FUEL PRICES IN SIERRA LEONE

The World Bank

Poverty Reduction & Economic Management Unit

Africa Region

Currency Equivalents

Currency Unit = Sierra Leonean Leone

US$1 = 4,340 Le.

(As of May 5, 2014)

Acronyms and Abbreviations

CIF	Cost, Insurance and Freight
CPI	Consumer Price Index
FOB	Free-on-Board
GDP	Gross Domestic Product
MT	Metric tonne
SLIHS	Sierra Leone Integrated Household Survey
USD	United States Dollars

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This note on fuel subsidies in Sierra Leone has been prepared by the World Bank Poverty Reduction & Economic Management Unit using the data from 2011 Sierra Leone Integrated Household Surveys and Consumer Price Index data, both produced by Statistics Sierra Leone.

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6. Fuel Prices in Sierra Leone

Executive Summary

This chapter is a written companion to an Excel-based tool presented to government stakeholders from the Economic Policy and Research Unit of the Ministry of Finance and Economic Development, the National Revenue Authority, the Petroleum Unit, and the Bank of Sierra Leone in April 2014. The tool uses household survey data, Consumer Price Index data, National Accounts, and fuel sales and pricing information to produce simulations of the fiscal, inflationary, and poverty impacts of changes to fuel prices. This note summarizes the necessary inputs and analysis of two common scenarios, full pass-through of international prices to consumer prices, and an increase in the international price of oil.

In June 2006, the government introduced harmonized fuel prices for petroleum, diesel, and kerosene across all areas of the country. Price harmonization eliminated the adulteration of diesel with lower price kerosene, which had led to kerosene shortages in some areas of the country. In addition, the elimination of price differentials in response to transportation costs effectively used revenue from Freetown to subsidize more remote regions. Prices were maintained by waving certain taxes and duties rather than a direct subsidy. The price was reviewed periodically and changed to reflect the rise and fall of world prices, though not to the level of full pass through. This system remained in place, with the exception of a brief period during the 2008 fuel crisis, until June 2012. At that time, full pass through of world prices was introduced for commercial consumers, while the previous pricing system was maintained for retail.

The current retail fuel price is among the lowest in Africa. The tax expenditure, or the tax revenue foregone by the government to maintain fixed retail prices, reduces the price of gasoline by 11 percent and the price of diesel and kerosene by 18 percent relative to the commercial price. In 2014 the tax expenditure amounted to one percent of the non-iron ore GDP, and is likely to increase as the economy develops and fuel consumption increases. By means of comparison corporate income tax amounted to 1.3 percent of non-iron ore GDP, mining royalties to 1.2 percent, excises to 1.6 percent, and import duties to 1.5 percent.

The model calculates the impact of a change in fuel prices on state revenue, consumer inflation, and poverty. The fiscal cost is calculated by using current fuel consumption, estimated growth in fuel consumption, and the per liter amount of foregone revenue. To analyze the impact on inflation, pass-through coefficients of changes in fuel prices to inflation generally are estimated using comparable data from similar developing country contexts. The final output of the model is to estimate the associated poverty impacts. To focus in particular on the poor, a “poverty basket inflation” index is developed and used instead of the standard consumer price index. This allows for the study of both the direct effects, increases in prices for fuel purchases, as well as the secondary effects, such as an increase in fuel prices due to increased transportation costs. These price changes are then applied to the household survey data to study poverty impacts. In addition, the model is also able to calculate the cost of offsetting social transfers.

Finally, the note considers the political economy considerations in undertaking reforms of this nature.

INTRODUCTION

6.1 **This chapter has been prepared as a supplementary chapter to the World Bank's poverty assessment of Sierra Leone**. This chapter is the final chapter in a series of six, which include analysis on poverty, labor, agriculture, education, and rice prices. The key objective of the poverty assessment is to provide inputs to the government of Sierra Leone's policy making process as well as to anticipate potential future shocks.

