

# The Quest for Subsidy Reforms in Libya

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## Abstract

Shortly before the 2011 Libyan revolution, consumers' subsidies were rapidly increased by the regime in an effort to reduce social discontent. In the aftermath of the revolution, these subsidies became important for people's subsistence, but also a very heavy burden for the state budget. Since then, the Libyan government has been confronted with the necessity of reforming subsidies in a politically and socially complex environment. This paper uses household survey data to provide a distributional analysis of food and energy subsidies and simulate the impact of subsidy reforms on household wellbeing, poverty, and the government's budget. Despite the focus on direct effects only, the results indicate that subsidy reforms would have a major impact on household welfare and government revenues.

The elimination of food subsidies would reduce household expenditure by about 10 percent and double the poverty rate while saving the equivalent of about 2 percent of the government budget. The elimination of energy subsidies would have a similar effect on household welfare, but a larger effect on poverty while government savings would be almost 4 percent of the budget. The size of these effects, the weakness of market institutions, and the current political instability make subsidy reforms extremely complex in Libya. It is also clear that subsidy reforms will call for some form of compensation for the poor, a gradual rather than a big bang approach, and a product-by-product sequence of reforms rather than an all-inclusive reform.

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## 1. Introduction

Libya has a long history with consumers' subsidies covering food and energy products. Subsidies were first introduced in the early 1970s and continued with various degrees of coverage until the late 2000s when a first serious attempt to reform the system was launched. This reform process was quickly reversed shortly before the 2011 revolution in an attempt to reduce social discontent. This could not stop the revolution and resulted in a major cost to the state budget during the post-revolution period already characterized by a declining economy and political instability.

Subsidies have not been the only source of economic distortions in Libya under Gadhafi's rule and the combination of subsidies and other distortionary policies has deprived the Libyan economy of the very fundamental set of incentives that drives a market economy while making both the population and private firms dependent on the state's support (Chami et al, 2012; Charap, 2013). Functioning markets are among the foundations of functioning democracies and a reform of the subsidy system is a step forward in the direction of a functioning state, but subsidy reforms are politically complex and economically costly for the population and cannot be implemented without a preliminary assessment of the reforms' implications.

This paper provides for the first time a distributional analysis of food and energy subsidies in Libya and simulates the impact of subsidy reforms on household wellbeing, poverty and the government's budget. We assess the benefit that different population income groups derive from subsidies; the social cost of subsidy reforms for the different segments of the population; and the government gain from increases in prices of subsidized goods. Information on the distributive incidence of subsidies and the social impact of reforms is essential to design compensation mechanisms that may accompany subsidy reforms and alleviate the burden of reforms for the poor. This paper provides some tentative estimates of the effect of cash compensations and also some considerations on how subsidy reforms could be implemented.

Despite the focus on direct effects only, the results indicate that subsidy reforms would have a major impact on household welfare and government revenues. The elimination of food subsidies would reduce household expenditure by about 10% and double the poverty rate while saving the equivalent of about 2% of the government budget. The elimination of energy subsidies would have a similar effect in terms of household welfare but a larger effect on poverty while government savings would be almost 4% of the budget. The size of these effects, the weakness of market institutions and the current political instability make subsidy reforms extremely complex in Libya. It is also clear that subsidy reforms will call for some sort of compensation in cash, a gradual rather than a big bang approach and a product-by-product sequence of reforms. This paper provides an initial set of considerations that can be used by policy makers for preparing a reform plan.

The paper is structured as follows. The next section presents an overview of Libya's food and energy subsidy program and its evolution. Section 3 introduces the baseline data and assumptions made. Sections 4 and 5 present the results for the distributive incidence of subsidies and reform simulations for food and energy subsidies, respectively. Section 6 discusses the political economy of reforms and Section 7 summarizes the main findings and lays out considerations for possible future subsidy reforms.

## 2. Evolution of subsidies

Libya's ample subsidy program dates back to 1971 when a national institute was created to oversee consumption of essential goods. The system covers a number of food and energy products, as well as public services (water, sanitation, education and garbage collection), medicines and animal feed. Subsidies are regulated by a compensation fund that determine prices with the objective of keeping essential consumption items at affordable prices and protect consumers from major global price shocks.

Food subsidies have significantly increased in recent years, imposing a toll on the government's budget. Data from Libya's Price Regulation Fund show that the nominal cost of food subsidies has increased from under 172 million LYD in 2001 to over 2 billion LYD in 2012. Over the years, the basket of subsidized goods has seen some variation, from a minimum of 3 to a maximum of 13 products with flour, semolina, and rice consistently subsidized throughout the last decade. A process of subsidy reforms took place between 2005 and 2010 but, at the outbreak of the revolution, these reforms were rolled back almost entirely. This led to a significant increase in the cost of food subsidies from 1.1% of GDP in 2010 to 2% of GDP in 2012 (Table 1). As a share of government expenditure, food subsidies also doubled from 2 to 3.8 percent between 2010 and 2012. Flour, sugar, rice, vegetable oil and semolina represent the lion's share of the cost of food subsidies to the government.

**Table 1: Government Expenditure on Food Subsidies 2001-2012 (Millions LYD)**

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011*	2012*
Wheat	12	99	-31	77	0	0	0	0	0	0	n.a.	n.a.
Flour	124	151	338	527	491	390	467	925	953	703	n.a.	n.a.
Sugar	11	22	39	44	55	54	107	0	0	0	n.a.	n.a.
Rice	8	52	46	104	101	108	97	141	236	187	n.a.	n.a.
Olive and other vegetable oils	-6	5	99	165	120	116	134	0	0	0	n.a.	n.a.
Tea	18	11	15	31	17	41	34	0	0	0	n.a.	n.a.
Tomato paste	9	9	16	0	0	0	0	0	0	0	n.a.	n.a.
Dry yeast	0	1	4	11	10	17	13	0	0	0	n.a.	n.a.
Evaporated milk	-7	3	56	147	0	0	0	0	0	0	n.a.	n.a.
Semolina	0	4	37	48	37	68	43	50	144	58	n.a.	n.a.
Miscellaneous	4	2	6	6	7	7	7	0	0	0	n.a.	n.a.
Pasta	0	0	0	42	0	0	0	0	0	97	n.a.	n.a.
<b>Total</b>	<b>172</b>	<b>357</b>	<b>625</b>	<b>1,202</b>	<b>839</b>	<b>801</b>	<b>902</b>	<b>1,117</b>	<b>1,333</b>	<b>1,046</b>	<b>1,414</b>	<b>2,046</b>
<i>in percent of GDP</i>										1.1	3.3	2.0
<i>in percent of government expenditure</i>										2.0	4.8	3.8

Source: Data provided by Libya's Price Regulation Fund, obtained from the Central Bank of Libya. \* Data for 2011-12 are preliminary. For 2001-2010, the breakdown refers to the Price Regulation Fund's operational balance, a proxy for the cost of subsidies to the government since the Fund is responsible for buying the commodities on the international market and distributing them to the cooperatives. A negative number therefore indicates an operational surplus for that particular commodity and year, which could be due to accumulated inventories from previous years.

Food subsidies vary between 39% and 96% of the market price and they are well above 80% for most products (Table 2). They are administered under a system of individual quotas regulated by the Ministry of Economy. Subsidized food products are made available in fixed per-capita quantities at cooperatives throughout the country, except for subsidized flour used to bake bread which is distributed to bakeries directly. Quotas are identical for all individuals, and have remained unchanged for more than a decade.

The quantities are very generous and exceed an individual’s nutritional needs.<sup>4</sup> As indicated in Table 2, these quantities generate about 4,570 calories per person per day—more than double the level recommended by the WHO or the FAO. Initially, eight food products were made available under this system: flour, wheat, barley, rice, oil, sugar, tea and salt. But the list gradually increased over the years, to include items like pasta, coffee, tomato paste, milk for children, and others.

**Table 2: Food Subsidies and Quotas (2008-2012)**

	Subsidized price (Libyan Dinars per kg*)	Market price (Libyan Dinars per kg*)	Subsidy (percent of the market price)	Quota Enforced (in kilograms* per person per month)					Generated calories (per person per day)
				2008	2009	2010	2011	2012	
Flour for individuals	0.090	1.030	91	3.00	3.00	3.00	3.00	3.00	407
Flour for bakeries	0.037	0.959	96	12.00	12.00	12.00	12.00	12.00	1628
Yeast for bakeries	1.350	5.345	75	not subsidized	not subsidized	not subsidized	0.06	0.06	...
Semolina	0.080	0.911	91	1.00	1.00	1.00	1.00	1.00	137
Rice	0.140	1.559	91	2.50	2.50	2.50	2.50	2.50	347
Sugar	0.250	1.318	81	not subsidized	not subsidized	not subsidized	2.00	2.00	1067
Tea	1.500	5.097	71	not subsidized	not subsidized	not subsidized	0.20	0.20	13
Pasta	0.200	1.394	86	1.50	1.50	1.50	1.50	1.50	206
Vegetable oil	0.600	3.402	82	not subsidized	not subsidized	not subsidized	1.50	1.50	173
Tomato paste	0.600	2.141	72	not subsidized	not subsidized	not subsidized	1.00	1.00	433
Milk for children	7.500	12.250	39	not subsidized	not subsidized	not subsidized	3.20	3.20	...
Milk, condensed	0.975	2.622	63	not subsidized	not subsidized	not subsidized	1.23	1.23	159

\* For vegetable oil the unit is liter

Source: Information provided by Libyan Authorities during World Bank missions; FAO (2003) and World Bank staff calculations.

Despite some attempts to control the food subsidy system, significant leakages and abuse are believed to occur. Individuals need to be members of a cooperative to be able to shop there. However, individuals are also able to buy these goods on the free market at liberalized prices, so that not all Libyans are cooperative members, particularly among wealthier households. Nonetheless, while there are no centralized membership records or other mechanisms to control “double-dipping”, Libyan authorities estimate that the total number of cooperative members in the country exceeds the population size, suggesting that abuses of the quota system are widespread.

Energy subsidies were also introduced in 1971 and are currently administered by the National Oil Corporation under the authority of the Ministry of Oil. They include five products: gasoline, diesel, liquefied petroleum gas (LPG), kerosene and electricity. Between 1995 and 2000, subsidies on these products were already on the rise increasing from around 234 million dinars in 1995 to 404 million in 2000 and with the largest subsidies accorded to diesel and electricity (Waniss and Erling, 2007). But the largest increases occurred during the 2000s before the revolution because of the inability of the regime to increase retail prices during the global rise in oil prices. Energy subsidies continued to increase after the revolution reaching an estimated peak of 6.3 billion dinars in 2012. Energy products are universally

<sup>4</sup>The quantities provided within the quota system are not negligible. For example, a family of four is entitled to the following quotas at subsidized prices each month: 8 kg of sugar, 800 gr. of tea, 4 kg of tomato paste, 6 liters of vegetable oil, 10 kg of rice, 12 kg of flour, 4 kg of semolina and 6 kg of pasta. These quantities are not small and can cover well above the total amount of calories necessary for a family of four for a period of one month.

subsidized, at rates exceeding 85 percent of the products' market value (Table 3), with the highest subsidies provided for LPG and kerosene.

**Table 3: Energy Prices and Subsidies (2013)**

	Subsidized price (Libyan Dinars per unit)	Market price (Libyan Dinars unit)	Subsidy (percent of the market price)
Gasoline (Liters)	0.150	1.072	86
Diesel (Liters)	0.150	1.110	86
Electricity (kWh)	0.020	0.156	87
LPG (Liters)	2.000	20.939	90
Kerosene (Liters)	0.090	1.089	92

Source: Libyan Authorities and World Bank staff calculations. Market prices refer to first quarter 2013.

It is important to stress that estimates of subsidies in Libya vary significantly across sources. For example, government figures for 2012 indicated that the total amount for food and energy subsidies in 2012 was 9.5 billion dinars, equivalent to about 9.2 percent of GDP,<sup>5</sup> while the IMF, by including estimates on electricity and other subsidies, reaches an amount of 14.8 billion dinars or 13.8% of GDP (IMF, 2013). These estimates vary in absolute terms and relatively to GDP. Absolute estimates vary partly due to what is considered a subsidy and partly on whether subsidies include or exclude administrative costs. Estimates of subsidies as percentage of GDP can also vary because GDP figures are themselves volatile estimates in Libya due to weak national accounts and the prominence of oil as a source of revenues. Despite these caveats, it is clear that consumers' subsidies in Libya are among the highest in the North Africa and Middle East (MENA) region (Zaptia 2013).

### 3. Baseline data, assumptions, and limitations

The analysis provided in this paper is based on the 2007-08 Libyan Household Expenditure Survey (LHES), with all figures presented in the distributional and simulation analyses estimated at 2013 prices. This survey is the most recent household expenditure survey administered by the national statistical agency, and the only survey available in Libya today for this type of analysis. Data are projected from 2008 to 2013 using official population estimates and IMF estimates for inflation and real GDP growth for the period 2008-2013. Table 4 shows the parameters used for the 2008-2013 extrapolations.

