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MOROCCO

SELECTED ISSUES

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A. Introduction

1. The social unrest in the Middle East, high unemployment in many advanced economies in the aftermath of the financial crisis, and the possible adverse impact of fiscal consolidation measures in a number of advanced and emerging economies, have renewed concerns about growth, job creation, and inclusiveness. Faced with these challenges, many governments have set for themselves the goal of "inclusive growth."

2. Addressing inclusiveness in growth is not only important for redistributive purposes and to ensure social cohesion, but also because non-inclusiveness can have detrimental effects on economic activity and macroeconomic stability through a number of economic, social, and political channels such as: (i) wasted productive potential and a misallocation of resources, thus undermining long-term growth (Berg et al., 2011); (ii) reducing individuals' ability to cope with risk; (iii) social conflicts (Campante and Chor, 2012); and (iv) directly increasing macroeconomic instability (Fitoussi and Sareceno, 2010; Kumhof and Ranciere, 2010).

3. While there is no consensus definition of inclusive growth, it has been variously defined by several institutions as reflecting a combination of the following elements: (i) a more equal distribution of income; (ii) a decrease in absolute poverty; (iii) the internalization of externalities in the measurement of economic growth; (iv) more equal opportunities, including access to basic services; and (v) a higher level of employment.

4. The aim of this work is to analyze inclusive growth in Morocco focusing on two broad dimensions: (i) achieving sustainable higher growth that will create and expand economic opportunities; (ii) ensuring broader access to these opportunities so that all members of society can benefit from growth. The first dimension is analyzed by focusing on economic growth and labor market opportunities. The second dimension is identified by focusing on a broad set of social indicators including inequality and poverty, and access to health, education and other basic services.

5. The paper is organized as follows: Section B describes Morocco's growth performance over the past three decades,[2] presents the main challenges, and describes the set of policies needed to foster growth. Section C presents a similar analysis for unemployment and labor market conditions,

[1] Prepared by Davide Furceri.

[2] Throughout this paper, "growth" refers to the growth of nonagricultural output.

while Section D focuses on a broad set of inclusiveness indicators. Finally, Section E concludes summarizing the main policy implications of the analysis and discussing possible trade-offs.

B. Growth

Stylized facts

6. Morocco has recorded robust growth over the past three decades. Over the period 1980-2010, growth in Morocco averaged about 4 percent compared to 3½ percent in other emerging markets and developing economies (EMDEs). Peaks in activity—defined as annual growth rate over 5 percent – occurred in 1982, 1988, 1990, and 2005, while a severe downturn took place in 1992–93. Overall, three broad growth phases can be distinguished: (i) a period of moderate growth (about 3.9 percent per year) from 1980 to 1990; (ii) a period of growth deceleration between 1992 and 1999; and (iii) a period of growth acceleration since 2000, reflecting a pick-up in investment and productivity. This latest period has also been characterized by a marked reduction in growth volatility, as evidenced by a sharp decline in the standard deviation of the annual growth rates (Figures 1 and Table 1).

7. Growth has been driven by capital accumulation and domestic demand. On the supply side, growth has been mostly driven by strong capital accumulation. Over the period 1980-2010, the contribution of capital accumulation has been close to 45 percent (Figure 2, Panel A). Labor has been the second factor providing the largest contribution (about 40 percent) while human capital and total factor productivity (TFP) accounted together for less than 15 percent. However, while the contribution of human capital has been rather constant, TFP's contribution has markedly increased, reaching about 20 percent over the past decade. On the demand side, growth has been exclusively driven by domestic demand (consumption contributing to about 75 percent and investment to about 35 percent). In contrast, net exports have decreased during the past three decades (Figure 2, Panel B), resulting in a negative growth contribution of external demand (about -10 percent).

Challenges ahead

8. Growth has slowed down. Growth has decelerated in the most recent years due to the deterioration in the global economy since the start of the great recession in 2008. In addition, given the strong trade, remittance, and investment linkages with European countries, a protracted downturn in euro area countries is likely to have significant short- and medium-term effects on Morocco's growth performance.

9. Higher growth is required for reducing unemployment. Despite significant gains in growth, employment and labor force participation rates have not increased substantially and remain relatively low compared to other emerging market economies, averaging 46.8 and 52.6 percent, respectively, during the period 2000–09 (Figure 3, Panel B and C). While unemployment has steadily declined over the past decade, youth unemployment remains very high at about 18 percent. Clearly, in addition to structural reforms aimed at improving the functioning of the labor market, higher growth will be required to absorb new entrants into the labor market and reduce unemployment.

Policy recommendations

10. There is limited space for macroeconomic policy to boost domestic demand in the short term. First, the ability of fiscal policy to boost domestic demand in the short and medium term is constrained by the high fiscal deficit and the need to maintain fiscal sustainability in the medium term. Second, monetary stimulus is not warranted at this time, given that policy should guard against potential second-round effects on inflation of domestic energy price increases, external pressures, and given that the nonagricultural output gap is close to zero.

11. The urgency of the need for growth-enhancing structural reforms has increased in Morocco. The recent global crisis has had significant disruptive effects on most advanced economies, with GDP falling by over 3 percent on average in 2009. In addition, available empirical evidence points to sizeable permanent GDP losses from financial crises (Cerra and Saxena, 2008; Furceri and Mourougane, 2012). Given the strong trade, remittances, and investment linkages with European countries, a protracted downturn in euro area countries is likely to have significant short- and medium-term effects on Morocco's growth performance. In particular, a downturn of magnitude of about 2 percent in Europe is found to decrease Morocco's potential output by about 0.6 percent in the very short term (one year after the occurrence of the downturn), and by about 1.3 percent three years after (Box 1). Against this background, and given the limited space for macroeconomic policy to boost demand in the short term and the need for higher growth to reduce high (youth) unemployment, the urgency of growth-enhancing structural reforms has arguably increased.

12. Structural reforms could significantly boost Morocco's potential growth. Potential gains from structural reforms could more than offset spillover effects from a protracted recession in euro area countries. The effect of structural reforms in individual policy areas ranges from 0.2 percentage point in the case of capital account liberalization reforms to 0.7 percentage point in the case of trade liberalization reforms. Large-scale reforms are likely to deliver even larger effects. Under an ambitious reform agenda, including financial sector reforms, a move toward greater capital account openness, further trade liberalization, and reforms of the product and labor markets, the overall potential growth gain might come close to 2½ percentage points (Box 2).[3]

[3] The analysis assumes that it is possible to disentangle the effects of specific reforms, and abstracts from the complementarity of these reforms and the appropriate sequence of implementation.

Box 1. Dynamic Effect of Downturns in European Countries on Morocco's Growth

The recent global crisis has had significant disruptive effects on most advanced economies, with GDP falling by over 3 percent on average in 2009. In addition, available empirical evidence (Cerra and Saxena, 2008; Furceri and Mourougane, 2012) suggests that financial (banking and debt) crises may lead to sizeable and permanent GDP losses by: (i) increasing risk premia and lowering the incentive to invest in physical capital; (ii) raising long-term and structural unemployment via hysteresis effects; and (iii) reducing labor force participation (discouraged worker effect). Given the strong trade, remittances, and investment linkages with European countries, a protracted debt crisis in euro area countries may also reduce Morocco' potential output.

The empirical strategy adopted to estimate the dynamic effect of downturns in European countries on Morocco's growth follows the method proposed by Jorda (2005), which consists of estimating impulse response functions (IRFs) directly from local projections. In detail, for each future period *k* the following equation has been estimated on annual data:

$$y_{t+k} - y_t = \alpha + \mathrm{Time}_t^k + \sum_{j=1}^{l} \gamma_j^k \Delta y_{t-j} + \beta_k D_t^D + \varepsilon_t^k \qquad \text{(A1)}$$

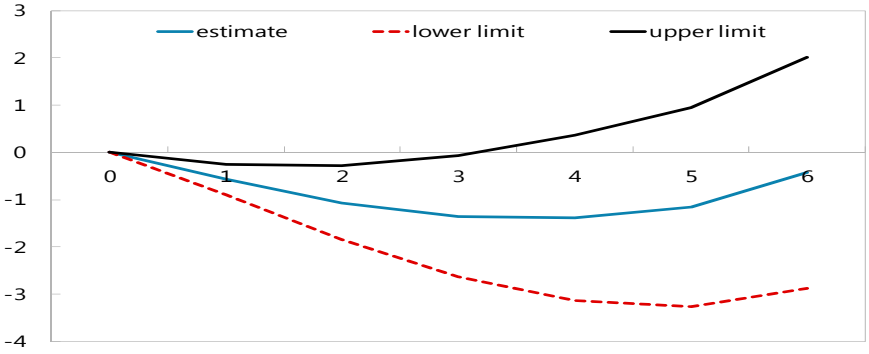
where k = 1, ...6, y is the (log) of output, $Time_t$ is a time trend, and β_k measures the impact of European downturns on the change of (the log of) potential output for each future period k. The number of lags (l) has been chosen to be equal 2. IRFs are then obtained by plotting the estimated β_k for k = 1, ...6, with 95 percent confidence bands for the estimated IRFs computed using the standard deviations associated with the estimated coefficients β_k.

Downturn dummies have been constructed using the Harding and Pagan (2002) methodology applied to quarterly GDP data for the European countries. This method identifies seven years in which European countries have been in a downturn: 1981–83, 1992–93, and 2008–09.

The results from estimating potential output using Equation (A1) are presented in Figure A1: they show that downturns in European countries have significant effects, reducing potential output up to four years after the occurrence of the downturns.

In particular, a downturn of magnitude of about 2 percent in Europe is found to decrease Morocco's potential output by about 0.6 percent in the very short term (one year after the occurrence of the downturn), and by about 1.3 percent three years after (Figure A1).

Figure A1. The Effect of EU Downturns on Morocco Potential Output



Note: dotted lines represent 95 percent confidence bands.

Box 2. Estimates of the Effect of Structural Reforms on Morocco's Economic Growth

This box tries to quantify the possible magnitude of the impact of structural reforms on Morocco' potential growth, by making use of existing empirical evidence on the links between structural policies and economic growth. Before turning to the analysis, however, it is important to highlight the limitations of this approach. First, the results are sensitive to the uncertainty associated with the estimates of the effect of structural policies on economic performance. Second, the analysis implicitly assumes that the estimated effects are homogenous across countries. Third, it assumes that it is possible to disentangle the effects of specific reforms, and abstracts from the complementarity of these reforms and the appropriate sequence of implementation. DESPITEhese caveats, we believe that this analysis could provide some indication of the need for growth-enhancing structural reforms in Morocco and the magnitude of the effects of such reforms.

The analysis relies on existing empirical evidence of the links between growth and the following indicators: (i) **Domestic financial sector restrictions:** the indicator includes measures of securities market and banking sector restrictions; (ii) **Capital account restrictions:** the index is based on a broad set of restrictions including, for example, controls on external borrowing between residents and nonresidents, as well as approval requirements for foreign direct investment (FDI);[1] (iii) **Current account restrictions:** the indicator is measured along two dimensions: tariff restrictions, which measures average tariff rates; and a broader indicator of current account restrictions, which captures surrender requirements for export proceeds, and other items under Article VIII of the Articles of Agreement; (iv) **Product market regulation (PMR):** the indicator captures restrictions in the agricultural sector and in telecommunications and electricity markets; and (v) **Labor market regulation:** the index is a measure of employment protection legislation (EPL) (Aleksynska and Schindler, 2010). These indicators are standardized between zero and one, with higher values of the indicator implying lower restrictions (an exception is the EPL, for which a higher value indicates a more stringent labor market regulation).[2]

The effect of structural reforms on Morocco's economic growth is computed by simulating a convergence of policy settings towards those prevailing in benchmark countries, identified as those with the lowest restrictions.[3] In detail, the impact of structural reforms is simulated as:

$$g_I^M = \beta_I(I^M - I^B)$$

where g_I^M is the impact of a reform in the policy area *I*; β_I is the estimated parameter of the effect of structural reforms on growth for each indicator *I* (Furceri, 2012); I^M and I^B are the values of the structural reform indicator *I* in Morocco and in the benchmark countries, respectively (Figure A2).

1/ The index represents a de jure measure of financial integration. According to this measure, the level of financial integration in Morocco corresponds to the first quartile of the distribution of the indicator. A similar finding is obtained also for the de facto measures of financial integration, as the one proposed by Lane and Milesi-Ferretti (2007).

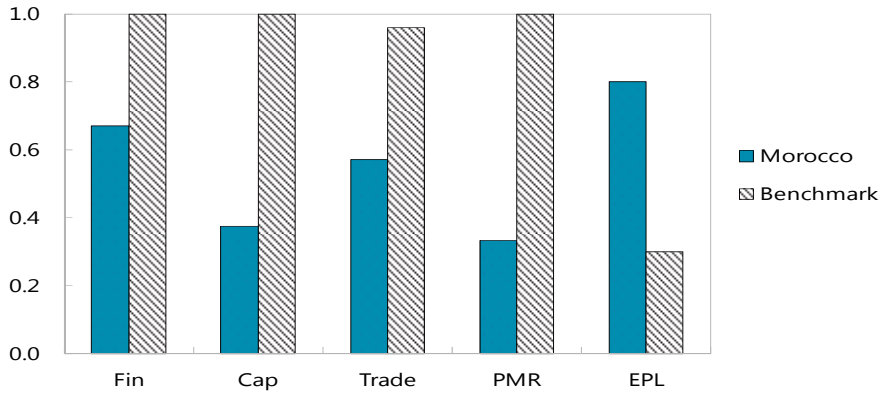
2/ These indicators are included in an extensive dataset, compiled by the IMF Research Department, that brings together information on a variety of structural reforms in different sectors over roughly the past 30 years, and which covers a cross-section of both industrial and developing countries.

3/ The countries with the lowest level of restrictions are: Estonia and Latvia for domestic finance; Bolivia, Chile, Costa Rica, Cyprus, Ecuador, Estonia, Gambia, Hong Kong, Latvia, Lithuania, Malta, Paraguay, Peru, Singapore, the Slovak Republic, Uruguay, and Zambia for capital account; Bahrain, Estonia, Hong Kong, Saudi Arabia, and Singapore for current account; Bolivia, Colombia, Lithuania, Cote d'Ivoire, Mozambique, Russia, and Thailand for EPL; Brazil, El Salvador, Estonia, and Romania for product market.

Box 2. Estimates of the Effect of Structural Reforms on Morocco's Economic Growth (concluded)

The results described in Furceri (2012) suggest that potential gains from structural reforms could be large for Morocco: (i) 0.3 percentage point from financial sector reforms; (ii) 0.2 percentage points from capital account reforms; (iii) 0.7 percentage point from current account reforms; (iv) 0.6 percentage point from product market reforms; (v) 0.5 percentage point from labor market reforms. Under an ambitious reform agenda, the overall potential growth gain from undertaking the full range of reforms described might come close to 2½ percentage points.

Figure A2. Structural Policy Indicators
(Morocco vs. Benchmark Emerging Markets)



Sources: IMF structural reform database; and author's calculations.

C. Unemployment

Stylized facts

13. Unemployment has considerably declined over the last decade. The overall unemployment rate in Morocco declined from 13.4 percent in 2000 to 9.1 percent in 2009, and has remained broadly constant since (Figure 4).

- **Demographic factors have played an important role in affecting the dynamics of unemployment rates**. Over the past three decades Morocco has undergone a rapid demographic transition to low fertility. Fertility rates have decreased steadily, from 4.8 percent in 1985 to 2.4 in 2007. As a result, population growth has declined from 2.2 percent to 1.2 percent over the same period. Participation rates have also declined during the past decade, generating fewer entrants into the labor market—on average, each year has recorded 123,000 new entrants into the labor market. In contrast, employment growth has been robust, averaging about 2 percent over the same period. In particular, about 164,000 jobs were created each year between 2000 and 2008, leading to an average yearly reduction of 40,000 unemployed.

- **Higher growth has contributed significantly to job creation**. Average economic growth increased from about 3 percent in the 1990s to about 5 percent over the period 2000–08 (Table 1 and Section B), resulting in an increase in employment growth to about 2 percent per year over the same period. In other words, each percentage point of economic growth has generated about 0.4 percent growth in employment.

- **Job creation has occurred mainly in the services sector**. Among the different sectors of economic activity, the services sector has absorbed the largest share of new entrants (84,000 jobs created each year), followed by industry (61,000) and agriculture (13,000).

14. Unemployment remains high among educated youth (Table 2). Despite the large gains in the overall rate of unemployment, it has not decreased with the same speed for all segments of the population, particularly for the youth. As a result, the ratio of youth unemployment to overall unemployment has steadily increased from about 1.5 in 2001 to more than 2 in 2011 (Figure 3).

- **First-time job seekers account for the largest share of unemployed youth**. First time - job seekers account almost for 65 percent of total youth unemployed—compared to about 50 percent of total unemployed—with about 70 percent in cities and 50 percent in rural areas.

- **Youth unemployment is largely of a structural nature**. About two-thirds of youth unemployed are without a job for at least one year. This rate is even higher for women and for people living in urban areas.

- **Unemployment among the educated is persistently high**. At the national level, the unemployment rate ranges from 4.5 percent for workers with no degree to 16 percent for those with a diploma below the secondary level (*niveau moyen*), and to 18.1 percent for those of diploma for secondary studies or higher (*niveau supérieur*).

- **The persistent high rate of youth unemployment recorded over the past decade is mainly the result of a negative youth employment growth (-1.2 percent over the period 2000–10)**. Two complementary factors can explain the high rate of youth unemployment. First, young people are generally more educated than other job seekers and have higher expectations,[4] which are not matched by the available opportunities in the market. Labor market mismatches have been driven by the inability of the economy to create highly skilled work, but also by the unbalanced distribution of students in scientific fields (e.g., only about 7 percent of post-secondary students are completing engineering programs), which generates an undersupply of the skills most needed by the private sector. Second, Morocco's labor market is highly rigid and tends to obstruct the integration of outsider workers (Figure A2, Box 2).

[4] About 33 percent of highly educated first-time job seekers have a reservation salary higher than 3,300 Dirhams.