6.2 **The fuel price supplement serves as a companion to the tool developed for the government and presented at a workshop for the government in April 2014.** The World Bank has developed a tool that can be used to simulate the potential impacts of changes to Sierra Leone's fuel subsidy program on inflation, fiscal position and the poverty rate. In addition to changes in the regulated price of fuels, the model can simulate the impacts of exchange rate and oil price movements on fuel subsidies. The key model inputs are assumptions about oil prices and exchange rates, growth in the economy, prices, consumption elasticities, price pass-through elasticities, employment and population, and household microeconomic data from a national socio-economic survey. This note briefly describes the data sources, the methodology developed in the model, and some key predicted outcomes of possible price change scenarios.

6.3 **This chapter uses the following data sources: the 2011 Sierra Leone Integrated Household Survey (SLIHS), the Consumer Price Index (CPI), National Accounts, Petroleum sales and pricing formulas from the Sierra Leone Petroleum Unit.**

6.4 **The chapter is divided into two sections: the main text and the appendices.** The main text includes 19 key figures with accompanying explanations and analysis. The appendices include supporting information, including a series of tables of more detailed assumptions of the model.

HISTORY OF FUEL PRICES

6.5 **Prior to June 2006, prices for petroleum, diesel, and kerosene moved independently and in response to the international market.** At that time, prices were determined individually based on a formula that took into account the market price and transportation costs, and which allowed for full pass-through of fluctuations of the world price. Following this pricing scheme, diesel fuel was almost 50 percent more expensive than kerosene. This price disparity led to widespread adulteration of fuel as kerosene was used to dilute petroleum and diesel. These issues were compounded by the fact that there were differences in prices between Sierra Leone and neighboring countries which led to a thriving black market in which it was not possible to verify the quality of the fuel. As it was being used to adulterate higher priced fuels, shortages of kerosene also developed in certain parts of the country.

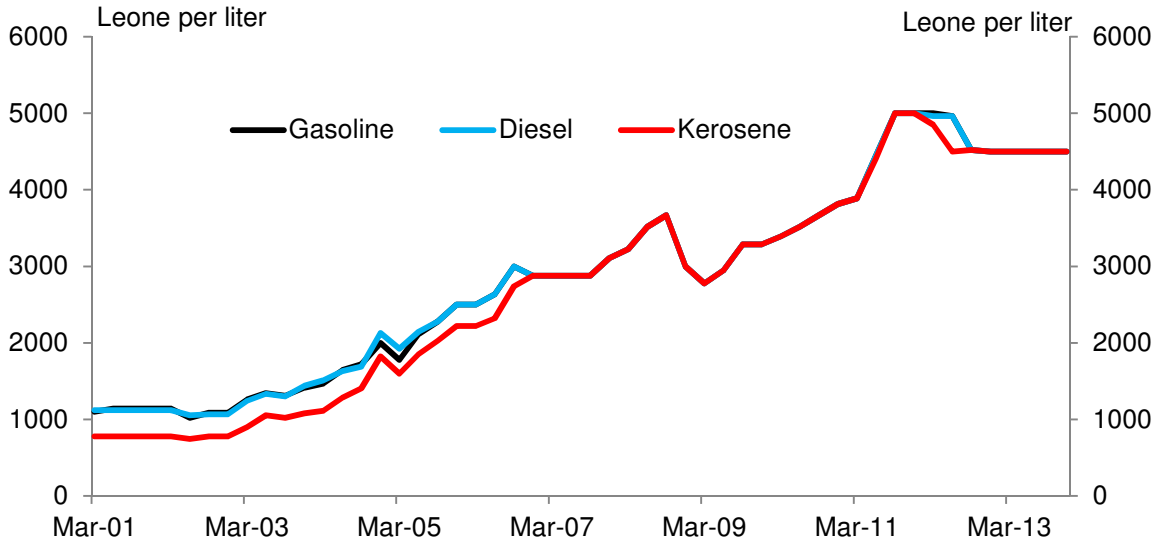
6.6 **To address the concerns listed above, the government harmonized the prices of petroleum and diesel fuel.** The prices were first harmonized in 2005 and a further universal price of 13,500 Leone per imperial gallon for all three fuels was introduced on June 3, 2006. This constituted approximately a ten percent increase over the previous price of petroleum and diesel, and a 20 percent increase in the

price of kerosene. This price also eliminated differences in fuel prices across regions, with Freetown and the environs effectively subsidizing the fuel costs and consumption of more remote regions.

