CHAPTER 3

Macroeconomic, Environmental, and Social Implications

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HOW SUBSIDIES DEPRESS GROWTH

Energy subsidies depress growth through a number of channels. The effects of subsidies on growth go beyond their adverse impact on fiscal balances and public debt (Kumar and Woo, 2010). Subsidies can discourage investment in the energy sector, crowd out other public spending that would enhance growth, create incentives for smuggling, and over the long term diminish the competitiveness of the private sector.

Subsidies can discourage investment in the energy sector. Low and subsidized prices for energy can result in lower profits or outright losses for producers, making it difficult for state-owned enterprises (SOEs) to expand energy production and unattractive for the private sector to invest in either the short term or the long term (Box 3.1). The result is severe energy shortages that hamper economic activity.[1]

Subsidies can crowd out growth-enhancing public spending. Some countries spend more on energy subsidies than on public health and education (Figure 3.1). Reallocating some of the resources freed by subsidy reform to more productive public spending could help boost growth over the long term.

Subsidies also diminish the competitiveness of the private sector over the longer term. Although in the short term subsidy reform will raise energy prices and increase production costs, over the longer term there will be a reallocation of resources to activities that are less energy and capital intensive and more efficient (Box 3.2), helping spur the growth of employment. Removing energy subsidies helps prolong the availability of nonrenewable energy resources over the long term and strengthens incentives for research and development in energy-saving and

[1]Both households and firms spend considerable amounts to address electricity shortages, including through the purchase of generators. For example, in the Republic of Congo, private household and enterprise generator capacity is nearly double the public generation capacity. The cost of own generation by firms is estimated in the range of US$0.3–US$0.7 per kWh—about three to four times as high as the price of electricity from the public grid (Foster and Steinbuks, 2008). These costs are even higher for households because of the smaller generators they use.

Box 3.1 Electricity Subsidies and Growth in Sub-Saharan Africa

Electricity subsidies in sub-Saharan Africa (SSA) are substantial and primarily reflect high costs of production. The average cost of subsidized electricity prices in a sample of 30 countries was 1.7 percent of GDP, and in 12 countries it exceeded 2 percent of GDP. On average, the effective tariff in SSA was only about 70 percent of the cost-recovery price during 2005–9. The primary driver of high subsidies has been high costs, rather than low retail prices—residential tariffs in SSA countries are much higher than in other regions of the world. High costs stem from operational inefficiencies, extensive use of backup electricity generation, low economies of scale in generation, and limited regional integration. Therefore, in addition to increasing tariffs, reducing subsidies will require improving operational efficiency and modernizing electricity operations.

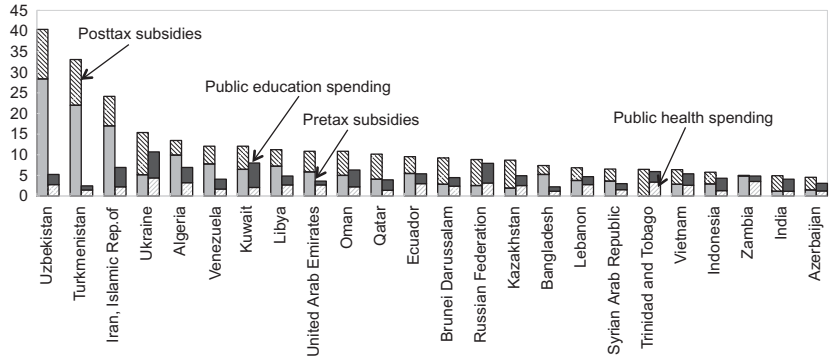
The losses incurred by electricity suppliers owing to subsidized prices have severely constrained their ability to invest in new electricity capacity and improve service quality. As a result, installed per capita generation capacity in SSA (excluding South Africa) is about one-third of that of South Asia and one-tenth of that in Latin America. Similarly, per capita consumption of electricity in SSA (excluding South Africa) is only 10 kWh per month, compared with roughly 100 kWh in developing countries and 1,000 kWh in high-income countries.

