Realizing the Millennium Development Goals through socially inclusive macroeconomic policies

Country Study

Assessing Development Strategies to Achieve the MDGs in

The Kyrgyz Republic

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This (unedited) report was elaborated as part of the capacity-development project "Realizing the Millennium Development Goals through socially-inclusive macroeconomic policies", which was implemented by the Development Policy an Analysis Division of the United Nations Department of Economic and Social Affairs (DPAD/UN-DESA), in close collaboration with the United Nations Development Programme in Kyrgyzstan.

The overall objective of the project was to strengthen the capacity of policymakers to formulate and evaluate socially-inclusive macroeconomic policies aimed at facilitating the achievement of the MDGs through the adaptation of an integrated modelling framework to country-specific conditions. The methodological framework is based on the adaptation of the economy-wide model system, known as *Maquette* for **M**DGs **S**imulation (MAMS) – a dynamic computable general equilibrium (CGE) model that includes a special module for the "production" of services associated with the Millennium Development Goals (MDGs). It also compromises methodologies at the micro level to identify determinants of MDG achievement, on the one hand, and to quantify effects on poverty and inequality, on the other.

The views and opinions expressed herein are those of the authors and do not necessarily reflect those of the United Nations or its member states.

CONTENTS

TABLES

FIGURES

ABBREVIATIONS

BPFC	Benefit for Poor Families with Children
CGE	Computable general equilibrium
CIS	Commonwealth of Independent States
CPI	Consumer Price Index
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
HIPC	Highly Indebted Poor Countries
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
ILO	International Labor Organization
IMF	International Monetary Fund
lhs	Left-hand side (axis)
MAMS	Maquette for MDG Simulations
MDG	Millennium Development Goals
MoF	Ministry of Finance of the Kyrgyz Republic
NBKR	National Bank of the Kyrgyz Republic
NSC	National Statistical Committee of the Kyrgyz Republic
OLS	Ordinary Least Squares
PIP	Public Investment Program
PISA	Program for International Student Assessment
PPP	Purchasing Power Parity
rhs	Right-hand side (axis)
SAM	Social Accounting Matrix
SME	Small and Medium Enterprises
SOE	State-Owned Enterprise
UMB	Unified Monthly Benefit
UNDESA	United Nations Department of Social and Economic Affairs
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USSR	Union of the Soviet Socialist Republics
USD	Dollar of the United States of America
VAT	Value Added Tax
WHO	World Health Organization
WTO	World Trade Organization

Executive Summary

This study has been prepared in the framework of the project "Assessing Development Strategies to Achieve the MDGs in Asia" implemented in the Kyrgyz Republic with methodological and financial support from the United Nations Department of Economic and Social Affairs (UN-DESA) and UNDP. This paper aims at analyzing macroeconomic and financial strategies aimed at ensuring achievement of the Millennium Development Goals (MDGs) in the Kyrgyz Republic.

The paper is based on results of simulations generated through the application of with standard MAMS, a computable general equilibrium model developed by the World Bank. This model was adjusted to the country situation and was calibrated with data of the Kyrgyz Republic. The exercise enabled the analysis of selected MDGs for extreme poverty (MDG1), primary education completion (MDG2), under-five and maternal mortality (MDGs 4 and 5, respectively), and access to safe water and sanitation (MDGs 7a and 7b, respectively).

The analysis indicates that responsible macroeconomic policies in 2000-2008, adaptation of population to new realities and new opportunities and positive developments in the economies of neighboring countries allowed for several years of good economic growth and significant poverty reduction. Yet, the country remains vulnerable to numerous external and internal shocks, and its public finance and balance of payments are still fragile. The social policies in Kyrgyzstan have always been directed towards sustaining the most important country's achievements in education, health and access to water and sanitation. While the access to essential social services has been mostly preserved, quality of a broad range of services has suffered. Achievement of many MDGs is at risk.

MAMS-model-based simulation results indicate that a continuation of the current policies under the baseline scenario would allow for achieving MDG1 only; the country would fall short of the targets for other MDGs.

In order to achieve all MDGs, the country needs to increase government spending on MDG-relevant sectors (education, health, water and sanitation) by 7.8-8.1% of GDP per annum in comparison to the baseline scenario. This increase in government spending could be financed either through increased domestic tax collections, or through official foreign transfers to the government, or through concessional foreign borrowing, or through a mix of these options. All of these financing options seem to be politically difficult and hardly implementable. The scenario that combines increased taxes and aid inflows seems to be the most realistic, but it would still require very substantial increases in both tax collections (by 2.5% GDP per annum) and grant aid (by 6.1% GDP per annum).

The situation is going to be easier, if the economic growth rates 2011-2015 would be higher than 7% per annum. This is possible, if the government would be more successful in implementation of structural reforms, FDI and private domestic investments attraction and mobilization of resources for infrastructure development. Another possible way out is a substantial increase in government spending efficiency allowing for receiving higher social returns for money spent.

Thus, the MDG achievement in the Kyrgyz Republic seems to require combination of four types of policies: (i) promotion of economic growth in the country, (ii) increased domestic financing of MDG-related sectors through redistribution of resources between sectors, (iii) increase in cost efficiency of social policies, and (iv) increased attraction of foreign aid.

Introduction

This study is prepared in the framework of the project "Assessing Development Strategies to Achieve the MDGs in Asia" implemented by country teams in the Kyrgyz Republic, the Philippines and the Republic of Uzbekistan with methodological and financial support from the United Nations Department of Economic and Social Affairs (UN-DESA) and UNDP. This paper aims at analyzing macroeconomic and financial strategies aimed at ensuring achievement of the MDGs in the Kyrgyz Republic.

Kyrgyzstan is making progress towards achievement of the MDGs and is on track to achieve MDG1 by 2015. However, achievement of other MDGs is at risk due to problems remaining in the development of the country. Key policies, which are to ensure good progress in the MDG-related areas, have been formulated in a number of government strategic documents and summarized in two MDG progress reports (2003 and 2009). However, human, material and financial resources available in the country have never been fully sufficient for practical implementation of these policies, so finding a realistic path towards the MDGs is still an open issue in Kyrgyzstan. Progress in the MDG achievement has also been inhibited by the governance problems and associated political instability in the country during last years. Fully recognizing an acute need in fundamental improvement in all areas of governance, this paper concentrates on **macroeconomic and sector policies and resources necessary for timely MDG achievement in the country**. Identification of such policies and resource requirements is the main objective of this study. The analysis provided in this paper contributes to selection of a feasible mix of policies, for which necessary resources could be mobilized inside and outside of the country.

The 2010 political events in Kyrgyzstan have resulted in an acute humanitarian crisis in the southern part of the country. Many components of the education, health and other key public services, which are considered in this study, have been severely damaged. This damage is currently being assessed by the government and international experts, and substantial domestic and donor resources are being mobilized in order to recover the social system. Only very rough estimates of the damage and additional resource requirements have been published so far. On this background, the paper is based on an assumption that additional resources for the post-conflict recovery will be possible to mobilize and utilize to compensate the damage. As this paper is aimed at analysis of the longer-term trends and the resources needed for a normal, conflict-free development of the country, the additional conflict-related resource requirements have not been included into the estimates provided in this paper.

The paper is based on results of simulations generated through the application of with standard MAMS, a computable general equilibrium model developed at the UN-DESA and the World Bank. Full description of the model is provided in [Lofgren and Diaz-Bonilla, 2009]. This model was adjusted to the country situation and was calibrated with data of the Kyrgyz Republic, which enabled the analysis of selected MDGs for extreme poverty (MDG1), primary education completion (MDG2), under-five and maternal mortality (MDGs 4 and 5, respectively), and access to safe water and sanitation (MDGs 7a and 7b, respectively). The progress shown in achieving these MDGs can be explained in close association with economic and financial policies. Other MDGs are not part of the analysis.

The paper has the following structure. Chapter 2 is devoted to the analysis of macroeconomic developments in the country throughout history of its independence. Section 2.1 is focused on economic reforms and policies implemented in the country in 1991-2009. Section 2.2 describes growth performance of the economy on different stages of its development, the relationship between growth and poverty in Kyrgyzstan, and main economic imbalances. Section 2.3 considers major sources of vulnerability of the economy: public finance problems, terms of trade fluctuations and other external shocks. Chapter 3 contains a brief analysis of social policies in Kyrgyzstan. Section 3.1 provides a review of government policies in education, health, social protection and supply of water and sanitation. Section 3.2 analyses the evolution and structure of public social

spending. Section 3.3 addresses the issue of social policies' implications for poverty reduction in the country and describes progress of the country towards MDG achievement. Chapter 4 discusses MDG determinants and their inter-dependence for education, child and maternal mortality and access to safe water and improved sanitation. Chapter 5 describes key data sources, assumptions and the methodology used to estimate parameters that were used in the calibration of MAMS for the Kyrgyz Republic. Chapter 6 contains an analysis of baseline and different MDG achievement scenarios focusing on macroeconomic and labor market outcomes as well as on estimated resource requirements under different financing strategies. Finally, Chapter 7 summarizes the main findings of the paper and discusses some policy implications.

1.   Macroeconomic policies and economic performance in 1991-2009

1.1.   Economic reforms and policies

When Kyrgyzstan gained independence in 1991, the conditions for its development were largely determined by its natural resources, geographical location and the structural and institutional legacy of the Soviet era. Among the most significant initial conditions were the following:

- geographic location: landlocked and remote from major economic centers;
- agro-industrial structure of the economy: most of the large industry worked for the needs of the whole Soviet Union (including military industrial facilities) and, therefore, it was heavily dependent on suppliers and consumers in other Soviet republics and on the USSR federal budget;
- lack of easily extractable energy resources and minerals;
- well developed social infrastructure and relatively high living standards[1] of the population;
- lack of many of the institutions typical for an independent state (central bank, border guard, customs, etc);
- lack of experience with independence, democracy and market economy.

After gaining independence, the above fundamental factors coincided with the consequences of macroeconomic instability (inflation, a severe shortage of consumer goods, etc.) of the late *perestroika* period. The dissolution of the USSR led to the termination of Union budget subsidies and cheap energy supplies from other republics, a crisis in inter-republican trade, a collapse in the demand for military production, a drastic change in relative prices, a huge increase in transportation costs, and the need to address the completely new tasks that the government and people faced. Heavy social and economic repercussions were witnessed as a result:

- hyperinflation and a severe output decline led to the loss of half of the officially recorded GDP and three-quarters of industrial production, and agriculture also suffered considerably;
- decreased real wages and social benefits, increased unemployment and lack of experience to subsist in a market economy led to increased poverty and inequality;
- poverty and instability promoted a quite significant outward migration;
- noticeable deterioration of education, health care, culture and other social services.

However, during the early transition period, both the government and the people could quickly adapt to the new conditions. The complex institutional, economic and social reforms conducted in the first half of 1990s helped to build basic state institutions, overcome the output decline, achieve initial macroeconomic stabilization, and prevent social services from utterly collapsing. Price liberalization, privatization of State-Owned Enterprises (SOE), de-collectivization in agriculture

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[1] Compared to what it might have been without the USSR central budget subsidies.

coupled with equitable land reform[2] and external economic liberalization[3] increased the contribution of the private sector represented mostly by the SME sector to both GDP and employment to a level far exceeding 50%. These changes also helped new social groups such as entrepreneurs, private farmers, and traders (including the so-called shuttle traders) to emerge.

Unfortunately, these reforms were not always consistent and comprehensive enough. The state budget remained unbalanced; many structural reforms (privatization, restructuring of the infrastructural sectors, etc.) were incomplete; social commitments exceeded real financing possibilities and so on. All these flaws undermined the social and economic stability of the country and resulted in the financial crisis of 1998-1999, which had fairly harsh implications in terms of poverty growth, macroeconomic destabilization, external indebtedness among other problems.

After the crisis, the socio-economic situation of Kyrgyzstan has improved, and poverty has fallen significantly. This was the result of many people managing to adapt themselves to the new conditions, and becoming able to assume responsibility for themselves and for the welfare of their families.

A more responsible economic and social policy has managed to reduce inflation to a low single-digit level, create a more favorable tax regime for SME in the area of trade and services, and implement a complex health care reform among other achievements. Key directions of the current economic policy are:

♦   maintenance of macroeconomic stability through controlling government budget deficit, public debt, and inflation, and

♦   promotion of sustainable economic growth through easing and more equally distributing the tax burden on the economy, expanding public investments in infrastructure, improving of business and investment climate, integrating the economy into the global economic system, and implementing structural reforms for the development of key sectors of the economy (energy production, mining, processing of agricultural production, tourism, transport, financial sector, etc.).

1.2.   *Evolution of the economy during the period of independence*

1.2.1. *Economic growth*

The economic decline in the first half of 1990s was deep; by 1995 the country's GDP almost halved (Figure 1). In 1996, the economy started to recover driven by reformed agriculture and gold production[4]. The crisis of 1998-1999 resulted in deceleration of economic growth but by 2000 the economy returned to a more sustainable growth path, showing GDP growth rates in the range of 5-7% per annum.

Technological problems faced by the largest enterprise, Kumtor mine, and unfavorable climate conditions that affected agriculture took the economic growth to be near zero in 2002 and 2005. The biennium 2007-2008 was, however, good for the economy as during this period of time GDP cumulatively increased by 16.8%. The global economic crisis that erupted during the second half of 2008 affected Kyrgyzstan moderately, mainly through a decline in remittances and exports, but GDP remained positive.

Because of the mixed growth performance during the period of independence real GDP in 2009 still did not achieve the level of 1990 (but is very close to this level), while its structure is now very different from that of the last year of the Soviet period (as explained in the next subsection).

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[2] The reform provided every rural household with a land plot proportional to the number of people in the household.
[3] Kyrgyzstan was the first country of the Commonwealth of Independent States (CIS) that joined the WTO in 1998.
[4] The largest enterprise of the country—Kumtor gold mine and associated refinery—had been built in 1993-1996 and started its operations in 1997.