Challenges ahead

15. Demographic factors will continue to play an important role in unemployment dynamics. The working age-population (15–64 years old) is expected to increase by 224 thousand each year between 2012 and 2020, with the largest increase for the age group 35–39. Similarly, labor force projections suggest that the active population 15–64 is expected to increase annually by about 148,000 over the same period. Among the different age groups, the labor force is expected to increase the most in the age group 30–39 and to decrease slightly in the age group 15–24. Given these trends, and assuming an average growth rate of about 5 percent, the overall unemployment rate could decline to about 8.5 percent by 2017 (Figure 5).

16. Higher economic growth might not necessarily be translated into higher youth employment growth. While overall employment has been responsive to changes in output, youth employment has steadily decreased in recent years despite sustained GDP growth rates. This suggests that higher economic growth might not necessarily translate into higher youth employment growth and in a significant reduction in youth unemployment. In particular, given the projected changes in youth labor force, youth unemployment is likely remain high in 2017 at a rate of about 15 percent (Figure 5).

Policy recommendations

17. A higher growth performance will be necessary but not sufficient to significantly reduce unemployment over the medium term. In the absence of structural reforms aimed at improving the responsiveness of labor market conditions to changes in economic activity, higher economic growth is likely to have only a modest impact on the overall rate of unemployment and negligible effects on youth unemployment. In this context, deepening structural policies aimed at improving the functioning of the labor market will be crucial. In particular:

- Reforms aimed at reducing labor market rigidities (including search and hiring costs) will be essential to increasing labor demand over the medium term and to facilitating the integration of young outsider workers into the labor market.

- Reforms aimed at improving the business climate and fostering product market competition will also be key to reducing unemployment over the medium term. In particular, lower barriers to entry curb market power and incumbents' rents, and tend to reduce wage claims and close the gap between productivity and real wages. Moreover, stronger competition may reduce the bargaining positions of employers, and increase employment costs for higher wages. Reduced rent sharing would also decrease the time spent for searching for employment opportunities in high wage sectors.

18. Structural reforms may have significant effects in reducing unemployment, particularly among the youth. Recent empirical evidence suggests that large-scale reforms in labor and product markets may have sizeable effects in increasing the responsiveness of the labor market to changes in economic activity (Crivelli et al. 2012). In addition, as shown in the previous

section, reforms in these areas may also increase Morocco's potential growth. Simulation analysis based on these two effects suggests that labor and product market reform could reduce overall and youth unemployment over the medium term to 5 and 8 percent, respectively (Figure 5).[5] However, while these policies will have an important role in reducing youth unemployment, the high level of unemployment among young graduates is also the result of mismatches between labor market demand and supply. In this context, strengthening current programs (such as the *Taahil* and the *Moukawalati*) and properly designing additional active labor market policies will improve the efficiency of the job matching process and by enhancing the skills of the unemployed. Finally, supporting enterprise development by improving infrastructure and ensuring that micro, small and medium-sized enterprises (MSMEs) have access to credit may have significant effects on youth employment.

D. Inclusiveness

Stylized facts

19. Poverty has considerably decreased over the past decade. The significant increase in growth recorded over the past decade has contributed to a marked reduction in poverty.[6] In particular, over the period about 1.7 million of people have moved out of poverty, and the poverty rate has decreased by more than 40 percent. On the basis of the national poverty line, the share of the population that could be qualified as "poor" has decreased from about 16 percent in 1999 to less than 9 percent in 2008 (Table 5), and poverty gaps have also improved relative to other emerging market economies (Figure 6, Panel A). In addition, the reduction in poverty has been uniform between urban (about 50 percent) and rural areas (about 40 percent).

20. Income inequality has slightly increased. The substantial decline in the poverty rate has not been matched by a similar improvement in inequality. Indeed, descriptive statistics of the GINI coefficient suggest that inequality has slightly increased over the past decade, even compared to other emerging market economies (Figure 6, Panel B) and remains persistently high in both urban and rural areas (Table 4). Similarly, the income share held by the poorest 20 percent of the population has not increased and remains relatively low (Figure 6, Panel C). High income inequality is also, in part, the result of an unequal distribution of assets and wealth. For example, data on the

[5] The effect of structural reforms on the responsiveness of Morocco's labor market to changes in economic activity is computed by simulating a convergence of policy settings towards those prevailing in benchmark countries, where these are identified as those scoring the highest (lowest) value in the product (labor) market indicator. In detail, the impact of structural reforms is simulated as: $e_I^M = \beta_I(I^M - I^B)$, where e_I^M is the impact of a reform in the policy area *I*; β_I is the estimated parameter of the effect of structural reforms on employment elasticities for each indicator *I* (Crivelli et al., 2012); I^M and I^B are the values of the labor and product market indicator in Morocco and in the benchmark countries, respectively (see Figure A2 Box 2).

[6] Estimates from the Moroccan High Commissariat of Planning (HCP) suggest that an increase of one percentage point in per capita growth may reduce poverty rates by about 3 percent.

distribution of agricultural land indicate that the distribution of land is highly skewed towards the richest farmers.

21. Inequality in the access to health services remains high (Figure 7). While health outcome indicators such as life expectancy at birth and mortality rates have recorded a significant improvement over the past two decades (Figure 7), they remain highly inequitable. In particular, disparities in maternal and child health outcomes (including malnutrition) still persist between rural and urban regions, and between rich and poor. Similarly, the distribution of health services is highly skewed toward higher socioeconomic status and urbanized areas (Figure 8). Access to comprehensive health coverage is quite limited and mostly exclusive to urban areas; while 100 percent of the urban population lives at a distance of less than 5 kilometers from health care providers, more than 70 percent of the rural population lives at a distance of more than 5 kilometers from the closest health facility. Per capita health expenditure is low also compared to other countries in the region (in 2006, health care spending per capita in Morocco has was $114 compared to $154 in Tunisia and $238 in Jordan), and it is mainly supported by households' out-of pocket payments (about 60 percent).

22. Educational outcomes have improved only slightly. The substantial increase in growth and reduction in the poverty rate has not been accompanied by a significant improvement in educational outcomes. At the national level, the adult literacy rate has increased only by 13 percentage points during the past decade—from 42 percent in 1998 to 55 percent in 2008—and it remains very low compared to other countries (Table 7 and Panel A of Figure 9). High illiteracy rates are recorded in particular for females (57 percent) and people living in rural areas (63 percent). The high illiteracy is mostly an elderly phenomenon, but literacy rates remain quite low also among the young. One of the driving factors of the improvement in literacy rates is the reduction in dropout rates from primary school, resulting in an increase in primary completion rates (Figure 9, Panel B). However, although primary completion has increased, enrollment rates in secondary school remain very low and have not significantly improved (Figure 9, Panel C).

23. Access to infrastructure has considerably improved over the past two decades, owing to the launch of several programs. In particular, following the launch of the *Programme d'Approvisionnement Groupé en Eau Potable des Populations Rurales* in1994, the share of rural population with access to drinkable water has increased from 14 percent in 1994 to more than 40 percent in 2009. Over the same period, the *Programme d'Electrification Rurale Global* has led to a significant increase in the country's electrification rate, from 18 percent in 1995 to 84 percent in 2009. Similarly, in the ambit of the *Programme National des Routes Rurales* 1,000 kilometers of rural roads have been built, increasing the access rate from 36 percent in 1995 to 54 percent in 2005.

24. Gender inequality remains high, even compared to other countries in the region. According to the UNDP Gender Inequality Index—which reflects gender-based inequalities in three dimensions: (i) reproductive health; (ii) empowerment; and (iii) economic activity—Morocco ranked 104 out of 146 countries in gender inequality in 2011, and performs considerably worse than other countries in the region including Tunisia (45), Algeria (71) and Jordan (83) (Figure 10). The ratio of young literate females to males, despite a slight increase over the last decade, is still below

80 percent, and the participation of women in the labor force remains persistently at very low levels. In particular, during the period 2000–09 the ratio of labor force participation, females to males, averaged about 32 percent, lower than in other countries in the region such as Algeria (43 percent) and Tunisia (35 percent).

Policy recommendations

25. Morocco has made substantial progress in fostering inclusive growth over the past decade, but additional efforts are needed. Improvement in economic growth, health, and educational outcomes, easier access for basic infrastructure, and a marked reduction in poverty rates are tangible evidence of the progress made in the past decade. In this context, the launch of several programs, including the National Initiative for Human Development in 2005, had a significant contribution to ameliorating the conditions of poor and vulnerable groups. Despite this progress, however, additional efforts are needed to strengthen inclusiveness, particularly with the aim of reducing inequality in the distribution of income and wealth, to broaden health access, and to further improve educational outcomes.

- **Policies to reduce income inequality**. Reducing income inequality would require strengthening redistribution policies. For this purpose, a reallocation of government spending would be needed to free resources for the social sector. The increase of the budgetary resources in the social sector could be obtained through reforming the current subsidy scheme, and redirecting savings from this reform to well-targeted social programs. Increasing social expenditure for disadvantaged groups would allow reducing inequality and sustaining demand in the short/medium-term. On the revenue side, cutting back tax expenditures, which mainly benefit high-income groups, would be beneficial for income equality and for long-term output. In addition, scaling back tax expenditure would reduce the complexity of the tax system, and thus improve tax compliance and lower collection costs. Shifting revenue toward progressive taxes could also have a positive impact on equality. However, there is likely to be a trade-off with growth objectives as personal and corporate income taxes are the most distortive. Improvement in the quality of productive spending, however, can reduce the severity of this trade-off. Finally, reducing inequality would also require policies aimed at broadening access to financial services.

- **Policy to reduce inequality in access to health services.** The two reforms launched by the government in 2005 (the creation of the *Assurance Maladie Obligatoire* and the *Regime d'Assistance Medicale*) were important steps in reducing disparities of health access between income groups and between rural and urban areas. In order to enhance the potential effects of these reforms, an increase in the amount of public resources devoted to health care would be needed to expand the coverage, meet the population's health demands, and broaden the scope of benefit packages. In addition, strengthening the efficiency of public and private spending would be needed to improve the quality and increase access to health services. Further intensifying partnerships with the private sector, non-governmental organizations, and local communities could also help reduce inter-regional inequities.

- **Policies to foster educational outcomes.** Despite some improvement in educational outcomes, illiteracy rates and enrollment rates in secondary school are still low, especially in rural areas. To further increase basic schooling and equality in educational outcomes, factors that affect low school attendance of the poor and girls, such as indirect cost and access, need to be addressed. In particular, further efforts are needed to: (i) increase the budget allocation for educational spending, particularly toward basic schooling in rural areas; (ii) improve school facilities in rural areas; (iii) foster school autonomy; and (iv) reinforce cooperation with nongovernmental organizations and local communities. Policies aimed at improving the quality of and access to upper basic and secondary education, and increasing opportunity for continuing schooling, will also be key to increasing secondary enrollment rates and the skills of the future labor force.

E. Conclusions

26. Morocco has made substantial progress in increasing inclusive growth over the past decade, but additional efforts are needed. Morocco's social indicators have improved over the past decade. Higher economic growth, lower unemployment, better health and educational outcomes, better access to basic infrastructure, and a marked reduction in poverty rates are tangible evidence of the progress made in fostering inclusive growth. Additional efforts are, however, needed to increase potential growth, improve educational outcomes, and to further reduce the still-high youth unemployment and the inequality in the distribution of income and access to health care, particularly across regions.

27. The urgency of growth-enhancing structural reforms has arguably increased in Morocco. Given the strong trade linkages with European countries, a protracted downturn in euro area countries is likely to have significant short- and medium-term effects on Morocco's growth performance. Against this background, and given the limited space for macroeconomic policy to boost demand in the short term, the urgency of structural reforms in the area of trade and financial liberalization, and labor and product market has arguably increased in Morocco.

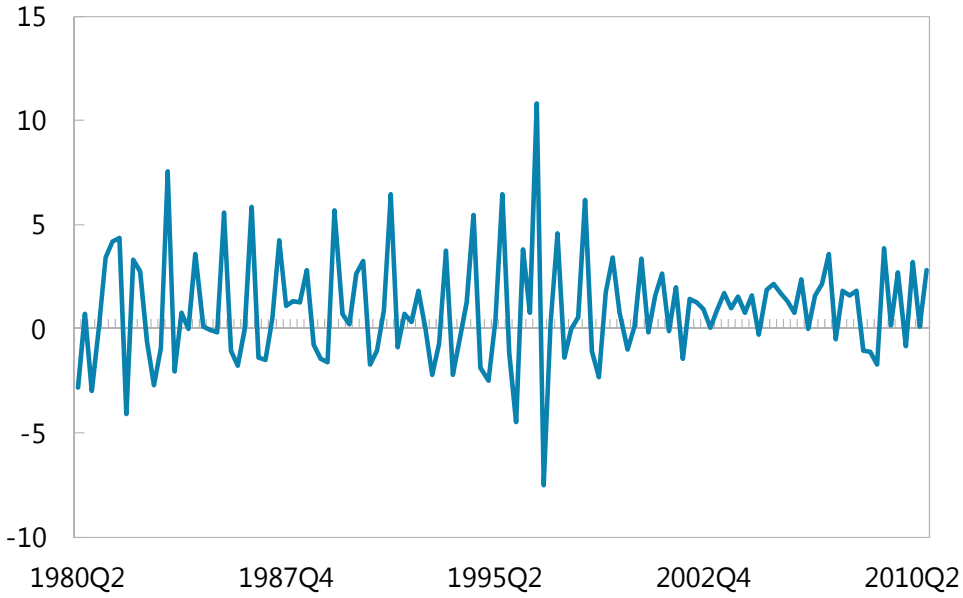
28. Potential job and growth gains from structural reforms could be large. Under an ambitious reform agenda, the overall potential growth gain from undertaking a full range of reforms might come close to 2½ percentage points. Similarly, labor and product market reforms may have sizeable effects in reducing overall and youth unemployment over the medium term to 5 and 8 percent, respectively.

29. While higher growth and employment are a prerequisite to reduce poverty and income inequality, strengthening social policies and increasing safety nets will be needed. Increasing budgetary resources for social spending in health and education are key to improving outcomes and reducing disparities in health and educational access between different income groups and between rural and urban areas.

30. Preserving economic efficiency and fostering growth while strengthening inclusiveness remains a priority. The increase of the budgetary resources for the social sector

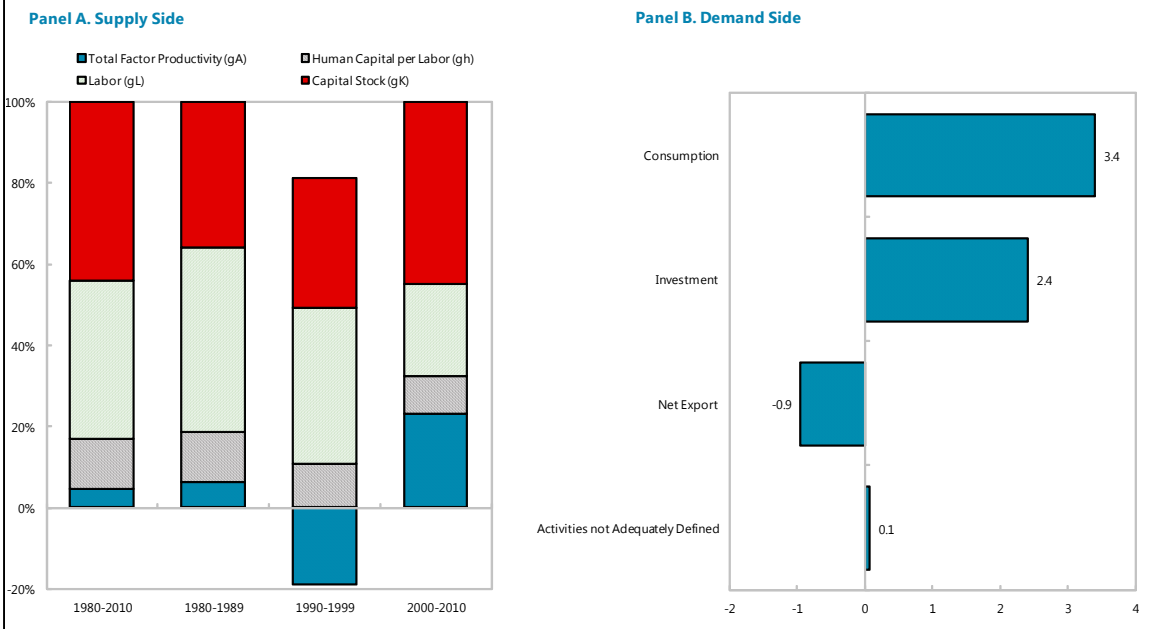
could be obtained through reform of the current subsidy scheme and redirecting savings from this reform to well-targeted social programs. On the revenue side, cutting back tax expenditures, which mainly benefit high-income groups, would be beneficial for income equality and for long-term GDP per capita. In addition, scaling back tax expenditure would reduce the complexity of the tax system and thus improve tax compliance and lower collection costs. Shifting revenue towards progressive taxes could also have a positive impact on equality; however, there is likely to be a trade-off with growth objectives as personal and corporate income taxes are the most distortive. Improvement in the quality of productive spending (including investment in infrastructure, health, and education), however, can reduce the severity of this trade-off. Finally, supporting enterprise development by improving infrastructure and ensuring that micro, small, and medium-sized enterprises have access to credit may have significant effects on generating employment, raising income, and reducing poverty and inequality.

Figure 1. Real Nonagricultural GDP Growth, 1980-2010



Source: Moroccan authorities.