Deficient electricity infrastructure and shortages dampen economic growth and weaken competitiveness. Weaknesses in electricity infrastructure are correlated with low levels of productivity (Escribano, Guasch, and Pena, 2008). For example, potential efficiency gains in electricity generation and distribution could reduce costs in the sector by more than 1 percentage point of GDP for at least 18 SSA countries. Simulations based on panel data in Calderón (2008) suggest that if the quantity and quality of electricity infrastructure in all SSA countries were improved to that of a better performer (such as Mauritius), long-term per capita growth rates would be 2 percentage points higher.

alternative technologies. Subsidy reform will crowd in private investment, including in the energy sector, and benefit growth over the longer term.

Finally, subsidies create incentives for smuggling. If domestic prices are substantially lower than those in neighboring countries, there are strong incentives to smuggle products to higher-priced destinations. Illegal trade increases the budgetary cost for the subsidizing country while limiting the ability of the country receiving smuggled items to tax domestic consumption of energy. Fuel smuggling is a widespread problem in many regions around the world, including in North America, North Africa and the Middle East, parts of Asia, and sub-Saharan Africa. For example, Canadians buy cheap fuel in the United States; Algerian fuel is smuggled into Tunisia; Yemeni oil is smuggled into Djibouti; and Nigerian fuel is smuggled into many West African countries (Heggie and Vickers, 1998).[2]

[2]In 2011, it was estimated that more than 80 percent of gasoline consumed in Benin was smuggled from Nigeria (IMF, 2012e).



Sources: Clements, Gupta, and Nozaki (2012); IEA, *World Energy Outlook 2012*; IMF staff estimates; OECD; World Bank.
Note: Health and education spending are for 2010 or latest available.

Figure 3.1 Posttax Subsidies and Social Spending, 2010 (Percent of GDP)
Subsidies are substantially higher than critical social spending in many countries.

Box 3.2 Energy Subsidy Reform and Competitiveness

The short-term effects of higher energy prices on competitiveness depend on the energy intensity of traded sectors and developments in energy prices in competing countries. Increases in energy prices to reduce subsidies—or to avoid the emergence of subsidies in periods of rising international prices—increase production costs. The effects on costs will vary by sector, depending on both their direct use of energy (e.g., fuel products) and indirect use (e.g., the higher costs of intermediate inputs that use fuel) (Gupta, 1983; Dick and others, 1984). Higher fuel prices, for example, can lead to higher electricity prices, which in turn will affect costs and output in manufacturing (e.g., Clements, Jung, and Gupta, 2007). The use of input–output tables can often be helpful to trace the direct and indirect effects of higher energy prices on costs and competitiveness and to quantify which sectors will be most affected. The effect of higher energy prices on competitiveness depends on developments in energy prices in countries competing for the same markets. If all countries pass on the increase in international prices to domestic prices, for example, the effects on production costs may be similar across countries.

The adverse effects on competitiveness, at the aggregate level, can be reduced if appropriate macroeconomic policies are in place. The extent to which higher energy costs result in a persistently higher price level and adversely affect competitiveness will depend on the strength of "second round" effects on wages and the prices of other inputs (Fofana, Chitiga, and Mabugu, 2009). If prices rise relative to those in trading partners, the real exchange rate will appreciate, reducing competitiveness. These second-round effects can be contained with appropriate monetary and fiscal policies that help anchor inflationary expectations (IMF, 2012d). Subsidy reform helps support an appropriate fiscal policy response by reducing budget deficits and helping contain demand pressures on prices. Flexible exchange regimes also mitigate the impact of volatile international prices on economic growth (IMF, 2008).