**Table 4: Parameters used for the 2007-2013 extrapolations**

	2007	2008	2009	2010	2011	2012	2013
Gross domestic product (in billions of LYD/constant prices)	44.5	45.7	45.3	47.6	18.1	36.9	44.4
Inflation (average percent change in CPI; base year 2003)	112.0	123.7	126.7	129.8	150.5	159.6	162.8
Population (in millions)	6.0	6.2					6.4

Source: International Monetary Fund, World Economic Outlook Database, April 2013, and Libyan authorities.

<sup>5</sup> Preliminary data on government spending in 2012 indicated that food, electricity, and other energy subsidies cost respectively 2.1 billion, 1.1 billion and 6.3 billion dinars to the budget.



The paper focuses on direct effects of subsidy reforms.<sup>6</sup> This is not a major constraint for the case of food subsidies, but is an important limitation for energy subsidies. Given that food subsidies in Libya are subject to a quota system, the share of subsidized food products that could be used in the production of other goods is likely to be negligible.<sup>7</sup> For example, although sugar can be an input to the production of many processed food products, the quota system in place makes it unlikely that sugar used in food production is actually bought at subsidized prices. We will therefore assume that indirect effects for food are relatively small.<sup>8</sup>

The treatment of bread in the analysis requires a number of assumptions. We have information on subsidized prices and quantities of flour (and yeast) for bakeries, both of which are supposed to be used in making bread, but we only have household expenditure data on bread. We translate the flour subsidy into a bread subsidy as follows. We estimate that 1kg of bread requires 1 kg of flour, and given disparate prices of bread across bakeries in Tripoli we assume that a 100-gramme baguette is sold for 5 Libyan cents. Therefore, the price of a kilogram of bread is 0.5 Libyan dinars. We are therefore able to map the household expenditure on bread into first a quantity of bread (using the 5 Libyan cents per 100-gramme baguette) and then into a quantity of flour, and present these information under the heading “Flour\_bread” in the tables below.

While it is reasonable to assume that indirect effects are small in the case of food products, they are likely to be significant in the case of energy products. This is because energy subsidies in Libya are universal and very large in magnitude, and energy products are an important input in a number of production processes. Thus, the effect of increasing energy prices on consumer prices is likely large, particularly if producers pass on the associated increases in production costs to consumers. However, input-output data for the Libyan economy were not available and indirect effects could not be estimated.

The survey data suggest that Libyan households are large and their aggregate consumption is a low share of GDP (Table 5). Libya has a small population, estimated at just below 6.4 million people and about one million households. Aggregate annual household expenditure is estimated at 12.5 billion LYD, implying that annual expenditure per capita is about 1,967 LYD. Households that belong to the bottom two quintiles (the poorest households) are very large in size, at 9.5 and 7.4 members per household, respectively. On average, these household sizes are larger than those in neighboring countries. For example, household size in Morocco is 6.5 for the first quintile and 5.9 for the second quintile, while in Tunisia these figures are 5.8 and 5.0, respectively. Aggregate household expenditure is only about 12% of GDP.<sup>9</sup> This is atypical of the North African region, where surveys indicate that household expenditure is usually around two-thirds of GDP; but it is not totally surprising when we look at comparative data for

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<sup>6</sup> Direct effects represent the impact of subsidies via subsidized products consumed by households. Indirect effects represent the impact of subsidies via non-subsidized products consumed by households that use subsidized products as a production input.

<sup>7</sup> Anecdotal evidence suggests that because not all households actually take advantage of the quota system for their food purchases, some of the surplus subsidized food ends up being used as cattle feed, or input to the production of sweets in bakeries for the case of sugar and flour. However there are no data available to quantify these observations and if animal raising and bakeries are household activities, these effects would be captured in the direct effects estimations. A share of subsidized food products is reportedly smuggled and sold illegally in supermarkets, thereby depressing market prices, so some effect from removing subsidies on these products may filter through to market prices, but that effect is likely very small.

<sup>8</sup> We note here that this paper’s analysis does not capture the administrative costs of subsidies, which may be large given the system of quotas administered through cooperatives.

<sup>9</sup> Although no data are available, hydrocarbons are believed to constitute about two-thirds of GDP in Libya. This suggests that estimated aggregate expenditure could be about 35 percent of non-oil GDP.

other oil rich countries such as Qatar, Saudi Arabia and Algeria where household expenditure as percentage of GDP can vary between 11 and 35 percent.<sup>10</sup> Household final consumption is essentially a small fraction of output as a whole because oil dominates the economy (producing more than two-thirds of GDP). Only a small share of oil proceeds accrues to households via wages and public transfers while a bigger share accrues through subsidies, which do not appear in actual expenditure.

**Table 5: Household statistics projected to 2013**

	Population (persons)	Number of households	Household size (persons)	Total expenditures (LYD)	Expenditures per capita (LYD)	Expenditures per household (LYD)
Quintile_1	1,936,699	203,399	9.5	1,842,216,192	951	9,057
Quintile_2	1,512,025	203,373	7.4	2,288,316,928	1,513	11,252
Quintile_3	1,264,391	203,346	6.2	2,580,271,872	2,041	12,689
Quintile_4	992,019	203,392	4.9	2,745,245,952	2,767	13,497
Quintile_5	666,346	203,331	3.3	3,077,710,080	4,619	15,136
Total	6,371,480	1,016,842	6.3	12,533,761,024	1,967	12,326

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and World Bank staff calculations.

In what follows, the incidence and impact analyses are presented separately for food products and energy products. The analysis is conducted separately because of the different subsidy systems (universal for energy but quota-based for food), which require a different set-up for the subsidies simulation model. Also, differences in the relative importance of indirect effects (as noted above) call for a different approach to interpreting the results. The analyses that follow are based on SUBSIM, a subsidies simulation package produced by the World Bank ([www.subsim.org](http://www.subsim.org)).

## 4. Food subsidies

### 4.1. The distribution of food subsidies

Food subsidies are relatively progressive but a third of these subsidies does not reach households. Below, we quantify the size of subsidies received by households at different income levels. The results suggest that food subsidies are relatively progressive in Libya, mostly thanks to the quota system by which they are administered. However, only about 65 percent of the budgetary costs of subsidies reach households. The difference is probably explained by “leaks” from the subsidy system, including waste from illegal resale of subsidized items outside of the quota system at close-to-market prices and perhaps administrative costs that cannot be clearly separated and accounted for.

Our estimates are an *upper bound* of the subsidies received by households. This is because the analysis is based on the assumption that all households purchase the entire amount of quotas they are entitled to.<sup>11</sup> This may not always be the case as some households may choose not to go to cooperatives to purchase

<sup>10</sup> <http://data.worldbank.org/indicator/NE.CON.PETC.ZS>.

<sup>11</sup> We make that assumption when in the survey there is no separate expenditure data for subsidized versus nonsubsidized quantities for a given product.

products at subsidized prices—as is in fact reported for a non-negligible share of the population (mostly middle and upper-income tranches) in Libya. However, in the absence of information on the share of households taking advantage of the quota system in their food purchases, it is more conservative to assume that households take the maximum advantage of the benefit available to them so as not to underestimate the impact of any reform on the population. This also compensates for the non-observable leakages due to “double dipping”.

Households allocate about 9.3 percent (1.2 billion LYD) of their total expenditure on subsidized food products if we consider the share bought under the quota system and the share bought at market prices (Table 6). About 22.2% of this amount is expenditure on quotas at subsidized prices, while the rest is on the same products bought on the free market. This may seem at odds with the fact that quotas provide generous quantities. However, richer households, as noted earlier, are unlikely to shop at cooperatives (which administer quotas), opting for better quality and more expensive products, while poorer households may also consume a share of better quality brands not available in the quota system. Indeed, for most of these food products, the market may offer several better quality options that may be preferred by the rich and poor alike. Also and more importantly, expenditure on quotas is low because prices are low under the quota system as compared to the market prices. For some products, like flour-bread and milk for children, the total expenditure is only on quotas, and there are no purchases of these products at non-subsidized prices. For other products like bread which is also sold outside cooperatives the quota system is not binding.

**Table 6: Household Expenditure on Subsidized Food Products (Million LYD)**

	Q1	Q2	Q3	Q4	Q5	Total	% at subsidized prices
Flour	11.2	11.6	11.8	11.7	10.5	56.9	15
Flour-bread	3.6	3.3	2.9	2.4	1.9	14.1	100
Semolina	7.6	7.9	7.2	6.3	5.1	34.1	3.7
Rice	18.6	20.6	20.2	20.2	19.3	98.8	15.7
Sugar	21.3	23.5	23.2	23.3	21.8	113.1	21.7
Tea	17.9	20.2	20.0	19.4	19.1	96.6	12.6
Macaroni	33.4	34.8	33.3	32.1	29.8	163.5	11.4
Vegetable Oil	58.0	60.9	61.4	59.1	55.4	294.8	18
Paste tomatoes	24.2	25.8	26.2	25.0	24.2	125.3	28.4
Milk for children	4.5	6.8	8.3	9.7	9.0	38.3	99.9
Milk (concentrated)	26.5	29.1	27.9	24.3	23.0	130.8	28.3
Total	227.0	244.5	242.4	233.4	219.0	1,166.2	22.2
Total (% tot.exp.)	12.3	10.7	9.4	8.5	7.1	9.3	2.1

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

In terms of quantities, households consume approximately half of the food products via purchases made under the quota system at subsidized prices, while they buy the other half at market prices (Table 7). The first and second quintiles consume products at subsidized prices in higher quantities than the upper quintiles. This is natural given the larger size of households in lower quintiles and the larger reliance on

quotas on the part of poorer households. The share of products bought via the quota system varies from 30.6% for semolina to 100% for milk for children and flour for bread. Flour for bread and pasta are the subsidized products with the largest consumption. These products are basic staples for Libyans and quotas for these products are larger than those for other products.

**Table 7: Quantities of subsidized food products consumed (Kilograms or Liters)**

	Q1	Q2	Q3	Q4	Q5	Total	% at subsidized Prices (quotas)
Flour (kg)	35.4	31.7	29.2	26.0	19.6	141.9	66.9
Flour-bread (kg)	96.9	89.7	77.9	64.9	51.5	380.9	100
Semolina ( kg)	12.8	12.6	10.9	9.0	6.7	52.0	30.6
Rice (kg)	39.1	37.2	34.2	30.0	24.0	164.3	67.5
Sugar (kg)	38.3	37.0	33.9	30.8	25.2	165.2	59.3
Tea (kg)	5.1	5.4	5.1	4.7	4.3	24.6	32.8
Macaroni (kg)	47.1	44.2	40.1	35.9	30.0	197.4	47.4
Vegetable Oil (liter)	37.8	35.3	33.0	29.2	24.2	159.6	55.5
Paste tomatoes (kg)	23.5	22.3	21.0	18.5	15.9	101.2	58.6
Milk for children (kg)	0.6	0.9	1.1	1.3	1.2	5.1	100
Milk concentrated (kg)	16.8	17.1	15.6	13.0	11.2	73.8	51.5

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

Poorer households spend a much greater share of total expenditure on subsidized food items than richer households. Indeed, while expenditure on food products at subsidized prices represents 9.3% of total household expenditure (Table 8) on average, this share is higher for the first (12.32%) and second (10.68%) quintiles, and falls to 7.12 for the fifth quintile. The fact that poorer households are larger in size explains part of this observation. If we focus on quotas only (the share bought at subsidized prices), the first quintile's share is 3.61% against the fifth quintile share of 1.07%.