Figure 2. Morocco's Growth Decomposition (1980-2010)

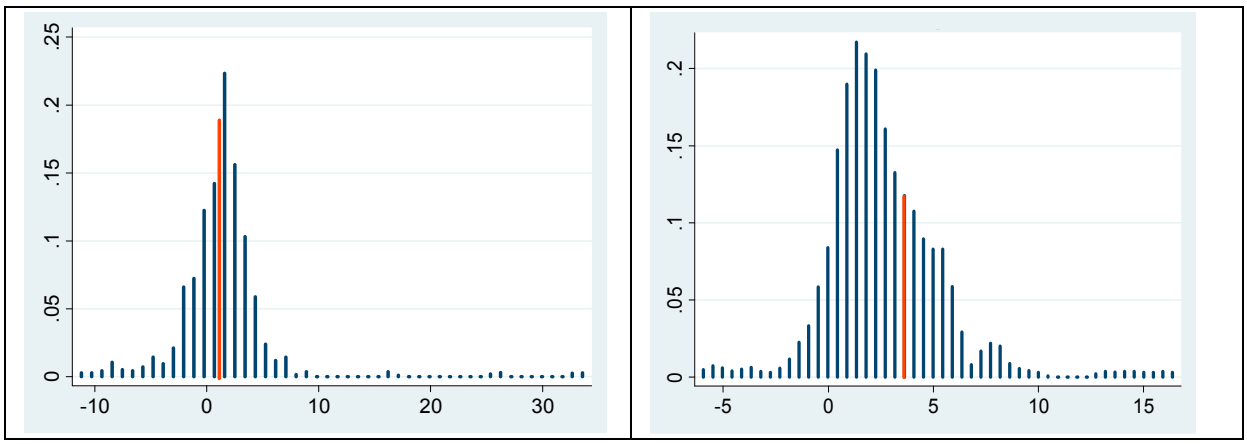


Source: Moroccan authorities

Figure 3. Economic Growth Indicators—Kernel Density Charts

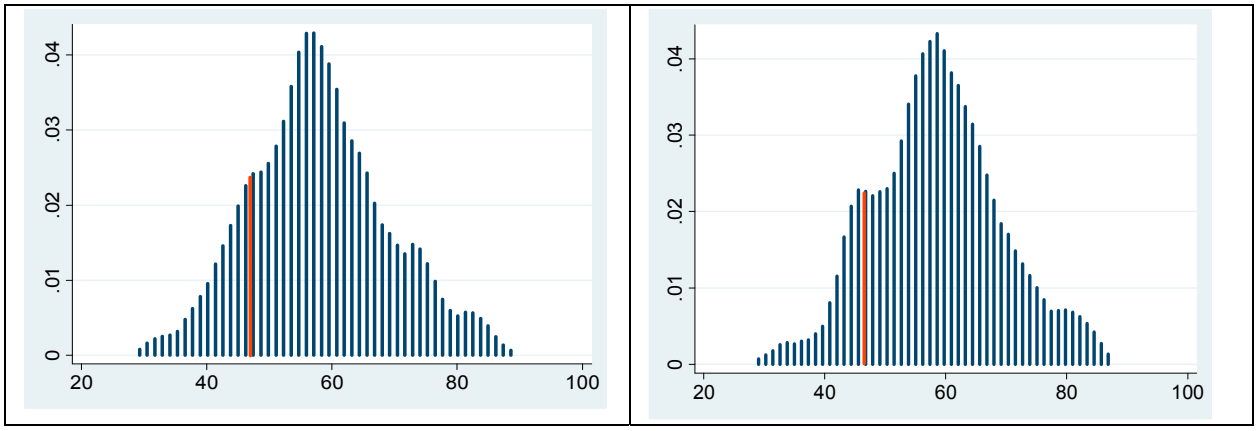
Panel A. Per Capita Real GDP Growth

Average 1990–99 | Average 2000–09



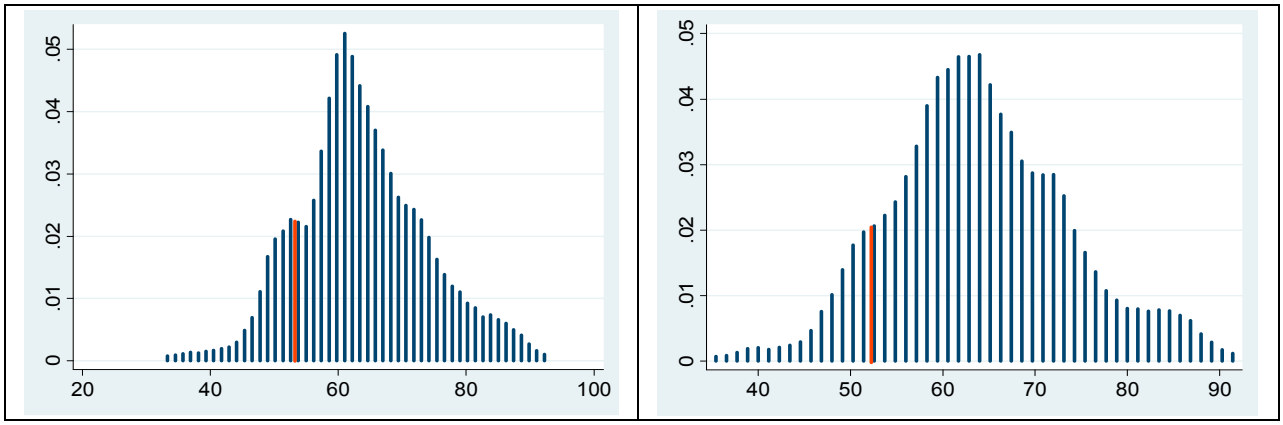
Panel B. Employment Rate

Average 1990–99 | Average 2000–09



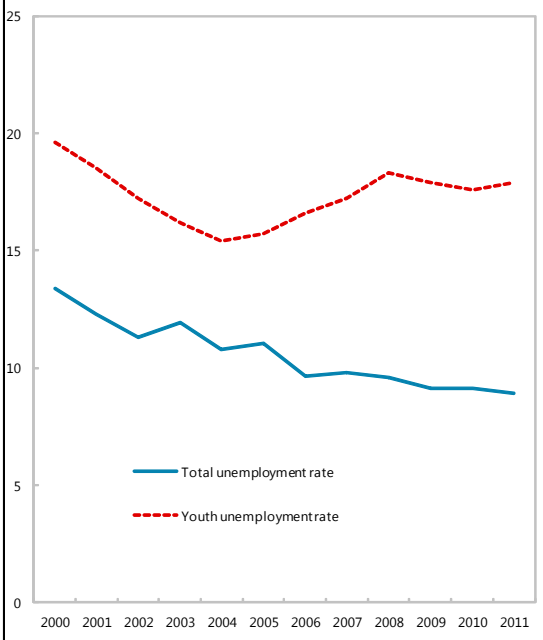
Panel C. Participation Rate

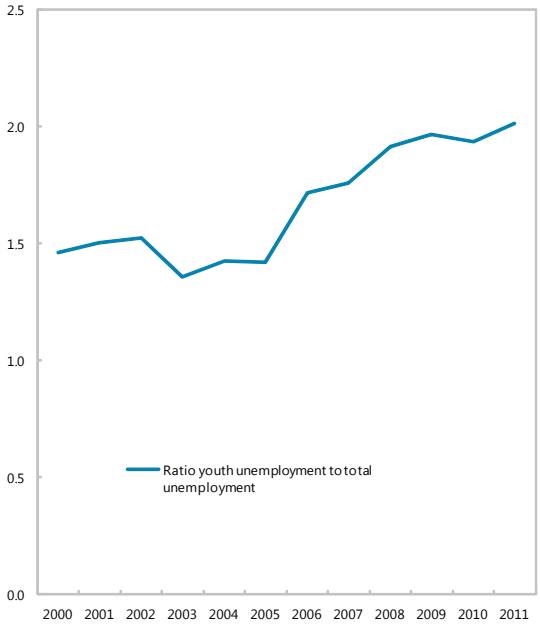
Average 1990–99 | Average 2000–09



Source: World Bank's World Development Indicators.
Note: Y-axis= Cross-country Kernel density estimates for an unbalanced sample of emerging market and developing economies; X-axis=variable; ---Morocco.

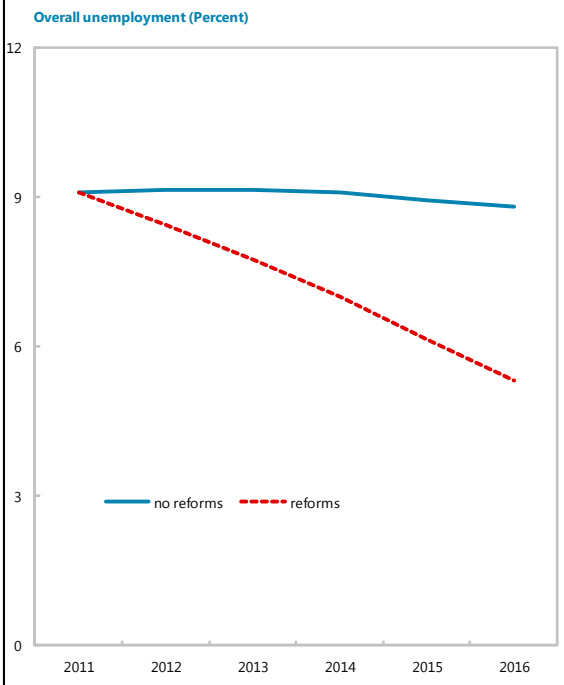
Figure 4. Unemployment and Youth Unemployment: Past Trends

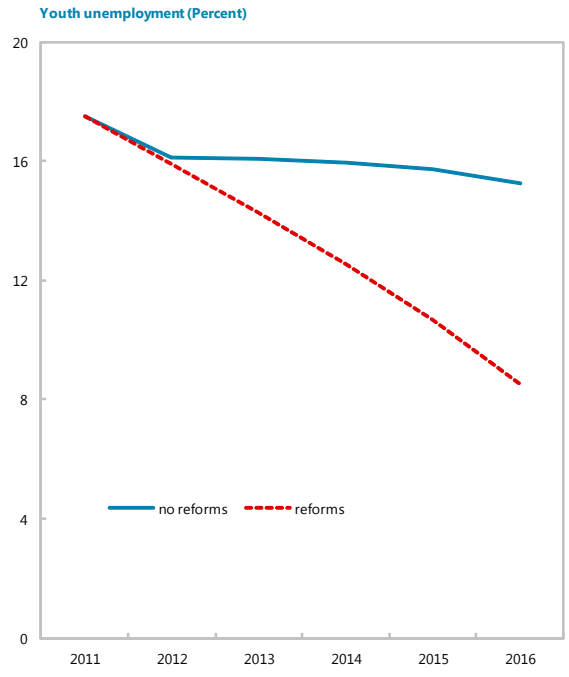




Source: Moroccan High Commissariat of Planning (HCP); and IMF staff estimates.

Figure 5. Unemployment and Youth Unemployment: Projected Future Trends



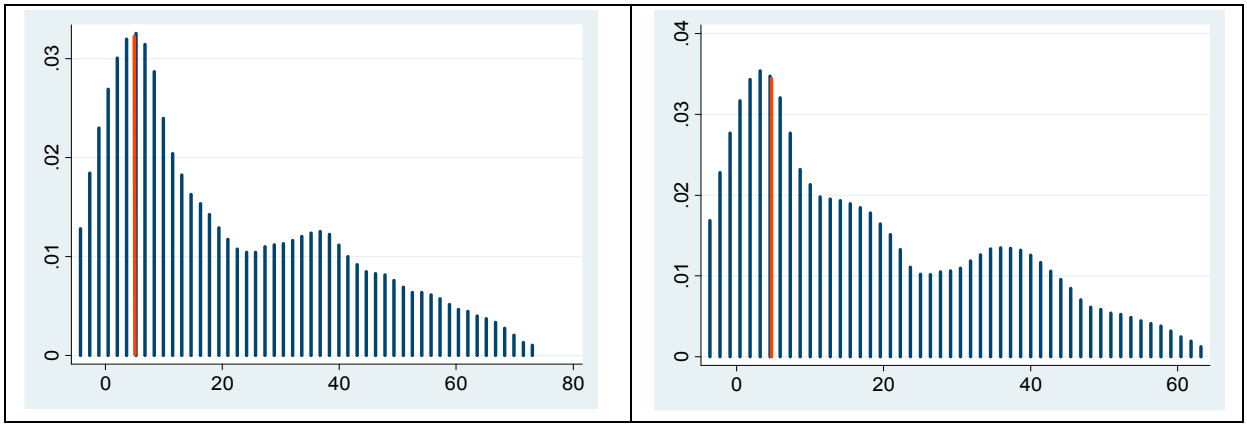


Source: Moroccan High Commissariat of Planning (HCP); and IMF staff estimates.

Figure 6. Poverty and Inequality Indicators—Kernel Density Charts

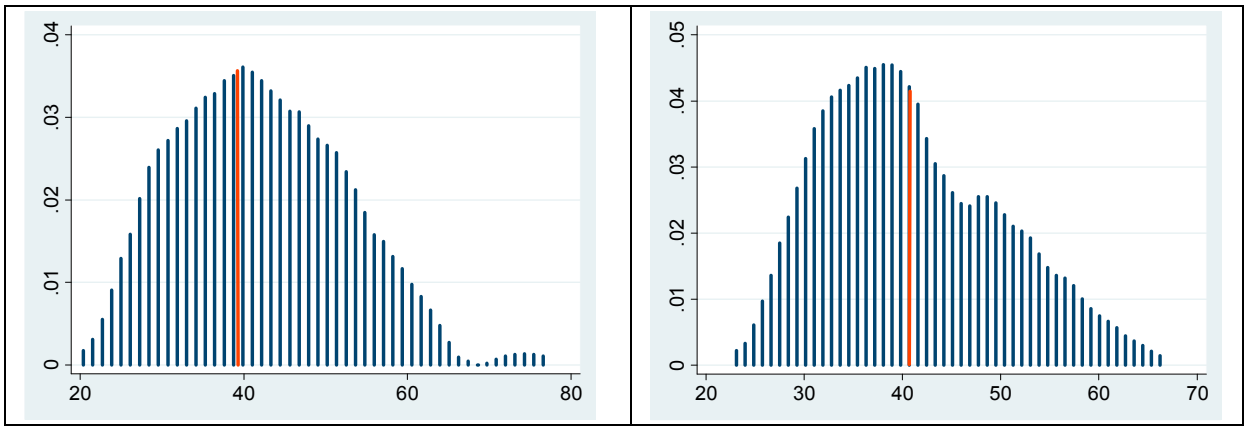
Panel A. Poverty GAP at $2 a day (PPP, Percent of population)

Average 1990–99 | Average 2000–09



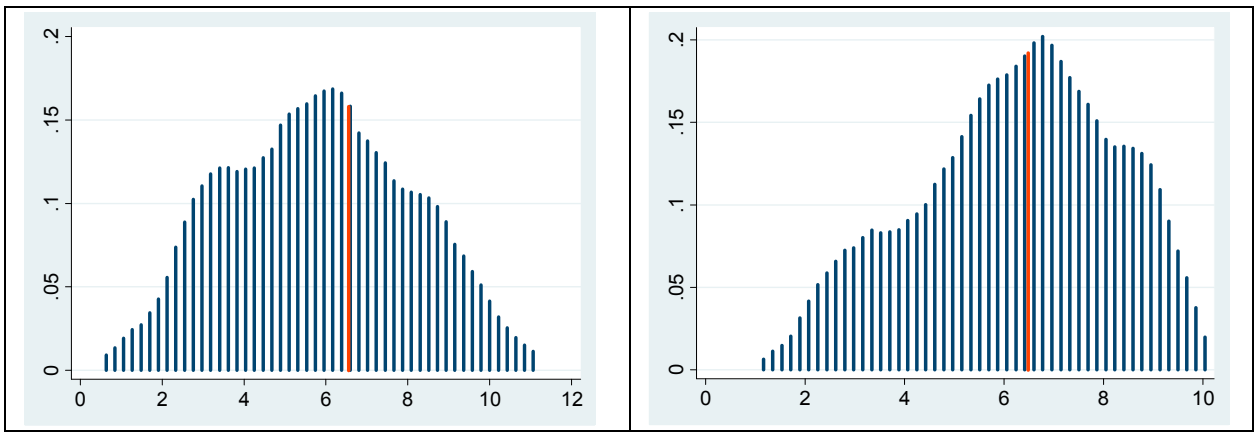
Panel B. GINI Coefficient

Average 1990–99 | Average 2000–09



Panel C. Income Share Held by Lowest 20 Percent

Average 1990–99 | Average 2000–09

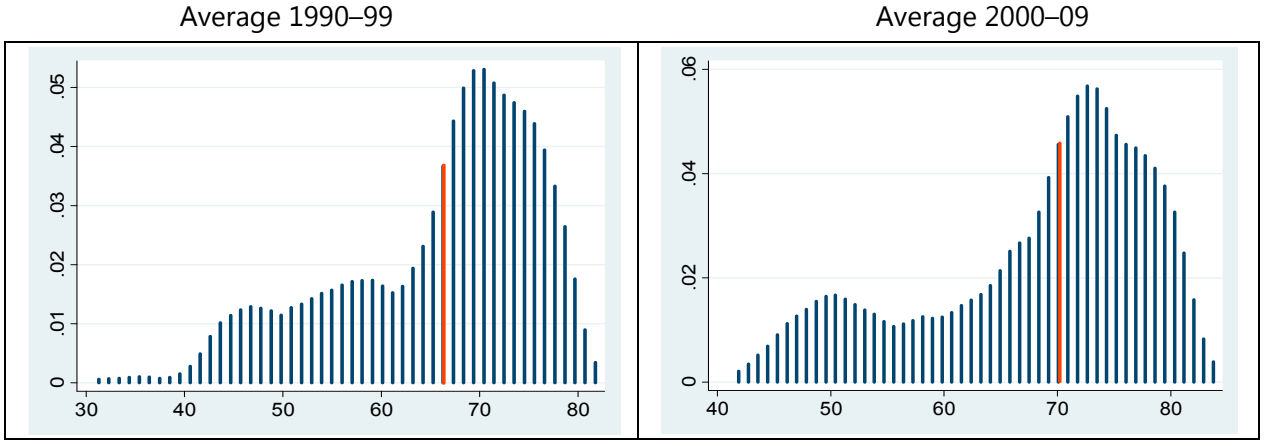


Source: World Bank's World Development Indicators.