6.7 **During the 2008 fuel crisis, the government intervened in the market with direct subsidies to control rising consumer prices.** On March 8, 2008, with world oil prices pushing past $147 per barrel, the government, through the Petroleum Board, decided to intervene with direct subsidies for the first time. Previously, price controls were maintained by waiving certain percentages of taxes, which constituted a tax expenditure. This price was then regularly reviewed according to a predetermined formula. The price continued to rise and fall with world market prices, though there was not full market pass-through. Following a review of the budget and growth implications, the government raised prices on May 1, 2011 and also switched the unit of measurement from imperial to metric.

6.8 **Full pass-through of the economic price was reintroduced for commercial consumers in June 2012.** To further address budgetary pressure, the two-tiered pricing system was introduced in which the retail pump price was maintained for consumers, but large companies and diplomatic organizations now paid a higher price, representing again full pass-through of world market prices. Commercial users must access fuel directly from the port or government outlets, whereas all pump stations only sell at the retail price of fuel. Figure 1 below graphs these changes in pump prices (retail) for the three main fuel types.

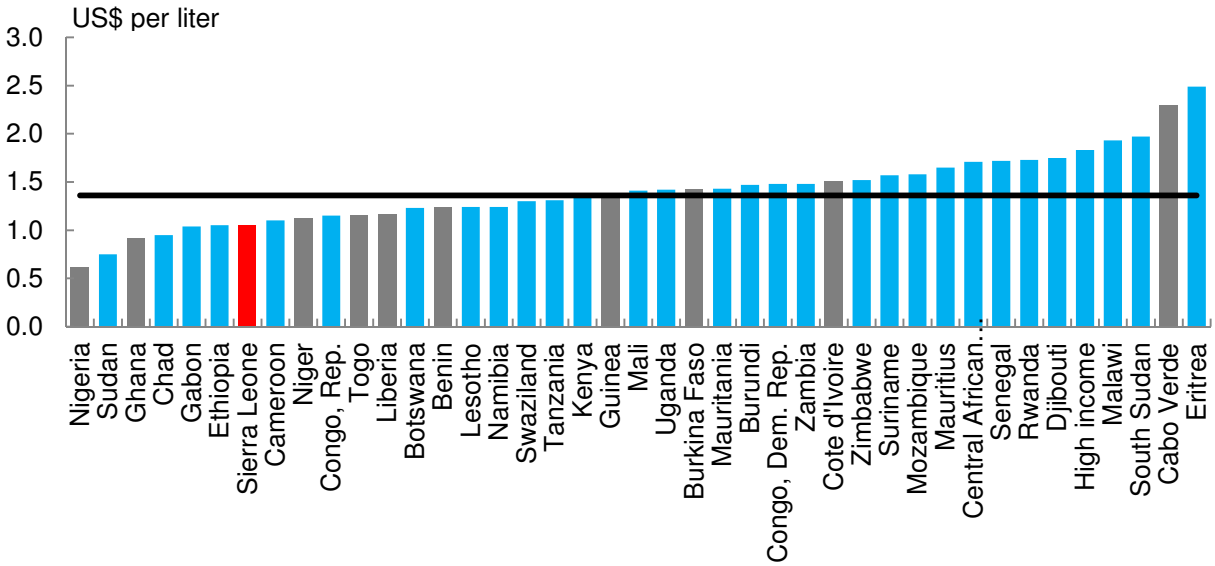
Figure 1. Pump Prices (retail) in Sierra Leone (2001 – 2013)



Source: Sierra Leone Petroleum Unit

6.9 **The regulated price of gasoline in Sierra Leone is among the lowest in Africa.** The retail price of gasoline is around 1.05 USD per liter in Sierra Leone, much lower than the regional average of $1.36 USD per liter (2012 – see figure 2). Importantly, the price in Sierra Leone is much lower than the price in its neighboring countries. In Guinea the price is $1.34 USD per liter while in Liberia the price is $1.17 USD per liter. This raises the potential for households and businesses to cross the border into Sierra Leone to purchase fuel. In effect, the Government of Sierra Leone would be subsidizing the fuel costs of neighboring countries.