**Table 8: Share of spending on subsidized food in total expenditure (percent)**

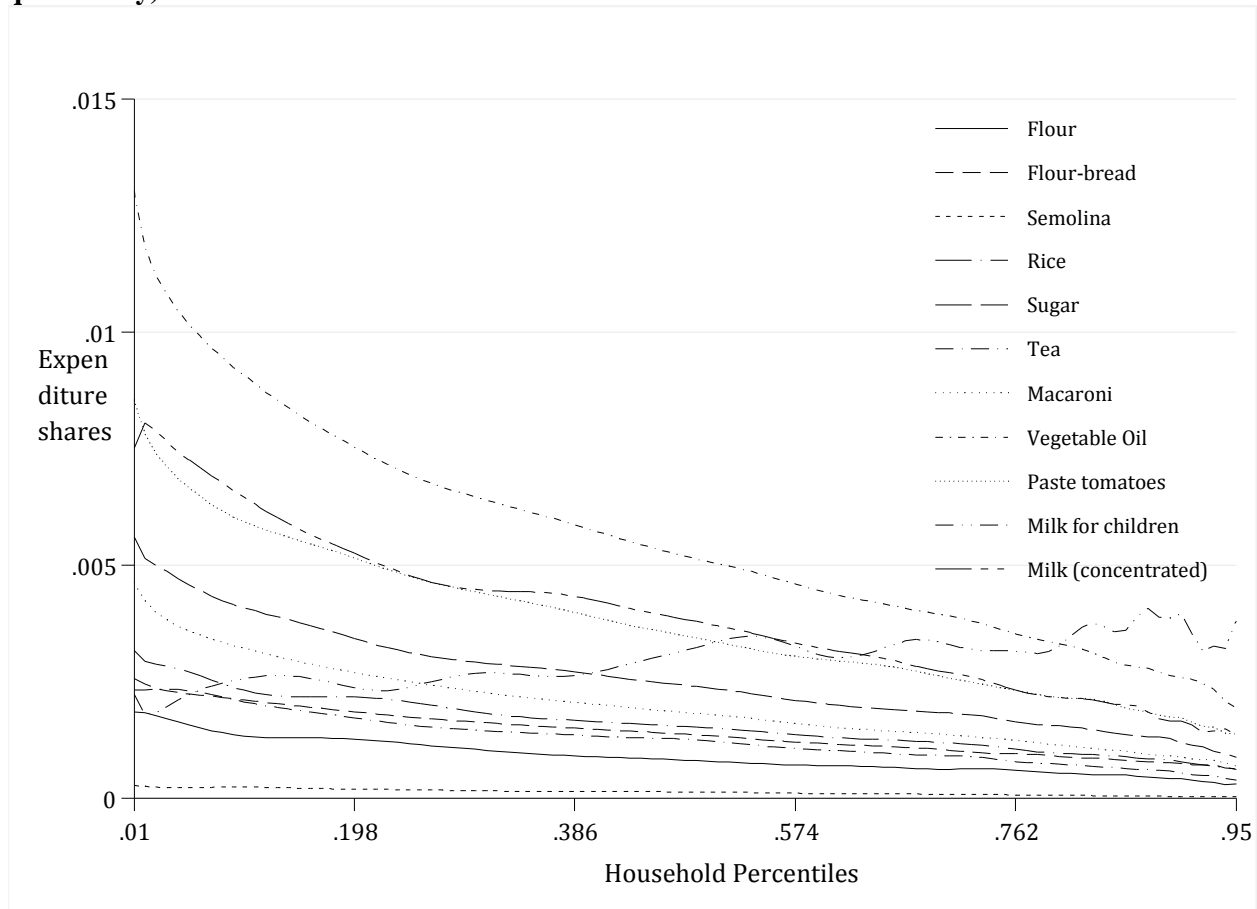
	Q1	Q2	Q3	Q4	Q5	Total	Total (quotas)
Flour	0.61	0.50	0.46	0.43	0.34	0.45	0.07
Flour-bread	0.19	0.15	0.11	0.09	0.06	0.11	0.11
Semolina	0.41	0.35	0.28	0.23	0.16	0.27	0.01
Rice	1.01	0.90	0.78	0.74	0.63	0.79	0.12
Sugar	1.16	1.03	0.90	0.85	0.71	0.90	0.2
Tea	0.97	0.88	0.77	0.71	0.62	0.77	0.1
Macaroni	1.81	1.52	1.29	1.17	0.97	1.30	0.15
Vegetable Oil	3.15	2.66	2.38	2.15	1.80	2.35	0.42
Paste tomatoes	1.31	1.13	1.01	0.91	0.78	1.00	0.28
Milk for children	0.25	0.30	0.32	0.35	0.29	0.31	0.31
Milk (concentrated)	1.44	1.27	1.08	0.89	0.75	1.04	0.3
Total	12.32	10.68	9.39	8.50	7.12	9.30	2.07

Total (quotas)	3.61	2.63	2.08	1.65	1.07	2.07
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Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

The importance of food subsidies for poorer households is even more apparent when looking at the distribution of expenditure shares by population percentiles. This can be seen in Figure 1 which plots the share of expenditure on food products at subsidized prices, relative to total expenditure, by population percentiles. The negative slopes indicate that poorer households devote a larger share of their total spending on food bought under the quota system than richer households (for all products except milk for children.) In other words, food is a larger component of the consumption basket of poorer households.

**Figure 1: Household Expenditure on Food Bought at Subsidized Prices (% of total expenditures, quotas only)**



Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

The poorest quintiles benefit the most from the monetary value of subsidies (Table 9). This is true for each product with the exception of milk for children. This result sets Libya apart from other countries in the region, where food subsidies tend to be slightly regressive because richer households consume more food overall and because subsidies are universal, unconstrained by a quota system.

**Table 9: Value of food subsidies by quintile (Million LYD)**

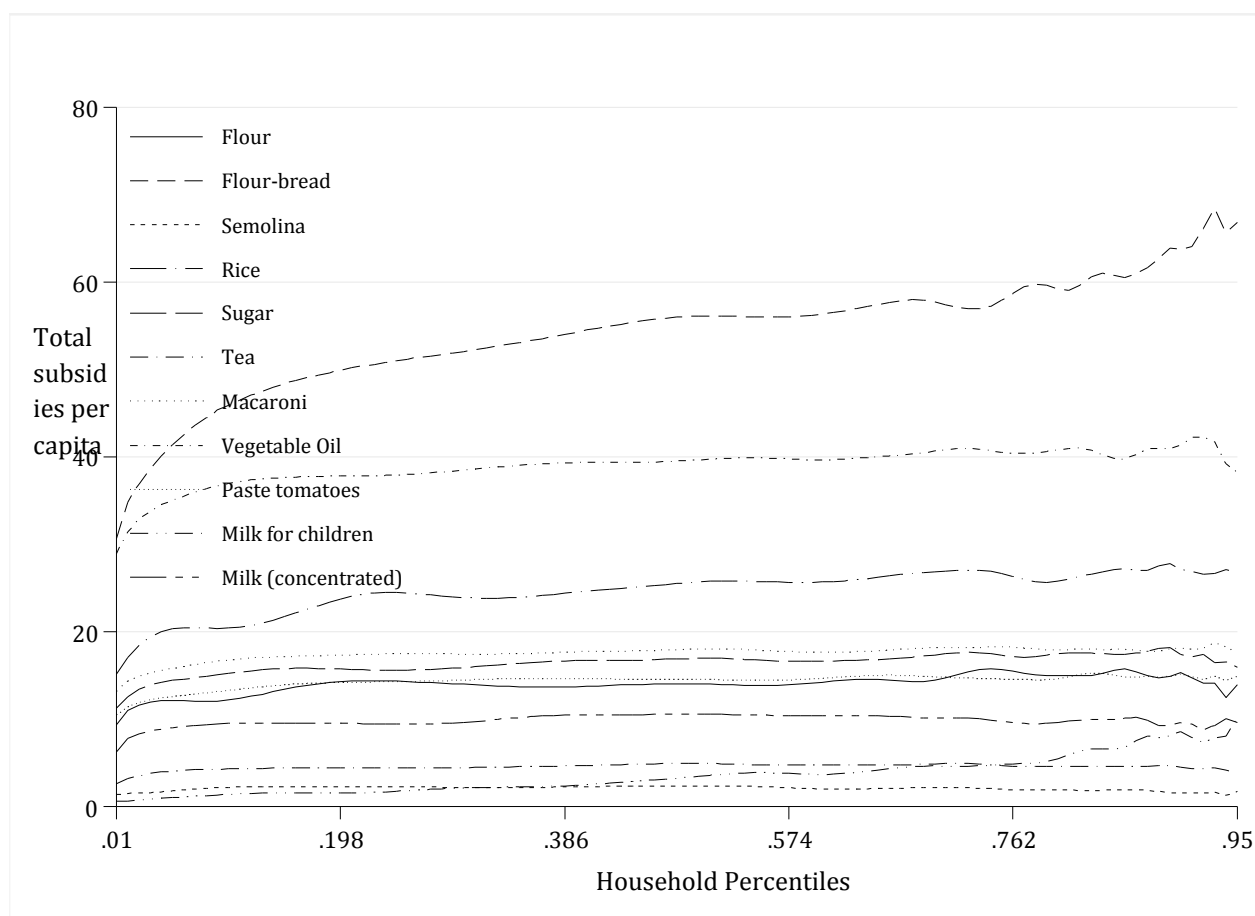
	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q5</b>	<b>Total</b>
Flour	25.2	21.1	18.3	15.1	9.6	89.3
Flour-bread	89.4	82.7	71.9	59.8	47.5	351.2
Semolina	4.1	3.5	2.7	1.9	1.0	13.2
Rice	42.3	37.4	33.1	26.5	18.1	157.4
Sugar	29.2	25.3	21.4	17.4	11.3	104.6
Tea	8.2	7.2	6.1	4.6	3.0	29.1
Macaroni	32.3	26.9	22.6	17.9	12.0	111.7
Vegetable Oil	70.7	59.3	50.9	40.2	27.1	248.3
Paste tomatoes	26.1	22.1	18.7	14.7	9.9	91.4
Milk for children	2.9	4.3	5.2	6.1	5.7	24.2
Milk (concentrated)	17.6	15.8	13.1	9.7	6.4	62.6
<b>Total</b>	<b>348.0</b>	<b>305.6</b>	<b>264.1</b>	<b>213.8</b>	<b>151.6</b>	<b>1,283.0</b>

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

The per-capita data suggest that subsidies benefit all people broadly equally, with the exception of flour used for bread and milk for children.<sup>12</sup> Figure 2 plots the total monetary value of food subsidies per capita on the *y-axis* and the population percentiles on the *x-axis*. The curves are flat, indicating everyone across the spectrum of the population derives the same monetary value from food subsidies. Again, this results is not surprising given that the quota system is established on a per-capita basis, allocating the same quantity of food at subsidized prices to every individual regardless of the income bracket.

<sup>12</sup> Household sizes are different across quintiles, as noted earlier, with poorer households also being the largest. It is therefore useful to also look at per-capita estimates in addition to per-household estimates to assess whether or not food subsidies are progressive.

**Figure 2: Per-Capita Benefits from Food Subsidies by Product (Libyan Dinars)**



Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

## 4.2. Simulation of food subsidy reforms

This section simulates subsidy reforms and estimates the impact on household welfare and the government budget. We consider two scenarios: 1) a 30 percent decrease in the subsidy for each product and 2) the total elimination of all subsidies. Note that a 30% decrease in the subsidy on each product would result in a different price increase for each product. Table 10 reports the current subsidized price for each product under the quota regime, the unit subsidy, the price after a 30% reduction in subsidy (Final price, scenario 1) and the price after the elimination of all subsidies (Final price, scenario 2). This last price is equivalent to the market reference price that we consider for each product.<sup>13</sup>

Eliminating all food subsidies (scenario 2) would result in exceptionally high price increases. The price of flour used in making bread would need to increase by almost 26 times to reach the market price, and prices of flour, semolina and rice would need to increase more than 11 times. Even in the case of the

<sup>13</sup> Market prices were obtained from the authorities (Ministry of Economy) dated for the first quarter of 2013.

product the price of which is currently the closest to the market price (milk for children), a 60 percent increase would be needed to match the market price—a significant price increase.

**Table 10: Prices, Subsidies and Reform Scenarios**

	<b>Initial price</b>	<b>Subsidy</b>	<b>Final price (Scenario1)</b>	<b>Final price (Scenario 2)</b>	<b>Final price (Scenario 2)/ Initial price</b>
Flour	0.090	0.940	0.372	1.030	11.4
Flour for bread	0.037	0.922	0.314	0.959	25.9
Semolina	0.080	0.831	0.329	0.911	11.4
Rice	0.140	1.419	0.566	1.559	11.1
Sugar	0.250	1.068	0.570	1.318	5.3
Tea	1.500	3.597	2.579	5.097	3.4
Macaroni	0.200	1.194	0.558	1.394	7.0
Vegetable oil	0.600	2.802	1.441	3.402	5.7
Tomato paste	0.600	1.541	1.062	2.141	3.6
Milk for children	7.500	4.750	8.925	12.250	1.6
Milk	0.975	1.647	1.469	2.622	2.7

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

These price increases would affect the poor in greater proportion than the rich. The total monetary impact of a complete removal of subsidies (scenario 2) on households would be equivalent in magnitude to the total estimated monetary value of subsidies received by households, namely 1.3 billion LYD (Table 11).<sup>14</sup> The total impact of a 30% reduction in subsidies (scenario 1) is estimated at 385 million LYD. The impact would be regressive in that poorer households would be affected more than richer households, as indicated by the greater loss in per-capita spending for lower quintiles (Table 12). This is to be expected since food subsidies were shown to benefit the poor in greater proportion. For example, with an elimination of subsidies, the first quintile (the poorest 20% of the population) would bear a cost of 348 million LYD. And at 18.9 percent, the decline in per-capita spending of the lowest quintile if food subsidies were eliminated is nearly 4 times that of the highest quintile (4.9 percent). This would be a disproportionate cost for poorer households.