Figure 1.   Real GDP index and growth rate, 1991-2009
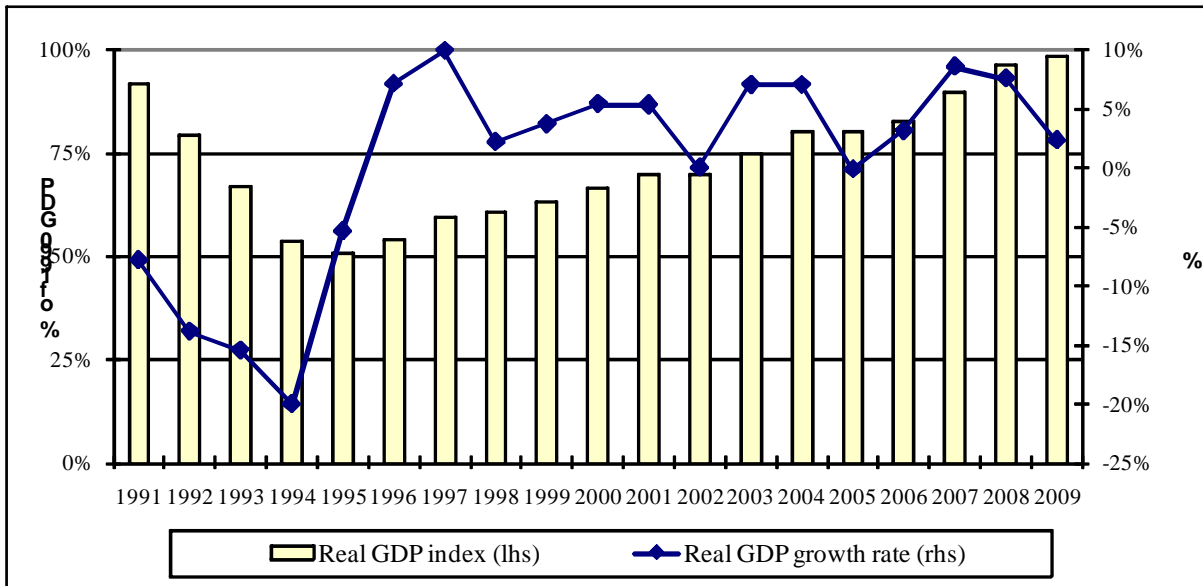
Source: National Statistical Committee of the Kyrgyz Republic (NSC)

In GDP PPP terms, however, the growth story looks somewhat better. According to the World Bank's World Development Indicators, the 2007 GDP per capita value of USD1,980 PPP already exceeded the 1990 value (USD1,813). Still, Kyrgyzstan belongs to the low-income category according to the classification of countries provided by the World Bank.

1.2.2.   Main factors driving economic growth

The sectoral structure of the economy went through deep changes in 1991-2009. The economic decline of 1991-1995 affected all key sectors of the economy (Figure 2). The industrial sector suffered the most as its production fell by three quarters in relative to the 1990 level. Among the main reasons of this production collapse were loss of markets as the former USSR economy disintegrated and a notable deterioration of the terms of trade (that is a hike in energy and transportation prices, which used to be highly subsidized in Soviet times) that turned out to be very unfavorable to Kyrgyz manufacturing enterprises that had dominated the industrial sector in pre-independence times. Public services more than halved, too, as a result of a cut in the government budget that were no longer supported by subsidies from the central government of the USSR. Agriculture and commercial services were less affected, but they also lost 30-40% of their output.

Commercial services appeared to be the most rapidly growing sector of the Kyrgyz economy with a share of GDP that has increased from 27% in 1996 to 40% in 2008. The growth of commercial services is driven by wholesale and retail trade, which provides now almost one-sixth of GDP. An important component of the trade sector is re-exporting activity. Due to the liberalization of custom regulations and the taxation regime for physical persons involved in international trade, Kyrgyzstan became a trade center[5]. Commodities are brought by Kyrgyz traders from China, Turkey and some other countries and these are then redistributed to different parts of Russia, Kazakhstan, Uzbekistan and other countries in Central Asia.

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[5] There are two main markets serving this purpose: Dordoi market near Bishkek, the capital of the country, on the Kyrgyz-Kazakh border, and Kara-Suu market near Osh, the second large town, on the Kyrgyz-Uzbek border.

Figure 2.   GDP structure by sector, 1990-2009
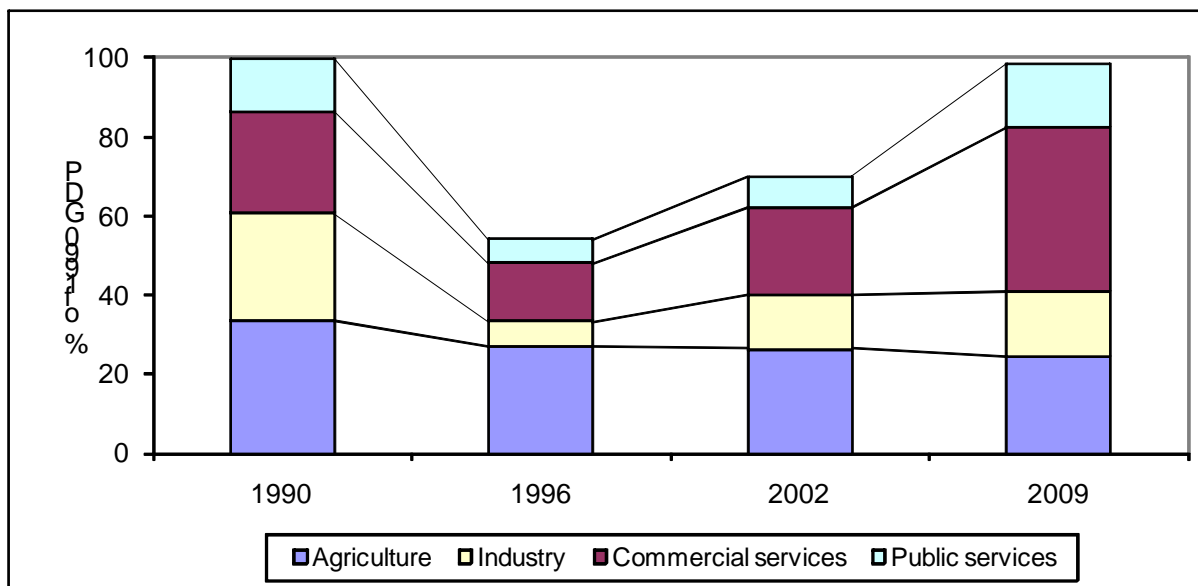
Source: NSC

Other dynamic commercial services, which started to develop quickly in the mid-2000s are tourism, communications, and, until the last year, the financial sector. Tourism promises to be a driver of economic growth in the country in the long-term as the country possesses unique natural resources (Issyk-Kul lake shore, mountains, thermal waters, relict forests, etc.) and cultural heritage. Development of the sector is somewhat inhibited by the country remoteness, though, and it therefore depends on the demand from neighboring countries (first of all, Kazakhstan and Russia). Growth in the communication sector is driven by penetration of new technologies (mobile telecommunications and internet) and is supported by expanding private demand. The financial sector was developing quickly (albeit from a very low basis) due to general economic recovery, prudent sector regulation and inflows of FDI to the sector (mainly from Kazakhstan, where rich oil and other natural resources allowed for the development of a relatively large and aggressive financial sector). As Kazakhstan was hit early by the global financial and economic crisis, expansion of Kazakh financial institutions in Kyrgyzstan stopped, which resulted in slowing of growth of the Kyrgyz financial sector.

Agriculture is growing very slowly in the 2000s. Small (typically one-family) farms dominating the sector have a semi-subsistence orientation and are good in ensuring food security of rural households. However, due to lack of access to markets, modern equipment, necessary material inputs, and cheap credit these farms are not able to increase production substantially. The share of agriculture in GDP shrunk from 50% in 1996 to 30% in 2008.

The moderate recovery of industry in the period 1996-2002 (Figure 2) can basically be attributed to the beginning of gold production on Kumtor mine. Recently, sewing industry has become another source of the Kyrgyz industrial sector growth. This industry emerged as a network of small (often less than ten employees) informal enterprises producing garments for a lower-end market segment. Due to the combination of cheap prices and a reasonable quality, these garments have appeared to be highly competitive, even relative to similar Chinese production.

The development of public services depends on the situation of the government budget. A recent increase in government budget revenues and expenditures (see section 2.3.1) allowed to push up salaries of public servants, teachers and doctors and other components of public spending, so the

share of these services rose somewhat, though their absolute per capita level is still much lower than in 1990.

The economic growth pattern in Kyrgyzstan could also be seen from the GDP expenditure side (Figure 3). Private consumption has been growing quickly (on average 11% per annum in real terms) during last several years. This consumption growth has been accompanied with poverty reduction (see the next section), so it affected all layers of the society. Investments were a GDP component, which grew even faster than private consumption – on average, by 15% per annum in real terms in 2003-2008. Exports have also grown robustly by 11% per annum. Government consumption, on the other hand, is the GDP component that has grown more slowly (4% per annum in 2003-2008), which is partially attributed to some redistribution of government resources from consumption to investments in public infrastructure. The expansion of private consumption and investments boosted the demand for imports which grew very quickly at an average annual growth rate of 20%.

Figure 3.   GDP structure by expenditure, 1990-2008
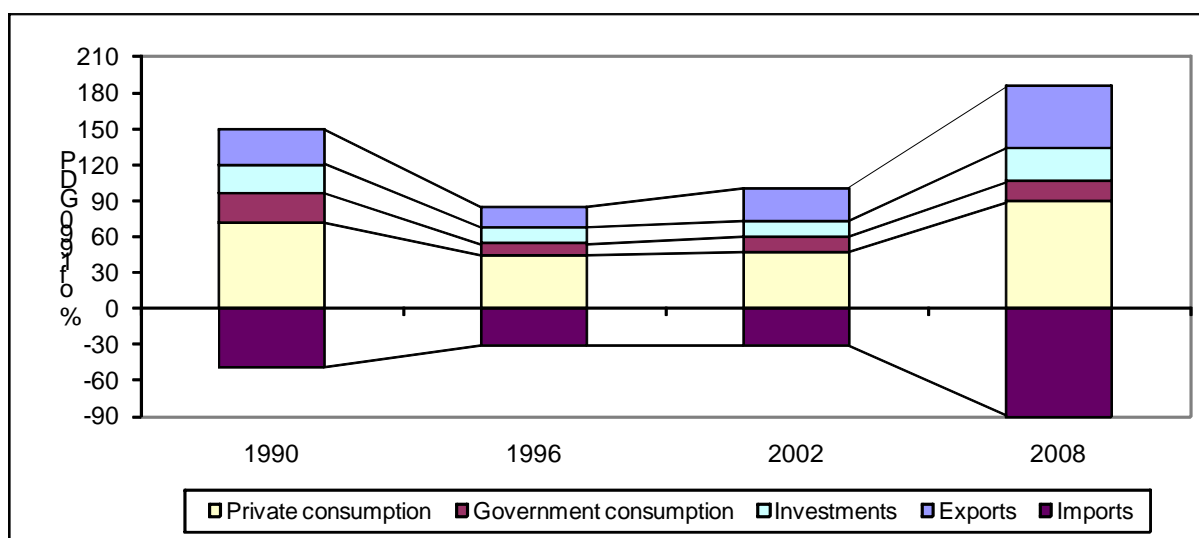
Source: NSC

Remittances from Kyrgyz labor migrants working mainly in Russia and Kazakhstan have been driving part of the growth in private consumption. By different estimates, from 250 to 500 thousand Kyrgyz workers (roughly 12 to 25% of total labor force) seek employment in other countries. According to the NBKR estimates, their remittances in 2008 exceeded USD1.4 billion or 28% of GDP. The inflow of remittances also allowed financing increasing imports.

The growth of investments in recent years has mainly been driven by increased domestic private and public investments and inflows of FDI which increased by more than 30% per annum in USD terms during the last six years.

The expansion of exports has been explained by growing demand for Kyrgyz goods and services in the markets of Russia and Kazakhstan; two oil-producing countries that have experienced rapid economic growth due to favorable international prices for energy products. Taking into account that remittances and FDI also came mostly from these countries, one could infer that recent growth of the Kyrgyz economy reflects a spillover effect from growth in these large neighboring countries.

It has to be noted that the Kyrgyz economy has a very large informal component. There are many small enterprises and self-employed people active in agriculture, retail trade, transport, construction, tourism and other services and some industrial sectors (e.g., in sewing industry), which do not

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report or underreport on their economic results. Activities of the informal sector are only partially accounted in official GDP and employment data. Available estimates of the size of unobserved part of informal sector vary from 18.3% of GDP (NSC for 2007) to 53.2% GDP (UNDP for 2004). The dynamics of the unobserved part of the informal economy may also be quite different from the official economy growth indicators. So, all GDP data should be treated with some caution.

1.2.3. *Growth and poverty*

Poverty is measured in Kyrgyzstan since 1996 in consistency with the World Bank's methodology. Two poverty lines are in use: the general poverty line and the extreme (food) poverty line. The extreme poverty line reflects the cost of a food basket ensuring consumption of 2100 Kcal per person per day. The general poverty line takes the food poverty line and adds-up the cost of basic non-food expenditures. As of 2008, the general poverty line was 18,323 soms per person per annum (about USD3.13 PPP per person per day), and the extreme poverty line was 11,710 soms per person per annum (USD2.00 PPP per person per day). Data on household expenditures are based on the Kyrgyz Integrated Household Survey covering more than 5,000 households interviewed quarterly. For poverty measurement, household consumption per capita is used as a household welfare indicator.

The dynamics of poverty (Figure 4) is pretty consistent with that shown by GDP. There was a decline in poverty in 1997 corresponding to a good growth in agriculture and industry in 1996-1997. During the 1998-1999 period of crisis there was a considerable increase in the poverty level. Starting in 2001, economic growth has been accompanied by a steady, uninterrupted poverty reduction. Interestingly, the poverty dynamics has been smoother than that of GDP, partially because a great deal of the GDP fluctuations has been explained by gold production: that is, such fluctuations have mostly been due to exports rather than private consumption, a macroeconomic indicator that is most closely related to household consumption.

Figure 4.   Poverty indicators, 1996-2009
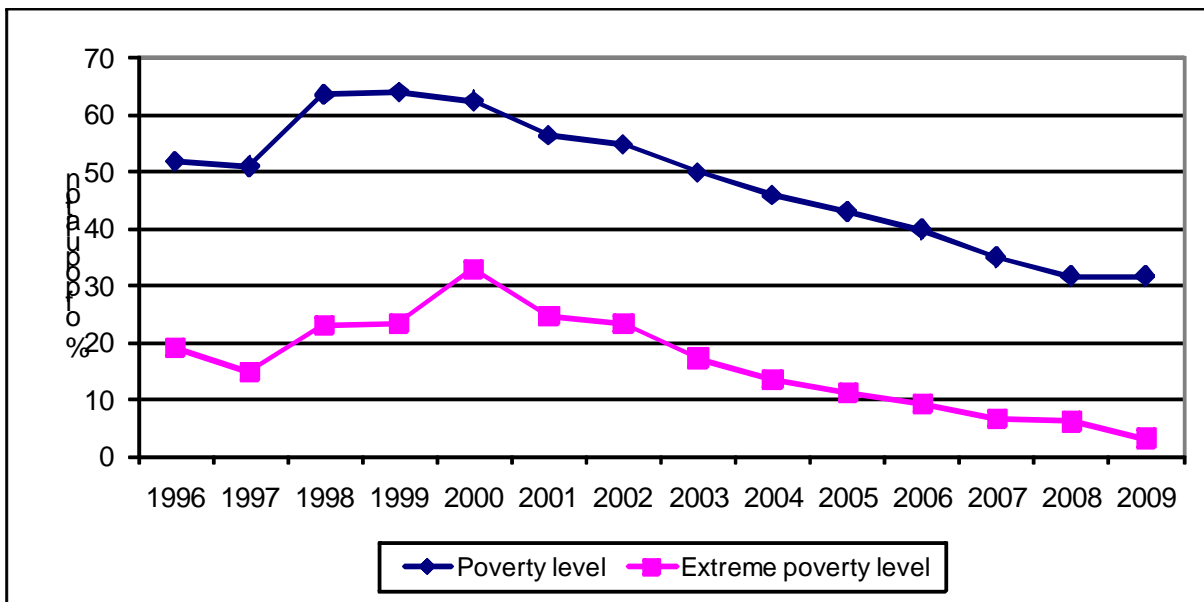
Source: NSC

Between 2002 and 2009, general poverty went down from 54.8% to 31.7% and extreme poverty from 23.3% to 3.1%. In the same period, real GDP per capita grew cumulatively by 29.9%.

