps would be seen for maternal mortality, and, to a lesser extent, basic sanitation. MDG progress would be less if pre-revolution public spending is disrupted as a result of the revolution. The impact of the revolution on the MDGs, simulated primarily through reduced household income and consumption per capita, would be only modest if pre-revolution growth rates for MDG spending are maintained. The global financial crisis did not affect MDG progress precisely because social spending grew at high rates in spite of observed GDP deceleration.

In order for the MDG targets under study to be met by 2015, public spending would have to rise by 5.7 to 7.8 per cent of GDP per year, depending on how public spending evolves after the revolution and how additional spending is financed. The health goals would be the most expensive to finance (3.2-3.9 per cent of GDP per year), in view of the gaps in maternal mortality. Little more than half of the new spending requirements would be for new investment, as a great deal of infrastructure needs to be renewed. If this growth in public spending is not disrupted, the impact of the revolution on the MDGs and additional spending requirements will be minimized.

The injection of additional public spending would not be harmless to the economy, though. It could result in a small real exchange rate appreciation—if skilled-labour supply constraints lead to upward pressure on the skill premium for teachers, doctors and other trained workers, which in turn increases labour costs for the public sector. As a consequence, exports and economic growth would somewhat be penalized. This effect was found to be larger for scenarios in which additional public MDG spending is financed through resources from abroad on account of the foreign-exchange inflow. GDP growth was found to be even slightly less when the new public spending is financed through domestic borrowing or increased taxation as these mechanisms of financing crowd out private spending. In these cases, we found the government incurs an extra cost of 0.4-0.7 per cent of GDP per year in order to compensate for less private spending in MDG-related sectors. Due to these macroeconomic trade-offs and as productivity gains from greater MDG achievement would take some time to materialize, the MDG strategy should not be expected to stimulate the economy right after the revolution.

Domestic borrowing and increased taxation are less desirable and perhaps infeasible options to finance MDG spending requirements in Tunisia. The revolution has hurt the economy and it would be unthinkable that under such circumstances sufficient national savings could be mobilized to finance MDG spending. Worker's remittances from abroad have been an important source of household savings but these have also been on the decline. The mechanisms of domestic resource mobilization analysed here could slow down the economic recovery that Tunisians badly need. Furthermore, Tunisia's domestic bond market is not sufficiently developed to allocate domestic savings in amounts that are commensurate to development financing. The existing tax burden, at around 20 per cent of GDP, would also be difficult to increase from both political and economic reasons.

Tunisia will likely have to rely on foreign resources to reconstruct its political system, renew key infrastructure, spur economic growth and

finance development goals. Non-concessional loans and other borrowing from abroad would come at the cost of debt accumulation. According to the scenario analysis performed here, relying on foreign borrowing alone to finance additional MDG spending requirements would push the government debt up to at least 62 per cent of GDP by 2015, 6 percentage points of GDP more than in 2005.

Acquiring that amount of new debt can be avoided if the international donor community honours recent pledges of aid. The willingness of donors to help Tunisia is based on the expectation that current political changes will translate into constitutional amendments that ultimately pave the way for a full-blown election. According to our scenario analysis, Tunisia would need at least an additional 6 per cent of GDP per year in foreign aid in order to be able to finance public spending required to meet the goals in primary education, health, and water and sanitation by 2015. The necessary foreign aid would be in the range of \$2.7 billion to \$3.9 billion per year, depending on the pace at which MDG spending grows after the revolution. This is plausible given the amount of aid that the Group of Eight (G8) has promised to grant to countries like Tunisia and Egypt.

If foreign aid cannot be mobilized in the amounts required to finance the MDG strategy, a combination of foreign aid and foreign borrowing—at levels that would not compromise debt sustainability—seems to be the other plausible option. The use of aid should be coordinated behind a national development strategy (NDS) with the main conditionality being well-planned disbursements linked to the achievement of NDS targets, including the MDGs. The NDS should allow for fiscal expansion during post-revolution reconstruction. Domestic resource mobilization should gradually replace foreign resource mobilization, mainly through fiscal reforms that enhance the efficiency of tax collection and broaden the tax base. The fiscal constraints could also be eased if the sale of assets confiscated from members of the ousted dictatorship were to generate resources to finance the achievement of development goals.

In addition to a smart development financing strategy, the government will need to implement active production sector and labour market policies in order to raise productivity growth, improve production capacity, resolve labour market frictions and create more jobs, especially for groups that felt excluded from the economic model before the revolution. This path will enable the economy to recover enough to reduce the alarming level of youth unemployment. Finally, economic growth could have a large impact on poverty reduction by ensuring that fiscal reforms are progressive—that they reduce the inequities that were a source of conflict before the revolution.