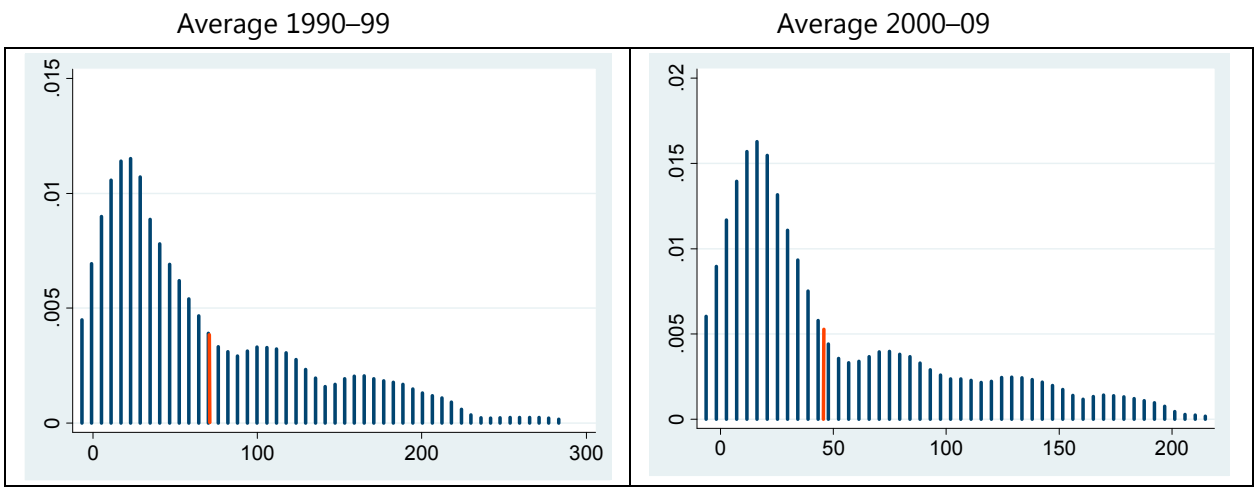
Note: Y-axis= Cross-country Kernel density estimates for an unbalanced sample of emerging market and developing economies; X-axis=variable; ------Morocco.

Figure 7. Health Indicators—Kernel Density Charts

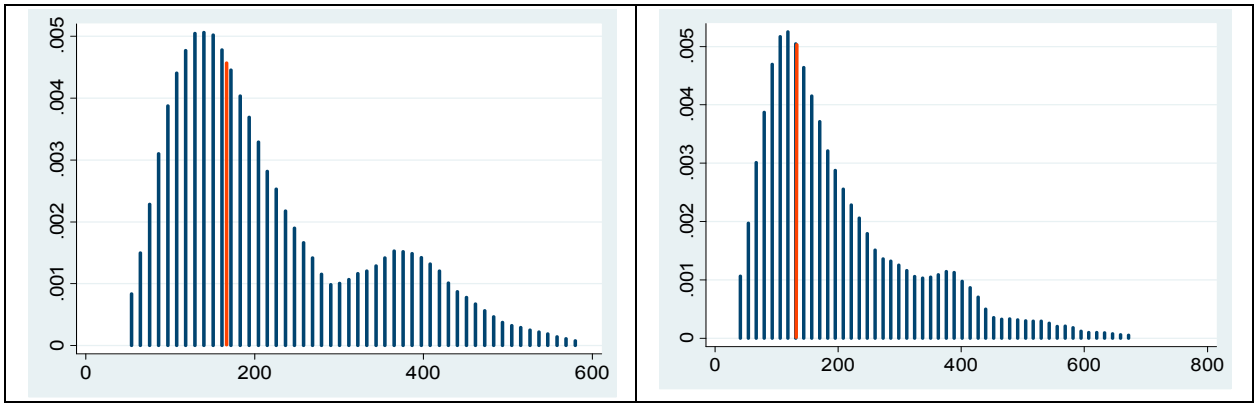
Panel A. Life Expectancy at Birth



Panel B. Mortality Rate Under Five



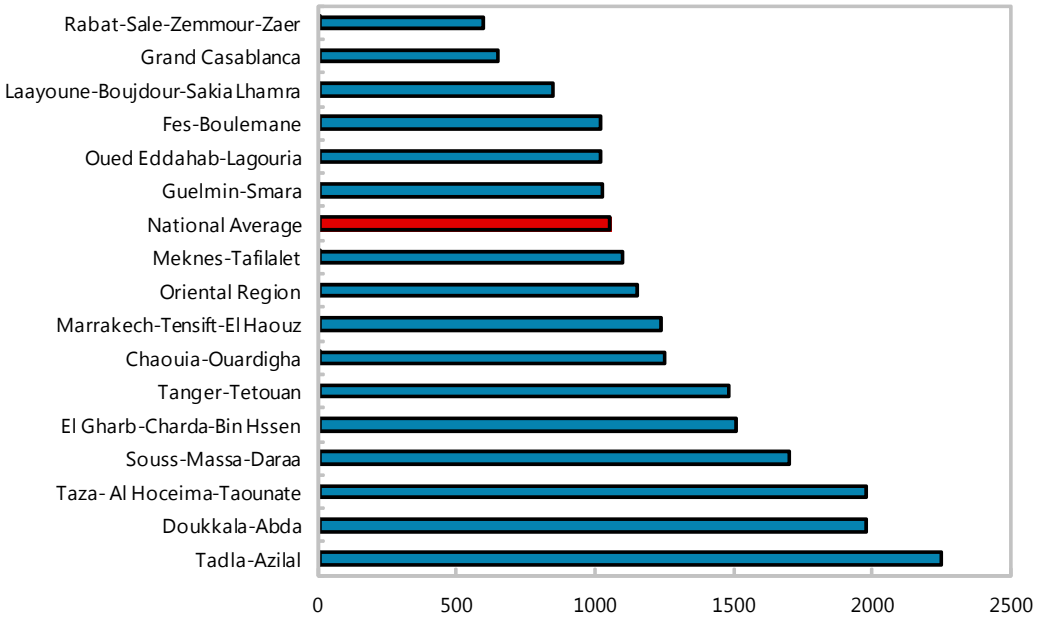
Panel C. Mortality Rate Adult (Average Male and Female)



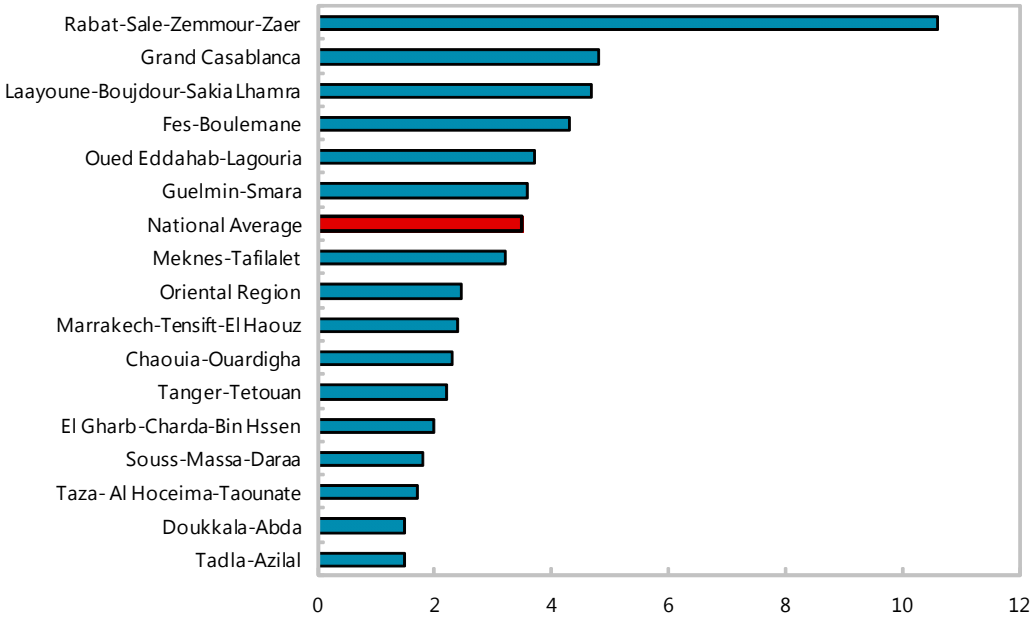
Source: World Development Indicators.
Note: Y-axis= Cross-country Kernel density estimates for an unbalanced sample of emerging market and developing economies; X-axis=variable; ------Morocco.

Figure 8. Regional Inequality in Access to Health Services

Hospital Bed Coverage
(Habitants per hospital bed)



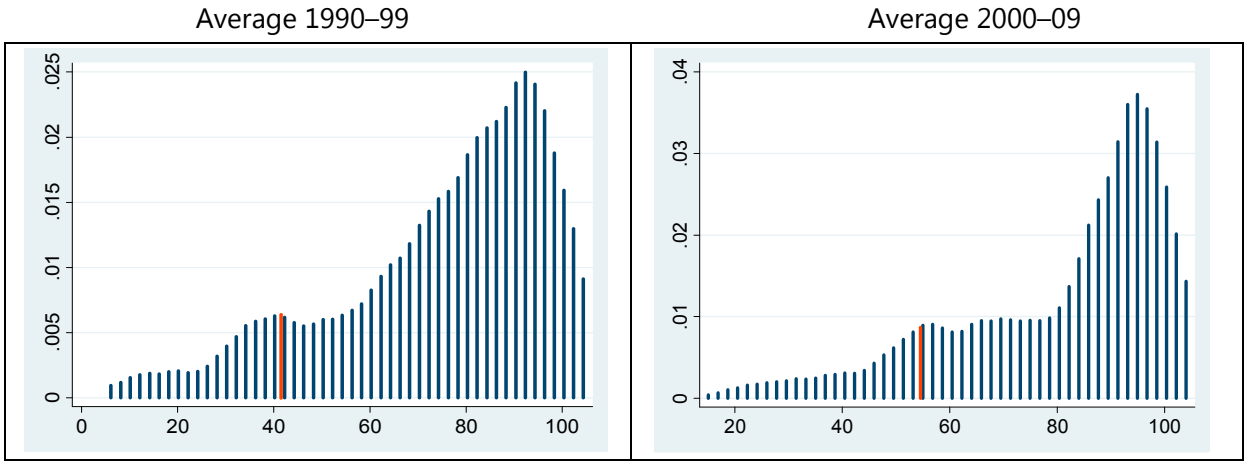
Ratio of medical personnel to population
(Doctor/habitants x 10000)



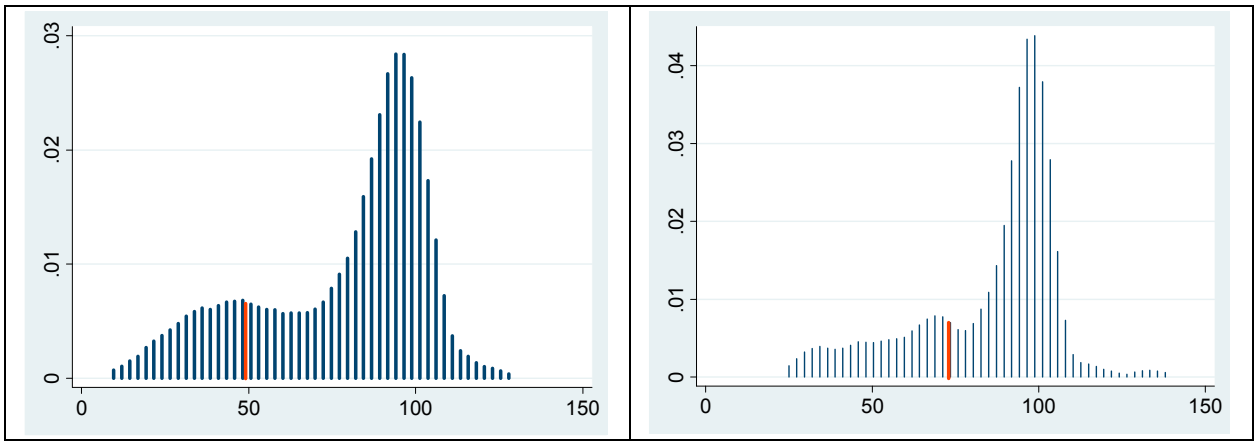
Source: Semlali, H. (2012), "Morocco Case Study: Health Care Environments in Morocco," Global Health Workforce Alliance.

Figure 9. Education Indicators—Kernel Density Charts

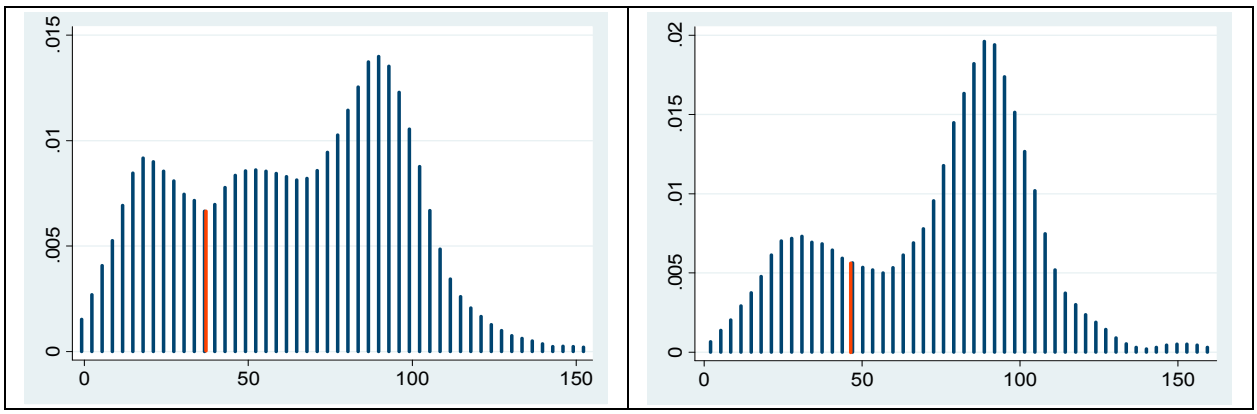
Panel A. Literacy Rate



Panel B. Primary Completion Rate



Panel C. Secondary School Enrollment

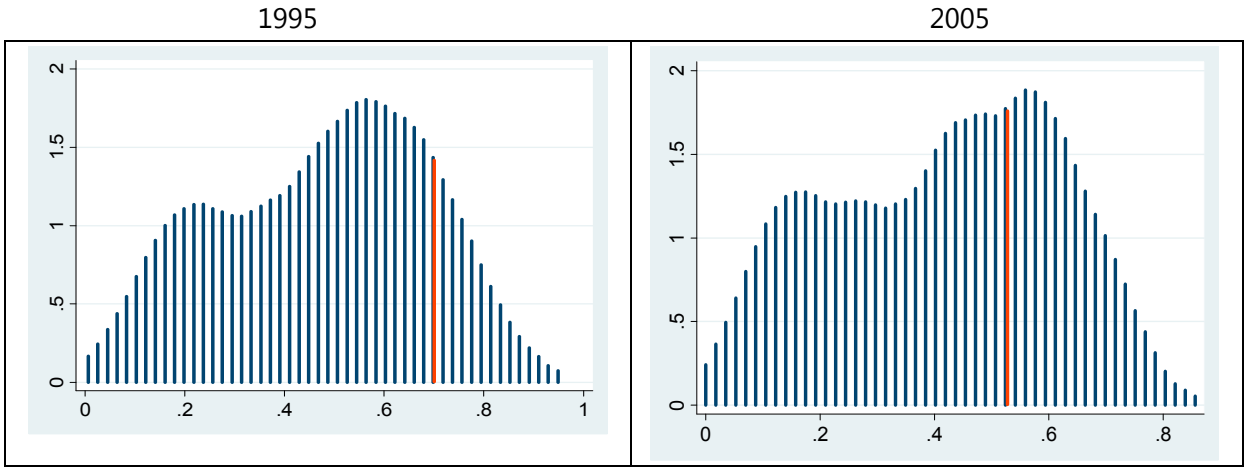


Source: World Bank's World Development Indicators.

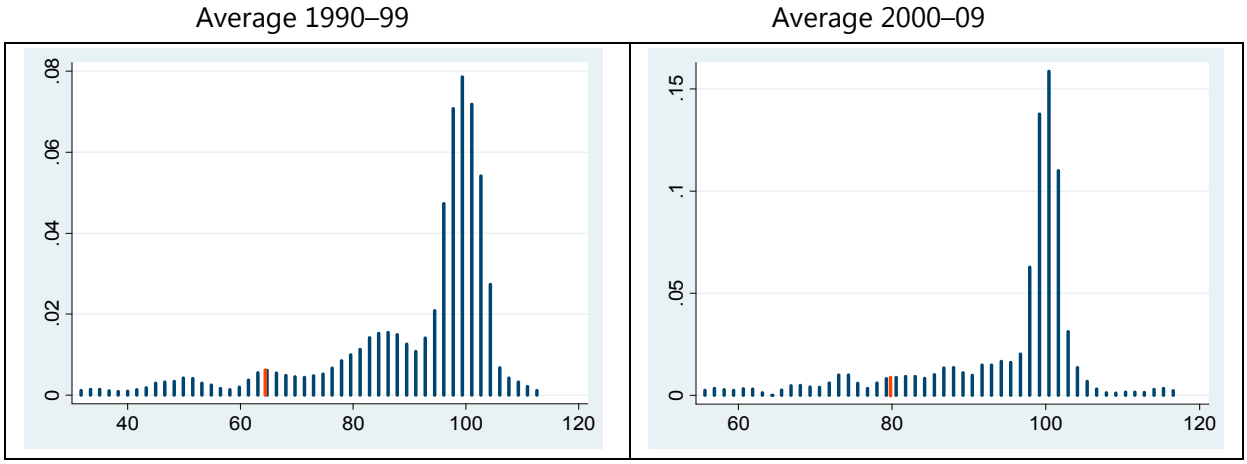
Note: Y-axis= Cross-country Kernel density estimates for an unbalanced sample of emerging market and developing economies; X-axis=variable; ------Morocco.

Figure 10. Gender Indicators—Kernel Density Charts

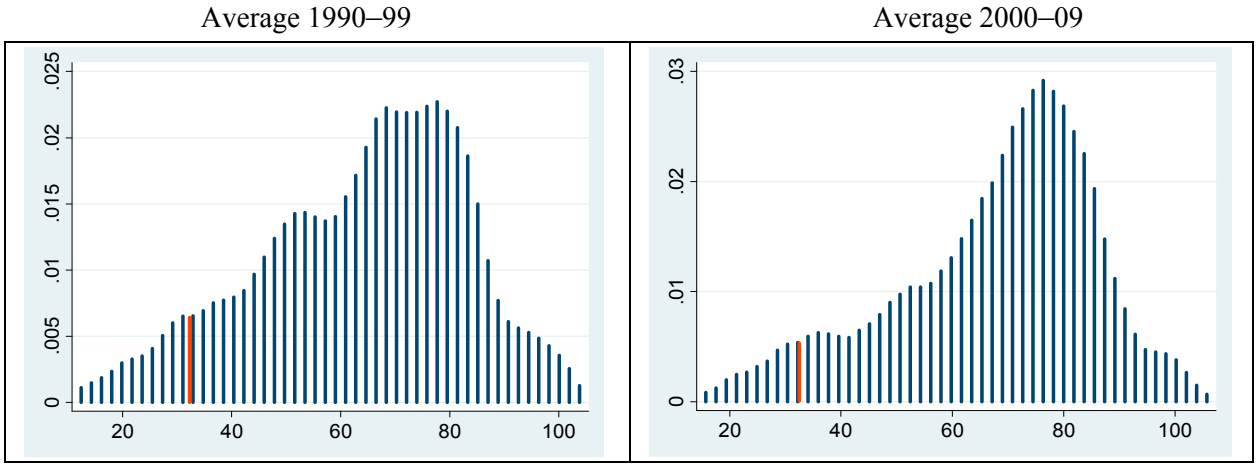
Panel A. UNDP Gender Inequality Index (0-1)



Panel B. Ratio of Young Literate Females to Males (Percent ages 15-24)



Panel C. Participation Rate Ratio of Females to Males



Source: World Development Indicators.