Figure 2. Gasoline Pump Prices in Africa 2012*



*Countries in the Economic Community of West African States are shaded in grey
Source: World Development Indicators

CURRENT PRICES

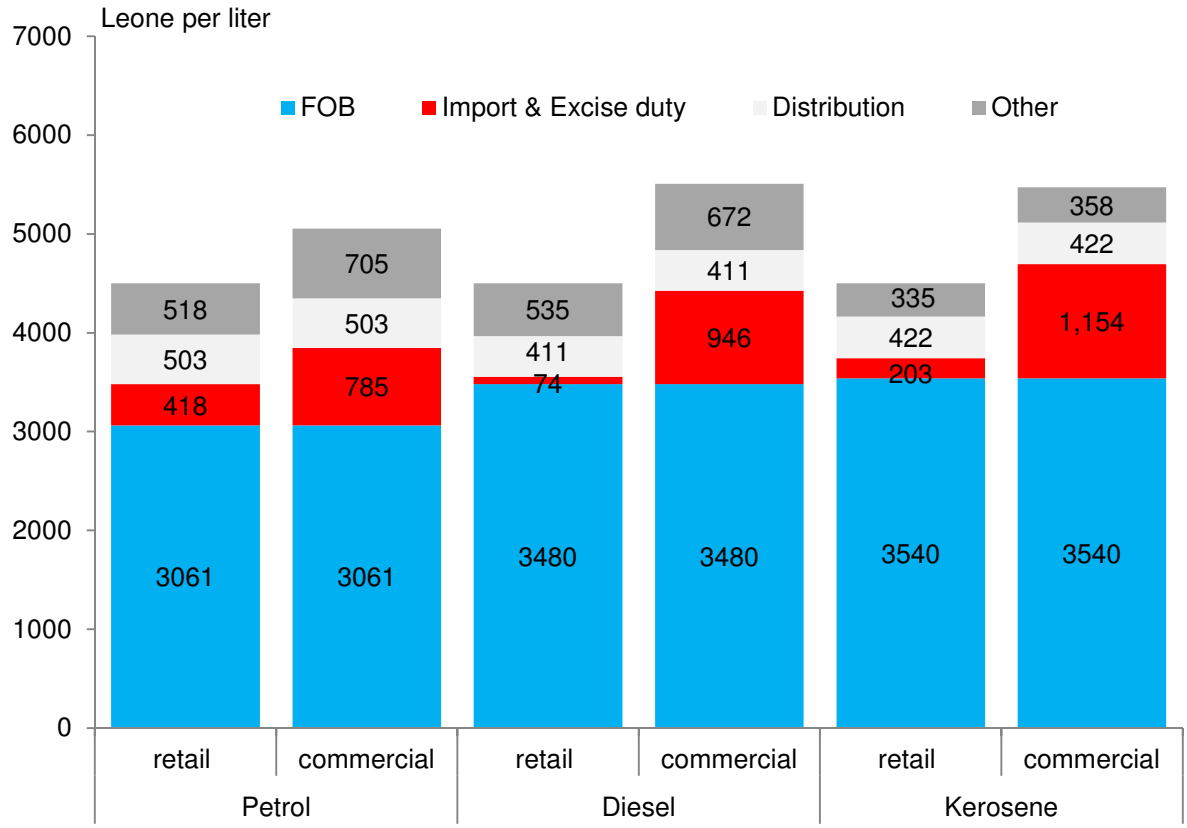
6.10 **Fuel prices in Sierra Leone are determined by three components: external costs, taxes and duties, and the subsidy amount.** The first two components, the external price and taxes and duties, comprise the 'economic price' or the cost to consumers including taxes but excluding any subsidy. The external costs include world market price, freight charges, storage, demurrage, transfer fees, agency fees, and the distribution costs. Taxes and duties include import duties, port charges, freight levy, excise duty, road user charges, contribution to strategic stocks, and a contribution to the Petroleum fund. Since Sierra Leone does not currently have a direct subsidy, the subsidy component is rather foregone revenue from the taxes and duties, specifically for port charges, excise duties, and road user fees, which are levied on commercial users but at a lower amount for retail users. The subsidy program is therefore best thought of as a tax expenditure: a spending policy that is undertaken through the tax system rather than through direct fiscal spending.[1]