Correspondingly, the elasticity of the general poverty rate with respect to GDP is equal to -0.77, and the elasticity of extreme poverty rate with respect to GDP -0.68. These elasticity values seem to be rather high. Possible explanations for such pro-poor growth are prevalence of low inflation, which was maintained in the country until 2007 and which, of course, was beneficial for poor[6], and the growth of consumption driven by remittances, substantial part of which was accrued by the poor rural areas. Social policies of the government have also somewhat impacted the poverty reduction in the country. Despite of the limited scope and efficiency of the income redistribution policies (see section 3.1.3), some social protection/insurance mechanisms (e.g., pensions) did play an extreme-poverty-preventing role in the most difficult period of the country's development at the end of 1990s – early 2000s [World Bank, 2003].

Income inequality in Kyrgyzstan is relatively high and shows an ambiguous trend. According to NSC, the Gini coefficient for household incomes fluctuated in the range 0.41-0.45 during the period 1996-2009 with some decline to 0.37 in 2009. This type of inequality dynamics seems to be consistent with the nature of economic growth in 2001-2009, which was beneficial for different layers of society, and limited scope of redistribution policies by the government (see section 2.1.3). Gradual reduction in income inequality during last years was one among other factors that has allowed economic growth to translate into poverty reduction.

1.2.4. *Inflation, unemployment and balance of payments*

Despite recent economic growth and significant poverty reduction, different imbalances still persist in the economy. The most important of them relate to inflation, unemployment, and government budget (see section 2.3.1) and balance of payments deficits.

Inflation. The history of the Kyrgyz economy belonging to an independent State started with a period of hyperinflation (1992-1994, Figure 5). This was caused by inflationary pressure that had accumulated during the pre-independence period which became apparent through the shock of price liberalization in 1992 and attempts by the government to finance the budget deficit and support enterprises by printing money. Starting in 1994, the Government kept from resorting to the inflationary sources of budget deficit financing and this allowed for gradual decline of the CPI-based inflation rate to 13% in 1997. However, core problems causing macroeconomic instability—huge budget and current account deficits—had not been eliminated and, as a result, the economy was strongly affected by the 1998-1999 global crisis. In 1999 the inflation rate went up to the level of almost 40%.

Figure 5.   Inflation rate by CPI (December-to-December), 1992-2009
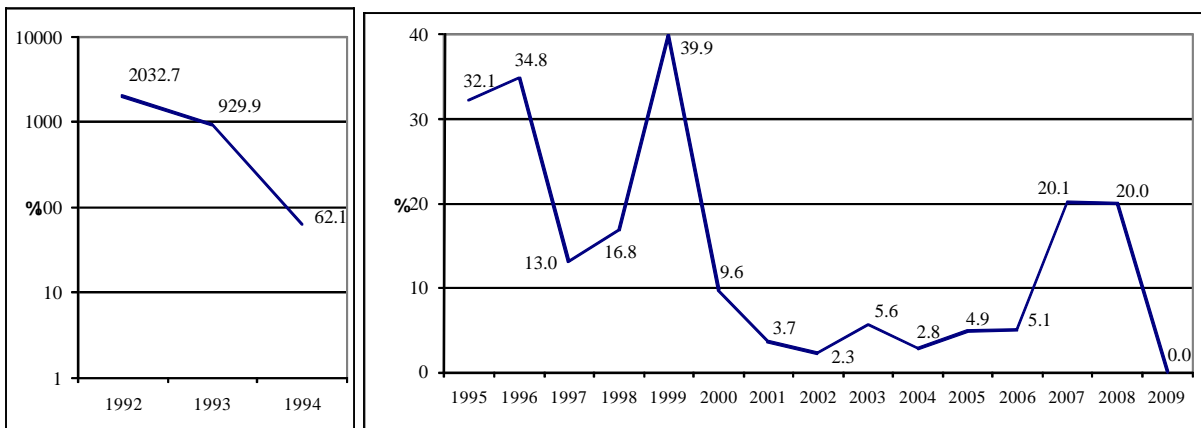
Source: NSC

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[6] Zero inflation in 2009 is also among factors contributing to poverty reduction in 2009 despite of the economic deceleration during the crisis.

In the 2000s, the Government switched to a much more conservative monetary and fiscal policy reducing the government budget deficit and making low inflation the main target of monetary policy. This set of policies took the inflation rate to nearly 5% per annum in 2001-2006.

Several years of low inflation substantially reduced inflationary expectations, which had been high in 1990s. This created conditions to an increase in demand for money and remonetization of the economy. Monetization of the economy (measured by M2x-to-GDP ratio) increased from 11.1% in 2001 to 30.3% in 2007.

During these years the money supply grew very quickly, such that the average annual growth rate of M2x was 32%. For a while, increasing demand for money resulted in such fast increase in the money supply without adding any significant inflation, but the economy was gradually being exposed to inflationary pressure. In 2007, inflationary pressure started to turn into actual inflation as the country was negatively affected by the global hike in food and fuel prices: in fact, the CPI grew by more than 20% and, later, in July 2008, the 12-month inflation rate had climbed to 32.4%. Anti-inflationary efforts by the Government and the NBKR, coupled with a price decline in the global commodity markets in mid-2008, allowed for some reduction in inflation up to 0 for the 12-month inflation rate in December 2009. This inflation story seems to demonstrate that the scope for expansionary monetary policies in Kyrgyzstan is still very limited.

Unemployment. Two unemployment rates are used in Kyrgyzstan: namely, the official unemployment rate and ILO-definition-based unemployment rate. As incentives to register as unemployed are very weak (the unemployment benefit is very small, vacancies provided by government employment services are usually not attractive, retraining programs are very few and it is perceived they do not increase the chances to find a job much), the official unemployment rate is usually 2.5-3 times less than the ILO-definition-based rate. Another factor reducing the official unemployment rate is the law-based rule for treatment of peasants having some land plot. Currently, every peasant having a plot above some very low threshold is automatically considered as employed regardless of whether or not income from the plot farming is sufficient for living. Taking into account that due to land reform implemented in 1990s almost every peasant has some land, this rule prevents the majority of peasants from registering as unemployed.

The official unemployment rate has been measured since 1992. It started from 0.1% and climbed to 4.3% in 1996 (the highest value for all years). Next, it gradually declined and for already more than ten years it fluctuates in the range 2.8% to 3.5%. The official unemployment rate was 2.6% by late 2009.

The ILO-definition-based unemployment rate is measured since 2003, when a labor force module was added to the regular household survey run by NSC. It was estimated at 9.9% in 2003, it stayed between 8% and 9% in the following years and the latest rate for 2009 was 8.4%. While this value seems to reflect reality better compared to the official unemployment rate, it seems to have no close linkage to GDP dynamics—substantial GDP growth in previous years was not accompanied by a decline in unemployment indicators. This lack of correlation between economic growth and unemployment rate may be related to different, often very flexible and fluid forms of employment in the informal sector of the Kyrgyz economy[7], which may not be captured by the unemployment measuring methodology.

In general, the labor market situation in the country is difficult and number of well-paid jobs is limited. According to NSC, the average monthly wage in 2009 was 6161 soms (about USD150). In such conditions many people look for employment abroad (mostly in Russia and Kazakhstan) and are considered as not participating in domestic labor force.

Balance of payments. Kyrgyzstan is a small and very open economy. Many essential consumer goods (e.g., cereals, sugar, and shoes) are imported, and a large number of economic agents are

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[7] Such as partial or seasonal employment of many rural and urban people combined with labor migration or, for students, with studies in universities.

involved in exporting activities. The share of exports of goods and services in GDP was growing almost all the time and reached the level of 56% in 2009. The share of imports in GDP is much higher; it was 93% in 2008. So, openness of the economy measured as the ratio of total exports plus imports of goods and services to GDP was near 140% in 2008-2009.

Imports have always been higher than exports. The trade deficit was especially high in 1995-1999 (with the only exception of 1997). Then, after a sharp devaluation of the som (by 2.5 times) in 1998-1999, the trade deficit went closer to zero and it then started to widen again as GDP grew and the demand for imports increased fast. Inflows of FDI and foreign aid helped financing the current account deficit in the 1990s when this was particularly high (Figure 6). Later on, remittances have become one of the main sources of deficit financing.

Figure 6. Current account balance, 1993-2009
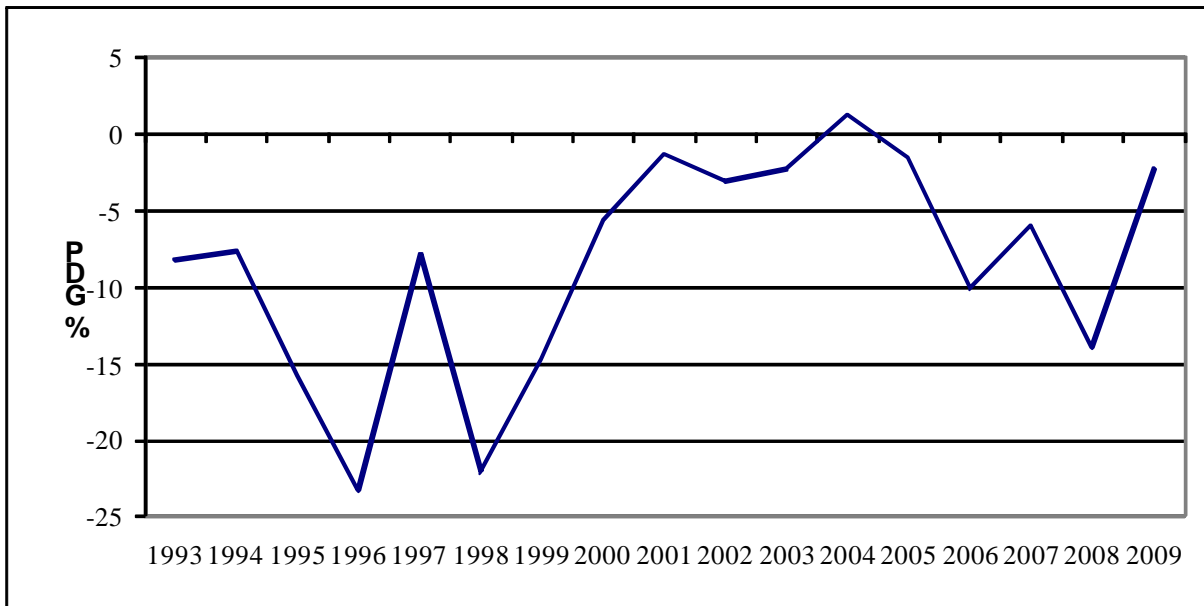
Source: NBKR

Most probably, another important source of foreign exchange covering this deficit was income from re-exports of commodities from China to Russia and Central Asia. This type of export revenue is not captured by official statistics. But judging from the discrepancies between Kyrgyz statistics on imports from China and Chinese statistics on exports to Kyrgyzstan[8] as well as on the size of the "errors and omissions" item of the balance of payments of Kyrgyzstan (which in 2008 was roughly equal to the current account deficit), one could consider these flows as very large.

Since the moment of the introduction of the national currency som in 1993, the exchange rate regime was defined as managed floating. The NBKR never had enough international reserves to effectively fix the exchange rate. From its introduction in in May 1993, the som began to devaluate from 4 soms/USD to 48.44 soms/USD in 2001. In the 2002-2008 period, the som appreciated up to reaching 36.57 soms/USD in 2008. This was a reflection of both the improving economic situation in the country and a global trend of USD depreciation. As it happened to many other currencies in the world in 2009, the som devaluated to 42.89 soms/USD. In the 2000s, until the inflation hike in the second half of 2007, the real exchange rate of the som relative to the currencies of major trading

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[8] In some years Kyrgyz customs reported less than one-tenth of the trade volumes reported by Chinese authorities.

partners (Russian ruble and Kazakh tenge) was moderately depreciating. So, the exchange rate dynamics did not have as much effect on trade as it really had it on external debt (see section 2.3.1).

1.3. *Some key economic development issues*

1.3.1. *Public finances*

The country inherited a system of public finances heavily dependent on transfers from the central budget of the USSR with expenditures much exceeding the level of domestically mobilized revenues. For example, in 1992 the level of government expenditures (in % of GDP) was almost twice as much as the level of government revenues. The attempts to cover the budget deficit by monetary emission in the early 1990s resulted in hyperinflation. Around 1995-1996 the government stopped using direct credits of the NBKR for deficit financing and switched to the concessional foreign borrowing. Even so, the deficit remained very high—around 10% of GDP (Figure 7). The high deficit was not sustainable and made the entire macroeconomic system of Kyrgyzstan extremely fragile. Relatively minor external shocks associated with the global crisis of 1998-1999 (transmitted through Russia) resulted in a sharp currency devaluation, more inflation, and decline in the GDP growth rate. Also, the external public debt (accumulated during the period of massive borrowing from foreign donors) leveled off above 100% of GDP.

Figure 7.   Dynamics of general government budget revenues and expenditures, 1992-2009
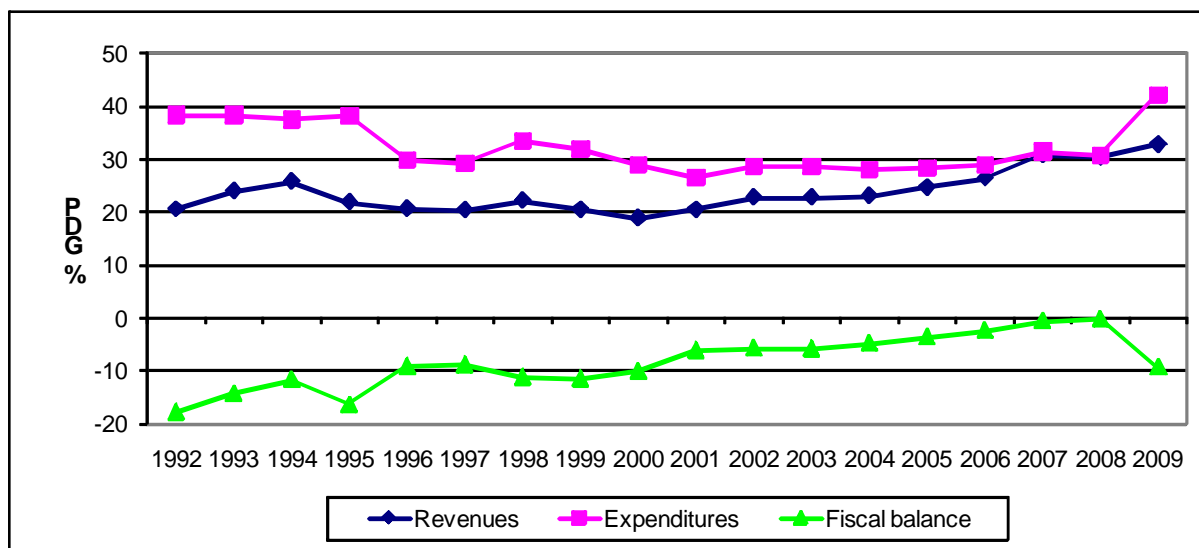
Source: MoF, NSC

In the situation of crisis and immediately after it (2000-2001), the government had to go through a process of expenditure cuts from 33.5% of GDP in 1998 to 26.6% of GDP in 2001. This was done mainly through non-indexation of government spending to inflation, while in some cases expenditure cuts in nominal terms were also implemented. The deficit of the general government budget[9] was reduced to the level of around 6% of GDP. Economic growth in 2002-2007 permitted the budget situation to improve substantially: the deficit was brought almost to zero in 2008 when government revenues and expenditures managed to growth simultaneously. The situation in 2009, however, changed dramatically and the deficit returned to the level of 10%.