Note: Y-axis= Cross-country Kernel density estimates for an unbalanced sample of emerging market and developing economies; X-axis=variable; -----Morocco.

Table 1. Average Growth, Quarterly Basis			
Period	**Average**	**Median**	**Std. Dev.**
1981–2010	3.89	3.96	1.68
1981–1990	3.89	3.64	1.78
1991–2000	3.19	3.61	1.47
2001–2010	4.60	4.78	1.64
Source: Moroccan authorities; and IMF staff estimates			

Table 2. Unemployment, 2011		
	Unemployment	
	(Percent)	(Millions)
Overall	8.9	1.028
	Unemployment rural vs. urban areas	
	(Percent)	(Millions)
Urban	13.4	0.817
Rural	3.9	0.211
	Unemployment by Gender	
	(Percent)	(Millions)
Male	8.4	0.713
Female	10.2	0.211
	Unemployment by Age Groups	
	(Percent)	(Millions)
15–24	17.9	0.397
25–34	12.9	0.438
35–44	5.2	0.133
45–59	1.8	0.060
	Unemployment by Education	
	(Percent)	(Millions)
No degree	4.0	0.283
Average degree	15.4	0.528
High degree	19.4	0.216
	Unemployment by Duration	
	(Percent)	(Millions)
12 months +	64.8	0.666
Source: Moroccan High Commissariat of Planning (HCP)		

Table 3. Poverty Rate (Percent)						
	Area	1990	1999	2001	2007	2008
Poverty rate based on national poverty line (percent)	National	13.1	16.2	15.3	8.9	8.8
	Urban	7.6	9.5	7.6	4.8	4.7
	Rural	18.0	24.1	25.1	14.4	14.2
Source: Moroccan High Commissariat of Planning (HCP)						

Table 4. GINI Coefficient (Percent)					
	Area	1991	1999	2001	2007
Gini coefficient	National	39	39	41	41
	Urban	38	38	39	41
	Rural	31	32	32	33
Source: Moroccan High Commissariat of Planning (HCP)					

Table 5. Adult Illiteracy Rate (Percent)			
Category	1998	2004	2008
Female	66	60	57
Male	37	34	32
Urban	38	33	32
Rural	72	68	63
National	52	48	45
Source: Moroccan High Commissariat of Planning (HCP)			

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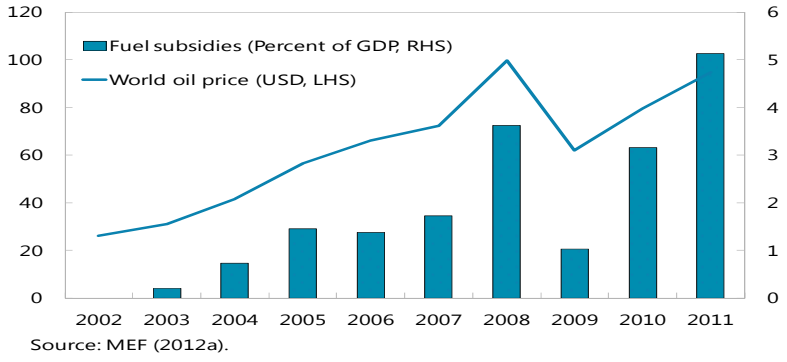
FUEL SUBSIDIES IN MOROCCO: INTERNATIONAL EXPERIENCE AND POSSIBLE WAYS FORWARD[1]

This paper describes the fuel subsidy system in Morocco, introduces an organizing framework to illustrate the trade-offs involved in meeting various economic and social objectives when considering subsidy reform, and highlights some lessons from the international experience in implementing subsidy reforms that may be pertinent to the case of Morocco.

A. Introduction

1. The current Moroccan subsidy system needs urgent reform as it is a drain on the budget, exposes the fiscal position to external shocks, and is an ineffective way to support the poor. The total cost of generalized subsidies reached more than 6 percent of GDP in 2011, with gross fuel subsidies alone accounting for more than 5 percent of GDP (Figure 1).[2] The fiscal deficit and the sustainability of public debt are particularly sensitive to shocks to the international price of oil as expressed in dirham due to the current structure of the subsidy system. Furthermore, fuel subsidies in Morocco are regressive, with disproportionally higher benefits accruing to the relatively wealthier groups, especially for diesel and gasoline (Figure 3). These factors highlight the urgency of a reform of the general subsidy system and the need for a better targeted system of social protection.

Figure 1. Fuel Subsidies in Morocco, 2003-11



Source: MEF (2012a).

[1] Prepared by Samah Mazraani (MCD) and Bruno Versailles (FAD). We thank Jean-Francois Dauphin, Carlo Sdralevich (both MCD), David Coady, and Vimal Thakoor (both FAD) for valuable comments and suggestions. Research assistance from Kadia Kebet and Anna Maripuu is gratefully acknowledged.

[2] Throughout the paper, gross subsidy estimates are inclusive of taxes, i.e. they are calculated as the difference between actual retail prices and the prices implied by a price structure that includes taxes. Net subsidies, on the other hand, are calculated as gross subsidies minus taxes (see Table 1).

2. In considering a successful subsidy reform strategy, there is a variety of tools available to meet a country's unique economic and social objectives. Fuel subsidy reform involves possible trade-offs between different objectives, including: (i) supporting vulnerable households; (ii) ensuring fiscal sustainability; (iii) allowing for efficient allocation of factors of production; and (iv) shielding households from world price volatility. The tools chosen to meet these objectives will be a function of a country's current socio-macro environment and the relative weights given to each objective. The objectives of the subsidy system in Morocco could be better achieved through alternative tools. Between the current system of generalized flat subsidies and a system of fully liberalized prices, the authorities could consider intermediate pricing mechanisms allowing a gradual automatic price adjustment involving some degree of price smoothing, combined with targeted social transfers.

3. Based on international experience, gradual reforms supported by an effective communication strategy tend to be more successful. Once the directions for the reform are clear, the international experience highlights the importance of carefully determining the optimal pace of reform. Gradual reforms have proven generally more successful and durable. In practice, the reform should be sufficiently fast to yield timely benefits (e.g., in terms of fiscal sustainability), while also taking into consideration issues such as institutional capacity, including for the rolling out of mitigating social protection measures, and the need to overcome resistance against the reform. In that respect, a clear communication strategy to explain the need for and direction of the reforms (e.g., cost of subsidies and the mitigating measures envisaged to protect the most vulnerable) is a key element of successful reform.

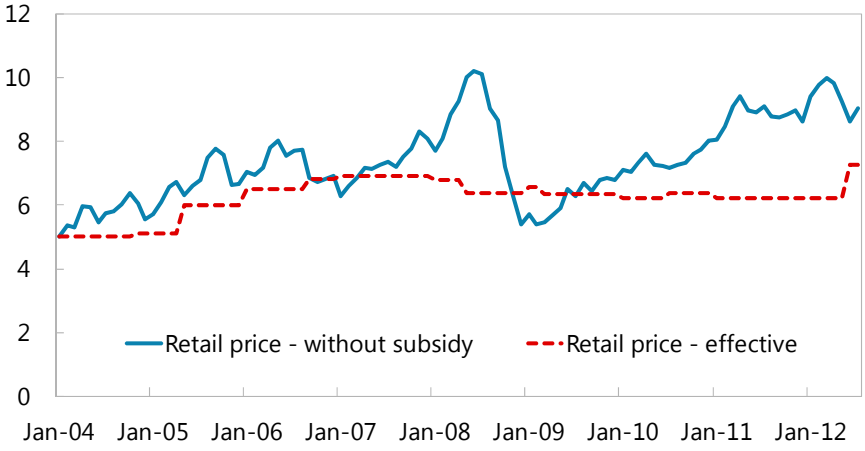
4. The rest of the paper is organized as follows. Section B describes the current system of fuel subsidies in Morocco. Section C illustrates the challenges that the current subsidy system poses to the fiscal position through stress-tests. Section D introduces a conceptual framework to assess tools and objectives related to subsidies and their reform. Section E looks at the reform process, drawing lessons from international experience. Section F concludes.

B. The Current Moroccan Fuel Subsidy System

Pricing structure for petroleum products

5. The current generalized subsidy scheme was introduced in 2000. In 1995, petroleum product prices, with the exception of butane gas, were fully indexed to world prices, but this system was suspended in September 2000 in response to large increases in the world oil price. Since then, retail prices have been fixed by the government, with the difference between the administered price and the recovery price supported by the budget. Figure 2 shows the historical evolution of the discrepancy between actual retail prices and an estimate of the prices without subsidy for a weighted average of liquid petroleum products.

Figure 2. Retail Prices of Liquid Petroleum Products Under Alternative Pricing Mechanisms



Sources: MEF (2012a); and IMF staff calculations.
Note: The series shown are weighted averages of prices of the three main liquid petroleum products consumed in Morocco (gasoline, diesel, and fuel oil).

6. Retail prices of four different types of petroleum products are currently subject to price regulation. These are super, diesel, fuel oil, and butane gas. Even though the import and refining market is free *de jure*, in practice, the oil refinery SAMIR is the only company importing and refining crude. The market for refined products has been liberalized, with imports and distribution assured by 13 petroleum companies and 14 gas companies.[3]

7. Fuel subsidies are based on a pricing structure, with super and diesel cross-subsidizing butane. Table 1 shows the main elements of the pricing structure at end-2011. FOB prices are taken from the Rotterdam market. Distribution companies have been exempted from import duties since 2002 (MEF, 2008). As the poor consume relatively more butane, taxes on super and diesel include an equalization tax to pay for part of the butane subsidy (cross-subsidization). The total gross fuel subsidy amounted to 41.4 billion dirham (5.1 percent of GDP) in 2011 (line 14), while total taxes levied on the respective fuel products amounted to 27.1 billion dirham (line 15).

[3] This paper focuses on consumer subsidies and their impact on the budget, and does not dwell on market structure and the supply side issues.

Table 1. Fuel Price Structure for Retail Sale, end-2011

	Item in the pricing structure		Super (dh / l)	Diesel (dh / l)	Fuel[1] (dh/kg)	Butane > 5 kg (dh/kg)	Butane < 5 kg (dh/kg)	Total
[1]	FOB price[2]		5.94	6.45	4.89	6.83	6.83	
[2]	Freight, port fees, insurance, storage[3]		0.34	0.38	0.38	0.50	0.50	
[3]	Recovery price	= [1] + [2]	6.29	6.83	5.27	7.33	7.33	
[4]	Tax on domestic consumption (TIC)		3.76	2.42	0.18	0.05	0.05	
[5]	Distribution costs and margins[4]		0.78	0.61	0.09	1.51	1.67	
[6]	Equalization fund for butane		0.88	0.11	0.00	0.00	0.00	
[7]	VAT	= ([3]+[4]+[5]+[6]) * 10%	1.17	1.00	0.55	0.89	0.90	
[8]	(Implicit) free market price	= [3]+[4]+[5]+[6]+[7]	12.89	10.97	6.09	9.77	9.95	
[9]	Local retail price (wholesale for butane)		10.18	7.15	3.68	3.14	3.08	
[10]	Gross subsidy (per unit)	= [8] - [9]	2.71	3.82	2.42	6.64	6.86	
[11]	Gross subsidy (percent of free market price)	= [10] / [8]	21%	35%	40%	68%	69%	
[12]	Net tax rate (percent of before-tax price)	= ([4]+[6]+[7]-[10])/([3]+[5]	44%	-4%	-31%	-65%	-66%	
[13]	Consumption (millions)		719	5,444	2,697	897	897	
[14]	Total gross subsidy (billions of dirham)	= [10] * [13] / 1000	1.95	20.79	6.52	5.95	6.16	41.4
[15]	Total tax receipts (billions of dirham)	= [4]+[6]+[7]	4.18	19.21	1.99	0.84	0.85	27.1
[16]	Total net subsidy (billions of dirham)	= [14] - [15]	-2.24	1.57	4.53	5.11	5.31	14.3

Source: Caisse de Compensation.

[1] Aggregate of three categories of fuel: fuel N2, fuel ONE, and fuel Special. The aggregate numbers are estimated using the price structure of fuel N2 as FOB prices, retail prices, and consumption data were not available on a disaggregated basis for all three categories.

[2] Note that the FOB price actually paid by the importing companies is negotiated freely, ie. it can be higher or lower than the reference price, thus with possible losses/gains for those companies.

[3] Includes: 'Fret', 'Taxes Portuaires', 'Frais d'approche', 'Taxe Parafiscale' and 'Remuneration Stockage'.

[4] Includes for the liquid petrol products: 'Credit de droit', 'Frais et marges de distribution', 'Coulage de detaillants', 'Correction pour variation thermique des stocks' and 'marges de detail'. For butane this line includes: 'Credit de droit', 'Coulage emplissage', 'Marges et frais d'emplissage', 'Marge speciale pour financement des stocks', 'Provision de transport en vrac', 'Capsulage bouteilles', 'Frais et marges societes de distribution' and ' Frais et marges depositaires'.

8. In Morocco, net petrol and diesel taxes are below the average for other oil importing countries. The average net tax rates for oil importing countries at end-2007 were 47 percent for petrol and 41 percent for diesel (Table 2). To reach these averages in 2011, Morocco's petrol and diesel retail prices would have had to go up by 2 and 47 percent respectively. According to this benchmark, the implicit loss in tax revenues for 2011 was 18.5 billion dirham (2.3 percent of GDP). This is illustrative, as there is no one optimal fuel tax rate, but relevant as fuel taxes should in general be higher than the average consumption tax (as explained in more detail in Section D below).

Table 2. International Comparison of Net Tax Rates for Petrol and Diesel

	Petrol[1]	Diesel
Oil importing countries (end-2007 figures)	47.0	41.4
Oil exporter countries (end-2007 figures)	21.0	5.5
Total (average of 93 countries, end-2007 figures)	42.9	35.9
Morocco (2011 figures)	44.0	-3.9

Sources: IMF (2008); and IMF staff estimates.
1/ Gasoline for Morocco.

Note: Aggregate net tax rate is the mean tax as a percentage of mean before-tax price (see line [12] in Table 1).

Cost of the Current Fuel Subsidy System

9. The current system is costly, as fuel subsidies:

- ***Are a drain on the budget.*** The cost of subsidies over the past ten years has risen in tandem with movements in world petrol prices. In 2011, gross fuel subsidies were estimated at 41.4 billion dirham, equivalent to 5.1 percent of GDP (Table 1).[4] In comparison, the overall budget deficit in 2011 was 6.8 percent of GDP.

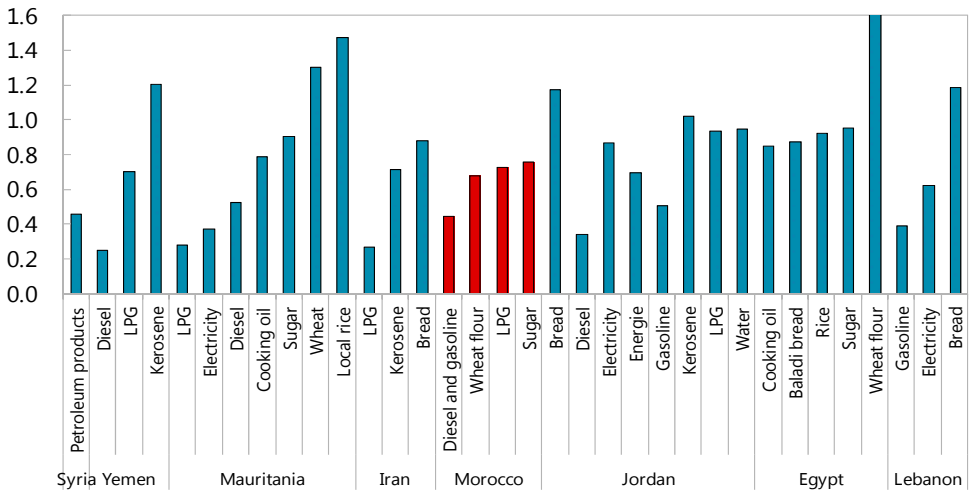
- ***Are not an efficient tool to improve the welfare of the poorest***. The regressive nature of fuel subsidies, i.e. the fact that subsidy benefits increase as income increases, is well documented throughout the literature (see e.g., Coady et al., 2006, and Arze del Granado et al., 2010). In North Africa and the Middle East, this is true for subsidies on most items. For Morocco, diesel and gasoline subsidies are particularly regressive (Figure 3). Since poverty in Morocco remains largely a rural phenomenon, the subsidy system does not help in reducing existing regional disparities in welfare between rural and urbanized areas.

- ***Distort the allocation of resources in the economy.*** The generalized subsidy system leads to higher fuel consumption than in a situation with no subsidy, alters relative prices, and therefore reduces the efficiency of resource allocation in the economy.

- ***Make the budget vulnerable to the volatility in international oil prices.*** Fuel subsidies as implemented in Morocco protect households from erratic movements in international commodity markets, but the volatility is fully transferred to the public sector. This is clearly visible in Figure 4, which shows large volatility in net taxes under the Moroccan system of fixed prices ('Net taxes– effective').