**Table 11: Aggregate Monetary Impact of Subsidy Reform on Welfare (Million LYD)**

	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q5</b>	<b>Total scenario 2</b>	<b>Total scenario 1</b>
Flour	-25.2	-21.1	-18.3	-15.1	-9.6	-89.3	-26.8
Flour-bread	-89.4	-82.7	-71.9	-59.8	-47.5	-351.2	-105.4
Semolina	-4.1	-3.5	-2.7	-1.9	-1.0	-13.2	-4.0
Rice	-42.3	-37.4	-33.1	-26.5	-18.1	-157.4	-47.2

<sup>14</sup> Note that these are upper bound estimates based on Laspeyers' estimations.



Sugar	-29.2	-25.3	-21.4	-17.4	-11.3	-104.6	-31.4
Tea	-8.2	-7.2	-6.1	-4.6	-3.0	-29.1	-8.7
Macaroni	-32.3	-26.9	-22.6	-17.9	-12.0	-111.7	-33.5
Vegetable Oil	-70.7	-59.3	-50.9	-40.2	-27.1	-248.3	-74.5
Paste tomatoes	-26.1	-22.1	-18.7	-14.7	-9.9	-91.4	-27.4
Milk for children	-2.9	-4.3	-5.2	-6.1	-5.7	-24.2	-7.3
Milk (concentrated)	-17.6	-15.8	-13.1	-9.7	-6.4	-62.6	-18.8
Total	-348.0	-305.6	-264.1	-213.8	-151.6	-1,283.0	-384.9

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

**Table 12: Per-capita Impact of Subsidy Reform (% of per-capita expenditure)**

	Q1	Q2	Q3	Q4	Q5	Total scenario 2	Total scenario 1
Flour	-1.37	-0.92	-0.71	-0.55	-0.31	-0.71	-0.21
Flour-bread	-4.85	-3.61	-2.78	-2.18	-1.54	-2.80	-0.84
Semolina	-0.22	-0.15	-0.10	-0.07	-0.03	-0.11	-0.03
Rice	-2.30	-1.63	-1.28	-0.97	-0.59	-1.26	-0.38
Sugar	-1.59	-1.10	-0.83	-0.63	-0.37	-0.83	-0.25
Tea	-0.44	-0.32	-0.24	-0.17	-0.10	-0.23	-0.07
Macaroni	-1.75	-1.18	-0.88	-0.65	-0.39	-0.89	-0.27
Vegetable Oil	-3.84	-2.59	-1.97	-1.46	-0.88	-1.98	-0.59
Paste tomatoes	-1.42	-0.96	-0.73	-0.53	-0.32	-0.73	-0.22
Milk for children	-0.16	-0.19	-0.20	-0.22	-0.18	-0.19	-0.06
Milk (concentrated)	-0.96	-0.69	-0.51	-0.35	-0.21	-0.50	-0.15
Total	-18.89	-13.35	-10.23	-7.79	-4.93	-10.24	-3.07

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

The direct impact on government expenditure from the complete removal of subsidies (Scenario 2) would be equivalent to the total impact on household welfare, namely 1.3 billion LYD—equivalent to 2.8% of government expenditure (Table 13, last two columns).<sup>15</sup> However, under a partial reduction of subsidies (30% in the case of scenario 1), the total impact on government expenditure would be greater than the impact on household welfare (Table 13, upper 6 lines). Under scenario 1, the former would amount to 660 million LYD, compared to 385 million LYD for the impact on household welfare (Table 11). This difference is explained by the fact that - when subsidies are not totally removed - we have two potential causes for lower government expenditure, the first resulting from the increase in subsidized prices (which is equivalent in size to the impact on household welfare) and the second resulting from the reduction in quantities consumed by households at these higher subsidized prices. If subsidies were totally eliminated, this second effect would disappear given that no quantities would be sold at a subsidized price.

<sup>15</sup> Estimates of the budgetary impact of alternative reform scenarios do not take into account savings from lower administrative costs of managing the subsidy program and from leakages of the subsidy program (e.g. smuggling).

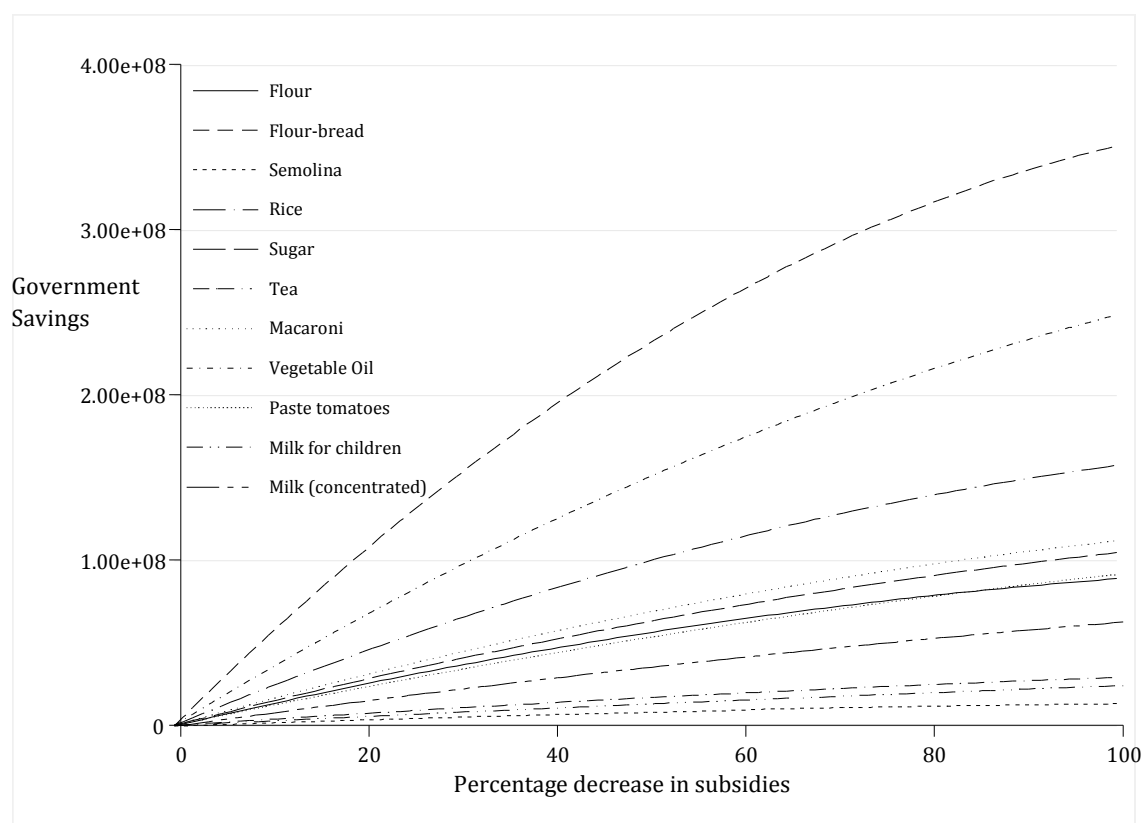
**Table 13: Impact of Subsidy Reform on the Government Budget (Million LYD)**

	Q1	Q2	Q3	Q4	Q5	Scenario 1 Total	Scenario 2 Total	Scenario 2 (% govt. exp.)
Flour	13.7	11.4	9.9	8.2	5.2	48.5	89.3	0.1
Flour-bread	56.4	52.2	45.4	37.8	30.0	221.7	351.2	0.5
Semolina	2.2	1.9	1.5	1.0	0.6	7.2	13.2	0.0
Rice	22.8	20.2	17.9	14.3	9.8	84.9	157.4	0.2
Sugar	13.2	11.5	9.7	7.9	5.1	47.4	104.6	0.2
Tea	3.3	2.9	2.5	1.9	1.2	11.8	29.1	0.0
Macaroni	15.7	13.1	11.0	8.7	5.8	54.2	111.7	0.2
Vegetable Oil	32.7	27.4	23.5	18.6	12.5	114.6	248.3	0.4
Paste tomatoes	10.7	9.0	7.7	6.0	4.0	37.5	91.4	0.1
Milk for children	1.0	1.4	1.8	2.1	1.9	8.1	24.2	0.0
Milk (concentrated)	6.7	6.0	5.0	3.7	2.4	23.9	62.6	0.1
<b>Total</b>	<b>178.4</b>	<b>157.1</b>	<b>135.7</b>	<b>110.0</b>	<b>78.6</b>	<b>659.8</b>	<b>1283.0</b>	<b>2.0</b>

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

Should a gradual approach to reform be considered, measuring the government budgetary impact may help with the decision regarding the sequencing and size of subsidy reforms. Figure 3 traces, for each product, the impact of a proportional reduction in subsidy (shown in percent on the *x-axis*) on government expenditure in absolute values (measured in LYD on the *y-axis*). The impact would differ across products because of different quantities consumed, different initial levels of subsidies and different price changes associated with a specific subsidy reduction. The fastest decline in government spending would result from reforming first the subsidy on flour used in bread production, and then that on vegetable oil. We note that the curves are not linear, implying decreasing marginal returns in terms of lower government spending should prices increase. This is mainly explained by the importance of the decrease in consumed quantities in response to price increases.

**Figure 3: Magnitude of Decline in Government Expenditure under Reform Scenario 2 (Libyan Dinars)**



Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

Removing subsidies on food products would have a significant negative impact on poverty (Table 14). We estimate poverty in Libya based on both the international poverty line (\$1.25 per day)<sup>16</sup> and an updated national poverty line (966.26 LYD per person per year).<sup>17</sup> Using the national poverty line, poverty is estimated at about 14.4 percent of the population. If food subsidies were eliminated, poverty would rise by about 2.8 percentage points under scenario 1 and by 9.6 percentage points under scenario 2. Flour (for bread), rice, and vegetable oil are the products whose price increases would contribute the most to a rise in poverty. Using the international poverty line would lead to a pre-reform poverty rate of 8.5% and a reform impact of 2.0 percentage points for scenario 1 and 8.1 percentage points for scenario 2.

Along with greater poverty, inequality would rise, from 30.2% to 33.2% in case of a complete elimination of food subsidies. This is consistent with the finding that food subsidies are pro-poor. It is interesting to note that inequality in Libya is very low: at 30.2 percent, the Gini coefficient is one of the lowest values

<sup>16</sup> We convert \$1.25 to Libyan dinars using 2009 PPP exchange rate data (1 LYD = 0.74 \$PPP; latest available data) and inflation for the period 2009-13. We find the equivalent universal poverty line for 2013 to be 821.42 LYD per person per year. This is lower than the national poverty line of 966.3 LYD per person per year leading to lower poverty rates.

<sup>17</sup> To estimate the national poverty line, we use the 2003 poverty line—which was estimated at 593.6 LYD by staff of Libya’s Office of Statistics but was not necessarily endorsed officially—and CPI inflation between 2003 and 2013. This national poverty line estimate corresponds to 2.65 LYD per day, or about \$2 at the actual exchange rate. The national poverty line estimate represents 49% of the average per-capita expenditure of households (1,967 LYD).

in the MENA region. For example, the latest Gini coefficient for Morocco estimated in 2007 was above 40%; that for the Arab Republic of Egypt, where inequality is believed to be very low, was around 32% in 2011.

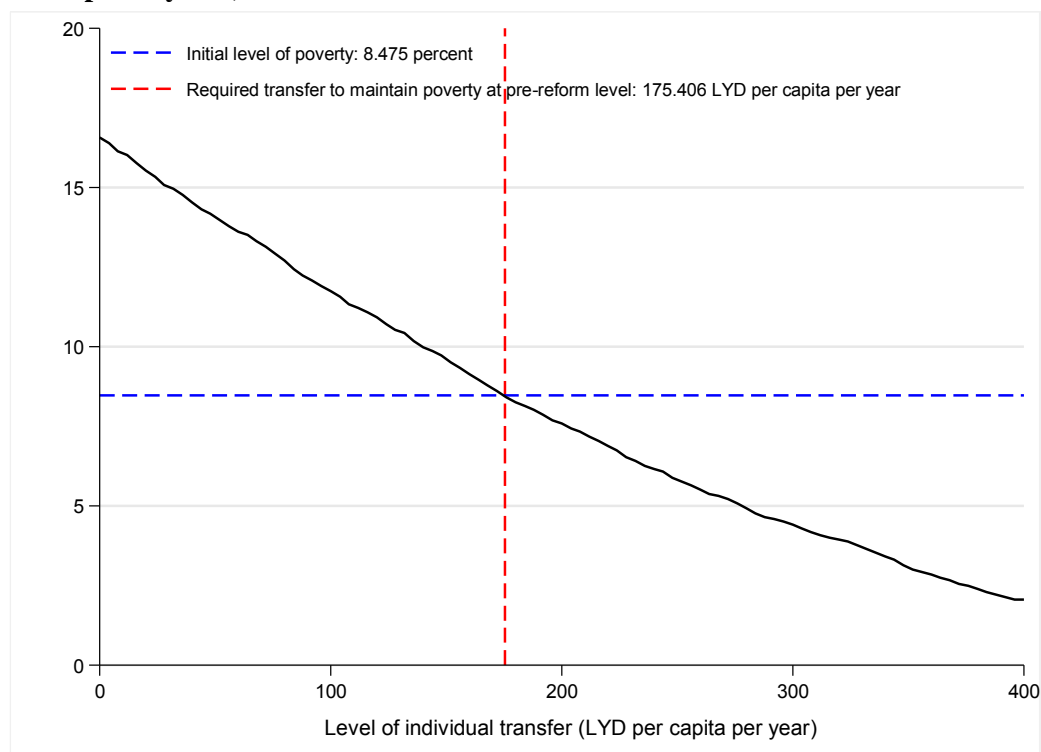
**Table 14: Poverty Impact of Subsidy Reforms**