NOTES

- 1 The authors are thankful to Moncef Youzbachi, Nidhal Ben Cheikh, Jameleddine Boumedie, Olfa Triki and Diyora Kabulova for their valuable inputs that made it possible to calibrate the economy-wide model used in this chapter.
- 2 See, for example, Ayadi and others (2005), Lahouel (2007) and Chemingui and Bchir (2008).
- 3 Government expenditures on education over the period 1990-2007 vary between 6 and 7.5 per cent of GDP, and this share stabilized at around 7 per cent in the biennium 2008-2009—according to World Bank data.
- 4 MDG 3 seeks to promote gender equality and empower women. Tunisia is one of the most advanced countries in the MENA region as far as women's rights are concerned. Females currently account for more than 50 per cent of all enrolled students, a rate that is reflected at all levels.
- 5 MAMS lacks sufficient detail of income distribution in order to analyze poverty changes in a rigorous manner and, by doing so, evaluate if the goal of reducing extreme poverty (MDG 1) is met under different assumptions. Many of the country applications in this publication combine MAMS and a microsimulation approach to determine how changes in the labour market, as generated by MAMS, would affect poverty and inequality when these changes are imposed into a micro dataset under different scenarios (see Chapter 1). Due to a lack of access to a detailed household survey, the microsimulation approach could not be implemented for Tunisia. In any case, MDG 1 had been met in Tunisia before the revolution. Nonetheless, it remains to be seen if the revolution will result in an increase of poverty that puts the country off track in meeting the extreme poverty target.
- 6 The net primary completion rate is the share of the students who would complete primary school on time, defined as the product of the relevant first-year primary school entry rate (or net intake rate) and the pass (promotion) rates over time for the cohort that graduates from primary school in the current year.
- 7 In this application of MAMS for Tunisia, the primary cycle comprises six grades, whereas the secondary and tertiary include, respectively, seven and three grades. The new definition, in which the first cycle is basic education and comprises nine grades, is not being used. The target of getting almost all boys and girls in the age cohort to enrol and pass all the basic education grades without repeating any would be overambitious given the short timespan to 2015. The target modelled here is for almost all boys and girls to enrol in the primary cycle of six grades at the expected age in 2010 and to graduate by 2015. On this basis, the computed net primary completion rate for the base year is close to 98 per cent for boys and girls aged 6 to 11. This equates with reported enrolment rates and thus assumes repetition and drop-out rates are nil. It may be a strong assumption, but it is difficult to calibrate the model otherwise in view of a lack of official data on net primary completion rates.
- 8 Other aspects of the calibration of MAMS for Tunisia are explained in Chemingui and Sánchez (2011), including econometric estimations of other, more standard elasticities used in CGE models.
- 9 Real GDP growth is imposed through a calibration procedure whereby factor productivity is adjusted, but GDP remains fully endogenous in the model. Thus, for the pre-revolution baseline scenario, in particular, the effects of the revolution take place through productivity losses, without exogenously updating any other parameter. Productivity losses affect the level of production, and so on.

- 10 Chemingui and Sánchez (2011) present detailed results that show the plausibility of the baseline scenarios generated for Tunisia.
- 11 As said, due to a lack of access to a detailed household survey, the microsimulation approach could not be implemented for Tunisia in order to monitor how MDG 1 evolves under the different scenarios (see note 5).
- 12 The model remains fully determined (that is, the number of endogenous variables is exactly equal to the number of equations) because, in the MDG-financing scenarios, the MDG indicators (including those for student behaviour) follow an exogenous, non-linear trend that leads to fully meeting targets by 2015, given diminishing marginal returns to variations in the MDG determinants.
- 13 The additional public spending requirement to achieve the MDGs is defined as the public spending on MDG-related sectors in the MDG-financing scenarios minus the public spending on MDG-related sectors in the corresponding baseline scenario. Annual averages for the additional public spending requirement for 2006-2010 and 2011-2015 are calculated and subsequently added.
- 14 In fact, wages for the highly skilled workers grow about 1 percentage point more in the MDG-financing scenarios, compared to the baseline scenarios. As applied here, the unemployment rate of all types of workers reaches a minimum unemployment rate of 11 per cent in the generated baselines. Since these are taken as the benchmarks, in the MDG-financing scenarios the labour market for all types of workers clears fundamentally through wages, not employment.
- 15 Estimates are based on additional foreign aid requirements presented in Table 7.7 and GDP at current prices (\$44.3 billion) as recorded in the July 2011 update of IMF's World Economic Outlook.

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