6.11 **The economic price can also be defined as the *landed price of fuel* plus the *landed costs*.** The *landed price* includes the average Platts price (which is an international benchmark for refined fuels) plus the freight costs, and the charges incurred at the port, including the import duty, storage, port charges, demurrage, levies, etc. The *landed costs* include the distribution costs, contributions to the Petroleum fund, the excise duty, and other charges incurred after the fuel has reached port. See table 1 in the appendix for a detailed description of the calculation of the economic price.

[1] For further information on the theory and application of tax expenditures see Congressional Budget Office report 2013, "The Distribution of Major Tax Expenditures in the Individual Income Tax System", http://www.cbo.gov/publication/43768,

6.12 **The size of the tax expenditure can be seen in the difference between the commercial and individual price of fuel.** Since the government returned to full pass through for commercial purchasers of fuel in 2012, commercial customers pay the full economic price. To keep the price down for households, the government forgoes some revenue in taxes and duties on retail fuels. Currently, the pricing formula for retail fuels forgoes all the import duty but still levies an export duty. This difference in the tax collected on retail fuels is the amount of the implicit subsidy (tax expenditure) which the government is providing to retail consumers who purchase at the pump.

Figure 3. Breakdown of Retail and Commercial Fuel Prices (as of 30 December 2013)



Source: Sierra Leone Petroleum Unit

6.13 **The tax expenditure reduces the price of gasoline by 11 percent and the price of diesel and kerosene by 18 percent relative to the commercial price.** Though the FOB (free on board)[2] oil price and transport prices are identical for the commercial and retail prices, imports and excise duties and other fees are higher for the commercial prices. These are the two mechanisms that the government has for controlling the amount of the tax expenditure. Of the total difference for gasoline, 66 percent is due to lower taxes and duties, and 34 percent for the remaining categories. For diesel and kerosene, the main difference in commercial and retail prices is due to lower excise and duties collected (86 percent of the difference for diesel and 98 percent of the difference for kerosene).

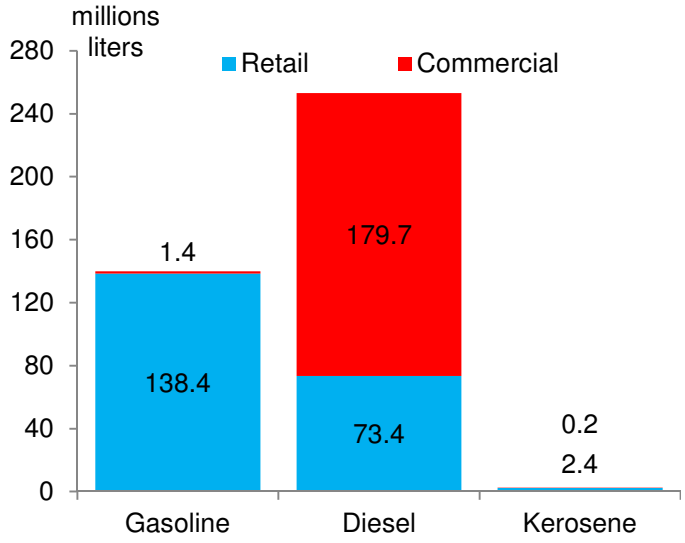
[2] Free on board is a term used when the buyer pays for the cost of transporting the goods.

6.14 **The commercial price of fuel is updated as necessary based on changes in the international price.** According to the Sierra Leone Petroleum Unit, the rate is adjusted "upwards or downwards periodically as and when the combined effect of the changes in world market prices (quoted in Platts) and the exchange rate (measured by the average selling rates quoted by the commercial banks & Bank of Sierra Leone weekly FX Auction), cause a +/- 5.0% change in the Leone-based Landed Cost of the product(s)."