	International Poverty Line			National Poverty Line		
	Poverty level	Scenario 1 Poverty change	Scenario 2 Poverty change	Poverty level	Scenario 1 Poverty change	Scenario 2 Poverty change
Pre reform	8.48	.	.	14.44	.	.
Flour	8.62	0.15	0.46	14.66	0.22	0.69
Flour-bread	8.91	0.43	1.63	15.06	0.61	2.38
Semolina	8.50	0.03	0.07	14.48	0.04	0.12
Rice	8.73	0.26	0.75	14.77	0.33	0.98
Sugar	8.59	0.11	0.45	14.72	0.28	0.75
Tea	8.53	0.05	0.14	14.50	0.06	0.17
Macaroni	8.64	0.16	0.56	14.72	0.28	0.85
Vegetable Oil	8.77	0.29	1.36	14.88	0.44	1.81
Paste tomatoes	8.61	0.14	0.40	14.66	0.22	0.63
Milk for children	8.48	0.00	0.03	14.45	0.01	0.08
Milk (concentrated)	8.57	0.09	0.28	14.59	0.15	0.45
Post reform		2.02	8.11	17.26	2.82	9.58

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

A cash transfer of LYD 175 per capita per year targeted to the first quintile would be enough to keep poverty unchanged under the scenario of full subsidy elimination (Figure 4). An increase in poverty from 8.5% to 16.5 % implies that poverty remains concentrated in the bottom quintile following the price reform. Therefore, targeting that share of the population would be sufficient to maintain poverty unchanged at the pre-reform level. This targeted transfer system would cost the government LYD 340 million per year. Given that savings from the price increases would amount to LYD 1.3 billion as calculated above, the net gains to the budget from full subsidy elimination *and* cash compensation to the population in the first quintile of LYD 175 per capita would be LYD 943 million. In case targeting the first quintile was not possible, extending that level of transfer to the entire population would raise the budgetary cost to LYD 1.1 billion per year. In this case, total net gains to the budget from subsidy reform *and* cash transfers would be much lower, at LYD 165 million per year.

**Figure 4: Poverty Impact of Cash Transfers to First Quintile under Food Subsidy Reform S2 (International poverty line)**



Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

The impact of subsidy reform on quantities consumed would also be significant (Table 15). It is useful to look at this impact because it gives an idea of the changes required in production and imports of food products bought via the quota system and also to better understand the impact on government revenues discussed above. When compared to the initial quantities consumed under the quotas, changes would vary from -13.7% for milk for children to -62.3% for flour for bread. The impacts are also quite flat across quintiles although the impact on the first quintile would be lower for all products.<sup>18</sup>

**Table 15: Impact of Subsidy Reform on Quantities Consumed Per-Capita (Scenario 2, kg/liters\*)**

	Q1	Q2	Q3	Q4	Q5	Total
Flour (kg)	-7.19	-7.69	-7.98	-8.37	-7.98	-7.73
Flour-bread (kg)	-31.19	-36.99	-38.42	-40.76	-48.18	-37.27
Semolina (kg)	-1.31	-1.45	-1.33	-1.19	-0.97	-1.29
Rice (kg)	-7.92	-8.97	-9.49	-9.69	-9.85	-8.96
Sugar (kg)	-5.55	-6.14	-6.23	-6.44	-6.26	-6.04
Tea (kg)	-0.36	-0.41	-0.41	-0.40	-0.38	-0.39

<sup>18</sup> These results are entirely dependent on the choice we made regarding the point elasticity at market price and the shape of the demand curve. Other assumptions would lead to different results and these findings should be taken with caution. Note, however, that the final results on household welfare reported earlier are not affected by the choice of elasticity and demand curve as these estimates depend only on the initial expenditure and the price change (relative changes in quantities consumed of subsidized and non-subsidized products do not affect the overall welfare effects given that we consider a hard budget constraint).

Macaroni (liter)	-6.16	-6.58	-6.62	-6.67	-6.66	-6.48
Vegetable Oil (kg)	-5.29	-5.68	-5.84	-5.87	-5.89	-5.64
Paste tomatoes (kg)	-2.78	-3.00	-3.05	-3.04	-3.04	-2.95
Milk for children (kg)	-0.04	-0.08	-0.12	-0.18	-0.25	-0.11
Milk (concentrated) (kg)	-1.42	-1.63	-1.61	-1.52	-1.50	-1.53

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

## 5. Energy subsidies

The benefits to households from energy subsidies are multiples of those derived from food subsidies—households in the lowest quintile derive 2.5 times more monetary benefit from energy than from food subsidies, and that ratio increases gradually to 6.5 times for the upper quintile.

The analysis in this section covers five energy products: gasoline, diesel, electricity, LPG and kerosene. Gasoline is the main energy product used by the road transport sector for individuals—both in private cars and taxis (there are no other means of public transportation). Diesel is mainly consumed by businesses (for transportation) and by the electricity generation company. Electricity and LPG are almost universally consumed. Half of the kerosene sold on the market goes to the air transport sector, while the rest is likely used by lower income households as a substitute for electricity, but no data are available to corroborate the latter hypothesis.

### 5.1. The distribution of energy subsidies

Gasoline and electricity represent the bulk of energy consumption and, together with other energy products, are heavily consumed by the rich. Gasoline and electricity take up more than 90% of household energy consumption and, correspondingly, the same share of government spending on subsidies. Subsidies for these two products are clearly regressive in absolute terms. An individual in the upper quintile benefits 3.5 times more from subsidies on electricity and gasoline than an individual in the bottom quintile (that ratio is 2.8 and 2.7 for Diesel and LPG respectively).

Households' direct benefits from energy subsidies are close to 2.5 billion LYD, which only represents about a third of the total cost to the budget of energy subsidies.<sup>19</sup> Given the extremely low subsidized prices, energy products represent a very small share of household expenditure—about 3 percent of total expenditures, equivalent to 370 million LYD (Table 16). Gasoline and electricity represent the greatest share while expenditure on kerosene is very low. The share of household spending on energy products is slightly higher for poorer households (3.6%) relatively to richer households (2.5%). The share of expenditure on gas LPG shows the largest difference across quintiles (Table 17), suggesting that it is used more intensively by poorer households.

<sup>19</sup> The budget data do not include administrative costs associated with the subsidy system.

**Table 16: Household Expenditure on Energy Products (Million LYD)**

	Gasoline	Diesel	Electricity	LPG	Kerosene	Total
Quintile_1	28.9	0.7	29.9	5.7	0.3	65.4
Quintile_2	34.9	0.7	34.0	5.9	0.5	76.0
Quintile_3	36.1	0.6	34.2	5.7	0.5	77.1
Quintile_4	36.2	0.6	33.1	5.5	0.6	76.0
Quintile_5	33.6	0.7	35.8	5.2	0.6	75.9
Total	169.6	3.3	167.1	28.0	2.5	370.5

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

Compared to other countries in the North Africa region, the share of expenditure on energy products in Libya is more homogeneous across quintiles. This corroborates the result we found in analyzing food subsidies, namely that the income distribution in Libya is comparatively more flat, with lower inequality, compared to other countries in the region. Particularly striking is the distribution of gasoline and diesel expenditure. The poorest quintile of households spends on gasoline 85% of what the richest quintile spends and twice as much for diesel. Indeed, data on car ownership from the household survey confirm that most households in Libya own at least one car and that the share of non-owners, 25.8 percent (Table 18, first column), is rather homogeneously distributed across quintiles. This finding, which is atypical for countries at similar levels of per-capita income, is likely explained by the very low cost of gasoline and the availability of cheap old cars.<sup>20</sup>

**Table 17: Share of Energy Expenditure in Total Household Expenditure (%)**

	Gasoline	Diesel	Electricity	LPG	Kerosene	Total
Quintile_1	1.57	0.04	1.62	0.31	0.01	3.55
Quintile_2	1.53	0.03	1.49	0.26	0.02	3.32
Quintile_3	1.40	0.02	1.33	0.22	0.02	2.99
Quintile_4	1.32	0.02	1.21	0.20	0.02	2.77
Quintile_5	1.09	0.02	1.16	0.17	0.02	2.47
Total	1.35	0.03	1.33	0.22	0.02	2.96

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

**Table 18: Percentage of Households that Own Cars (by quintile and number of cars)**

	0	1	2	3	4	5	Total
Quintile_1	6.25	12.17	1.32	0.17	0.08	0	20
Quintile_2	4.64	13.54	1.51	0.29	0.03	0	20
Quintile_3	4.87	13.62	1.26	0.21	0.04	0	20
Quintile_4	4.69	13.86	1.16	0.24	0.04	0.01	20

<sup>20</sup> Anecdotal evidence suggests that the stock of cars in Libya is quite old, many low-income people drive run-down cars and keep doing so given cheap gasoline and no alternative transportation means.

Quintile_5	5.35	13.63	0.83	0.16	0.03	0	20
Total	25.8	66.81	6.09	1.06	0.22	0.01	100

Source: 2007-08 Household Survey; and authors' calculations. The columns correspond to the number of cars that can be owned by a household (ranges from 0 to 5).

Highly subsidized prices have unsurprisingly led to excessive consumption of energy products in Libya. The household survey data imply that households consume an estimated 1.13 billion liters of gasoline per year, equivalent to about 177 liters per capita (Table 19).<sup>21</sup> To put that into context, we have extracted comparable data from the World Bank database on energy consumption for Libya and other countries in 2010.<sup>22</sup> These data suggest that per capita gasoline consumption in Libya in 2010 was 281 liters (far greater than the household survey data imply) which is also much higher than per-capita consumption in Italy (225 liters) or France (159 liters) for that year, and far higher than the world average (187 liters). Per-capita gasoline consumption in Algeria, another oil producer, is reported at 96 liters in the World Bank's database. These statistics all point towards significant gasoline overconsumption in Libya. The same conclusion holds when comparing electricity consumption in Libya to that of other countries.

**Table 19: Household Consumption of Energy Products (in millions of units)**

	<b>Gasoline (liter)</b>	<b>Diesel (liter)</b>	<b>Electricity (kWh)</b>	<b>LPG (in Bottle - 15 kg)</b>	<b>Kerosene (liter)</b>
Quintile_1	192.4	4.8	1,496.2	2.8	3.0
Quintile_2	232.9	4.9	1,700.9	2.9	5.2
Quintile_3	240.6	3.7	1,710.9	2.9	5.7
Quintile_4	241.2	4.0	1,654.9	2.8	6.7
Quintile_5	223.7	4.7	1,791.3	2.6	6.9
Total	1,130.8	22.1	8,354.2	14.0	27.4