Box 3.2 (continued)

The resources freed from subsidy reform can boost competitiveness over the longer term. Subsidy reform can contribute to lower budget deficits and interest rates, thus stimulating private investment (Clements, Jung, and Gupta, 2007; Fofana, Chitiga, and Mabugu, 2009). Furthermore, if part of the freed resources is invested in productivity-enhancing public spending, growth dividends can be high (Lofgren, 1995; Breisinger, Engelke, and Ecker, 2011). By removing distortions in price signals, subsidy reform can help reallocate resources toward their best use and improve incentives to adopt energy-saving technologies. Not all sectors will benefit from subsidy reform over the longer term, because those that cannot adapt to higher energy prices will suffer a loss of competitiveness. Yet in the aggregate, the effects on competitiveness are positive. Empirical estimates suggest that higher investment in more efficient and energy-saving technologies could boost growth by up to 1 percent over the long term (von Moltke, McKee, and Morgan, 2004; United Nations Environment Program, 2008; Burniaux and others, 2009; Ellis, 2010).

HOW SUBSIDIES EXACERBATE MACROECONOMIC IMBALANCES

By diluting incentives to reduce domestic energy consumption, the incomplete pass-through to domestic consumers of increases in international energy prices worsens the adverse balance-of-payments impact in oil-importing economies. It also reduces the beneficial balance-of-payments impact in oil-exporting countries. In the latter, the failure to fully adjust domestic prices during periods of rising international prices can make demand management more difficult when higher oil prices boost incomes in the oil sector and lead to higher domestic demand (Gelb and others, 1988). Allowing domestic prices to rise with international prices can help cool off domestic demand during commodity booms and build up fiscal buffers for use during periods of declining prices. To offset concerns about the transmission of high international price volatility to domestic prices, some smoothing of price increases can be considered (see Chapter 4).

OVERCONSUMPTION OF ENERGY AND ITS CONSEQUENCES

The negative externalities from energy subsidies are substantial. Subsidies cause overconsumption of petroleum products, coal, and natural gas and reduce incentives for investment in energy efficiency and renewable energy. This overconsumption in turn aggravates global warming and worsens local pollution. The high levels of vehicle traffic that are encouraged by subsidized fuels also have negative externalities in the form of traffic congestion and higher rates of accidents and road damage. The subsidization of electricity can also have indirect effects on global warming and pollution, but this will depend on the composition of energy

sources for electricity generation. The subsidization of diesel promotes the overuse of irrigation pumps, resulting in excessive cultivation of water-intensive crops and depletion of groundwater.

Eliminating energy subsidies would generate substantial environmental and health benefits. To illustrate the impact of subsidies on global warming and local pollution, this study estimated the effects of raising energy prices to levels that would eliminate tax-inclusive subsidies for petroleum products, natural gas, and coal (see Appendix B).[3] The results suggest that this reform would reduce CO_2 emissions by over 5 billion tons, representing a 15 percent decrease in global energy-related CO_2 emissions. Eliminating subsidies would also generate significant health benefits by reducing local pollution from fossil fuels in the form of SO_2 and other pollutants. In particular, this reform would result in a reduction of 12 million tons in SO_2 emissions and a 16 percent reduction in other local pollutants.