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[9] General government budget includes consolidated republican and local budgets, separately implemented donor-funded Public Investment Program (PIP) and extra-budgetary Social Fund (accumulating pension and mandatory health insurance contributions).

The improvement in tax collections—the main component of government revenues—in 2001-2008 should be attributed to the growth of imports, because import taxes (VAT, excises and import tariffs) are the best administered component of the tax system. In 2007, the share of import taxes was close to 50% of total tax collections. Later on, due to the adoption of a new Tax Code in 2008, the structure of government revenue changed in favor of direct taxes and official transfers from abroad (Table 1).

Table 1.   General government revenue, % of GDP, 2009

	Mil. soms	% GDP	% of total revenues
Direct taxes (including contributions to the Social Fund)	21 034	10.7	32.6
Domestic indirect taxes	9 430	4.8	14.6
Taxes on imports	14 180	7.2	22.0
Non-tax revenue	9 431	4.8	14.6
Capital revenue	312	0.2	0.5
Official transfers	10 163	5.2	15.7
Total	**64 551**	**32.9**	**100.0**

Sources: MoF, Social Fund

Personal and corporate income taxes bring to the budget less than 20% of total tax collections. Of course, rates of income taxes are low at just 10%, but with these rates collections are somewhat better than few years ago, when the rates were much higher (top marginal rates were 33% for personal income tax and 30% for profits/corporate income tax). Contributions to the Social Fund have the highest nominal rate (27.25% of payroll) among other taxes and are applied mainly to incorporated enterprises; self-employed, farmers and businesses in some sectors (trade, sewing industry etc.) pay them as a much smaller lump sum tax. High rate and uneven taxation regime make these contributions probably the most distorting tax, which keeps many businesses in informal economy.

Domestic indirect taxes have the same nominal rates as that of import taxes, but their administration is less efficient and some sectors of the economy (e.g., agriculture) are exempt from them, so collection from these taxes is not as large.

Altogether tax collections in 2009 were at the level of 22.6% GDP; this is already a rather high share, and the tax burden is seen by the government and by the private sector as one of impediments for the economic growth; therefore, any substantial increase in nominal tax rates is hardly possible. As it was already mentioned, in 2008 a new Tax Code was adopted, which introduced several important changes to the tax system. Its main intention was to reduce the tax burden on the economy through the elimination of some taxes and the introduction of other taxes. Consequences of many changes applied remain to be seen, but one radical change—reduction of nominal VAT rate from 20% to 12%—resulted in 2009 in a sharp drop of tax collections. No expected increase in the VAT base in response to the lower tax rate has materialized in the crisis environment. In the

view of the very large budget deficit, any additional tax cuts do not seem to be possible in the medium-term perspective.

Thus, no major change in tax rates or tax base definitions in either direction is being expected. Still, some improvement in the effective tax collection rate (in % to GDP) is possible due to improvements in the tax administration and due to the possible post-crisis response of the economy on the tax incentives provided in the past.

Non-tax revenues are also an important source of government revenues. To a large extent, these are revenues of budget-financed institutions (including medical establishments, universities etc.) from paid services. These revenues are accounted in the budget, but are left at the entities offering the services, so the government has a limited discretion power over this money. Foreign official transfers have an important role in the budget revenues.

Key components of general government expenditures are purchases of goods and services, wages, pensions and different transfers and subsidies. In recent years the government has substantially increased domestically-financed capital expenditures, investing in construction of hydropower stations and social infrastructure. From the point of view of the functional classification (Table 2), the government allots more than half of its budget to the social sector (education, health care, social protection, and utilities).

Table 2. General government expenditures by functional classification, 2009

	Current expenditures	Capital expenditures	Total	
	% GDP			% of total expenditures
General government services	4.2	0.5	4.7	11.1
Defense, public order and security	3.2	0.4	3.6	8.6
Economy	8.4	4.4	12.8	30.2
Health care	3.2	0.3	3.5	8.4
Education	5.7	0.7	6.4	15.1
Social protection	8.1	0.0	8.1	19.1
Utilities	1.2	0.8	2.1	4.9
Other sectors	1.0	0.1	1.1	2.7
Total	**35.1**	**7.2**	**42.3**	**100.0**

Sources: MoF, Social Fund, NSC

From the point of view of the government budget deficit financing, domestic sources do not play any important role nowadays. According to the law adopted in 1997, it is prohibited to the NBKR to

lend to the government; that is monetary emission was no longer available as a means of deficit financing. Domestic borrowing through government securities is marginal and often negative. So, external borrowing is the only real channel of the deficit financing[10].

The independent country started its history with no foreign debt. Extensive borrowing in the beginning and middle of the 1990s led to some debt accumulation (Figure 8), which did not seem to be very high, but became unsustainable after the national currency devaluation of 1998-1999. Kyrgyzstan went through two rounds of Paris Club treatment to receive a substantial debt relief on highly concessional terms. In 2006-2007 the country was on a brink of receiving debt relief in the framework of the HIPC initiative (because the main body of the public debt is to the World Bank, the Asian Development Bank and the IMF), but after some hesitation the government decided to refrain from joining this initiative. The debt situation has later on radically improved due to a healthier the economic situation, the national currency appreciation against the USD and the associated depreciation of mostly USD-denominated debt as well as an increase in the grants component of donors' aid. It must be noted, however, that the debt situation is still fragile as the debt indicators started to deteriorate again as a result of the 20% devaluation of the som in the end of 2008 and the beginning of 2009, increased borrowing for infrastructure projects, nearly-zero growth and a worsening of government revenue collection and exports.

Figure 8.   External debt of Kyrgyzstan, 1993-2009
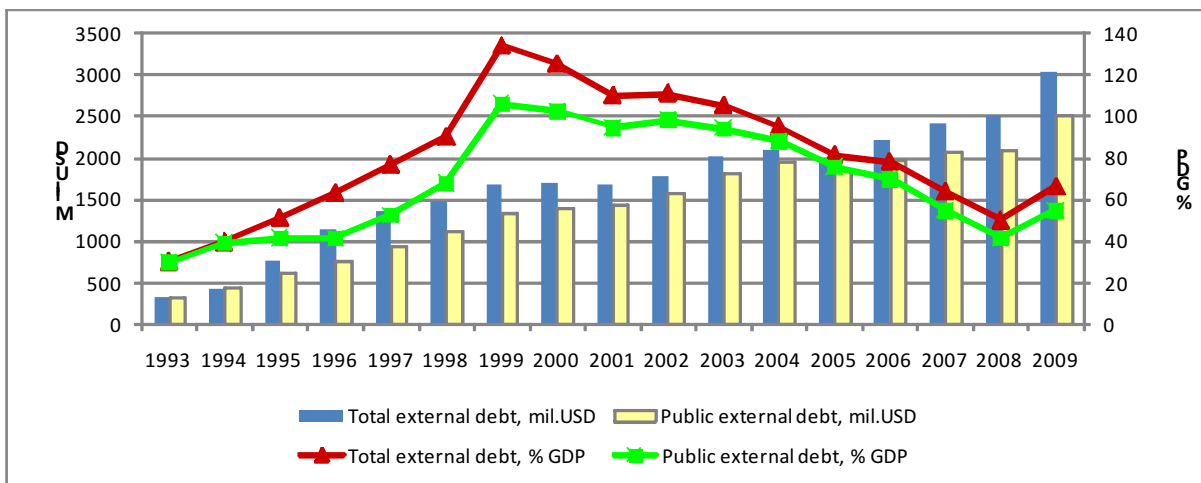
Source: NBKR

Foreign aid from multilateral institutions and bilateral donors was extremely important for the budget in the 1990s and in the beginning of the 2000s. Its role diminished somewhat later on as tax collection improved, and then it dramatically increased again in 2009 to the level above 5% of GDP.

Private borrowing from foreign sources is not large in Kyrgyzstan. The available private debt is associated to a large extent to only one investment project – Kumtor gold mine.

1.3.2.   Terms of trade and other external shocks

The small and open economy of Kyrgyzstan is subject to different exogenous shocks which transmit through several channels. Firstly is the situation in neighboring countries, especially Russia and

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[10] Grant aid (official transfers) does not increase the government debt, so it is considered as a part of the government revenues (see Table 1) and is not counted as deficit financing.

Kazakhstan. These countries are major export markets for Kyrgyz goods and services, major recipient countries of Kyrgyz migrants and key sources of critically important imports. Therefore, developments in these countries strongly affect economic development in Kyrgyzstan. These two neighboring countries did very well during the last years in which oil prices have boomed, and for Kyrgyzstan this brought about growing demand for Kyrgyz exports, FDI inflows, remittances inflows and lower unemployment due to outflow of labor migrants. The Custom Union of Belarus, Kazakhstan and Russian Federation operational starting July 2010 may introduce much stricter custom control procedures and in this way inhibit the Kyrgyz exports and especially re-exports of Chinese goods to the countries of the Union.

Dependence of Kyrgyzstan's domestic consumer market on imported commodities is another channel of vulnerability to external factors. The recent global increase in food and fuel prices substantially affected both relative prices and general inflation in Kyrgyzstan, which is to rely on imports of gasoline, kerosene, natural gas and other fuel. Kyrgyz exports are pretty diversified, so fewer price shocks are transmitted through this channel, while world prices for gold (the largest export item) do influence export revenues significantly. However, due to relatively little connection of the gold production to other sectors of the economy any increase/decrease in gold prices does not have much effect on general macroeconomic situation.

Agriculture still remains the largest sector of the economy. Its dependence on weather conditions makes the whole economy vulnerable to climate change. Recently, climate conditions also affected electricity production in the country; few years in series with lower-than-average inflow of water into reservoirs feeding hydropower stations significantly reduced energy generation capacity of the country and negatively affected industrial production and living conditions of the population in 2008-2009.

This analysis of the economic and fiscal situation in Kyrgyzstan indicates that the government managed to maintain short-term macroeconomic stability in the 2000s even when the economy was affected by sharp exogenous shocks. Still, the economic situation is vulnerable. Fiscal burden on the economy is already large and further increase in the government expenditures would be difficult to achieve by political and technical (limited revenue collection and foreign aid absorption capacity) reasons.

2. Social policy and MDG achievement

2.1. *Social policy during the period 1991-2009*

The country inherited a well-developed and expensive system of social services from the Soviet period, which could be usually found in countries with much higher level of GDP per capita. Therefore, social policies in the period of independence were mainly directed to sustaining the already achieved level of social development, when available resources reduced considerably.

2.1.1. *Education*

Restructuring of the education sector went in several directions: (i) limiting the scope of government commitments; (ii) maintaining those components of the system, which were left in the public domain; (iii) allowing private provision of education services; (iv) adjusting the education contents and structure to the requirements of the labor market.

Before 1993, general secondary education (10, and then 11 grades) was mandatory and available for all children free of charge. With the adoption of the Constitution in 1993, basic secondary education (1-9 grades) had become mandatory. Access to general secondary education remained free in public schools, but it was not guaranteed to everybody any more. Another area where government commitments were substantially reduced was pre-school education. Many public pre-school establishments were closed; their number was reduced from 1,696 in 1990 to 402 in 2001, and it

then went up to 594 in 2009. The number of children in pre-school establishments decreased almost five-fold from 1990 to 2001, and then increased by approximately one-half by 2009.

The situation in primary and secondary education[11] developed quite differently. The number of schools increased by 25% in 2009 in comparison to 1990 and the number of schoolchildren rose by 12% (mostly due to the increase in total population) during the same period. The student-to-teacher ratio has barely changed from 13.7 in 1990 to 14.8 in 2009. The possibility to get secondary education in the native language has been maintained for an absolute majority of the population; public schools provide education in Kyrgyz, Russian, Uzbek and Tajik, private schools provide education on some other minority languages. Because of financial problems and despite the government's efforts, teachers' salaries relative to the average wage in the economy slipped to 59% in 2009 from 77% in 1990. Spending on teachers' salaries and utility services for schools accounts for the larger part of total secondary education expenditures; while little remains to be spent on new textbooks, equipment and other items necessary for the normal education process. This, of course, has implications for the education quality (see below).

Private educational establishments funded by parents' contributions have been created in all education cycles, but their role is still marginal in pre-school, primary, basic and general secondary education (much less than 1% of all enrolled children). The role of private institutions is much more important in tertiary education: 33% of all universities with 11% of all students are private.

Until recently the contents of primary and secondary education and the professional structure of tertiary education have not changed very much in comparison to pre-independence times. Changes have been mainly in the area of languages and humanities. In the last few years, the ministry of education started to pursue more aggressive policies towards the adjustment of programs and budget-funded professional training to the realities of the modern economy of Kyrgyzstan.

While these policies allowed preserving and improving the enrollment numbers (see section 2.4.1) and the system of education as such, the quality of education has visibly deteriorated. For example, according to the results of an independent assessment of fourth grade students' learning achievements, in 2001 80% of the students successfully passed a test on math and 60% a test on reading, numbers that went down respectively to just 38% and 36% in 2007. Similarly discouraging results have been received, when Kyrgyzstan took part in 2006 PISA study on schoolchildren's literacy in reading, math and sciences. So, it seems that the quality of education is the main current problem of the Kyrgyz education system.

2.1.2. Health

Unlike mostly conservative education policies, in health the government has been implementing a far-reaching reform program aimed at increased effectiveness of the health care system and maintenance of nearly-universal access of the population to health care services. Implementation of the reform started in 1996 with significant support from WHO, World Bank and other donors.

Key components of this reform are: (i) restructuring of the health care system, implying strengthening of primary care and optimization/reduction of the network of health care establishments; (ii) changing in financing mechanisms in the sector, including the introduction of mandatory medical insurance, patient's co-payments, division of providers and payers in the system, transition from input-based (e.g., per bed) to output-based (e.g., per treated case) system of financing of medical establishments, and so on.; (iii) changing medical treatment practices towards improved quality of medical services, introduction of elements of evidence-based health care, etc.; (iv) strengthening of the public health system; and (v) transferring of some health care system functions (e.g., provision of medicines and dental care) to private establishments and organizational

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[11] In Kyrgyzstan, primary (1-4 grades), basic secondary (5-9 grades) and general secondary (10-11 grades) education is mostly provided in the same school.

changes in the government-funded health care. Due to its systematic and coherent reform in all components, the Kyrgyz health care model, which is already distinctively different from the inherited Soviet model, has become well recognized.