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

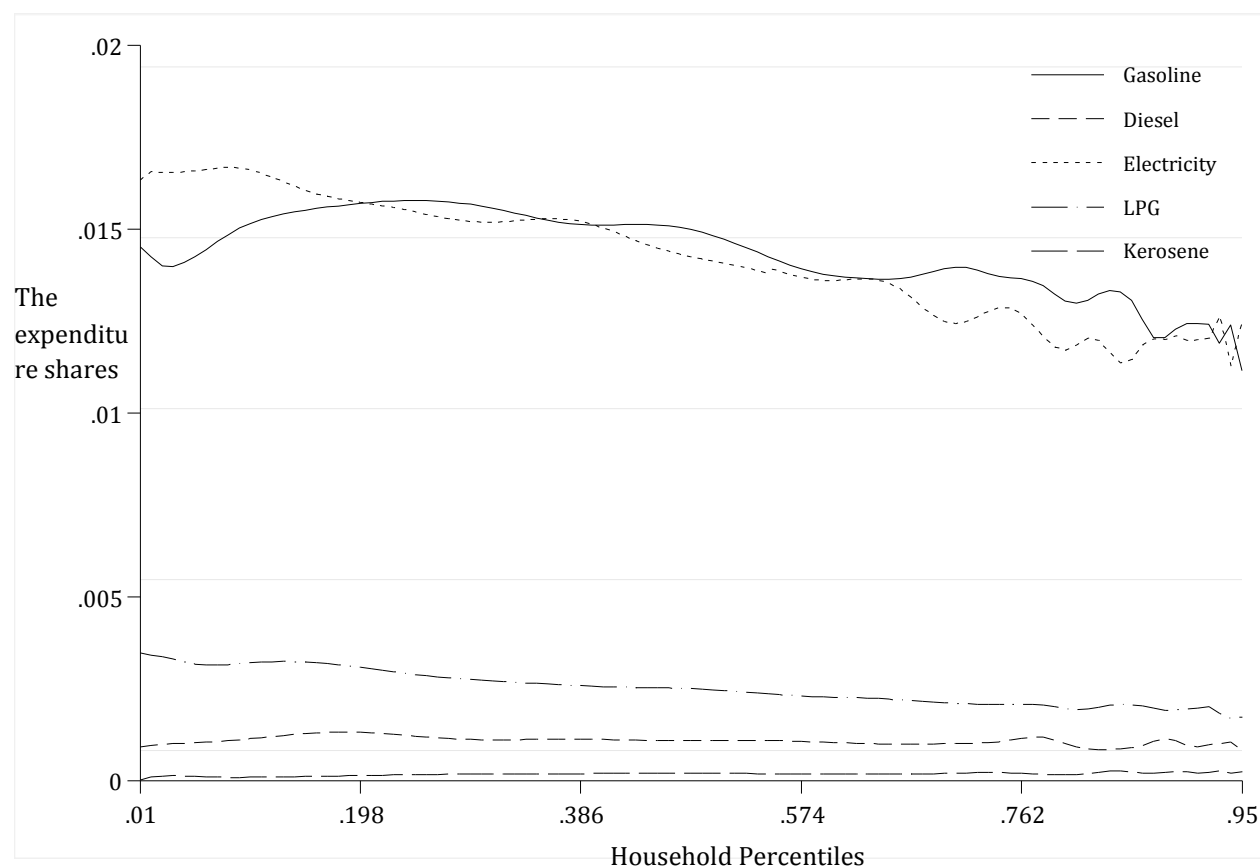
Figure 5 confirms that the expenditure share of energy products is low for both the poor and rich, although the share is higher for the poor. This is shown by the negative slope of some of the curves depicted in the figure. This is not perceptible for diesel and kerosene partly because these products are consumed in very small quantities but also because these products follow a different pattern across quintiles. The share of kerosene expenditure in total expenditure in particular is very flat across quintiles.

<sup>21</sup> The authorities had budgeted for 4.47 billion liters of gasoline to be sold on the market in Libya in 2013.

<sup>22</sup> Source: <http://data.worldbank.org>. The data were converted from Kg to liters on the basis that 1 liter of petrol weighs 0.711 kg.



**Figure 5: Household Spending on Energy Products (share of total household expenditure)**



Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

Households derive substantial benefits from energy subsidies. We estimated the total value of direct energy subsidies received by households at 2.5 billion LYD (Table 20)— 6.7 times higher than total household expenditure on these products. About 1 billion LYD of this total derive from gasoline and 1.1 billion LYD from electricity. This underscores the significant share of subsidy incorporated in energy prices in Libya: on average, the government should increase energy prices by 670% to reach market levels and eliminate subsidies.

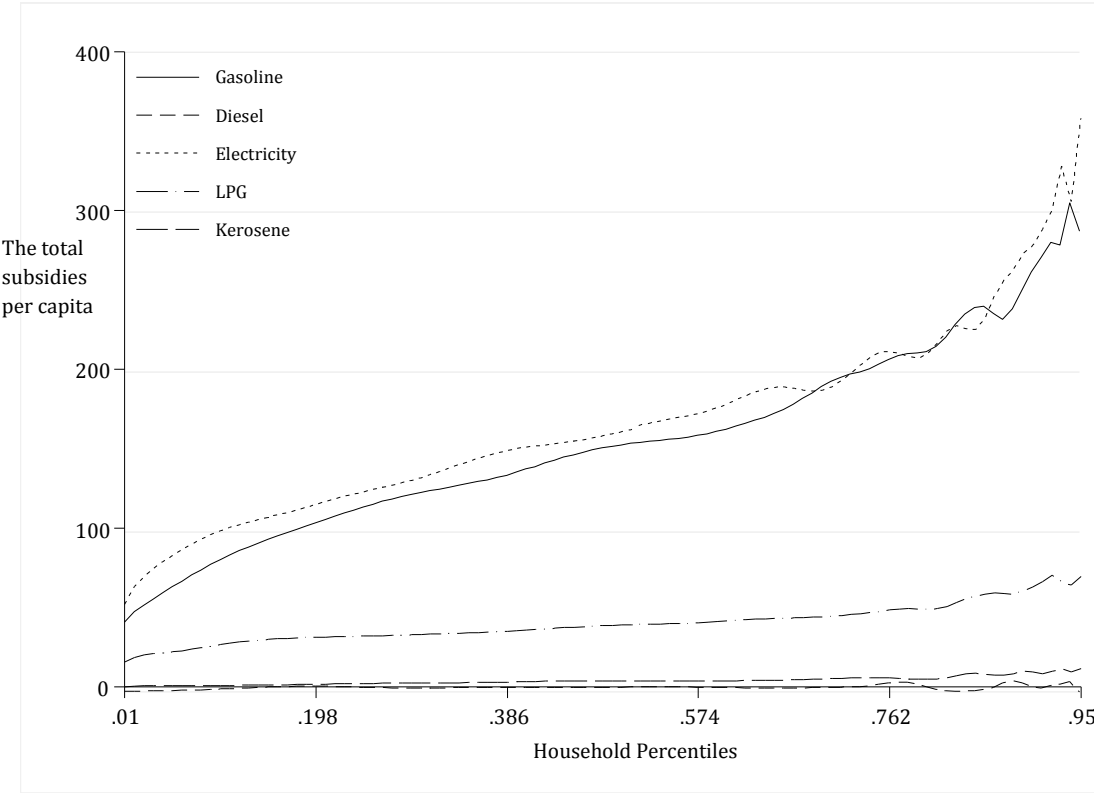
**Table 20: Energy Subsidies (Million LYD)**

	<b>Gasoline</b>	<b>Diesel</b>	<b>Electricity</b>	<b>LPG</b>	<b>Kerosene</b>	<b>Total</b>
Quintile_1	177.4	4.6	203.5	53.6	3.0	442.0
Quintile_2	214.8	4.7	231.3	55.4	5.2	511.4
Quintile_3	221.8	3.6	232.7	54.1	5.7	517.8
Quintile_4	222.4	3.8	225.1	52.5	6.7	510.4
Quintile_5	206.3	4.5	243.6	49.5	6.9	510.8
Total	1,042.6	21.2	1,136.2	265.2	27.4	2,492.5

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

Energy subsidies in Libya are regressive (in absolute value), or pro-rich. This can be more clearly seen when looking at the distributional analysis on a per-capita basis. Indeed, the per-household data mask the fact that poorer households are larger in size. This implies that, on a per-capita basis, lower income brackets are less well-off. Figure 6 shows per-capita subsidies (*y-axis*) across population percentiles (*x-axis*) for each subsidized energy product. All curves are positively sloped, which indicates that richer households receive higher amounts of subsidies per capita. The regressive feature of energy subsidies is less pronounced for the cases of kerosene and diesel, consistent with the proposition that these products are consumed more intensively by the poorer population. This feature is most pronounced for gasoline and electricity, the two products whose subsidies generate the biggest cost to the government budget.

**Figure 6: Per Capita Benefits Accruing From Subsidies on Energy Product (Libyan Dinars)**



Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

### 5.2. Simulations of energy subsidy reforms

Energy subsidy reforms are expected to have a significant direct impact on households. Consistent with the fact that gasoline and electricity are the main energy products consumed by households, we find that reducing subsidies on these two items would have a far larger impact on household real income and poverty, as well as on the government budget, than reducing subsidies on other energy products.

Presumably, the impact on productive sectors would also be large. Given the considerable price adjustments necessary to eliminate subsidies and the consequent impact on household welfare, a gradual approach to subsidy reform would be preferable, even if a cash compensation scheme is put in place.

As in the case of food subsidies, we simulate two scenarios: 1) a 30% cut in subsidies for each product and 2) a 100% decrease (total elimination) of subsidies. Recall that a 30% cut in subsidies would result in a different price increase for each product since price levels vary across products. Table 21 reports for all energy products considered the initial subsidized price, the unit subsidy, the price following a 30% reduction in subsidy (Final price, scenario 1) and the price after the elimination of all subsidies (Final price, scenario 2). This last price is equivalent to the market reference price that we consider for each product.

The elimination of subsidies (scenario 2) would lead to exceptionally large price increases. The price of kerosene would need to rise 13.1 times to match the market price; that of gas LPG would need to rise by a factor of 11.5; and those of gasoline, diesel and electricity would need to rise by about eight times. The product whose price is currently the “closest” to market price (electricity) would still undergo a price increase of 7.8 times to match the market price. These are the largest gaps observed between subsidized and market prices in North Africa and the Middle East region and represent a real challenge for reform.

**Table 21: Energy Subsidy Reform: Two Scenarios (LYD per unit)**

	Initial price	Subsidy	Final price(S1)	Final Market price(S2)	Final price (S2)/ initial price
Gasoline	0.15	1.07	0.47	1.22	8.15
Diesel	0.15	1.11	0.48	1.26	8.40
Electricity	0.02	0.14	0.06	0.16	7.80
LPG	2.00	20.94	8.28	22.94	11.47
Kerosene	0.09	1.09	0.42	1.18	13.10

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

The direct cost of a complete elimination of subsidies to households is estimated at 2.5 billion LYD (Table 22), equivalent to the total amount of direct subsidies received by households. This is a very large sum, representing almost 20% of total household expenditure. A 30 percent reduction in subsidies on each product would cost households 0.75 billion LYD. These costs would be rather evenly distributed across quintiles with the exception of the first quintile which would bear a much lower cost than the rest. Interestingly, the quintile that would bear the greatest cost is the third quintile. In per capita terms, removing subsidies would cost more to the upper quintiles, as expected given the result that energy subsidies are regressive. Nonetheless, because energy expenditure represents a higher share of total expenditure for the poor, the per-capita loss of the lower quintiles represents a larger share of their total per-capita spending (Table 23), although the difference is not as stark as we found it to be in the case of food subsidy reforms.

**Table 22: Welfare Direct Effects (m. LYD)**

	<b>Gasoline</b>	<b>Diesel</b>	<b>Electricity</b>	<b>LPG</b>	<b>Kerosene</b>	<b>Total</b>
Quintile_1	-53.2	-1.4	-61.0	-16.1	-0.9	-132.6
Quintile_2	-64.4	-1.4	-69.4	-16.6	-1.5	-153.4
Quintile_3	-66.5	-1.1	-69.8	-16.2	-1.7	-155.3
Quintile_4	-66.7	-1.1	-67.5	-15.8	-2.0	-153.1
Quintile_5	-61.9	-1.3	-73.1	-14.9	-2.1	-153.3
Total (Scenario 1)	-312.8	-6.4	-340.9	-79.6	-8.2	-747.7
Total (Scenario 2)	-1,042.6	-21.2	-1,136.2	-265.2	-27.4	-2,492.5

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

**Table 23: Per-capita Welfare Direct Effects as percentage of total welfare (Scenario 1 and 2)**

	<b>Gasoline</b>	<b>Diesel</b>	<b>Electricity</b>	<b>LPG</b>	<b>Kerosene</b>	<b>Total</b>
Quintile_1	-2.89	-0.07	-3.31	-0.87	-0.05	-7.20
Quintile_2	-2.82	-0.06	-3.03	-0.73	-0.07	-6.70
Quintile_3	-2.58	-0.04	-2.71	-0.63	-0.07	-6.02
Quintile_4	-2.43	-0.04	-2.46	-0.57	-0.07	-5.58
Quintile_5	-2.01	-0.04	-2.37	-0.48	-0.07	-4.98
Total (Scenario 1)	-2.50	-0.05	-2.72	-0.63	-0.07	-5.97
Total (Scenario 2)	-8.32	-0.17	-9.06	-2.12	-0.22	-19.89

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

Eliminating all energy subsidies (scenario 2) would create direct savings of 2.5 billion LYD to the government budget—the same amount as the total direct value of subsidies to households (Table 24). This is equivalent to 3.83 percent of total government expenditure. The removal of gasoline subsidies alone could create direct savings of 1.6% of government expenditure and the removal of subsidies on electricity about 1.75% (table 24). A 30 percent reduction in subsidies on all products (scenario 1) would create 1.22 billion LYD in direct savings to the government budget which is more than one-third of the decline in spending under the 100% reduction scenario (scenario 2). As already explained for the case of food subsidies, this is because with a partial reduction in subsidies we have two sources of reduced government spending, the first resulting from higher subsidized prices and the second resulting from lower quantities consumed by households at these higher prices. If subsidies were totally eliminated, this second effect would disappear given that no quantities would be sold at a subsidized price.