CURRENT FISCAL IMPACT

6.15 **Currently the tax expenditure amounts to 1.0 percent of total non-iron ore GDP.** The current tax expenditure level as described above leads to a 551 SLL per liter implicit subsidy for gasoline, 1004 SSL per liter for diesel, and 969 SLL per liter for kerosene. Figure 4 to the right shows the consumption by fuel type and by sector. Since commercial consumption is priced at the economic price, the tax expenditure is from the retail component. Combining the consumption of fuels by the retail sector and the implicit subsidy per liter results in a tax expenditure of around 152 billion Leone in 2013, or 1.0 percent of non-iron ore GDP (Figure 5). However, the actual figure may be higher if there are instances of commercial customers purchasing the fuel at retail prices.

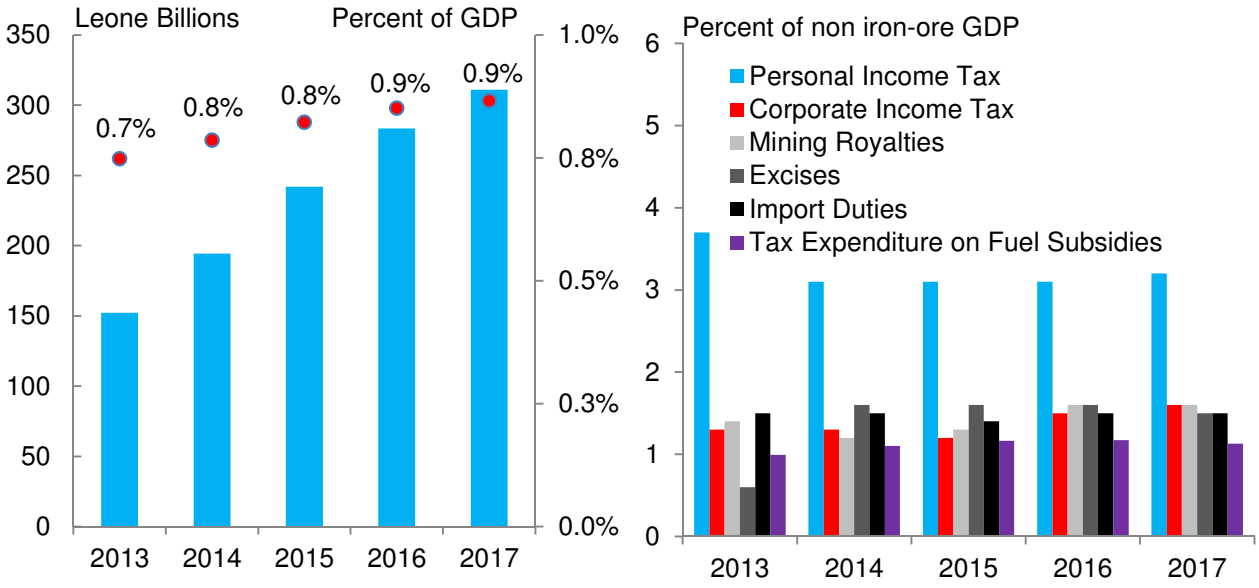
Figure 4. Consumption of fuels by type and sector (2013)



Source: Sierra Leone Petroleum Unit

6.16 **The tax expenditure on the implicit subsidy is sizeable compared with other revenue sources.** Resource generation from other major revenue sources in 2013 included personal income tax, 3.1 percent of non-iron ore GDP, corporate income tax, 1.3 percent, mining royalties, 1.2 percent, excises, 1.6 percent, and import duties, 1.5 percent (Figure 5). As discussed in the following section, these losses are projected to grow as the economy further develops and fuel consumption increases.