Health care reforms are still ongoing and it seems to be premature to make definite judgments on its successes and failures. Some outcome indicators[12] of the health system reform are improving (e.g., more effective use of available resources) whereas others are not (e.g., the level of patients' unofficial payments during treatment in hospitals). However, the main result of the reform is that the health care system seems to be sustained at considerably lower levels of government health expenditures (see section 3.2) without radical deterioration of the health situation in the country: that is, efficiency has improved.

2.1.3. Social protection and social security

The protection of the poor and vulnerable in the country is performed mainly through social insurance and social assistance systems.[13] The *social insurance* system consists mainly of pensions for former employees or farmers (for old age and disability) and their dependents (survivorship). Other social insurance benefits are sickness or maternity benefits for contributors, and funeral benefits for pensioners. The *social assistance* system includes a number of cash benefits and privileges.

Pensions are the main social protection tool in the country from the point of view of both coverage and the impact on welfare, and in 2009 accounted for some 80% of public social protection expenditure. As of late-2009, there were 565,000 pensioners (10.6% of the total population). Of these, 407,000 were in receipt of old-age pensions, 77,000 disability pensions and 81,000 survivorship pensions. Total expenditure on pensions in 2009 was equivalent to 6.4% of GDP.

The country inherited from the Soviet Union a pension system with a low pensionable age (55 for women and 60 for men) and practically universal coverage. Pension entitlements in this system were generous[14] in comparison to the fiscal potential of the state[15], with the result that with the collapse of the Soviet Union, the pension system in the 1990s was characterized by substantial arrears[16]. Delays in the payment of pensions and their payment in kind were the frequent result. The need for pension reform became evident for the Government, donors, and a broad range of other stakeholders. A new pension law for the Kyrgyz Republic was adopted in 1997. Important features of the new pension system were: (i) the gradual increase in the retirement age to 63 for men and 58 for women by 2007; (ii) the abolition of some pension privileges; and (iii) the introduction of a three-part pension system. The first component is the so called base pension, which is equal for everybody having the necessary number of working years (25 years for men and 20 years for women). The second component is to smooth the transition from the old to the new system. The third component is a new notionally defined contribution based supplement, which will eventually replace the second component. The reforms allowed for the transfer of pension liabilities from the Government to an increasingly balanced Social Fund. The pension system has also become an effective instrument for reducing poverty amongst the elderly: World Bank data shows households with pensioners have 20% less risk of becoming poor compared to households without pensioners. Even so, pensions remain low in Kyrgyzstan: the average old age pension at the end of 2009 was

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[12] See impact indicators of health care in section 3.4.1.

[13] There are also quite small components of social services for vulnerable groups of the population and labor market policies.

[14] Even in 1994, when pensions were already falling, the replacement rate (average pension as percentage of average wage) was 63% – a high value for low-income country.

[15] The source of fiscal sustainability problems for the pension system did not, as in many developed countries, result from the ageing of the population, but rather from the cessation of transfers from the USSR central budget and the subsequent development of a substantial informal sector making no contribution to the pension system.

[16] In 1996, for example, total pension liabilities were equal to 6.9% of GDP with a financing gap of 1.7% GDP.

marginally above USD50 a month[17]. The longer-term sustainability of pension system was weakened by amendments introduced into the Pension Law in 2007 which effectively returned the pension age to 60/55, increasing the number of pensioners substantially as a result, forcing the introduction of further adjustments to the system in order to rebalance Social Fund financing in order to meet growing pension liabilities.

In the social assistance system, there are two targeted cash benefit programs: the Benefit for Poor Families with Children (BPFC) and social allowances. The BPFC is a means-tested cash benefit for individuals from the poorest families with children, who are unable to support themselves. At the end of 2009, 6.9% of the population were beneficiaries from the BPFC; the average UMB paid out amounted to 172 soms (USD4) per month. Social allowances are cash benefits paid to defined categories of individuals unable to work (people with disabilities, families with children with disabilities, orphans, or mothers with many children, and elderly people without pensions). Approximately 1.2% of the population received social allowances at the end 2009, and the average allowance amounted to 827 soms per month, i.e., about 5 times higher than average BPFC amount.

Another component of the social assistance system is *privileges* or preferential pricing. These privileges are for certain categories of citizens for transport, communications, energy, medicines, health services, housing, vacations and utilities. The list of privileged citizens covers war veterans, law enforcement officials, the military, people with disabilities, highlanders, Chernobyl victims, and some poor households; the number of privileged categories of citizens is close to 40. Depending on the category, privileged persons are eligible for l00%, 50% or 25% price discounts up to a quota (social norms of consumption). The multiplicity of the different types of privileges, the fact that they are regulated by a number of different legal acts and paid from different budgets (republican and/or local), and the wide-spread payment in-kind make this part of the system the least transparent component of social protection spending Moreover, the fact that the recipients are not necessarily poor make it also the least effective in terms of poverty reduction. Starting in January 2010 a larger part of these privileges was monetized and this resulted in even higher budget expenditures on this item of the social protection system.

The key problem of all government social protection programs (including pensions) is their insufficient effectiveness. The level of benefits is too low, and the scarce government resources are spread among too many recipients, some of which are not necessarily poor. Therefore, increased targeting of social assistance is high on the government agenda.

2.1.4. Access to safe water and improved sanitation

The situation on access to clean water in the country is improving: in 2009, 90.4% of total population had access to safe water source. This is a considerable improvement in comparison to 1996 (81.3%). However, as it is indicated in [UNDP 2009], there is evidence of insufficient quality of water in some parts of the country.

Progress in access to improved sanitation was much more modest; 25.2% of the population in 2009, which does not differ very much from 1996 value (24.4%) and which is below values around 30% registered in the beginning of the 2000s.

The problems with access to water and sanitation are mostly concentrated in rural areas where relative to the urban areas the indicators are, respectively, 15-20% lower for safe water and 50-60% lower for improved sanitation. In urban areas these services are provided by specialized utility companies, while in rural areas they are mostly to be provided by communities themselves.

Government policies in this sector mostly concentrate on the sector regulation, rehabilitation of existing and construction of new infrastructure and institutional development. Regulatory activities cover quality standards (activity of the central government, e.g., law on drinking water adopted in

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[17] The replacement rate is now 38%, which is considerably lower than in majority of other countries.

1999) and size of user fees in urban areas collected by utility companies (local governments). Institutional development relates to establishing and enabling self-governing Rural Communities of Drinking Water Users, which received all previously created rural water pipelines as well as responsibilities for this infrastructure operation and maintenance and setting of water tariffs.

Financing of the sector is organized in such way that recurrent expenditures of utility companies and rural water suppliers are covered by user fees. The size of fees does not provide utility companies with resources for any considerable investments, so development of water and sanitation infrastructure is based almost solely on government spending. In 2000s, the government implemented "Taza Suu" (clean water) program supported by loans of the World Bank and the Asian Development Bank in total worth USD70 million. Hundreds of villages and water supply projects have been implemented in the framework of this program. Some smaller donor-supported infrastructure, institutional development and awareness raising projects have also been implemented through the country. Apparently, further improvement of the access of the population to safe water and appropriate sanitation require continuous public investments. Along with this, households' financed and implemented improvements (especially with regards to sanitation facilities in rural areas) are to be encouraged.

2.2.   *Evolution and structure of public social spending*

Social spending has always been a very large component of government expenditures in Kyrgyzstan. For all years since 1990 the share of social spending in general government expenditures was above or equal to 50% (Figure 9). The share of these expenditures was especially high in the mid-1990s, when the economy was going through its most difficult episode. In the 2000s, the government managed to sustain and even increase the shares of education and health in government expenditures, as these were considered priority sectors. At the same time, starting from the late-1990s the share of social protection was on the decline, in part because the government allowed for a decrease of social benefits in real terms and of pensions in relation to wages.

Figure 9.   Shares of social expenditures in the general government budget
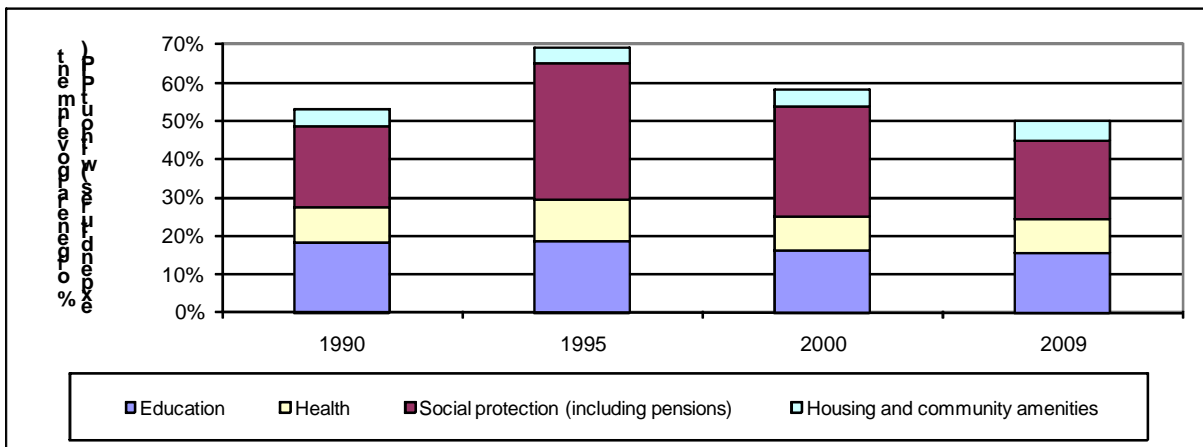
Source: NSC

However, while the share of social sectors in total government expenditures has always been high, the real value of these expenditures has had different dynamics. As total government resources were shrinking in real terms and as a percentage of GDP in the 1990s, even the increase in the share of social expenditures did not prevent them from falling sharply in absolute terms. All social expenditures per capita decreased in real terms by 2-4 times in 2000 from the 1990 levels (Figure

10). The situation changed in the 2000s, when all social expenditures demonstrated significant real growth – more in education and housing and community services, and less in social protection. Still, in 2009 the per capita spending on education, health and social protection was only about 65-75% of the 1990 level.

As mentioned in section 3.1, in conditions of diminishing government social spending private spending on similar services has been increasing. This was partially due to explicit government policies encouraging private funding for services in education and, especially, in health (see sections 3.1.1 and 3.1.2) and partially due to high population demand for these services. Purely private establishments in social service provision are relatively few; much more often government establishments offer services paid by consumers (e.g., patients or students' parents) along with services paid from the government budget. In 2009, 15% of total financing of government educational establishments were received from paid services (this share is higher in secondary professional training and especially in university education) and official payments of patients in the health care system were 10% of total government budget of the sector. Accounting for other out-of-pocket expenses in health care (medicines, informal payments etc.), the share of private funding of health services in total health spending was 57%, i.e., considerably higher than the share of public spending.

Figure 10. Index of real general government budget social expenditures per capita
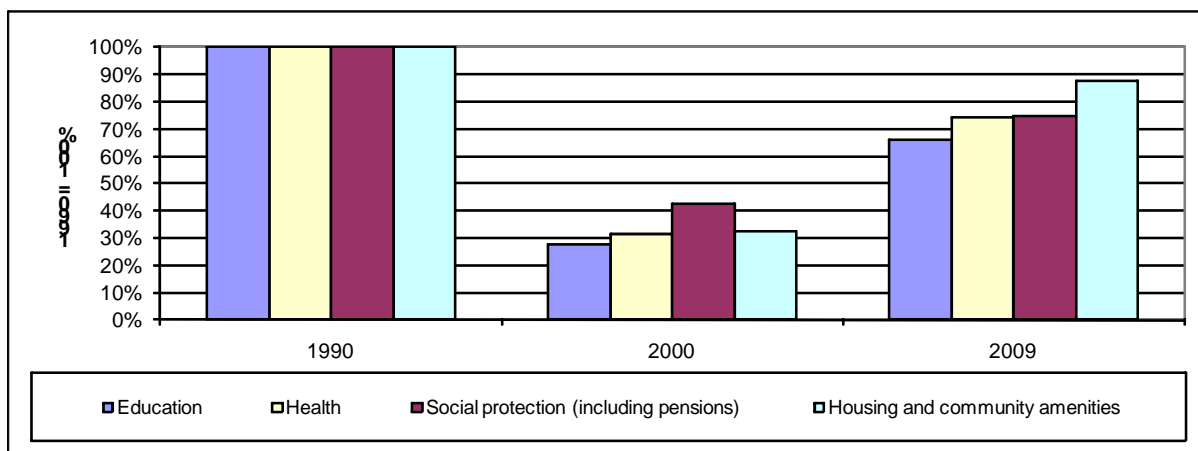
Source: MoF, NSC

This reduction in public spending on education and health takes place at the same time that the pattern is contrary in other countries that are investing heavily in human capital. This creates a gap between Kyrgyzstan and its neighbors (Figure 11). In 2007, the Kyrgyz government spent on education 4.6 times less than the government did in Russia and 2.3 times less than in Kazakhstan[18]; the gap in health spending was even larger: more than 7 times difference with Russia and 3.8 times with Kazakhstan. Obviously, the quantity and especially quality of services depend very much on the absolute level of spending. Therefore, the current level of public education and health spending in Kyrgyzstan should be seen as insufficient for maintenance of service quality corresponding to any reasonable modern international standards.

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[18] Due to smaller share of children in population of these countries in comparison to Kyrgyzstan, the gap in per student terms was considerably higher.

Figure 11. Public expenditures on education and health per capita, 2007
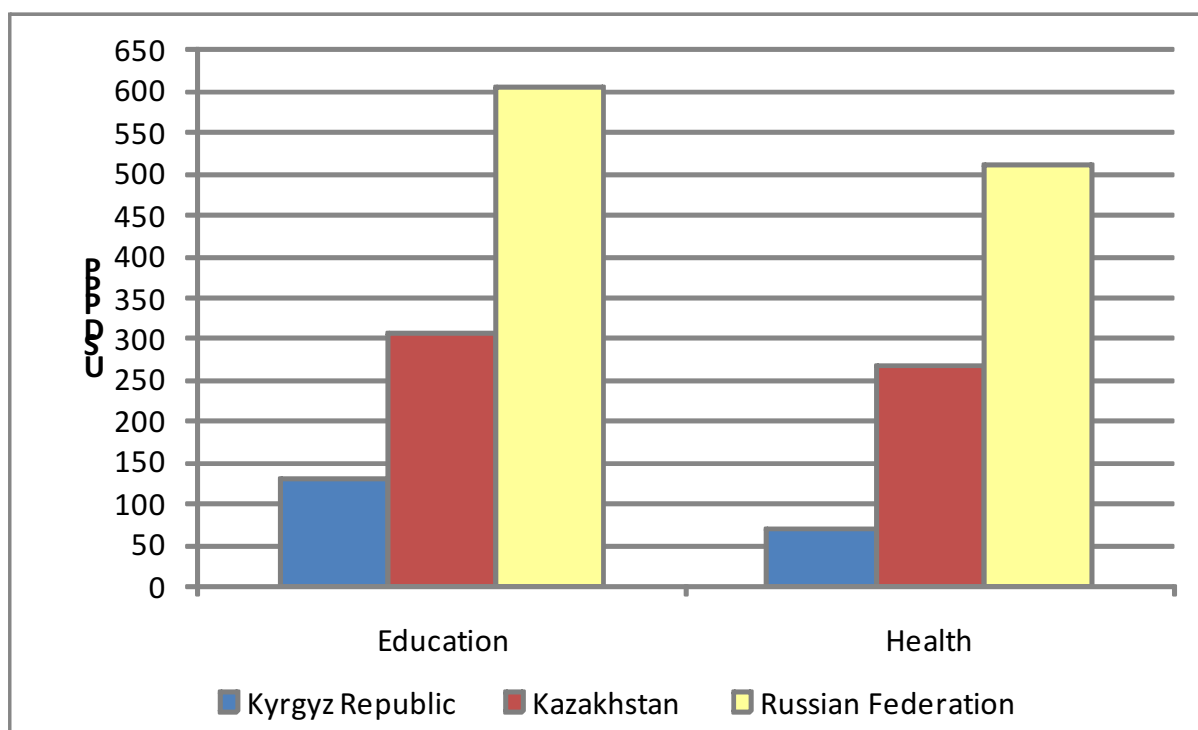
Source: World Development Indicators

2.3. *Evolution of the MDGs during the period 1991-2008*

2.3.1. *Is the country on-track to achieve the MDGs?*

In Kyrgyzstan, monitoring of the country progress towards MDGs is implemented on a regular basis. The first MDG progress report was published in 2003 and the second in 2009. Taking into account its development situation, the country has substantially adjusted some of the MDG targets and indicators. A summary of key MDG indicators, the most relevant for the purposes of this paper, is provided in Table 3.