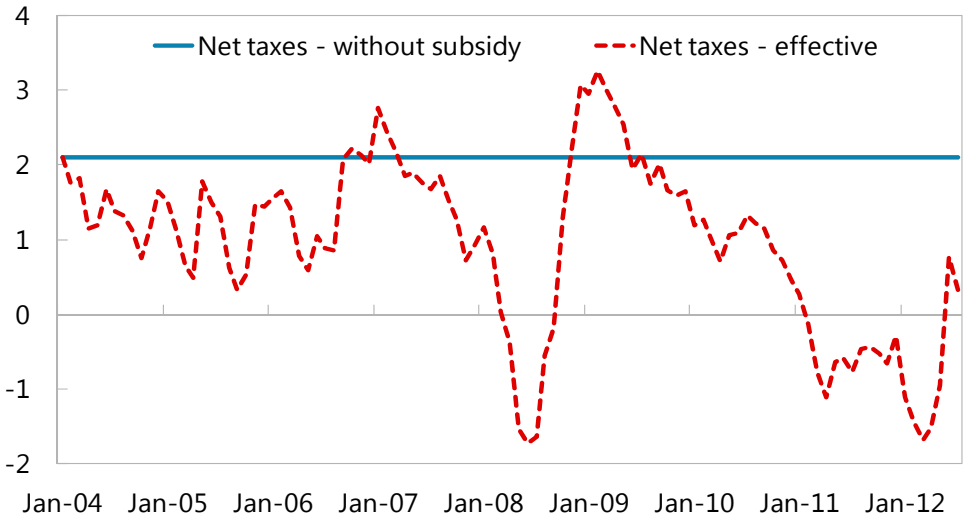
[4] Food subsidies added another 7.8 billion dirham. In terms of budgetary impact, the total of 49.2 billion dirham (6.1 percent of GDP) was only marginally lower than the total public investment budget in 2011 (MEF, 2012b)

Figure 3. Benefit Targeting Indicator for Fuel Subsidies Selected Countries



Sources: Latest available country household surveys; and IMF staff calculations.
Note: The indicator is the ratio of the share of total benefits received by the poor (defined as the bottom 40 percent of the income distribution) to the proportion of the poorest 40 percent households. If the indicator is, subsidy is neutral. A subsidy is progressive if it is greater than 1, and regressive if it is smaller than 1.

Figure 4. Net Taxes of Liquid Petroleum Products Under Alternative Pricing Mechanism
(Dirham per liter, basket)



Sources: MEF (2012a); and IMF staff calculations.

C. Fiscal Implications of the Current System

10. To analyze the budgetary implications of the current fuel subsidy system, several stress-tests are considered that illustrate the urgent need for reform. We consider three stress tests around a baseline scenario: (i) a shock to international oil prices; (ii) a depreciation of the dirham against the dollar; and (iii) a combination of the two. We estimate the impact of the three tests on the net fuel subsidy bill, the budget deficit, and the central government debt over the period 2012–18. Fuel subsidies are estimated using a partial equilibrium analysis based on: (i) December 2012 Brent futures contract prices (baseline); (ii) expected average dirham/US$ exchange rates (baseline); and, (iii) the assumption that the consumption of the five petroleum products remains constant as a share of real nonagricultural GDP, and reacts to domestic price increases reflecting respective price elasticities.[5] Finally, for each stress test, we calculate the necessary price adjustment needed for all petroleum products to return to the baseline scenario levels.[6] Different measures can reduce the fuel subsidy bill, such as the revision of the price structure or the revision of local prices for some fuel products or the reduction in the number or quantity of subsidized goods. For illustrative purposes however, we assume that the adjustments are made solely through retail price increases and that all fuel product prices are revised by a proportional amount in January of each year.

11. The baseline scenario is consistent with the government's target of decreasing the overall subsidy bill to less than 3 percent of GDP by 2017. The authorities have already lowered the fuel subsidy bill by 0.7 percentage point of GDP in 2012 by increasing the prices of three fuel products in June (Figure 6).[7] They intend to further reform the subsidy system and limit the gross subsidy bill (food and fuel) to 4.5 percent of GDP in 2013 and less than 3 percent over the medium term.[8] In our baseline scenario, the Brent price is assumed to remain at the 2011 level of about $113 per barrel in 2012 and to decrease to $106 in 2013 (Figure 7). Under this scenario, fuel subsidies would amount to 5.4 percent of GDP in 2012, and decline to 3.6 percent in 2013 and 2.2 percent by 2018. To achieve the 2013 target, we assume that the prices of all petroleum products (gasoline, diesel, industrial fuel, and butane) would need to increase by around 5.1 percent if implemented in January or 10.2 percent in July to keep the subsidy bill within the budget envelope.[9] Absent any

[5] Goodwin et al. (2004) estimate a range of values for price elasticities between -0.25 and -0.64 based on a review of developed countries. We assume an elasticity of -0.5 for all fuel products.

[6] This exercise is done for illustrative purposes only. To the extent that the 2013 budget envelope and medium-term target of 3 percent includes spending on the planned targeted cash transfers, the price adjustment required would be higher than illustrated here in order to generate the necessary saving to finance the cash transfers. In addition, it is assumed that food subsidies remain constant as a share of GDP at 0.7 percent.

[7] On June 2, 2012, the prices of diesel, gasoline, and fuel oil were increased by 14, 20, and 27 percent respectively.

[8] See paragraphs 18 and 19 of Morocco—Staff Report for the 2012 Article IV Consultation and First Review under the Two-Year Precautionary and Liquidity Line.

[9] It is assumed that quarterly prices are flat in a given year, hence the price adjustment in July is always double that of January.

price increases in 2013, the gross fuel subsidy bill would reach 4.2 percent of GDP, and the debt level would remain relatively flat at about 56 percent of GDP by 2018 (Figure 6 and Tables 4-8). In the baseline scenario, the debt level is expected to gradually decline to reach 53 percent of GDP by 2018 (Figure 6 and Table 6).

12. Shocks to oil prices relative to the baseline would require additional price adjustments to ensure debt sustainability (Figure 8 and Tables 4-8)**.** Two stress tests based on Brent price shocks were simulated: (i) an increase in the Brent price of 5 percent a year starting in 2013 (Test A); and (ii) an increase in the Brent price of 10 percent a year starting in 2013 (Test B). Oil prices have historically witnessed large fluctuations, increasing on average by 16 percent over the last 10 years (Figure 7). Analysts consider that, following a drop in oil production in 2005, increases in future energy prices remain likely.[10] For each stress test, we estimate fuel-related tax revenues and calculate a measure of net fuel subsidies. Under Test B for example, fuel subsidies are estimated to reach about 11 percent of GDP by 2018, while fuel tax receipts would reach 3.3 percent of GDP (compared to the baseline estimates of 2.2 percent and 2.7 percent respectively). This requires a price adjustment of all petroleum products of about 20 percent if implemented in January 2013, and further adjustments every year until 2018. Absent any price revisions and given no policy changes, debt could reach 83 percent of GDP by 2018.

13. Under a stress test of a depreciation of the dirham relative to the dollar in 2013, additional price adjustments would be needed to limit the subsidy cost (Figure 9 and Tables 4-8). As Morocco maintains a fixed exchange rate against a basket composed of the euro (80 percent) and the dollar (20 percent), the dirham/US$ exchange rate could depreciate, among others, following a depreciation of the euro against the US dollar. Two stress tests on exchange rate were prepared: (i) a one-off dirham/US$ nominal exchange rate depreciation of 10 percent relative to the baseline in 2013 (Test C); and (ii) a one-off dirham/US$ nominal exchange rate depreciation of 20 percent relative to the baseline in 2013 (Test D). Under Test D for example, a 20 percent exchange rate depreciation of the dirham relative to the dollar in 2013 would add an annual average of 1.6 percent of GDP to the net subsidy bill, leading to an increase of the debt level of about 8 percentage points of GDP by 2018 relative to the baseline. This would require a one-time price adjustment of all petroleum products of about 23 percent to return to fuel subsidy baseline levels (Figure 10). The sensitivity of the fuel subsidy system to the exchange rate illustrates the importance of making progress on subsidy reform prior to moving to a fully flexible exchange rate.

14. Under a combined worst case stress test with shocks to both oil prices and the exchange rate, significant efforts would be required in 2013 and over the medium term (Figure 10 and Tables 4-8). Two combined stress case tests based on oil price shocks and exchange rate developments were prepared: (i) an increase in the Brent price of 5 percent a year starting in 2013 and a dirham/US$ nominal exchange rate depreciation of 10 percent relative to the baseline

[10] See for instance Kumhof and Muir (2012).

(combining Tests A&C); and (ii) an increase in the Brent price of 10 percent a year starting in 2013 and a dirham/US$ nominal exchange rate depreciation of 20 percent relative to the baseline (Tests B&D). Under the combined Tests B&D for example, the net fuel subsidy cost is estimated to increase to about 10 percent of GDP by 2018, absent any policy measures. In order to return to the baseline subsidy bill of less than 3 percent of GDP over the medium term, a proportional price increase of about 40 percent would be required for all petroleum products in 2013, as well as further price adjustments until 2018.

D. An Organizing Framework of Objectives and Tools

15. Fuel subsidy reform involves possible trade-offs between different objectives, which will need to be settled according to a country's unique socio-economic circumstances. In this section, we introduce an organizing framework to help highlight trade-offs in objectives and inform the choice of tools to meet these objectives. Among the many macroeconomic and social objectives that a country's authorities may choose to pursue, four objectives are particularly relevant to the issue of fuel subsidy: (i) supporting vulnerable households; (ii) ensuring fiscal sustainability; (iii) allowing for an efficient allocation of factors of production; and (iv) shielding households from volatility in world prices.[11] The rows of the table below shows some available policy tools, with the color scheme used indicating whether these tools are considered less conducive (red), reasonable/indifferent (orange) or more conducive (green) to reach the respective objectives. The resulting combination of tools and objectives that a country settles on will be a function of its socio-macro environment (e.g., a country with a high and rising public debt would need to put a stronger premium on reducing the cost of subsidies), the relative weights given to each objective, including to reflect its social preferences, and the level of preparedness to use the respective tools. The rest of this section does not go over every detail of the table below, but highlights some important considerations to keep in mind.

[11] Other important long-run objectives would typically include improving energy efficiency and lowering energy consumption (Dudine et al., 2006), which the Moroccan authorities are pursuing through the development of renewable sources of energy such as solar power generation.

Table 3. Objectives and Tools of Fuel Subsidies

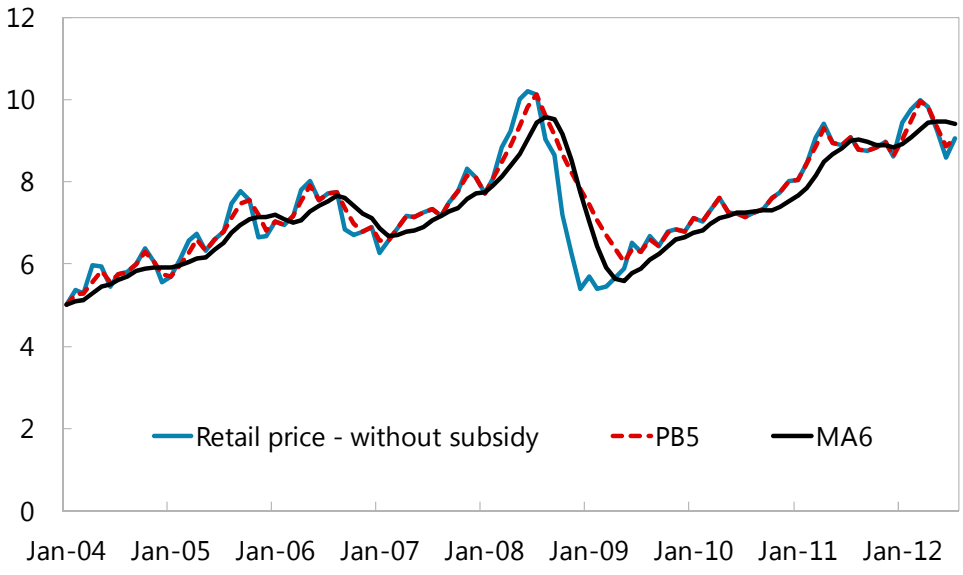
			MACRO-SOCIAL OBJECTIVES			
			Support vulnerable households	Fiscal sustainability	Non-distortive resource allocation	Shield households from price volatility
TOOLS	Price structure of fuel products	a) General subsidies as fixed nominal prices	Does help vulnerable households but is not targeted, so not equitable.	Not sustainable when prices increase on average.	Incentivizes companies to use too much energy inputs as price signal distorted.	Fully shielded (as prices are flat).
		b) Automatic pricing mechanism (with smoothing)	Does help vulnerable households but is not targeted, so not equitable.	Could still be problematic in high price environment.	No distortion to price signals.	No shielding as pass-through is immediate, unless smoothing used.
		c) Fully liberalized prices	Does not specifically help vulnerable households.	No subsidies, so best in terms of fiscal sustainability.	No distortion to price signals.	No shielding as pass-through is immediate and 100 percent.
	Tax regime governing fuel products	a) Excise Tax	Does not specifically help vulnerable households.	Taxes help increase fiscal revenues and thus fiscal sustainability	Distortion in price signals as relative prices are impacted.	Excise tax better than VAT in environment of large price increases, as total tax burden will be lower.
		b) VAT	Does not specifically help vulnerable households.	Taxes help increase fiscal revenues and thus fiscal sustainability.	Does not impact relative prices, unless VAT is different across products.	Does not shield the economy from price volatility.
		c) Cross-subsidization of products consumed relatively more by poor	Will help the vulnerable, but substitution risks.	Typically less costly than subsidy for all fuel products; can be costly if substitution is high.	Does not help, nor hinder the economy to reach allocative efficiency.	Price volatility goes down only for the subsidized products.
	Targeted social protection schemes		If targeted well, best solution.	Can be costly if too generously applied or not well targeted.	No distortion to price signals.	Does not shield the economy from price volatility.
	Hedging of fuel subsidy cost		Helps reduce volatility and thus safeguard fiscal resources for targeted interventions.	Helps reduce volatility, but problematic during long periods of increasing prices.	Does not help, nor hinder the economy to reach allocative efficiency.	Does not reduce volatility in itself, but helps to control subsidy, which does reduce volatility.

16. Between generalized subsidies and a fully liberalized regime, alternative pricing mechanisms can allow automatic adjustment to world prices, while smoothing volatility. Automatic price adjustment mechanisms introduce an explicit link between retail prices and import prices, while leaving a choice on the speed of the pass-through. Coady et al. (2011) describe in detail the different steps needed to implement such a mechanism. Smoothing can be used (i) to ease the transition path towards world prices (assuming retail prices are lower) and/or (ii) to smooth price volatility once retail prices have reached the desired pass-through level. Fully liberalizing prices requires careful preparation and would normally only be considered once appropriate regulatory frameworks are in place (IMF, 2008).[12] Figure 5 shows alternative pricing mechanisms, including

[12] Baig et al (2007) give evidence that liberalized regimes tend to be more politically robust than automatic pricing formulas as it helps de-politicize product prices (see also Section E).

(i) full pass-through ('Retail Price – without subsidy'), (ii) a 6-month moving average of world prices ('MA6'); and (iii) a five percent price band ('PB5'), meaning prices can change by a maximum of five percent at a time.[13]

Figure 5. Retail Prices Under Alternative Smoothing Rules
(Dirham per liter, basket)



Sources: MEF (2012a); and IMF staff calculations.

17. The level and structure of taxes should reflect the revenue efficiency and equity objectives. The following considerations are of particular relevance for fuel taxation.

- Fuel products are typically subject to both ad valorem (e.g., VAT) and specific (e.g., excise) taxes, with the latter seeking to address negative externalities like pollution or traffic congestion. One way to reduce the impact of a price increase is to cut the excise tax when prices go up as the application of the ad valorem tax will increase the retail price proportionally.

- Tax rates on fuel products should be higher than on other goods as fuel demand is typically considered less elastic (Ramsey rule). However, rates should be similar across fuel products as they are thought to be close substitutes, and differentiating rates will thus result in efficiency losses. However, from an equity perspective, products consumed disproportionally more by

[13] Countries such as Chile, Colombia, Malawi, Nigeria, Peru, Thailand and Vietnam, have used smoothing rules to avoid fully passing through sharp increases in world prices.

the poor (e.g., butane) should have lower tax rates.[14] This efficiency-equity trade-off makes it important to explore the possibility of using more efficient direct policy instruments to protect low income households (Coady et al., 2011).

18. Targeted transfers are a better way to support vulnerable households and reduce disparities, but need careful preparation. Generalized fuel subsidies are almost invariably badly targeted, which means that there is typically scope for using some of the budgetary savings to compensate the poorest segments of society. Preparation is key in such targeted interventions, as a system of identifying the poor is needed to make sure the intended population is reached (see Box 4 below). In general, the roll-out of a new country-wide social protection program will need to be accompanied by measures to reinforce administrative capacity to achieve cost-effectiveness.

19. In the face of increasing oil prices, hedging strategies can be used in the short term to limit the exposure of the budget to price volatility. There is a variety of hedging instruments available to manage price volatility. For example, instruments such as forwards, futures, and options can be used by oil importers to provide some temporary relief for the budget against upward movements in oil prices. The optimal instrument should be based on a careful assessment of financial risks and benefits associated with different tools. However, while one can hedge against volatility, hedging cannot substitute needed structural measures in the long run as it cannot insulate the budget from a sustained trend in world prices (see Box 5 and Yépez-García et al., 2012).

E. International Best Practice in Fuel Subsidy Reform

20. A number of lessons can be drawn from the international experience in conducting subsidy reforms. Largely following the organizing framework in Laan et al. (2010), this section presents what could form key elements of a successful reform strategy based on international experience, with specific country examples presented in boxes. The key lessons are that successful reforms include the following elements:

- Undertake comprehensive research to assess the costs and benefits of the current subsidy system and the impact of possible reforms;
- Consult as widely as possible and communicate clearly;
- Decide on the optimal speed of the adjustment;
- Roll-out mitigating and transitional measures, linked to the speed of the adjustment;
- Decide on the institutional set-up, which will be country-specific.

[14] In the long term, substitution possibilities are considered high as higher-income households adjust their consumption to capture benefits of the lower rates.