**Table 24: Reduction in Government Expenditure (Libyan Dinars)**

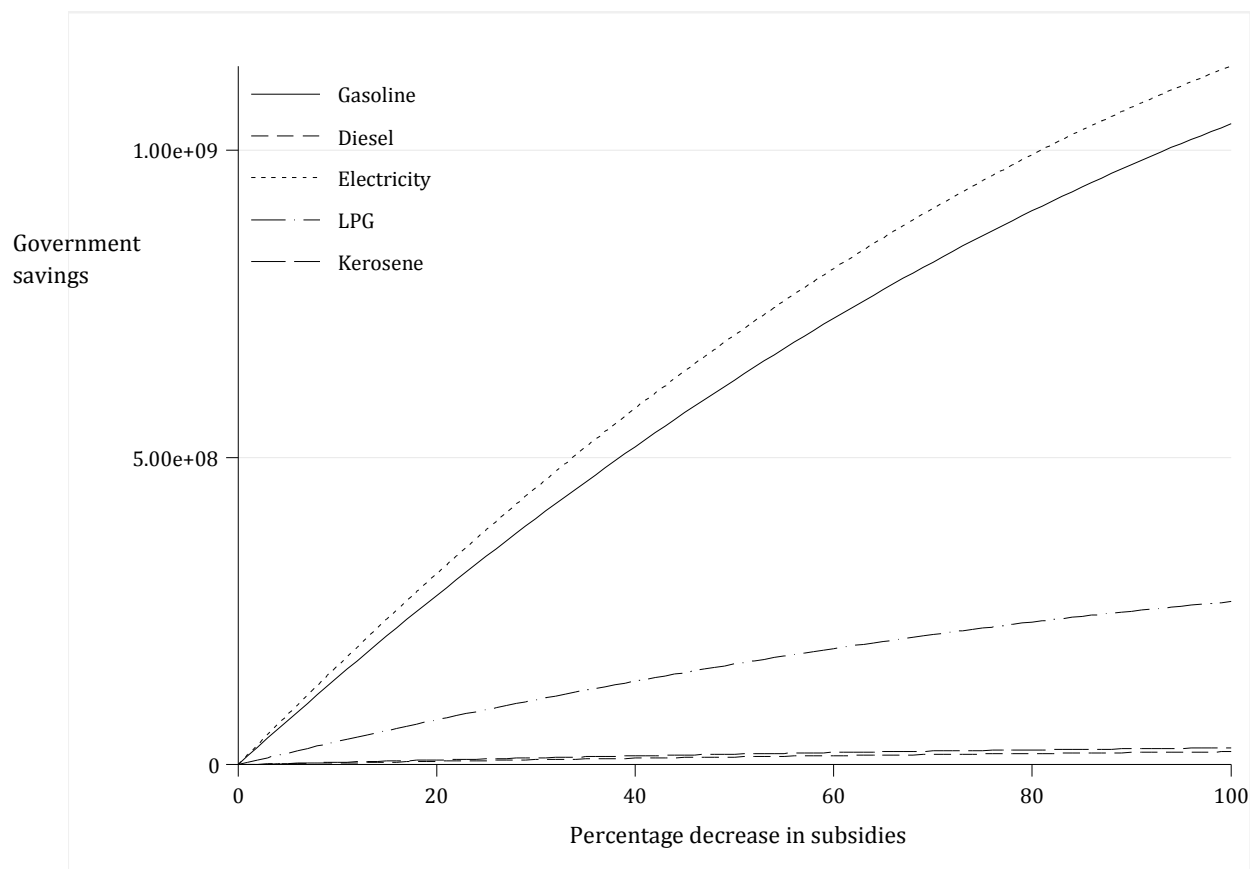
	<b>Gasoline</b>	<b>Diesel</b>	<b>Electricity</b>	<b>LPG</b>	<b>Kerosene</b>	<b>Total</b>
Quintile_1	84.3	2.2	101.4	27.9	1.6	217.4
Quintile_2	102.0	2.3	115.3	28.8	2.8	251.2
Quintile_3	105.4	1.7	116.0	28.1	3.0	254.2
Quintile_4	105.6	1.8	112.2	27.3	3.6	250.5

Quintile_5	98.0	2.1	121.5	25.7	3.7	251.1
Total (Scenario 1)	495.3	10.1	566.4	137.8	14.7	1,224.4
Total (Scenario 2)	1,042.6	21.2	1,136.2	265.2	27.4	2,492.5
% of govt. exp. (Scenario 2)	1.60	0.03	1.75	0.41	0.04	3.83

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

Reforming gasoline and electricity prices would bring the greatest savings to the government budget. Figure 7 illustrates, for each energy product, the direct impact on government expenditure (measured on the *y-axis* in LYD) versus a percentage reduction in subsidy (*x-axis*). The values that correspond to 30% and 100% reductions are the same as those reported under the two scenarios in table 24. For all products, government expenditures are a decreasing function of subsidy reduction. The marginal returns to reducing subsidies would diminish as prices get closer to market levels, because fewer and fewer quantities would be bought at subsidized prices given fixed household expenditure levels.

**Figure 7: Magnitude of Decline in Government Spending Following Reform Scenario 2 (Libyan Dinars)**



Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

Energy subsidy reform could have a substantial impact on poverty. A 30% reduction in subsidies, assuming unchanged consumption patterns, would increase poverty (measured by the national poverty line) by four percentage points, from 18.5% to 22.5% (Table 25). The increase in poverty following a

total elimination of subsidies would be significantly higher, at 17.7 percentage points, resulting in a post-reform poverty rate of over 36%. These magnitudes are commensurate with the magnitude of price adjustments that would be needed under either reform scenario. The products that would explain most of the rise in poverty under the two scenarios are gasoline and electricity. The rise in poverty would also be accompanied under scenario 2 by a rise in inequality, estimated at 3.1 percentage points. These estimates are among the highest when compared with those for other countries in the region such as Morocco, Tunisia, Egypt or Jordan, in part because of the higher level of subsidies in Libya compared to these countries.

**Table 25: Impact of Energy Subsidy Reform on Poverty (Headcount index)**

	International Poverty Line			National Poverty Line		
	Poverty level	Scenario 1 Poverty change	Scenario 2 Poverty change	Poverty level	Scenario 1 Poverty change	Scenario 2 Poverty change
Pre reform	8.475	.	.	14.44	.	.
Gasoline	9.306	0.831	4.010	16.16	1.72	6.77
Diesel	8.509	0.034	0.115	14.49	0.05	0.22
Electricity	9.687	1.212	5.254	15.97	1.53	6.47
LPG	8.674	0.199	0.842	14.83	0.39	1.49
Kerosene	8.502	0.027	0.055	14.47	0.03	0.06
Post reform	11.156	2.681	13.195	18.46	4.02	17.67

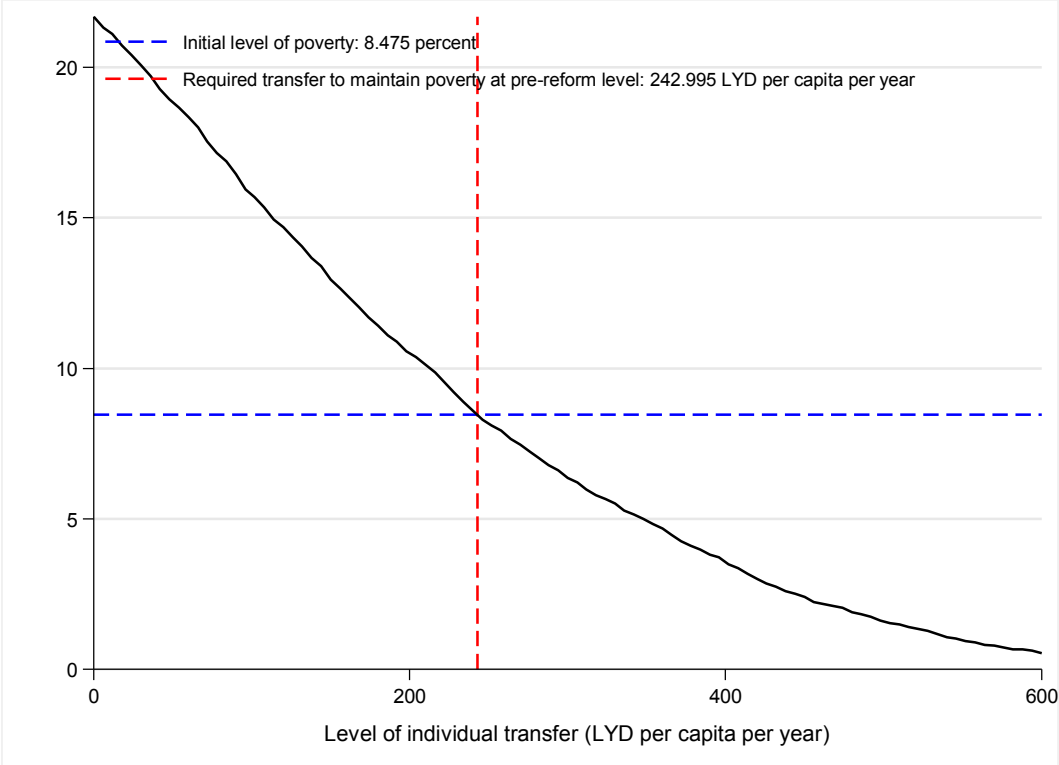
Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

A number of factors can help attenuate the above negative impact of energy subsidy reform. A gradual and sequenced approach to energy subsidy reform, across products and across time, would help make room for simultaneously working on improving public service delivery, so that households and productive sectors are able to gradually adjust to the new economic realities. Besides, the poverty impact of energy subsidy reform measured above is purely monetary, and thus does not take into consideration inevitable substitution patterns that would result when a reform is introduced; these substitutions would be greatly facilitated if the reform were gradual and accompanied by complementary measures to provide other options for citizens in terms of services (such as more efficient electricity production or the introduction of public transportation networks).

The impact of subsidy reform could also be attenuated through cash transfers. A transfer of LYD 243 per capita per year targeted to the first quintile would be sufficient to restore poverty to the pre-reform level of 8.5 percent under the scenario of full subsidy elimination and using the international poverty line of 1.25 USD per person per day (Figure 8). This targeted transfer system would cost the government LYD 471 million per year. Alternatively, because poverty would jump by almost 18 percentage points if all energy subsidies were eliminated, the government may decide to target the transfers to the first two quintiles. The per-capita amount required to bring poverty back to 8.5 percent in this case would be LYD 245, costing the government LYD 845 million per year. Yet another possibility to restore poverty to the pre-reform level would be a universal transfer of LYD 243 per capita per year, costing the government LYD 1.5 billion annually. Given that direct savings from the price increases would amount to LYD 2.5 billion (Table 24), the net gains to the budget from full subsidy elimination *and* cash compensation to the

population in the first quintile of LYD 243 per capita would be about LYD 2 billion. In case targeting the first quintile is not possible, extending a transfer of LYD 243 per person per year to the entire population—sufficient to maintain poverty at 8.5 percent—would reduce the net gains to the budget from subsidy reform *and* cash transfers to about LYD 1 billion per year.

**Figure 8: Poverty Impact of Cash Transfers to First Quintile under Energy Subsidy Reform S2**



Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

Energy price increases would also be expected to reduce consumption (Table 26).<sup>23</sup> Based on our assumptions, a 30 percent reduction in energy subsidies would reduce the quantities of energy products consumed by 46 percent for electricity, 52.7 percent for kerosene, and 40 percent for gasoline and diesel. The estimated impact on quantities would also vary across quintiles. For kerosene, for example, the impact would be greater for richer households, but for other products such as diesel and gas GPL the impact would be the greatest for the second quintile.

<sup>23</sup> These results are entirely dependent on the choice we made regarding the point elasticity at market price and the shape of the demand curve. Underlying our analysis are demand curves that depict the same elasticity for all households but differ in elasticity across products, with the difference depending on the gap between market price and subsidized price. For energy products, we assumed a point elasticity of -0.5 at the free market price. This estimate and a linear demand curve function are then used to estimate the point elasticity at the subsidized price.

**Table 26: Impact of Energy Subsidy Reform (Scenario 1) on Quantities Consumed**

	Gasoline (liter)	Diesel (liter)	Electricity (kWh)	LPG Bottle (15 kg)	Kerosene (liter)
Quintile_1	-48.1	-1.2	-424.4	-0.9	-1.0
Quintile_2	-58.3	-1.3	-482.4	-0.9	-1.7
Quintile_3	-60.2	-1.0	-485.3	-0.9	-1.9
Quintile_4	-60.3	-1.0	-469.4	-0.9	-2.3
Quintile_5	-56.0	-1.2	-508.1	-0.8	-2.3
Total scenario 1	-282.8	-5.6	-2,369.5	-4.4	-9.3
Total scenario 2	-454.2	-9.0	-3,843.2	-6.6	-14.4

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

## 6. The political economy of reforms

There have been attempts at subsidy reform during the decade that preceded the revolution but they did not last. In the early 2000s, following the removal of international sanctions, Libya embarked on a reform path to modernize and open up its economy (Vandewalle 2011), and cutting subsidies seems to have been an important part of that program (Wahby 2005). Despite widespread opposition among the population, the government proceeded with the reform, raising fuel, diesel, and electricity prices in 2005 and completely liberalizing the price of some food products. By 2006, only four food products were still subsidized: flour, rice, semolina and pasta. In 2007, the government also eliminated the subsidy on pasta, leaving only 3 food products subsidized, and, in compensation, tried to put in place a transfer system of 4 dinars per capita per month. However, the government was unable to dispense this cash transfer. Still, subsidies remained restricted to the three items just listed, until early 2011 when Gadhafi, in an attempt to quell the revolutionaries' demands, extended food subsidies back again to 13 items.