Table 3. Key MDG indicators in Kyrgyzstan

	Baseline		Last observation		2015 target	Progress assessment
	Year	Value	Year	Value		
Goal 1. Radical reduction of extreme poverty						
Extreme poverty level[19], %	2000	32,9	2007	6.6	12,9	On track
Goal 2. Achieve universal basic secondary[20] education						
Net enrolment ratio in basic secondary education, girls, %	1990	92.3	2007	97.3	100	On track

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[19] National poverty line.
[20] Different from primary education in international goal formulation.

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	Baseline		Last observation		2015 target	Progress assessment
	Year	Value	Year	Value		
Net enrolment ratio in basic secondary education, boys, %	1990	91.7	2007	97.8	100	
Goal 3. Promote gender equality and empower women						
Ratio of women's wages to men's wages, %	1996	73	2007	67.3	100	Off track
Goal 4. Reduce child mortality						
Under-five mortality rate, per 1,000 live births	1990	41.3	2007	35.3	10.4	Off track
Goal 5. Improve maternal health						
Maternal mortality ratio, per 100,000 live births	1990	62.9	2007	51.9	15.7	Off track
Goal 6. Combat HIV/AIDS, malaria and other diseases						
Tuberculosis prevalence, cases per 100,000 people	1990	52.1	2007[21]	115.5	52.0	Off track
Goal 7. Ensure environmental sustainability						
Proportion of the population with sustainable access to an improved water source, %	1996	81.3	2007	93.0	90.0	On track
Proportion of the population with access to improved sanitation, %	1996	24.0	2007	24.2	40.0	Off track

Source: UNDP

As follows from the table, the assessment of the country's progress towards MDGs is mixed. The country is on track with regards to extreme poverty reduction (MDG1), providing universal access to basic secondary education[22] (MDG2) and access to improved water source (MDG7). The country made some, albeit insufficient, progress towards reduction of child and maternal mortality (MDGs 4 and 5) and TB prevalence (MDG6). There was no progress – or the country has even witnessed setbacks – regarding gender equality (MDG3) and access of the population to improved sanitation (MDG7). In addition, it is worth to note that, as mentioned above, the poverty situation in Kyrgyzstan is fragile and dependent on exogenous shocks and the main problem in education is not so much enrollment, but quality. Finally, the second MDG Progress Report [UNDP, 2009] stipulates that quality of potable water does not always correspond to standards. Thus, the country

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[21] 2001 value of this indicator was 167.8.

[22] However, with regards to the net basic secondary school completion rate—another MDG indicator, which is used internationally and also in the MAMS model—the country is *off track*. Based on UNESCO data, this rate has been estimated at the level of 84.1% (2006) with reasonable target of 95% by 2015.

has a very dense MDG achievement agenda up to 2015. There is a high probability that some MDGs would not be achieved by 2015.

2.3.2. Policies for MDG achievement

According to the Government's newly adopted Country Development Strategy 2009-2011 and the latest MDG progress report, key policies aimed at MDG achievement[23] include:

Goal 1.

♦ Promotion of sustainable economic growth

♦ Maintenance of macroeconomic stability and control over inflation

♦ Rural and regional development

♦ Targeted and effective social protection

Goal 2.

♦ Improvement of quality of education

♦ Modernization of the contents of education

♦ Increased efficiency of organization and financing of education

Goals 4-5.

♦ Improved access of population to and quality of antenatal and perinatal care through creation of better health care infrastructure and better supply of medicines and other inputs as well as retention of skilled medical personnel in the sector and in the country

♦ Improved access of population to early childhood development programs including programs implemented on community level

♦ Public information campaigning on healthy living style and maternity protection, family planning methods etc.

Goal 7.

♦ Proper monitoring of the situation with the water and sanitation infrastructure

♦ Ensuring of financial sustainability of utility enterprises providing water and sanitation supply services

♦ Public information campaigning on sanitary issues

♦ Strengthening coordinating role of the government in the sector

These policies seem to be based on much more careful accounting of existing problems and resources available for their solution than before. It is planned to combine increased government funding in some directions (e.g., energy, roads and other production infrastructure, health) with significant increase in efficiency of government expenditures in all sectors (especially social protection and education) and mobilization of private resources (e.g., in water and sanitation supply through economically meaningful user fees).

The developments in social sector described above seem to provide a mixed picture of the impact of reforms on the poor. On one side, the government managed to preserve basic social infrastructure and access of all layers of the population to critically important services. Some important welfare indicators are improving (e.g., access to improved water source, child and maternal mortality), while sometimes more slowly than needed, some negative trends (e.g., increase in TB morbidity)

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[23] Only goals 1, 2, 4-5, and part of the goal 7 relevant to this study are considered.

have been reversed. As it was mentioned, the gap between the poor and the rich in access to health services has been somewhat reduced. Pensions and (to a lesser extent) other social protection programs do serve as an extreme-poverty-preventing mechanism.

Some positive improvements are to be attributed not so much to social policies, but to responsible macroeconomic policies in 2000s (e.g., control over inflation) and changes in economic and social behavior of the population (increased labor migration generating remittances, reduced fertility causing decline in child and maternal mortality, urbanization easing clean water supply).

On the other side, social policies have not prevented from general deterioration of service quality (e.g., in education and more sophisticated health care). Limited supply of quality services is being balanced with existing demand mainly by means of out-of-pocket user payments. In such situation, the access of poor population to quality services suffered to a disproportionally large extent.

3.   Sector analysis of MDG determinants

This section's purpose is to identify the factors determining dynamics of MDG indicators covered by MAMS and to link them to the key economic/fiscal variables available in the model. This allows for establishing explicit mechanisms to transmit changes in macroeconomic and sector policies into MDG outcomes.

Analysis in this section covers the following MDGs and indicators:

- MDG2 "Achievement of universal basic secondary education"; MAMS target indicator for this goal is *the net completion rate for basic secondary education[24]*.

- MDG4 "Reduction of child mortality"; MAMS target indicator for this goal is *the under-five mortality rate*.

- MDG4 "Improvement of maternal health"; MAMS target indicator for this goal is *the maternal mortality ratio*.

- MDG7a "Improvement of access of the population to safe drinking water"; MAMS target indicator for this sub-goal is *the proportion of the population with sustainable access to an improved water source*.

- MDG7a "Improvement of access of the population to basic sanitation"; MAMS target indicator for this sub-goal is *the proportion of the population with access to improved sanitation*.

Basic secondary education completion rate is a result of interaction of two variables: (i) net enrolment rate for the first grade, and (ii) average share of students passing in each grade (for grades 1-8). MAMS requires establishing rules governing dynamics of each of these two variables. In addition, determinants for few other variables describing students' behavior on the second and third cycles of education are to be identified. These variables include: (i) share of graduates from the previous cycle entering the first grade of a new cycle (for secondary and tertiary education), and (ii) average shares of students passing in each grade on secondary and tertiary cycles.

Potential determinants for all indicators have been selected on the basis of previous studies on MDG achievement in Kyrgyzstan. Testing of significance of these determinants' influence on the MDG indicators (or their components) and assigning of the relationships' functional form and their parameterization have been based on three main sources of data:

- Kyrgyz Integrated Household Survey database for 2007 (source – NSC);

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[24] Basic secondary education (1-9 grades) is the first cycle in the education system of the Kyrgyz Republic; the second cycle includes general secondary education (10-11 grades) or secondary professional education in technical colleges and similar educational establishments; the third cycle refer to university education.

- Macroeconomic, demographic and sector variables for Kyrgyzstan for 1996-2009 (source – NSC); and

- Data from World Development Indicators on transition countries of Europe and Central Asia (source – World Bank).

Heterogeneity of data, shortness of many time series and lack of disaggregation of some key variables led to an estimation approach based on a mix of different econometric techniques with different degrees of results' robustness. Therefore, concrete values of some estimates are to be taken with caution although their signs and the order of magnitude seem to be corresponding to actual data of the Kyrgyz Republic and qualitative relationships existing between variables.

Summary information on the potential determinants, which were accepted or rejected for inclusion to MAMS, is provided in Table 4. Values of elasticities linking changes in determinants with changes in the MDG indicators are presented in Table 5. Many potential determinants are considered to be insignificant because statistical tests have not proved their significance. This is either because these determinants are, indeed, irrelevant in the country conditions,[25] or because available proxies for these determinants may not be appropriate ones.

Table 4.   MDG determinants in education, health and access to water and sanitation

MDG indicator or its component	Potential determinants		
	Significant variables (sign of relationship[26])		Insignificant variables
MDG2 "Achievement of universal basic secondary education"			
Net enrolment rate for the *first* grade of the *first* education cycle	Education spending per student (+)		Wage premium for having basic secondary education
	Access to transport infrastructure (+)		Female child
	Household income per capita (+)		Household head's education
	Residence in urban area (+)		
Average share of students passing in each grade on the *first* education cycle	Education spending per student (+)	Female child (+)	Household income per capita
			Residence in urban area
			Household head's education
Share of the *first* cycle graduates entering into the *second* education cycle			Wage premium for having general/professional secondary education

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[25] For example, household head's education is not really important for basic secondary enrolment as it is compulsory and the necessity to have this education is universality recognized in the society.

[26] "+" if increase in a determinant variable's value increases MDG indicator value; "-" if increase in a determinant variable value decreases MDG indicator value.

MDG indicator or its component	Potential determinants		
	Significant variables (sign of relationship[26])		Insignificant variables
Average share of students passing in each grade on the *second* education cycle			Wage premium for having tertiary education
Share of the *second* cycle graduates entering into the *third* education cycle			Access to transport infrastructure
Average share of students passing in each grade on the *third* education cycle			

MDG4 "Reduction of child mortality"

Under-five mortality rate	Public health expenditures per capita (-)	GDP per capita / Household expenditures per capita
	Proportion of the population with sustainable access to an improved water source /MDG7a/ (-)	Fertility rate
	Proportion of the population with access to improved sanitation /MDG7b/ (-)	

MDG5 "Improvement of maternal health"

Maternal mortality ratio	Public health expenditures per capita (-)	GDP per capita / Household expenditures per capita
	Proportion of the population with access to improved sanitation /MDG7b/ (-)	Proportion of the population with sustainable access to an improved water source (MDG7a)
	Fertility rate (+)	

MDG7a "Improvement of access of the population to safe drinking water"

Proportion of the population with sustainable access to an improved water source	Spending on water and sanitation (+)	Household income per capita (+)
	Spending on other infrastructure[27] (+)	

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[27] Total infrastructure expenditures less spending on infrastructure in education, health care and water and sanitation.

MDG indicator or its component	Potential determinants	
	Significant variables (sign of relationship[26])	Insignificant variables
	Residence in urban area (+)	

MDG7b "Improvement of access of the population to basic sanitation"

MDG indicator or its component	Significant variables (sign of relationship)	Insignificant variables
Proportion of the population with access to improved sanitation	Household income per capita (+)	
	Spending on water and sanitation (+)	
	Spending on other infrastructure (+)	
	Residence in urban area (+)	

Source: Authors' calculations

Table 5.   Elasticity values of the MDG determinants with regards to their determinants

MDG indicator or its component	Health expenditures per capita	Expenditures on water and sanitation	Education expenditures per student	Capital stock in other infrastructure	Household consumption per capita	MDG7a indicator	MDG7b indicator
Under-five mortality rate (MDG4)	-0.592					-0.711	-0.698
Maternal mortality ratio (MDG5)	-0.312						-0.851
Proportion of the population with sustainable access to an improved water source (MDG7a)		0.389		0.602	0.004		
Proportion of the population with access to improved sanitation (MDG7b)		0.687		0.242	0.340		
Net enrolment rate for the *first* grade of the *first* education cycle (MDG2)			0.141	0.058	0.007		
Average share of students passing in each grade on the *first* education cycle (MDG2)			0.059				
Share of the *first* cycle graduates entering into the *second* education cycle			1.383				

MDG indicator or its component	Health expenditures per capita	Expenditures on water and sanitation	Education expenditures per student	Capital stock in other infrastructure	Household consumption per capita	MDG7a indicator	MDG7b indicator
(MDG2)							
Average share of students passing in each grade on the *second* education cycle (MDG2)			0.059				
Share of the *second* cycle graduates entering into the *third* education cycle (MDG2)			0.587				
Average share of students passing in each grade on the *third* education cycle (MDG2)			0.054				

Source: Authors' calculations

As follows from the Tables 4 and 5, there is some interdependence between MDG indicators, i.e., progress towards MDG7 contributes also to progress in MDGs 4 and 5. This synergy effect is important, because, as indicated in chapter 6 of this paper, this allows for saving resources in comparison to isolated treatment of each goal.

This analysis of MDG determinants allow for identifying factors, which contribute to the progress towards MDGs and could serve as policy variables in the MAMS simulations. These factors include[28]: (i) government spending in relevant sector, (ii) general economic growth to the extent it results in growth of household incomes, (iii) investments into other (transport and energy) infrastructure.

4.   Calibration of MAMS with country-specific data

The MAMS model has been calibrated to generate simulation results to be relevant to the situation in Kyrgyzstan. Calibration has been implemented on the basis of actual Kyrgyz statistical data.

MAMS includes the following key data blocks:

- Social accounting matrix (SAM);

- Miscellaneous macroeconomic and education-related time series; and

- Elasticities, i.e., parameters of relationships between variables in the model.

The SAM describes all key components of the economy. The Kyrgyz SAM has 12 sectors of economy (and correspondingly 12 commodities produced): agriculture, mining and metallurgy, manufacturing, energy, other infrastructure (construction and roads), commercial services, general government services as well as five MDG-related sectors: three cycles of education, health, and water and sanitation. Other SAM components/accounts are production factors (three labor types according to the highest level of education achieved by a worker and four capital types: one for private capital and three for government capital employed in water and sanitation, other infrastructure, and government services), three institutions (households, government, and rest of the

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[28] Some other factors, which influence MDG outcomes, could not be considered as policy variables as the government is able do little to change them, e.g., fertility rate and residence of a household in urban/rural area.

world), three types of taxes (direct, import, and other indirect taxes). The SAM also contains several other accounts related to different types of investments, interest payments, savings and capital. Altogether the SAM contains 54 accounts.