21. A launching pad for subsidy reform begins research on the costs and benefits of the existing system and the likely impact of reform on the economy. The reform process can be difficult when those among the population who bear the brunt of the fiscal burden are unaware of the opportunity costs involved. In contrast, groups that benefit most (e.g., transport companies) are often vocal and well-organized to protect their benefits. Further, fiscal costs are frequently not transparent (e.g., hidden in state-owned refineries), while the relative benefits to different income categories are often not well understood. In general, reforms will be easier to implement when stakeholders have a better understanding of these costs and benefits (Box 1).

Box 1. Country Examples—Research Efforts on Costs and Benefits of Fuel Subsidies

A comprehensive reform strategy requires a clear assessment of the current subsidy system and of the likely impact of the proposed reforms on the poor, on the fiscal framework and on the macroeconomy. In *Ghana in* 2005 (see Laan et al., 2010) a Poverty and Social Impact Analysis (PSIA) showed how the rich benefited disproportionally from the subsidy and quantified the likely impact of reform on the poor. Communicating this information was crucial for showing the necessity for reform and for designing mitigating measures for the poor. In *India*, a study showing that 40 percent of subsidized kerosene was diverted to the black market and did not reach the intended recipients, triggered government action (Shenoy, 2010). In *Nigeria (2011)*, in contrast, the absence of good quantitative information on the state of the refining industry and the subsidy mechanism itself precluded a transparent discussion on reforms. The National Assembly voted against petrol subsidy removal, claiming a lack of firm data underpinning the size and incidence of subsidies (Ogbu, 2012).

22. Throughout the reform process, it is important to consult widely and communicate clearly. The authorities need to consult with as wide an array of stakeholders (private sector, NGO's, distribution companies and all government bodies involved) as possible. Results from relevant research should be communicated widely; general information about subsidies and the pricing mechanism should become more transparent and published regularly. Publishing such information at regular intervals would also make it easier for the public at large to monitor the subsidy regime and reforms. Further, a clear communication strategy should be implemented that explains the problems with the subsidy and describes the mitigating measures envisaged to protect the most vulnerable, including those expenditures that would be scaled up. The political support of the highest authorities is crucial in this. IMF (2011) reports in a review of 40 country experiences between 2002 and 2006 that the odds of success in subsidy reforms almost triple with strong political support and proactive public communications (Box 2).

Box 2. Country Examples—Consultation and Communication Strategies

Clear communication with stakeholders and the public is a key element of an effective reform strategy. Close consultation with main stakeholders, including inviting them to participate in the formulation of a subsidy reform strategy, can help build consensus for reform. In 1996 in *Namibia,* the National Energy Council established the National Deregulation task force to examine fuel price deregulation through a consultative process involving all stakeholders. This resulted in the 1998 White Paper which stressed the importance of issues such as keeping subsidies to remote areas, transparency and gradual deregulation (Namibia, Ministry of Mines and Energy, 1998). These provisions were key to securing wide-spread support for the reform. In *Niger*, the authorities opted for a similar approach. They set up the "Comité du Differé" in 2010 to discuss how to advance fuel subsidy reform. This committee's role was to ensure that all relevant stakeholders were on board and forge a consensus on the main elements of the reform.

23. There are important trade-offs involved when considering the timing and pacing of the envisaged reforms. Ideally, reforms should be gradual (with frequent price adjustments for moving towards automatic pass-through), sufficiently fast to yield benefits, and slow enough to avoid resistance (Laan et al., 2010). However, the actual pace of reform needs to be calibrated to the prevailing macro-economic environment (e.g., when the fiscal burden of the subsidy scheme becomes too high, the reform strategy should be accelerated). The speed of reform should be in sync with the roll-out of mitigating social protection measures. This is important for managing the fiscal costs involved and for showing to the population that savings are being put to good use so as to make the reform socially acceptable. A period of declining prices might be an opportune moment to introduce automatic pass-through (Box 3).

24. Mitigating measures involve using some of the budgetary savings to accommodate the loss of purchasing power of the most vulnerable. Ideally, targeted social safety nets would already be in place, and the existing system could be expanded. However, typically, many countries that have generalized subsidies do this precisely because they do not have well-functioning social protection mechanisms and lack the capacity to set these up. An overview of such measures that have been put in place is provided in Box 4. Experiences with hedging are listed in Box 5.

Box 3. Country Examples—The Optimal Pace of Reforms

Subsidy reform is likely to be more successful if it is done gradually, as in the cases of Namibia and Brazil. In *Namibia*, the authorities launched the reform process in 1996, with a White Paper published in 1998. However, expenditures related to subsidies started declining only in 2001, reflecting the time needed to build consensus, prepare implementation of the reform, and roll-out mitigating measures in parallel (Bank of Namibia, 2005). *Brazil*'s price liberalization program for petroleum products took even longer—almost ten years (1991–2001). The phased removal followed a political agenda, as the first products to lose subsidies were generally those products used by politically weak stakeholders (see table). Of course, such a gradual approach can only be realized if the fiscal situation allows.

Brazil's Price Liberalization Program for Petroleum Products

Year	Liberalization
1991	lubricants, residuals, kerosene for final consumers
1993	gasoline for airplanes for final consumers
1996	ethanol and gasoline for final consumers
1997	asphalt for final consumers
1998	LPG for final consumers
1999	gasoline and fuel oil at refinery gates
2000	naptha for petrochemicals at refinery gates
2001	gasoline, diesel and LPG prices adjusted to Brent prices every three months

Source: de Oliveira and Laan (2010).

Box 4. Country Examples—Mitigating Measures[1]

Countries have used different methods to mitigate the initial impact on the population of an increase in the retail price of petrol products. This box focuses on the variety of possible strategies. For more detailed country-specific material, see IMF (2008), Kojima (2009) and Laan et al. (2010).

Gabon accompanied the 26 percent increase in gasoline and diesel prices implemented in March 2007 by the following measures:

- National Social Guarantee Fund cash payments to the poor were resumed.
- Assistance to single mothers via an existing program was increased, as was funding for microcredit programs targeting vulnerable women in rural areas.
- Primary school costs were reduced.
- The mass public transport network in Libreville was expanded.

Ghana increased domestic fuel prices by 50 percent in February 2005, while:

- Fees for attending primary and junior-secondary school were eliminated.
- Extra funds were made available for primary health care programs and a rural electrification scheme.
- Investment in the provision of mass urban transport was expanded and expedited.
- A Deregulation Mitigating Levy was introduced in the fuel pricing formula to compensate the poorest.

Mozambique increased fuel prices by 38 percent in 2008. Mitigating measures included the following:

- Budgetary allocations to a range of social protection programs were increased substantially.
- Cash benefits received by beneficiaries of a food subsidy program were increased.
- The National Institute for Social Protection extended its reach.

Indonesia increased domestic fuel prices in both March and October 2005 (more than doubling prices) and again in May 2008 (prices of fuel products were increased by 25–33 percent). Offsetting measures included:

- A temporary cash transfer program to 19 million poor families, was implemented in 2005, and again in 2007.
- Some budgetary savings from reducing subsidies were reallocated to existing education, health, and infrastructure programs that disproportionally benefit low- and middle-income households.
- Kerosene subsidies were reduced, while the use of LPG as an alternative fuel source was promoted.

[1] Adapted from Coady et al., 2011.

Box 5. Country Examples—Hedging of Fuel Price Volatility

Some countries have used hedging strategies to reduce the impact of volatile world prices on the budget. *Ghana* has been using a hedging scheme since October 2010, using call options to provide some temporary protection to its fiscal accounts against upward movements in oil prices. This is used to cover temporary delays in adjusting domestic petroleum product prices to cost-recovery levels. Recently, the pass-through of price increases has increasingly been delayed, with the cost covered by a combination of hedging revenue and other budgetary means. The less frequent price adjustments have exhausted hedging profits and increased the fiscal burden. The hedging strategy seems to have worked well up to the point where delays in adjusting prices upwards became too large for the hedging revenue to compensate (IMF, 2012).

Sri Lanka started using hedging as a strategy against price volatility in 2007. Hedging went well until oil prices began to collapse in September 2008, with Sri Lanka incurring very large losses, and abandoning its hedging strategy. Kojima (2009) points out that the large losses were a result of a misconceived hedging strategy, which underscores the point of building the necessary technical capacity before using hedging tools.

25. Transitional measures can help dampen the effect of increased prices, and add to the credibility of the reform process. Such measures include:

(i) Improve targeting by narrowing the scope of existing subsidies to products that are most important for the poor (e.g., kerosene/butane and food subsidies);

(ii) Cap quantities of subsidized products at subsistence consumption levels (IMF, 2011) (e.g., LPG in India and diesel for bus companies in Mauritius);

(iii) Add a line in the pricing formula for a specific tax to use for compensating the most vulnerable (e.g., Ghana).

(iv) Introduce smoothing mechanisms to cushion the impact of sudden large price increases (see above);

(v) Provide support to the clearest losers of the reforms (see Box 4).

Measures that typically take longer to implement include conditional cash transfers (which for example replaced generalized subsidies successfully in Mexico) and improved infrastructure and government services, which requires stronger government capacity in general and a better PFM system in particular (IMF, 2008).

26. The institutional set-up for an effective subsidy reform depends on country-specific circumstances. Making the subsidy reform durable is challenging. A key stylized fact is that countries with a past history of fuel subsidies find it difficult not to revert to a subsidy regime when world prices increase at a fast pace. Of crucial importance is that the authorities continue consulting and communicating even when the automatic fuel pricing mechanism is operational. An inclusive

approach will help the authorities to face new situations, e.g. when there is next a large oil price increase (Box 6).

Box 6. Country Examples—Durability of Reform and Institutional Set-Up

Making the subsidy reform durable is challenging. This is particularly so in an environment of fast increasing world oil prices. Numerous countries for example abandoned their reform strategies in the face of the rapid oil price increases in 2008 (Kojima, 2009). Also, countries that were deemed successful reformers at one point, e.g. Ghana and Indonesia, have reverted to ad-hoc price adjustments and increased subsidies in recent years.

A thoughtful institutional set-up can help to make the reform successful and sustainable but should not be expected to solve all underlying governance issues, as the following examples show. In *Tanzania (2007)*, a specialized regulatory agency was established to keep the public informed about the price structure of fuel products and to review the proper functioning of the market (Kojima, 2009). This played a positive role in the reform implementation. In *Ghana (2005)* a semi-independent National Petroleum Authority was set up to administer the pricing framework (Laan et al, 2010). The decision to adjust pump prices remained with the executive however, which has increasingly made use of this prerogative and has changed retail prices in an ad-hoc manner in recent years, partly undoing the success of the initial reforms (IMF, 2012).

F. Conclusion

27. Fuel subsidies have a significant fiscal impact in Morocco and need urgent reform. Fuel subsidies cost around 5.3 percent of GDP in 2012. With the overall fiscal deficit projected to be close to 6 percent, the subsidy is a key weak spot in Morocco's fiscal framework. The overall goal of the reform is to transition towards an automatic fuel pricing mechanism, while putting in place mitigating measures to protect the country's poorest.

28. More gradual reforms tend to be more successful, but the pace of the reform has to be consistent with fiscal sustainability. As stressed in section E of this paper, gradual reforms have better odds of enduring. Morocco started such a gradual process in June 2012, when domestic prices for petrol, diesel and fuel oil were significantly increased. The authorities aim to reduce overall subsidies to 4.5 percent of GDP in 2013 and 3 percent of GDP by 2016, consistent with their overall effort to rebuild fiscal buffers and ensure fiscal sustainability. Such effort will help remove an important weakness in the current fiscal framework, which is illustrated by the stress tests developed in Section C.

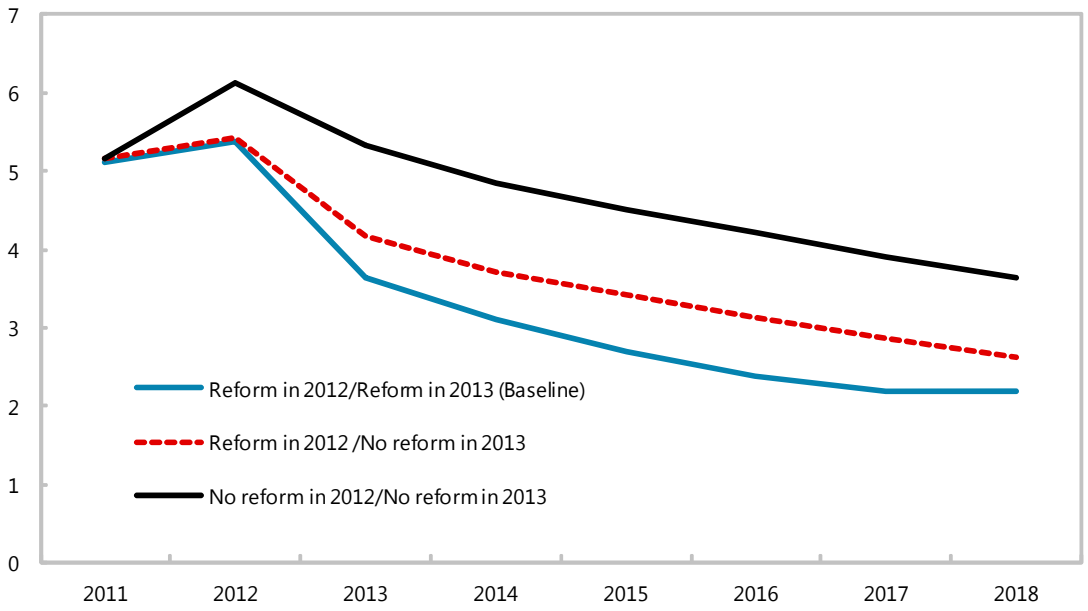
29. Mitigating measures, such as the roll-out of the envisaged cash transfers, need to be well coordinated with the rest of the strategy. From the points of view of both fiscal sustainability and social acceptance of the reform, the rolling back of the generalized subsidies needs to be well coordinated with the rolling out of the targeted social protection schemes. Other measures could be designed to reduce the impact of the volatility of world petrol prices. These include a range of

pricing mechanisms such as different smoothing rules that are characterized by imperfect pass-through of world prices to domestic prices, as well as hedging.

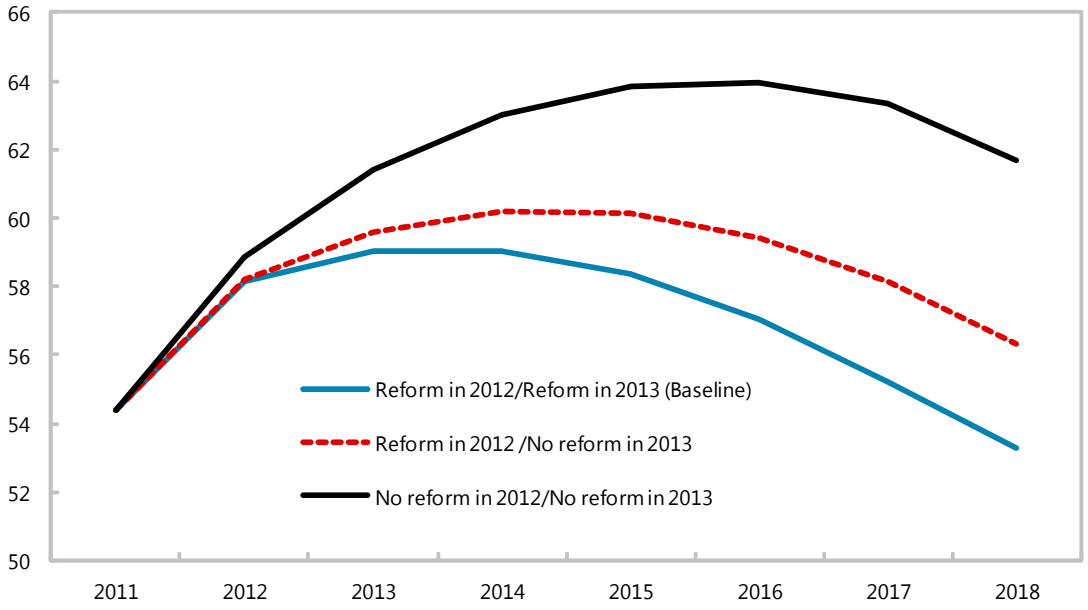
30. A key element of the subsidy reform should be a clear communication strategy. Effective communication is important to explain the cost of the subsidies (as was done for instance in an annex to the 2013 budget law) and to making the case for the directions of the reform. The authorities' planed wide consultations with stakeholders will be very important in that regard.