The political economy of the Gadhafi period was entirely driven by the Colonel's decisions and these decisions served budget interests or short-term political objectives. The post Gadhafi period has been characterized by internal conflicts among various factions that participated to the revolution and by a very volatile political environment. This made subsidy reforms very difficult to implement and the possibility of a public debate on subsidy reforms almost impossible. High oil and gas prices that characterized the period between the revolution in 2011 and the first half of 2014 helped to boost government revenues but the internal conflict over natural resources limited the possibility to exploit oil reserves to their full potential. The most recent slump in the price of crude oil and the continued internal instability are contributing to increase the pressure on government finances while keeping subsidy reforms very difficult to implement from a political perspective. Hence, Libya remains the most extreme of the cases in the MENA region in terms of the size and variety of subsidies, in terms of weight of subsidies on the government budget and in terms of lack of reforms and it will be very unlikely to see a reform of the subsidies system anytime soon.



Despite this very complex environment, reforming subsidies remains an important question for the Libyan government. In February 2013, the Ministry of Economy conducted a survey on a sample of 931 adult citizens aged 18 to 95 living in 25 cities. The University of Tripoli analyzed results and found that about 70% of the respondents were in favor of a policy that would eliminate subsidies and replace them with cash transfers, although only 28% thought that compensation via cash subsidies should be targeted to the poor only. Libyans believed that they are entitled to subsidies as a means to distribute national wealth to most citizens but they would trade low subsidized prices for a cash benefit.

The government announced several times the intention to reform subsidies. In April 2014, it made public the intention to introduce smart cards for the purchase of fuels and also stated the intention to eliminate subsidies within three years and in July 2014 it committed to substitute goods and fuel subsidies for cash subsidies by January 2015. According to the Libya Herald,<sup>24</sup> this is the first time in Libya’s history that this step is taken and this in spite of the political instability. Yet, at the time of writing this paper, no substantial reform had been implemented and political instability was deteriorating further.

## 7. Summary and recommendations

This paper provided a food and energy subsidy incidence analysis as well as an impact analysis for two alternative reform scenarios for Libya. The results provide information for each subsidized good in terms of the subsidy’s impact on household welfare and on poverty. Below we review briefly the key findings and discuss the main issues that would still need to be addressed for a more comprehensive picture of subsidy incidence and reform analysis.

Food subsidies save households some 10% of annual expenditure and eliminating them would have a significant effect on poverty. Table 27 summarizes the results of the food subsidy analysis. Household expenditure loss would reach 3.1% under scenario 1 and 10.2% under scenario 2. The incidence of subsidies would drop from 10.2% in the pre-reform scenario to 7.4% under scenario 1 and zero under scenario 2. Subsidy reform would reduce government spending by about 1% under scenario 1 and 2% under scenario 2 (but additional savings from lower administrative costs and less waste/smuggling would also materialize). The poverty impact would be particularly stark: depending on the poverty line used, poverty would rise from 8.5% (or 14.4%) to 10.5% (or 17.3%) under scenario 1 and to 16.6% (or 24%) under scenario 2. Inequality would also rise.

**Table 27: Summary of Aggregate Results for the Case of Food Subsidies**

	Pre-reform	Scenario 1 (30% reduction in subsidies)	Scenario 2 (Elimination of subsidies)
Total real household expenditure (bn. LYD)	12.53	12.15	11.25
Household expenditure loss in real terms (% of pre-reform)	n.a.	-3.1	-10.2
Total subsidies (bn. LYD)	1.28	0.9	0

<sup>24</sup><http://www.libyaherald.com/2014/07/06/2014-budget-commits-government-to-subsidy-reform-by-jan-2015/#axzz3OmulcpVM>

Incidence of subsidies (% tot exp.)	10.2	7.4	0
Change in government spending following reform (bn. LYD)*	n.a.	-0.66	-1.28
Savings to the government following reform (% govt. exp.)*	n.a.	1	2
Poverty headcount (% , international poverty line)	8.5	10.5	16.6
Poverty headcount (% , national poverty line)	14.4	17.3	24
Inequality (% , Gini)	30.2	31	33.2

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations. (\*) Estimates exclude savings from reduced waste, smuggling and administrative costs

While food subsidies are relatively progressive, a significant share is “wasted” (about 35% of government spending on food subsidies), which would support a move to replace them with cash transfers. This paper’s analysis can provide guidance for the size of cash transfers that would compensate for food subsidy reform. One can look for guidance in the estimates of the per-capita monetary value of subsidies received by the various quintiles of the population (Table 28). For example, under a scenario of full subsidy elimination, maintaining the poverty rate constant at 8.5 percent is feasible if a per capita transfer of LYD 175 per year is allocated to the population in the first quintile. If the objective is rather to compensate the population falling in the first quintile for the totality of their loss, the transfer could be LYD 180 per capita, again granted only to the population in that group. And if the objective is to compensate the average member of the population (a way to address in part the needs of the middle class in a compensation scheme) then cash transfers could amount to, for example, 201 LYD per year per person, which is the average monetary value that a Libyan person derives from food subsidies today.

**Table 28: Per-capita Monetary Value of Food Subsidies (in LYD/capita/year)**

	Q1	Q2	Q3	Q4	Q5	Total
Flour	13.0	13.9	14.5	15.2	14.5	14.0
Flour-bread	46.1	54.7	56.8	60.3	71.3	55.1
Semolina	2.1	2.3	2.1	1.9	1.5	2.1
Rice	21.8	24.7	26.2	26.7	27.1	24.7
Sugar	15.1	16.7	16.9	17.5	17.0	16.4
Tea	4.2	4.8	4.8	4.7	4.5	4.6
Macaroni	16.7	17.8	17.9	18.0	18.0	17.5
Vegetable Oil	36.5	39.2	40.3	40.5	40.7	39.0
Paste tomatoes	13.5	14.6	14.8	14.8	14.8	14.3
Milk for children	1.5	2.8	4.1	6.2	8.5	3.8
Milk (concentrated)	9.1	10.5	10.4	9.7	9.6	9.8
Total	179.7	202.1	208.8	215.5	227.5	201.4

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

The above examples dealt with eliminating all subsidies in one step but, alternatively, another possibility may be to sequence the reform over products and over time. Price liberalization could start with items that are likely to have a small impact on households such as semolina<sup>25</sup> and move onto bigger ticket items

<sup>25</sup> A caveat to our analysis is that it does not take into consideration the nutritional consequences of food subsidy reform. Such an analysis may be needed before arriving at a view on how small is the impact on households particularly if the reform is not accompanied by cash transfers.

over time. This approach may be easily followed in Libya since it was implemented in the past between 2007 and 2010 with only three food items subsidized, flour, rice and semolina. Yet another possibility, given the generous caloric content of the quotas, could be to start reducing the quantities of all food items under the quota system gradually before eliminating subsidies altogether at a later point in time.<sup>26</sup>

Energy subsidies save households about 26% of annual expenditure and their elimination would also significantly impact poverty. Table 29 summarizes the aggregate results for analysis of energy subsidies. Household expenditure loss would reach 6% under scenario 1 and 19.9% under scenario 2. These magnitudes are much larger than the ones seen in the case of food subsidies, given the much larger subsidized component underpinning energy prices in Libya today, compared to that in food prices. Subsidy reform would reduce government spending by about 1.9% under scenario 1 and 3.9% under scenario 2 (but this would be a partial impact on the government budget since factors like indirect effects and effects on productive sectors are not incorporated in the analysis, nor are other factors like smuggling). The impact on poverty would be very high with a rise in poverty from 8.5 percent under the international poverty line (or 14.4% under the national line) to 11.2 percent (or 18.2%) under scenario 1 and to 21.7% (or 30.4%) under scenario 2. This rise in poverty would also be accompanied by a rise in inequality of 3.2 percentage points.

**Table 29: Summary of Aggregate Results for the Case of Energy Subsidies**

	<b>Pre-reform</b>	<b>Scenario 1 (30% reduction in subsidies)</b>	<b>Scenario 2 (Elimination of subsidies)</b>
Total real household expenditure (bn LYD)	12.53	11.79	9.29
Household expenditure loss in real terms (% of pre-reform)	n.a.	-6	-19.9
Total subsidies (bn LYD)	2.49	1.74	0
Incidence of subsidies (% tot exp.)	19.9	14.8	0
Change in government spending following reform (bn LYD)	n.a.	-1.22	-2.49
Savings to the government following reform (% govt. exp.)*	n.a.	1.9	3.9
Poverty headcount (% , international poverty line)	8.5	11.2	21.7
Poverty headcount (% , national poverty line)	14.4	18.2	30.4
Inequality (% , Gini)	30.2	30.8	33.4

Source: Libyan Household Consumption Survey 2007/8; Libyan authorities; and Bank staff calculations.

Clearly, energy subsidy reform would have a huge impact on the Libyan economy, which calls for gradualism. Full liberalization would imply price increases of between 7 and 10 times the existing prices, in a context where alternatives (such as more efficient production processes for electricity, or public

<sup>26</sup> Indeed, as already mentioned, the current basket of subsidized products provides more than twice the amount of adult calories intake as recommended by the WHO or FAO. If we consider that the majority of household members in poor households composed of 6-7 individuals are children, this suggests that the amount of calories allocated within the quota system is anywhere between two and three times the calories needed. This would justify a reduction in quotas based on the level of individual caloric needs—quotas could be cut by half, for example. This would be equivalent to reducing food subsidies by half, which would save more than 1% of government spending.

means of transportation) are not available. It would therefore seem imperative that energy subsidy reform be planned in stages, with a product by product approach, gradually liberalizing product after product over a number of years, and along with significant improvements in service delivery in related areas (electricity, transport, etc.). The latter would help improving efficiency and contributing to lower energy consumption. For the electricity sector in particular, it would be important to first improve performance at all levels of production and distribution while tariffs are slowly increased.

While more analysis is needed to help develop a suitable subsidy reform plan, the results of this paper suggest a number of broad recommendations. The complete elimination of all subsidies in one stroke with no compensation to households could result in a sharp increase in poverty and could affect the middle-class severely.<sup>27</sup> This, in turn, could lead to social unrest. Hence, a “big bang” approach to subsidy reforms in Libya during this particular historical period is not advisable.

A less drastic approach would be to reduce subsidies in sequential steps over an extended period of time. Countries such as Morocco and Tunisia have followed this approach, achieving significant budget savings without social unrest. It is also advisable to implement reforms one product at a time starting with the products that affect the poor the least, although other considerations may be important as well, for example the importance of not delaying reforms where substantial waste is clearly established. Other things equal, this generally implies to start with petroleum products rather than food products and to start with gasoline rather than gas LPG. This paper provides important information that helps making a choice on priority products based on the importance of each product for different groups of households.

The elimination or reduction of subsidies would also call for targeted cash transfers. Compensation could be provided to the bottom 20 or 40 percent of households in the form of coupons or cash transfers. Such reforms could result in significant budget savings and no increases in poverty. However, the difficulty of this approach resides in the better targeting of households, and specific systems would need to be put in place to ensure that such targeting is operationally feasible. If the country does not have in place such effective systems, targeted subsidies may result in substantial waste of resources. A universal transfer is a second best option but would still reduce the burden on government expenditure.

This paper provided only part of the information required to put in place subsidy reform. As hinted above, much more work and preparation would be needed to prepare a feasible reform agenda. In particular, a few areas stand out for further work. First, it would be important to assess, in the context of the existing formal and informal support mechanisms in Libya, whether a new cash transfer system is really needed to compensate for subsidy reform and for what product. Second, if a transfer is needed, the next question is how best to introduce it in the context of existing social safety nets and/or what reforms to these safety nets are needed to support subsidy reforms. Also, actual mechanisms to disburse the transfers might need to be put in place and these may be costly. Third, a strategy for phasing out the transfers may also be needed, particularly if targeting cannot be achieved. Fourth, broad consultation needs to be conducted with all sectors affected by the reform to address, if need be, negative impacts. Beyond the impact on households, energy subsidy reforms will probably have significant impact on producers, and such impact will need to be assessed and factored in the reform. Fifth, a communication strategy in Libya would seem

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<sup>27</sup> This paper’s analysis doesn’t take into account new transfers enacted by the GNC in 2013 (such as transfers to heads of households and transfers for minors). A complete picture of the impact of subsidy reform on poverty and the middle class will require including these in the assessment.

even more important than in other countries given the size and sensitivity of subsidies and the current political fragility. These aspects are all beyond the scope of this study but need to be tackled in preparing for subsidy reforms.

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