The base year for the SAM and, hence, for MAMS in general is 2006. This year has been selected because the latest Input-Output table—key source of information for building of the SAM—is available for 2006. Other information sources for the SAM include balance of payments (NBKR), fiscal accounts (MoF and IMF), and education sector information (NSC).

Macroeconomic time series used for calibration of the model include data on population in total and by age group, employment by labor type, unemployment rates by labor type, government investments and consumption by sector, public and private foreign debt. Sources for this data are also NSC, NBKR and MoF as well as the UN Department of Statistics with regards to the population dynamics.

Education sector data used in the model include total enrolment to educational institutions by cycle and detailed information on behavior of children/students in enrolment to school, passing in from one grade to another and from one cycle to the next one, grade repetition, dropping out of education system etc. These data have been mostly taken from a detailed UNESCO database and supplemented by NSC data.

For the estimation of elasticities required by MAMS long time series describing relatively stable economic situation in the country are needed. These are not available in Kyrgyzstan with its relatively short history of independent development in turbulent conditions of transition from one social-economic system to another. Therefore, values of elasticities for the model have been borrowed from other countries comparable to Kyrgyzstan in terms of size of the economy, its sector structure, and degree of openness. Multiple runs of the model for different scenarios demonstrated ability of these elasticity values to provide a reasonable description of behavior of the Kyrgyz economy.

The analysis of poverty and inequality indicators is not directly generated by MAMS. A typical CGE model such as MAMS needs to be complemented with a micro-simulation methodology to make better judgment of the evolution of poverty and inequality in the scenarios simulates. We follow the approach explained in [Vos and Sanchez, 2010]: that is, a micro-simulation methodology that takes labor market results from the CGE model and imputes these into a household- and individual-person-level dataset. Data from the Kyrgyz Integrated Household Survey (source – NSC) have been used for this purpose.

5.   MAMS scenario analysis

The scenario analysis of this paper includes consideration of two types of scenarios: (i) baseline, which implies no significant changes in policies and no major exogenous shocks to affect the economy in 2011-2015, and (ii) MDG achievement scenarios, which imply achievement of some or all[29] MDGs simultaneously by 2015 due to increased government spending in sectors directly relevant for MDGs (primary cycle of education for MDG2, health for MDGs 4 and 5, water and sanitation for MDGs 7a and 7b).

5.1.   Baseline scenario

The baseline scenario is calibrated in a way to reproduce key actual developments (GDP growth rate etc.) in the economy in 2007-2010 and is based on the assumption that in 2011-2015 GDP will grow by 7% per annum, which is consistent with the government's and IMF's projections. Export

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[29] "All MDGs" relates to the MDGs covered by MAMS, i.e., MDGs 2, 4, 5, 7a, 7b. Achievement of MDG1 is analyzed separately in the section 6.3 through the aforementioned micro-simulations.

and import prices and remittances in the coming years are expected to grow at 5% per annum, which reflect previous trends in these variables and seem to be conservative assumptions. The baseline scenario also assumes that all government expenditures change in fixed proportion to domestic absorption. Foreign transfers received by the government and FDI are assumed to change in proportion to GDP, and government foreign borrowing is expected to stay fixed in USD terms at the 2006 level.

Simulation results in MAMS are dependent on the so called closure rules determining those variables, which change endogenously to maintain macroeconomic balances (government budget, savings-investments, external balance) and equilibrium in the factor markets. In the baseline scenario, taxes adjust endogenously to clear the government budget balance; saving-investment balance is cleared by household's savings rate; external balance is maintained through flexible real exchange rate. Labor markets for all three labor types are cleared through unemployment rate (if it is above minimum level) or through wages (if the unemployment rate is at minimum level[30]). Simulations show that the labor market clearing by unemployment rate works for relatively abundant labor types (with basic secondary education and with tertiary education), while for relatively scarce labor type (with general/professional secondary education) the market is cleared by wages.

Simulation results for the baseline scenario show (see Table A1 in Appendix I) that of all GDP components only exports are expected to grow faster than GDP; all other components would grow in 2007-2015 by an average rate in the range of 4-5% per annum.

Government expenditures would be on the level of 31.3% of GDP in average; this is below the 2006 level. The role of taxes as a source of government receipts is going to increase replacing the diminishing share of foreign borrowing. This is based on an assumption that with the expected resumption of economic growth in 2011-2015 the recent tax rate cuts (see section 2.3.1) would result in higher tax collections. Under this scenario, the government expenditures in the MDG-related sectors are going to shrink from 8.2% GDP in 2006 to 7.0% GDP per annum in average in 2007-2015.

The skill composition of the labor force and employment is projected to change towards an increased share of unskilled workers (those with basic secondary education only). This is a consequence of the transition from the mandatory general secondary to the basic secondary education made in 1993 (see section 3.1.1 of this paper). Young people, many of whom leave the education system after completion of the first cycle, would be gradually replacing retiring workers with mostly general/professional secondary education. Due to high university enrolment, the number of workers with higher education is expected to grow faster than total employment. This dynamics of labor supply explains changes in real wages, implied by the baseline scenario: wages for abundant labor type with basic secondary education is going to decrease, and wages for scarce labor type with general/professional secondary education are to increase.

The baseline scenario leads to some improvement in all MDG indicators under consideration; nevertheless, no one among MDGs 2-7 is going to be achieved under this scenario (see Figure 12). Thus, lack of pro-active policies aimed at MDG achievement is associated with a high risk of non-fulfillment of the MDG agenda in the country.

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[30] The minimum unemployment level in the model is set at 4%.

Figure 12. Dynamics of the MDG indicators under the baseline scenario

MDG2

Net basic secondary school completion rate — Target

MDG7a

Population with sustainable access to an improved water source — Target

MDG4

Under-five mortality rate — Target

MDG7b

Population with sustainable access to an improved sanitation — Target

MDG5

Maternal mortality ratio — Target
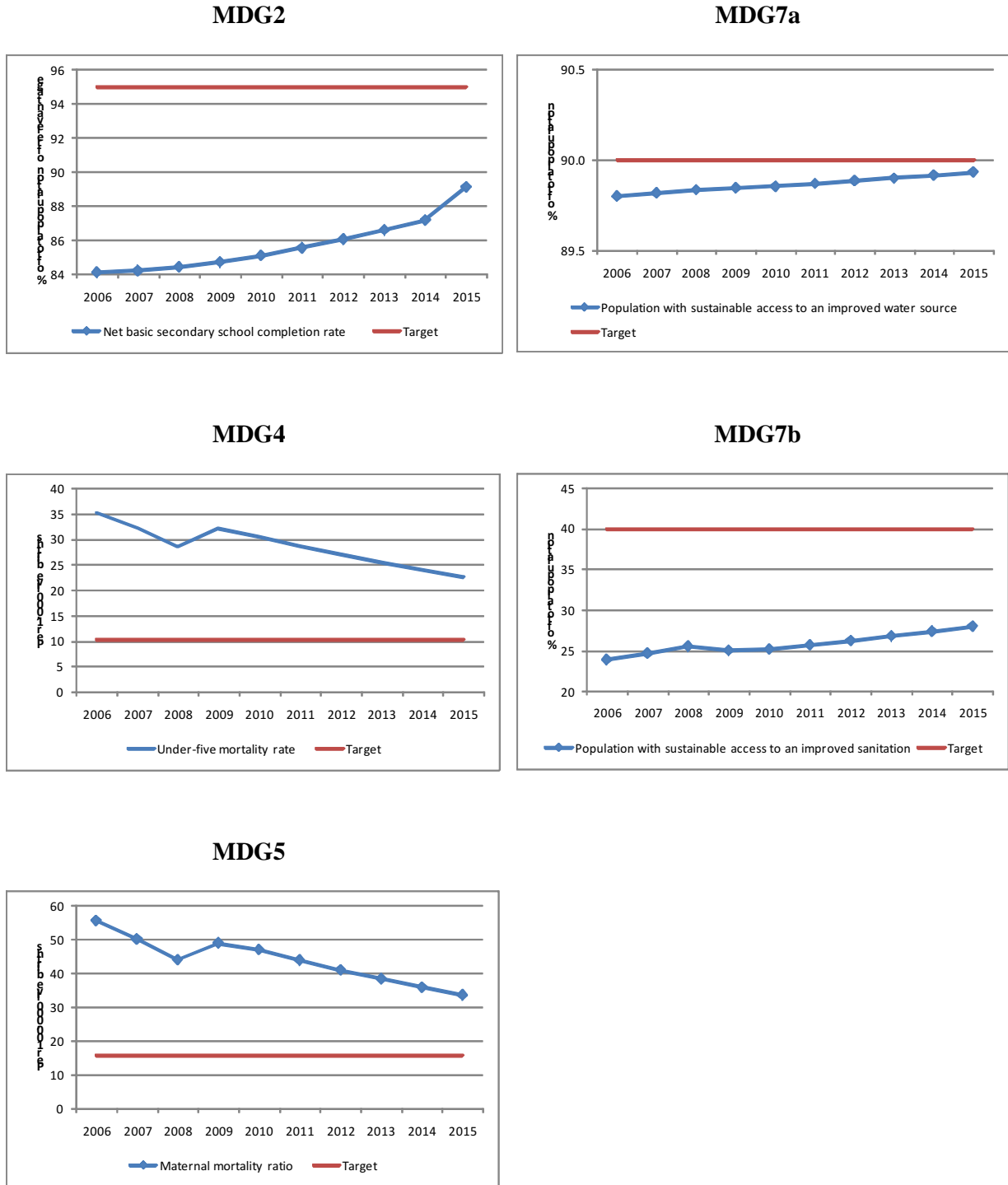
Source: Authors' calculations

5.2. *MDG scenarios*

Several MDG scenarios are considered in this paper. All MDG scenarios imply targeted resource mobilization, i.e., increased financing of those sectors, which contribute directly to the MDG achievement. These scenarios differ from two points of view: (i) which MDGs are to be achieved,

i.e., in which sectors resources are concentrated, and (ii) which source of financing for the increased MDG-related expenditures is used.

For MDG2, the policy variables (spending item responsible for MDG achievement) are government consumption and investments in the primary cycle of education; for MDGs 4 and 5 these variables are government consumption and investments in health; and for MDGs 7a and 7b the policy instrument is government investments in water and sanitation. As long as MDGs 4 and 5 (and MDGs 7a and 7b) share the same policy variable, only simultaneous achievement of these goals is possible in the model; no separate scenarios for these goals are considered. So, there could be MDG2, MDG45 and MDG7 scenarios. Apart from these, a combined scenario of simultaneous achievement of all MDGs is possible. Policy variables for "All MDGs" scenario would be government consumption/investments in primary cycle of education, health and water and sanitation.

Selection of an appropriate financing mechanism for MDG achievement is a central issue in the MAMS scenario analysis. Available financing options include increased: (i) collections of all or some domestic taxes, (ii) domestic borrowing of the government from private sector, (iii) foreign borrowing of the government, (iv) foreign transfers to the government from the rest of the world, and, as considered for this paper in particular, (v) a mix of some of these options. As follows from the discussion in section 2.3.1 of the paper, option (ii) is not really possible as domestic financial market is shallow and unable to supply substantial resources required for financing of MDG achievement programs. Therefore, increased tax collections (tax), foreign transfers to the government (ftr) and a mix of these two (mix) are considered as financing options in this paper. The option of foreign borrowing (fb) has also been added for illustrative purposes while it does not seem to be politically feasible taking into account the vulnerability of external debt situation in the country and the well-known hesitation of the government to borrow for social programs.

The choice of financing source is to affect simulation results significantly. Tax financing means that substantial resources are to be redistributed from the private sector to the government budget; this is to result in slower growth of private consumption, crowding out of private investments and, hence, in lower economic growth rates and less progress in poverty reduction. Financing through foreign transfers to the government, on one side, increases the total amount of resources in the economy and do not reduce resources of the private sector, so an increase in both private and government consumption and investments could be expected. However, on the other side, massive inflow of foreign exchange to the economy is to cause some kind of "Ditch disease" effect: appreciation of real exchange rate, reduction in exports and increase in imports of goods and services. Foreign borrowing option is to be very similar to the ftr option; the only differences are additional government expenditures for interest payments and accumulation of the government's foreign debt. Mixed financing option is to produce results somewhere in between the two extreme cases—tax and ftr—requiring less reduction in economic growth rates than tax option. In this paper, mix option consists in increase in collections of domestic indirect taxes (VAT, excises, sales tax etc.) up to 15% GDP (from 11.7% in 2006) with foreign transfers to the government left to be endogenously determined.

Different financing mechanisms also imply different closure rules. For government closure, tax and mix options are not different from the baseline, while the ftr/fb scenarios are based on the use of foreign transfers to/borrowing by the government as the clearing variable respectively. For savings-investments closure, investments and not household savings rate are endogenous in the MDG scenarios.

Altogether, ten MDG scenarios are considered: MDG2-ftr, MDG2-tax, MDG45-ftr, MDG45-tax, MDG7-ftr, MDG7-tax, All MDG-ftr, All MDG-fb, All MDG-tax, and All MDG-mix.

The main results of simulations are presented in Table A1. As expected, with regards to the economic growth rates all tax scenarios lead to slower growth, and all ftr/fb scenarios lead to roughly the same growth as in the baseline scenario. The scale of deviation from the baseline

scenario depends on the amount of resources required for achievement of this or that MDG. For MDGs 2 and 7 this deviation is not very large, and it is quite substantial for MDGs 4 and 5 achievement scenarios. These goals are among the most problematic from the point of view of their achievement (see Table 3), so resource requirements in health spending to achieve them are of significance. Also, as expected, the utilization of the mix financing scenario allows for less reduction in the economic growth rates in comparison to the tax scenario. "All MDGs" scenarios require less increase in government consumption and investments as they allow for capturing the synergy effect mentioned in section 4.

All MDG-related scenarios require a considerable increase in government spending in comparison to the baseline scenario (Table 6 and Table A1). The highest government spending level above 39% of GDP is expected under "All MDGs" scenarios. This is understandable as the government spending is to increase in all three MDG-related sectors (education, health and water and sanitation). Total government expenditure increase necessary to the MDGs achievement has been estimated to be in the range 7.8-8.1% of GDP. It is worth noting, however, that required increase in spending in this case is much less than the sum of additional spending requirements assessed for each of three sectors taken alone. Analysis of government spending by sector indicates that main increases are needed for recurrent spending in primary cycle of education (2.0-2.2% of GDP per annum depending on financing option in comparison to the baseline scenario), recurrent health spending (1.9-2.0% of GDP per annum) and especially investments in primary cycle of education (2.9-3.1% of GDP per annum[31]). All these increases look quite sensitive, and their implementation would require making hard policy choices.