Figure 6. Baseline Framework

Gross Fuel Subsidy
(Percent of GDP)

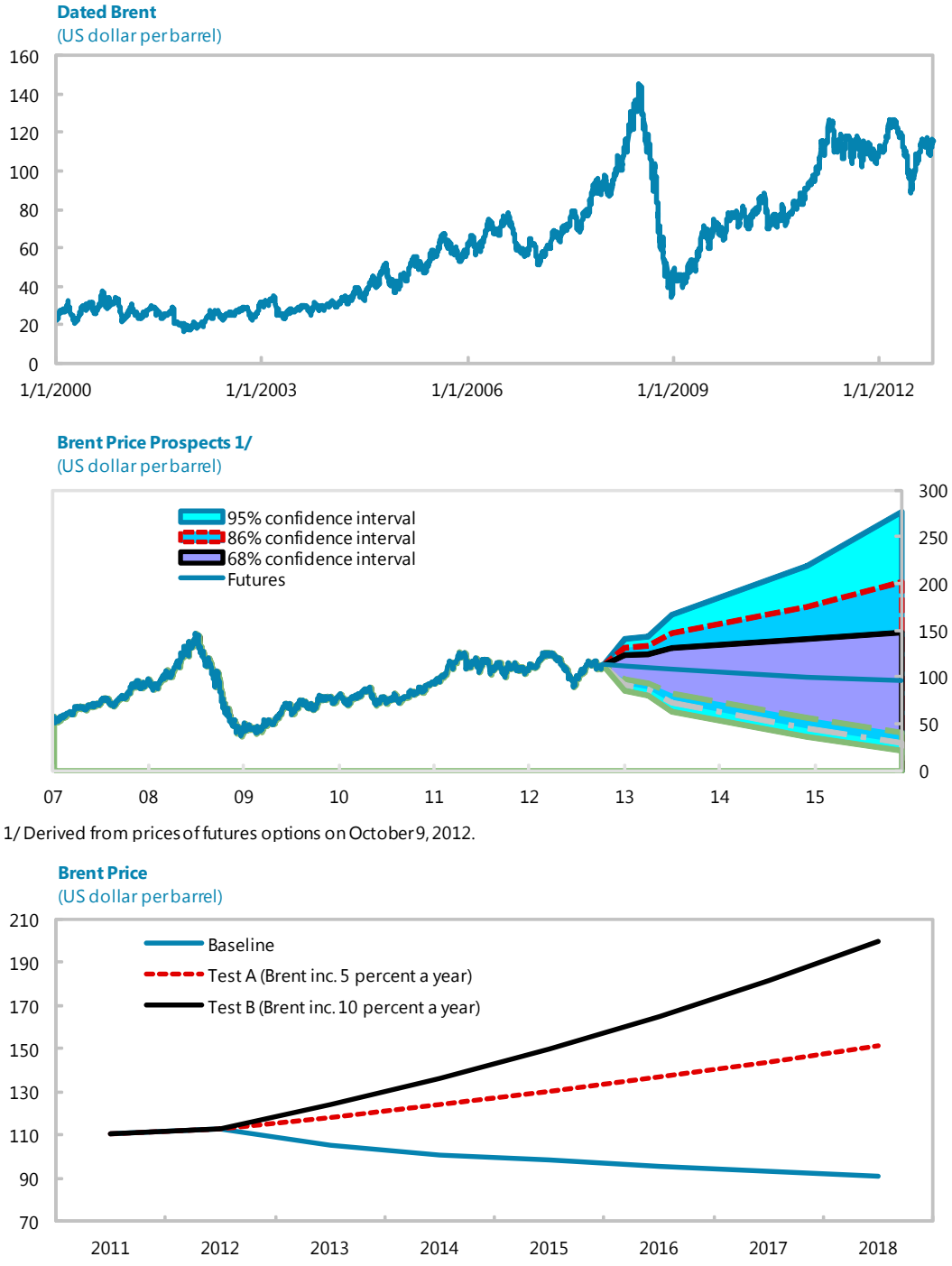


Public Debt
(Percent of GDP)



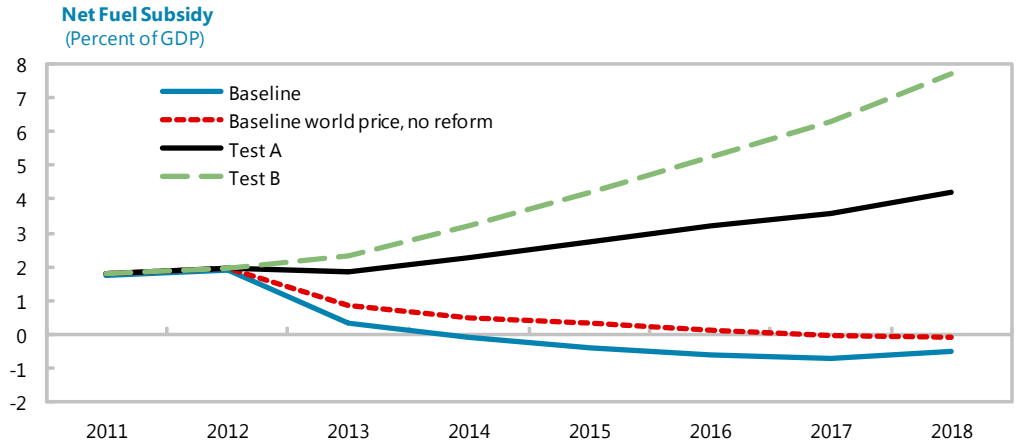
Source: Authors' estimates.

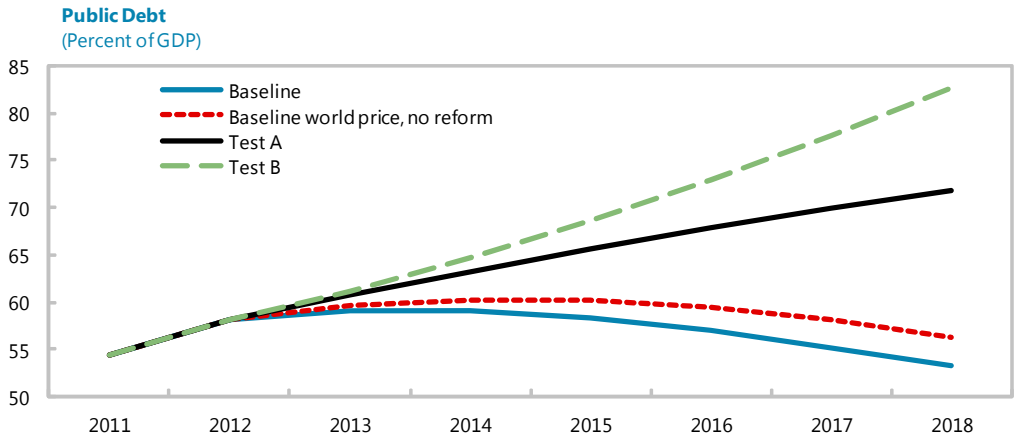
Figure 7. Brent Price Historical and Stress Tests

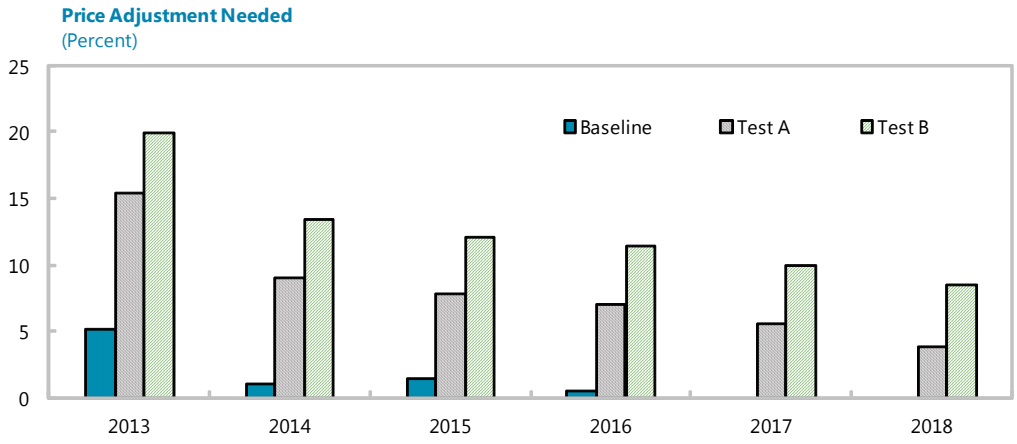


Sources: Bloomberg; and IMF staff estimates.

Figure 8. Brent Price Stress Implications



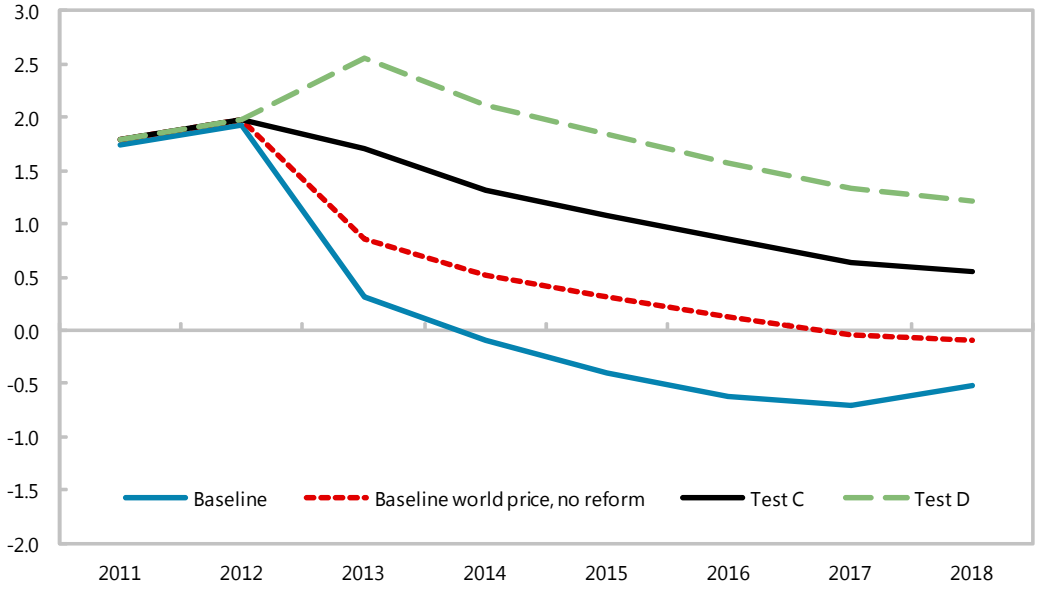




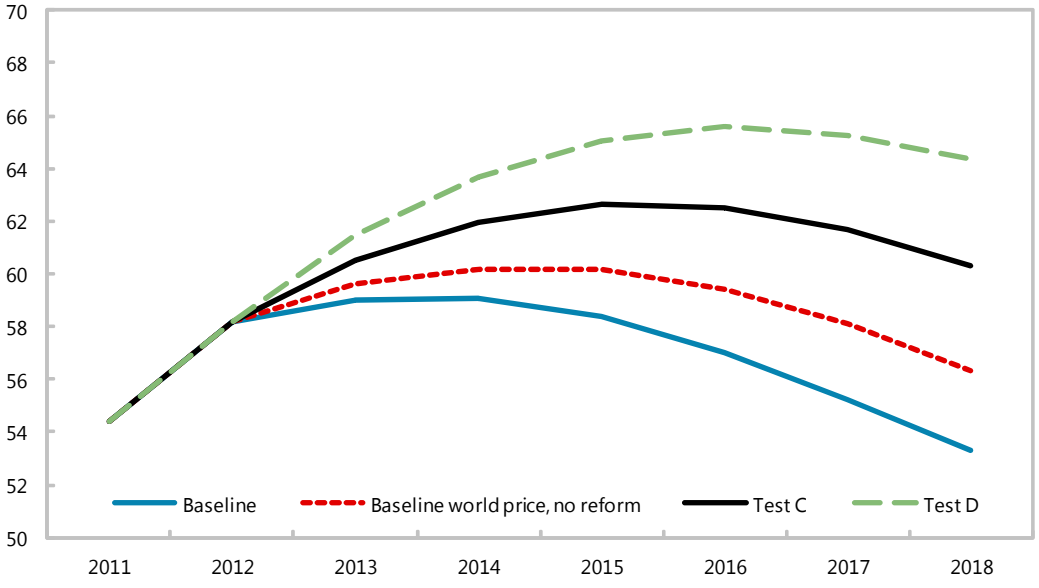
Source: Authors' estimates.

Figure 9. Exchange Rate Stress Tests

Net Fuel Subsidy
(Percent of GDP)

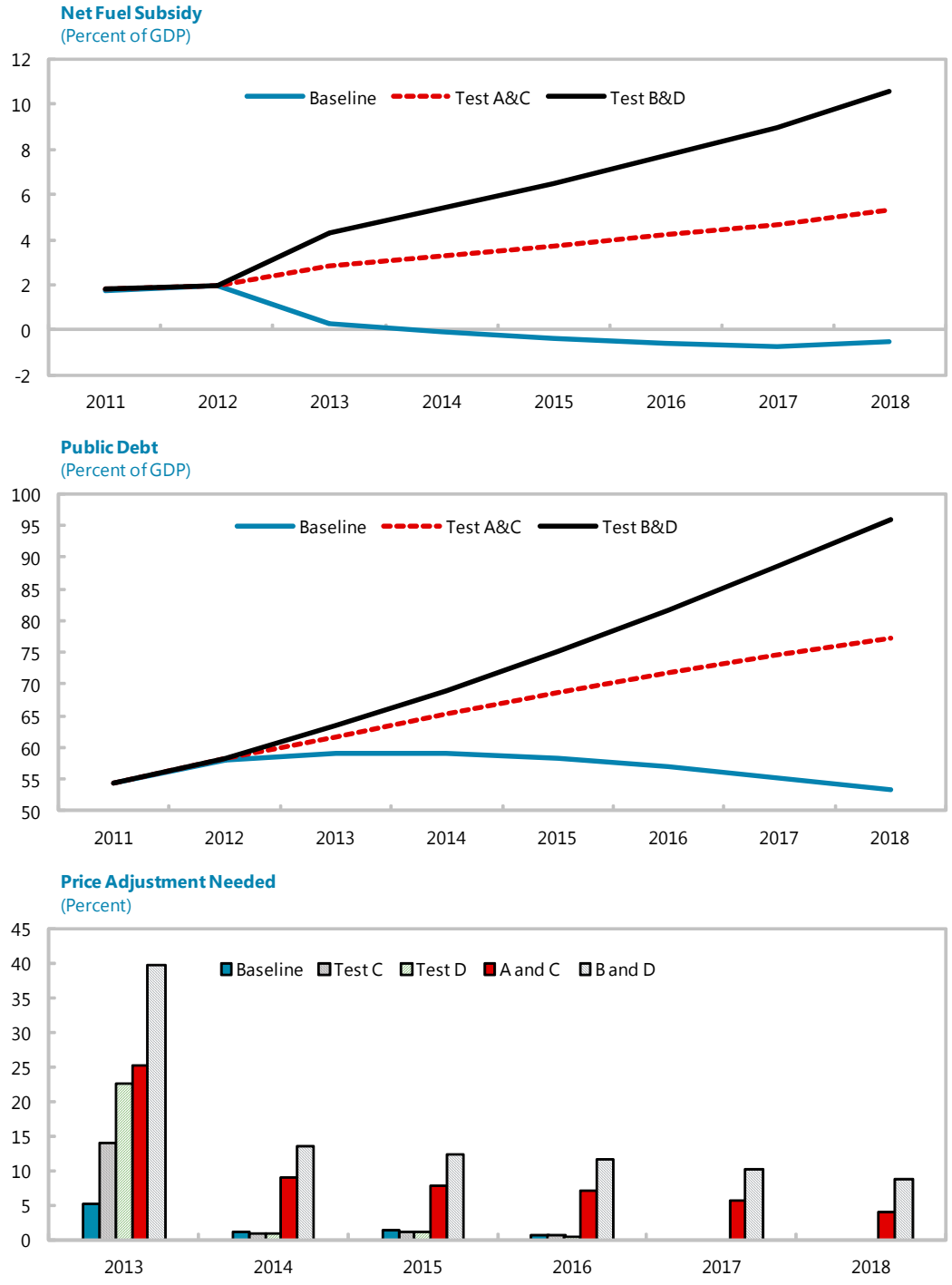


Public Debt
(Percent of GDP)



Source: Authors' estimates.

Figure 10. Combined Stress Tests



Source: Authors' estimates.

Table 4. Net Fuel Subsidy Bill
(Percent of GDP)

	2011	2012	2013	2014	2015	2016	2017	2018
Baseline	1.8	2.0	0.3	-0.1	-0.4	-0.6	-0.7	-0.5
Baseline world price, no reform	1.8	2.0	0.9	0.5	0.3	0.1	0.0	-0.1
Test A (Brent increases 5 percent a year)	1.8	2.0	1.9	2.3	2.7	3.2	3.6	4.2
Test B (Brent increases 10 percent a year)	1.8	2.0	2.3	3.2	4.2	5.3	6.3	7.7
Test C (10 percent depreciation in 2013)	1.8	2.0	1.7	1.3	1.1	0.9	0.6	0.6
Test D (20 percent depreciation in 2013)	1.8	2.0	2.6	2.1	1.8	1.6	1.3	1.2
Test A&C	1.8	2.0	2.8	3.3	3.7	4.2	4.7	5.3
Test B&D	1.8	2.0	4.3	5.4	6.5	7.7	9.0	10.6

Table 5. Central Government Deficit
(Percent of GDP)

	2011	2012	2013	2014	2015	2016	2017	2018
Baseline	6.8	6.1	4.7	4.1	3.5	3.0	2.7	2.4
Baseline world price, no reform	6.8	6.1	5.2	4.7	4.2	3.8	3.3	2.8
Test A (Brent increases 5 percent a year)	6.8	6.1	6.3	6.6	6.9	7.1	7.3	7.4
Test B (Brent increases 10 percent a year)	6.8	6.1	6.8	7.7	8.5	9.4	10.3	11.2
Test C (10 percent depreciation in 2013)	6.8	6.1	6.2	5.5	5.0	4.5	4.1	3.5
Test D (20 percent depreciation in 2013)	6.8	6.1	7.1	6.4	5.9	5.3	4.8	4.2
Test A&C	6.8	6.1	7.4	7.7	8.0	8.2	8.5	8.6
Test B&D	6.8	6.1	9.0	10.0	11.0	12.1	13.2	14.3

Table 6. Central Government Debt
(Percent of GDP)

	2011	2012	2013	2014	2015	2016	2017	2018
Baseline	54.4	58.2	59.0	59.0	58.4	57.0	55.2	53.3
Baseline world price, no reform	54.4	58.2	59.6	60.2	60.2	59.4	58.1	56.3
Test A (Brent increases 5 percent a year)	54.4	58.2	60.7	63.2	65.6	67.8	69.9	71.8
Test B (Brent increases 10 percent a year)	54.4	58.2	61.2	64.7	68.6	72.9	77.5	82.6
Test C (10 percent depreciation in 2013)	54.4	58.2	60.5	61.9	62.6	62.5	61.7	60.3
Test D (20 percent depreciation in 2013)	54.4	58.2	61.5	63.7	65.1	65.6	65.3	64.4
Test A&C	54.4	58.2	61.8	65.2	68.6	71.7	74.6	77.4
Test B&D	54.4	58.2	63.4	69.1	75.2	81.7	88.6	95.9

Table 7. Price Adjustment Needed
(January; percent)

	2011	2012	2013	2014	2015	2016	2017	2018
Baseline			5.1	1.0	1.3	0.5	0.0	0.0
Baseline world price, no reform			0.0	0.0	0.0	0.0	0.0	1.0
Test A (Brent increases 5 percent a year)			15.4	8.9	7.7	6.9	5.5	3.7
Test B (Brent increases 10 percent a year)			19.9	13.3	12.0	11.4	10.0	8.4
Test C (10 percent depreciation in 2013)			13.9	0.8	1.1	0.5	0.0	0.0
Test D (20 percent depreciation in 2013)			22.5	0.7	1.0	0.3	0.0	0.0
Test A&C			25.0	8.9	7.7	6.9	5.6	3.9
Test B&D			39.6	13.4	12.3	11.6	10.2	8.6

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