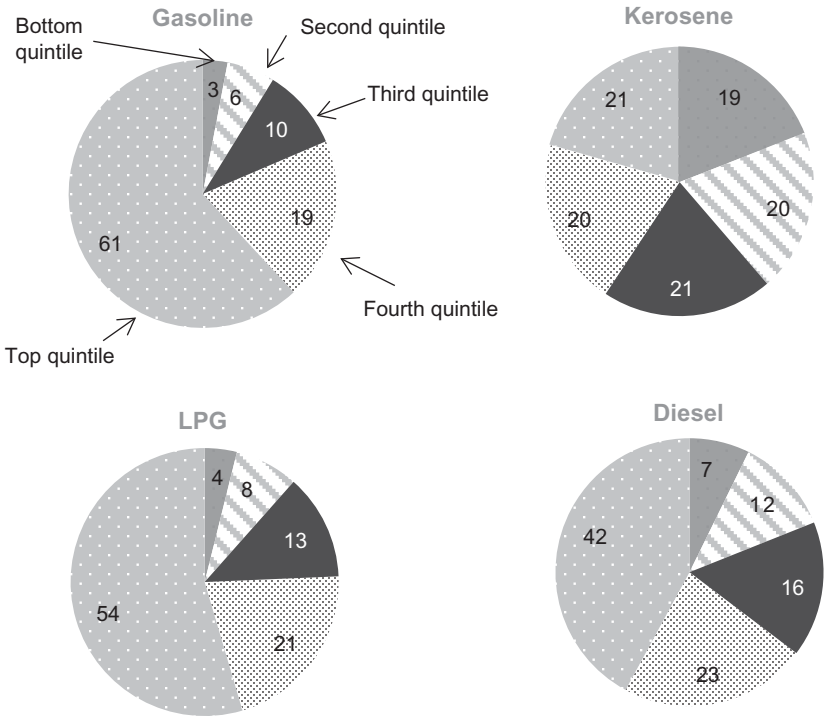
The overconsumption of energy products owing to subsidies can also have effects on global energy demand and prices. The multilateral removal of pretax fuel subsidies in non-OECD countries, under a gradual phasing out, would reduce world prices for crude oil, natural gas, and coal by 8 percent, 13 percent, and 1 percent, respectively, in 2050 relative to the no-change baseline (OECD, 2009; IEA, 2011c). The reduction would be substantially larger if prices were raised to levels that eliminated subsidies on a posttax basis. These spillover effects suggest that nonsubsidizers would share the gains from subsidy reform, as well as extending the availability of scarce natural resources.

EQUITY IMPLICATIONS

Energy subsidies are highly inequitable because they mostly benefit upper-income groups. Energy subsidies benefit households both through lower prices for energy used for cooking, heating, lighting, and personal transport and through lower prices for other goods and services that use energy as an input. On average, the richest 20 percent of households in low- and middle-income countries capture six times more in total fuel product subsidies (43 percent) than the poorest 20 percent of households (7 percent) (Figure 3.2).

The distributional effects of subsidies vary markedly by product, with gasoline being the most regressive (i.e., subsidy benefits increase as income increases) and kerosene being progressive. Subsidies to natural gas and electricity have also been found to be badly targeted, with the poorest 20 percent of households receiving 10 percent of natural gas subsidies and 9 percent of electricity subsidies (IEA, 2011a). Although subsidies primarily benefit upper-income groups, a sharp increase in energy prices can nevertheless have a significant impact on the budgets of poor households, both directly through the removal of the subsidies and indirectly through the reduction in real income because of higher consumer prices. For

[3]The impact of electricity subsidy removal is not assessed because of data limitations.



Source: Arze del Granado, Coady, and Gillingham, 2012.
Note: LPG = liquefied petroleum gas.

Figure 3.2 Distribution of Petroleum Product Subsidies by Income Groups (Percent of total product subsidies)
The distribution of subsidies varies across products, with gasoline being the most regressive and kerosene the most progressive.

example, a US$0.25 per liter increase in fuel prices can reduce real consumption of the poorest 20 percent of households by about 5.5 percent (Arze del Granado, Coady, and Gillingham, 2012).

This underscores the need for mitigating measures to ensure that fuel subsidy reform does not result in increased poverty (Sterner, 2012). In the case of electricity, the ability to differentiate tariff levels according to consumption levels (e.g., a lifeline tariff) can help protect low-income groups during electricity subsidy reforms. Nevertheless, such subsidies do not reach poor households that have no access to electricity, which limits the subsidies' progressivity. For example, only 30 percent of households are connected to the grid in sub-Saharan Africa (International Finance Corporation, 2012).

Energy subsidies divert public resources away from spending that is more propoor. In many subsidizing countries, equity could be improved by reallocating outlays toward better-targeted programs in health, education, and social protection. Over the longer term, the removal of subsidies, accompanied by a well-

designed safety net and an increase in pro-poor spending, could yield significant improvements in the well-being of low-income groups. In oil-exporting countries, subsidies are often used as a tool for sharing oil wealth with citizens. But given the inefficiencies that subsidies create in resource allocation and the high share of benefits that accrues to upper-income groups and in some countries to the expatriate population, energy subsidies are a much less effective policy instrument for distributing wealth than other public spending programs.