Table 6.   Additional government expenditures necessary for the MDGs achievement

Expenditure items	Increase in comparison to the baseline scenario								
	MDG2		MDG45		MDG7		All MDGs		
	ftr	tax	ftr	tax	Ftr	tax	ftr/fb	tax	mix
	Annual average for 2007-2015, % GDP								
All MDG-related expenditures	**5.1**	**5.1**	**6.1**	**6.7**	**0.7**	**0.7**	**7.8**	**8.1**	**7.9**
Final consumption in the primary cycle of education	2.1	2.0	0.1	0.0	0.0	0.0	2.2	2.0	2.1
Final consumption in health	0.1	0.0	5.6	6.2	0.0	0.0	1.9	2.0	1.9
Final consumption in water and sanitation	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.6	0.5
Investments in the primary cycle of education	2.9	3.1	-0.1	-0.1	0.0	0.0	2.9	3.1	3.0
Investments in health	0.0	0.0	0.5	0.6	0.0	0.0	0.1	0.1	0.1
Investments in water and sanitation	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3

Source: Authors' calculations

Scenarios based solely on the tax financing option require a very substantial (up to 8.3% of GDP) increase in the tax collections; this is a real challenge for the government revenue collection service. On the other side, the ftr financing option allows for keeping tax collections on the baseline scenario's level or even below it; this is quite feasible. However, an additional inflow of foreign grant aid in the amount equivalent to 9.1% of GDP per annum (under "All MDGs" scenarios) is needed for this option. This is a huge amount (roughly USD400+ million per year), and the ability of international community to supply this amount seems to be far from being guaranteed. The mix

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[31] This number is high, but it could be expected taking into account two decades of under-investments in the sector and increasing number of children in the country.

financing option is more acceptable as it requires only a relatively moderate increase in tax collections (by 2.5% of GDP in comparison to the baseline) and smaller (albeit still very high) inflow of grant aid (6.1% of GDP in comparison to 9.1% of GDP under the ftr option). The foreign borrowing option leads to additional government debt servicing expenditures equivalent of 0.3% of GDP per annum in comparison to the ftr scenario[32] and to the expected foreign debt accumulation of 71.8% GDP at the end of 2015[33]; all other resource requirements under the fb and ftr scenarios are the same.

Labor market outcomes of the MDG achievement scenarios are not that dramatic. Consistently with slower economic growth projections, employment of unskilled workers is to grow slower than under the baseline scenario. Real wages of this labor type are to fall a bit more than under the baseline. In contrast, wages of skilled workers (those, who completed tertiary education cycle) are to improve under the MDG achievement scenarios reflecting higher demand for skilled workers in education and health.

Targeted MDGs are, of course, achieved under the MDG scenarios. However, as follows from Table A1, without targeting, just due to general growth and progress in other sectors, no MDG is going to be achieved.

Summarizing the analysis above, it is possible to conclude that no one of the scenarios looks feasible from the financing point of view. All of them require financial resource mobilization of a scale, which is hardly possible to achieve in practice. But even if these resources are mobilized, their absorption is going to be a challenge. The required rate of increase in sector spending[34] may not be implementable taking into account existing human resource and governance limitations.

Additional MDG-related resource requirements could be reduced, if either (i) higher economic growth rates would be achieved in 2011-2015 under the baseline scenario, or (ii) measures increasing cost efficiency of policies would be implemented. It is worth to note that both promotion of sustainable economic growth and radical improvement in the cost efficiency of social policies are high priorities of the government policy. MAMS simulations indicate that, indeed, increase in the baseline GDP growth rate from 7% to 8% per annum in 2011-2015 results in the reduction of the additional MDG-related government expenditures by 0.3% of GDP per annum. Similarly, 25% increase in elasticities of MDG indicators with regards to all government spending variables (the way to simulate an improvement in cost efficiency of the policies in education, health care and water and sanitation) allows for tangible (albeit not radical) savings in the range of 0.14-0.17% of GDP.

5.3. Analysis of micro-simulation results for MDG1

Results of poverty and inequality simulations of the baseline and the MDG scenarios are presented in Table A2 (Appendix I). Poverty rates and Gini coefficient values in this table incorporate all effects related to changes in unemployment rates, shifts in employment by labor type (i.e., workers' education) and by sector, and wages' general level and sector structure.

The results indicate that MDG1 is going to be achieved under any scenario. This is expected as this goal has been achieved already in the base year of the model (that is, 2006). It seems that MDG1 formulation in Kyrgyzstan could be revised in order to set more ambitious target in poverty reduction. One option is to formulate MDG1 setting the target for general (and not extreme) poverty rate at the level of, say, 20% by 2015.

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[32] And correspondingly even higher requirements in additional foreign aid inflow (in the form of loans, not grants) by 9.4% of GDP per annum.
[33] All other scenarios lead to the foreign debt levels in the range 24.1-26.2% of GDP at the end of 2015.
[34] Depending on the financing option and sector, the increases in annual spending may vary from 69% to 9 times!

One could observe quite substantial variation in poverty rates between different scenarios. The higher economic growth rate and education spending in a scenario the lower poverty rates are. All ftr/fb scenarios, which imply faster economic growth, produce better results than tax scenarios. The baseline scenario also produces poverty outcomes better than the majority of tax scenarios. So, there is a kind of trade-off between higher economic growth rates and faster progress in achievement of MDG1 under the baseline scenario, on one side, and achievement of MDGs 4, 5, 7, but slower growth and less poverty reduction under the MDG-tax scenarios, on the other side. The story with MDG2 is different; increased spending on education results in better households' incomes[35] and lower poverty rates even under MDG2-tax scenario in the conditions of economic growth slower than in the baseline.

Values of Gini coefficient vary little between scenarios. MDG2-5 scenarios result in slightly lower inequality than in the baseline (due to some shift of employment from lower-paid agriculture and some other sectors to higher-paid government services as well as general improvement in labor skills composition), so from this perspective MDG2-5 achievement policies are slightly more pro-poor than current policies simulated in the baseline scenario. Tax scenarios tend to produce a bit higher inequality than ftr scenarios.

6.   Conclusions and policy implications

After a difficult period in the 1990s, the economic situation has substantially improved in 2000s in Kyrgyzstan. Responsible macroeconomic policies in 2000-2008, adaptation of population to new realities and new opportunities and positive developments in the economies of neighboring countries allowed for several years of good economic growth and significant poverty reduction. Yet, the country remains vulnerable to numerous external and internal shocks, and its public finance and balance of payments are still fragile.

The government's social policies have been directed towards sustaining the most important country's achievements in education, health and access to water and sanitation. While the access to essential social services has been mostly preserved, quality of a broad range of services has suffered. Achievement of many MDGs is at risk.

MAMS-model-based simulation results indicate that a continuation of the current policies under the baseline scenario would allow for achieving MDG1 only; the country would fall short of the targets for MDGs 2, 4, 5, 7a, 7b. Large deviations from the targets are expected in reducing child and maternal mortality, accessing improved sanitation for a large share of the population, and in increasing the net completion rate for basic secondary education.

In order to achieve all MDGs, the country needs to increase government spending on MDG-relevant sectors (education, health, water and sanitation) by 7.8-8.1% of GDP per annum in comparison to the baseline scenario.

This increase in government spending could be financed either through increased domestic tax collections, or through official foreign transfers to the government, or through concessional foreign borrowing, or through a mix of these options. All of these financing options seem to be politically difficult: the estimated increase in government revenue collections by 8.3% GDP in comparison to the baseline would require a substantial upgrade in government's tax collection capacity, implementation of rather radical sector shifts in the government expenditures (almost all additional revenues are to go to the social sector only increasing its share in the general government expenditures enormously) and would result in a somewhat slower economic growth (-0.4% per annum on average). On the other side, scenarios based on inflows of grant aid do not create these problems, but are based on an ungrounded assumption that donors would channel levels of aid

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[35] As follows from the simulations results, the higher education spending the better skills composition in the labor force with positive consequences for average wages and households' incomes.

(9.6% GDP per annum) that have never been seen in the past of Kyrgyzstan. In the foreign borrowing scenario the level of the government foreign debt sets above 70% of GDP. This is below the levels registered in the recent history of Kyrgyzstan, but taking into account that most probably the government would also borrow for different energy, transport and other infrastructure projects, the summary level of the foreign debt is going to become unsustainable. Finally, the scenario that combines increased taxes and aid inflows seems to be more realistic, but it would still require very substantial increases in both tax collections (by 2.5% GDP per annum) and grant aid (by 6.1% GDP per annum). Thus, all the MDG-achievement scenarios under consideration do not seem to be feasible. Obviously, an underlining issue is that the targets for the MDGs 2-7 are very ambitious in Kyrgyzstan, and time remaining for their achievement by 2015 is pretty short.

The situation is going to be easier, if projected economic growth rates would be higher. Then, the resources, which are to be redistributed to the MDG-related sectors, would compose smaller share of GDP making this redistribution more politically feasible. This is possible, if the government would be more successful in implementation of structural reforms, FDI and private domestic investments attraction and mobilization of resources for infrastructure development.

Another possible way out is a substantial increase in government spending efficiency allowing for receiving higher social returns for money spent. This seems to correspond to the government policies as they have been formulated in strategic documents of the country. If properly implemented, efficiency-oriented policies are able to reduce resource requirements substantially.

Thus, the MDG achievement in the Kyrgyz Republic seems to require combination of four types of policies: (i) promotion of economic growth in the country, (ii) increased domestic financing of MDG-related sectors through redistribution of resources between sectors, (iii) increase in cost efficiency of social policies, and (iv) increased attraction of foreign aid.

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Appendix I. Simulation results

Table A1. Results of scenario simulations for achievement of the MDG2 – MDG7

	2006	Baseline	MDG2		MDG45		MDG7		All MDGs			
	Actual		ftr	tax	ftr	tax	ftr	tax	ftr	fb	tax	mix
Macroeconomic aggregates	Bil. soms	*Annual average growth for 2007-2015, %*										
GDP at market prices	113.8	5.6	5.5	5.3	5.3	4.9	5.6	5.5	5.5	5.5	5.2	5.3
Private consumption	108.1	4.8	4.9	4.6	5.0	2.7	4.8	4.7	4.9	4.9	4.0	4.4
Government consumption	20.5	4.1	4.7	4.5	10.3	10.6	4.8	4.7	6.8	6.8	6.5	6.7
Private investments into fixed capital	18.7	4.9	4.9	4.7	5.1	3.3	4.9	4.8	5.0	5.0	4.2	4.6
Government investments into fixed capital	7.5	4.1	3.4	3.2	5.7	5.0	5.0	4.9	4.6	4.6	4.2	4.4
Exports	47.4	6.8	6.5	6.4	2.9	4.6	6.6	6.7	5.4	5.4	5.8	5.7
Imports	89.8	4.6	4.6	4.4	5.0	3.4	4.7	4.6	4.7	4.7	4.0	4.3
Public finance	% GDP	*Annual average for 2007-2015, % GDP*										
Receipts/Expenditures - total	33.5	31.3	37.0	36.4	38.1	37.9	32.1	32.0	40.0	39.5	39.7	40.4
Receipts												
Taxes	23.2	24.1	23.8	29.3	23.9	30.9	24.1	24.7	23.7	32.4	26.5	23.7
Foreign transfers	0.5	0.5	6.6	0.5	7.6	0.5	1.2	0.5	9.6	0.5	6.6	0.5
Foreign borrowing	5.6	2.3	2.2	2.3	2.2	2.3	2.3	2.3	2.2	2.3	2.2	11.7
Other receipts	4.2	4.5	4.4	4.4	4.4	4.2	4.6	4.5	4.5	4.4	4.4	4.5
Expenditures												
Final consumption in the primary cycle of education	1.5	1.4	3.0	3.1	1.4	1.4	1.4	1.4	3.0	3.2	3.1	3.0
Final consumption in health	3.0	2.7	2.7	2.7	8.2	9.0	2.7	2.7	4.5	4.7	4.6	4.5
Final consumption in W&S	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.4	0.5	0.5	0.4
Investments in the primary cycle of education	0.8	0.5	3.2	3.3	0.4	0.4	0.5	0.5	3.2	3.3	3.2	3.2
Investments in health	0.1	0.0	0.0	0.0	0.6	0.7	0.1	0.0	0.2	0.2	0.2	0.2
Investments in water and sanitation	0.2	0.0	0.0	0.0	0.1	0.0	0.3	0.4	0.3	0.4	0.4	0.3
Other expenditures	27.9	26.4	27.0	26.5	27.1	26.3	26.6	26.5	27.4	26.5	27.0	27.7

	2006	Scenarios										
	Actual	Baseline	MDG2		MDG45		MDG7		All MDGs			
			ftr	tax	ftr	tax	ftr	tax	ftr	fb	tax	mix
Government debt			*Value in 2015*									
Foreign debt of the government, % of GDP	76.2	26.0	25.8	26.2	24.1	25.5	25.8	25.9	25.2	71.8	26.0	25.4
Labor market			*Annual average growth for 2007-2015, %*									
Employment (millions of workers)	2.096	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
– Unskilled workers	0.188	8.1	8.0	8.0	7.7	8.0	7.4	8.1	7.9	7.9	7.8	7.8
– Semi-skilled workers	1.554	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
– Skilled workers	0.354	4.2	4.3	4.2	4.3	4.2	4.3	4.2	4.3	4.3	4.2	4.2
Real wage (soms/month)												
– Unskilled workers	1 519	-4.2	-4.2	-4.5	-4.9	-6.3	-4.2	-4.3	-4.4	-4.4	-5.1	-4.8
– Semi-skilled workers	1 924	4.3	4.4	4.0	5.2	3.4	4.4	4.2	4.6	4.6	3.7	4.0
– Skilled workers	2 472	-0.2	1.1	0.9	2.4	0.3	-0.1	-0.2	1.9	1.9	1.1	1.3
MDG outcomes			*Value in 2015*									
Basic secondary school completion rate, %	84.1	89.1	95.4	95.4	89.0	88.7	89.1	89.1	95.4	95.4	95.4	95.4
Under-five mortality rate, per 1,000 live births	35.3	22.7	22.7	23.4	8.4	8.2	14.6	14.7	10.4	10.4	10.4	10.4
Maternal mortality ratio, per 100,000 live births	55.5	33.7	33.7	34.9	15.7	15.7	18.8	18.8	15.7	15.7	15.7	15.7
Population with access to safe drinking water, %	89.8	89.9	89.9	89.9	89.9	89.9	90.1	90.1	90.1	90.1	90.1	90.1
Population with access to improved sanitation, %	23.9	28.0	28.0	27.7	28.7	27.4	40.0	40.0	40.0	40.0	40.0	40.0

Source: MAMS for the Kyrgyz Republic

Table A2. Poverty and inequality estimates for the MDG achievement scenarios

	2006	Scenarios									
	Actual	Baseline	MDG2		MDG45		MDG7		All MDGs		
			ftr	tax	ftr	tax	ftr	tax	ftr/fb	tax	mix
			Value in 2015								
Extreme poverty rate, %	9.1	7.1	6.2	6.9	6.3	8.6	6.9	7.4	6.3	7.9	6.6
General poverty rate, %	39.9	25.1	22.2	24.5	19.7	26.7	24.2	26.1	22.4	27.7	23.8

Gini coefficient	0.402	0.409	0.406	0.406	0.406	0.403	0.410	0.409	0.405	0.404	0.404

Source: MAMS for the Kyrgyz Republic