Figure 5. Tax expenditure on Fuel Subsidies

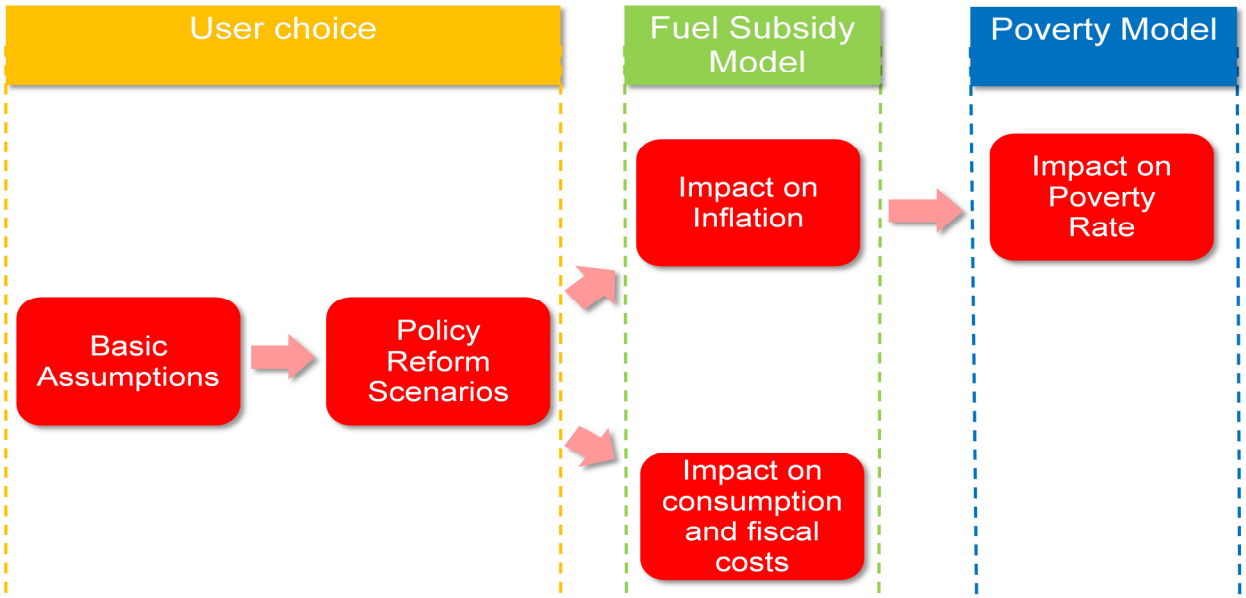


Source: World Bank calculations based on IMF data

MODEL INPUTS AND ASSUMPTIONS

6.17 **The model calculates the impact of a change in fuel prices on state revenue, consumer inflation, and poverty.** Figure 6 below shows a schematic of the model design first developed to examine the impacts in Indonesia and subsequently in selected countries in the Middle East region.[3]

Figure 6. Schematic of Model



[3] World Bank. 2011. *Indonesia economic quarterly : 2008 again?*. Indonesia economic quarterly. Washington, DC: World Bank. http://documents.worldbank.org/curated/en/2011/03/13924032/indonesia-economic-quarterly-2008-again

6.18 **To simulate the cost of the tax expenditure, it is necessary to estimate the growth in fuel consumption over time.** To project forward the consumption of fuel, it is necessary to compute a price-elasticity of fuel and income elasticity to nominal GDP growth. This is done by comparing how the volume of fuel consumed changes over time as nominal GDP and prices change. These data, however, were not available to estimate for Sierra Leone; therefore we looked at a study done for countries around the world and used elasticity estimates from similar countries in West Africa.[4] Other necessary components of the future consumption model include the macro framework (2013 IMF Article IV and World Bank), population growth assumptions (IMF World Economic outlook), and the Platts price (Petroleum Unit pricing formula). Key assumptions are provided in table 2 in the appendix for the period 2014-2017.

6.19 **Holding the price and exchange rate constant, the tax expenditure increases steadily.** Using the economic cost of fuel and the level of consumption, even with constant oil prices and exchange rates, the growth of incomes in the Sierra Leone economy will result in more fuel consumed in the future, which will increase the nominal cost of the tax expenditure. Figure 5 (shown above) shows the growth in the cost of the tax expenditure both as an amount and as a percentage of GDP.

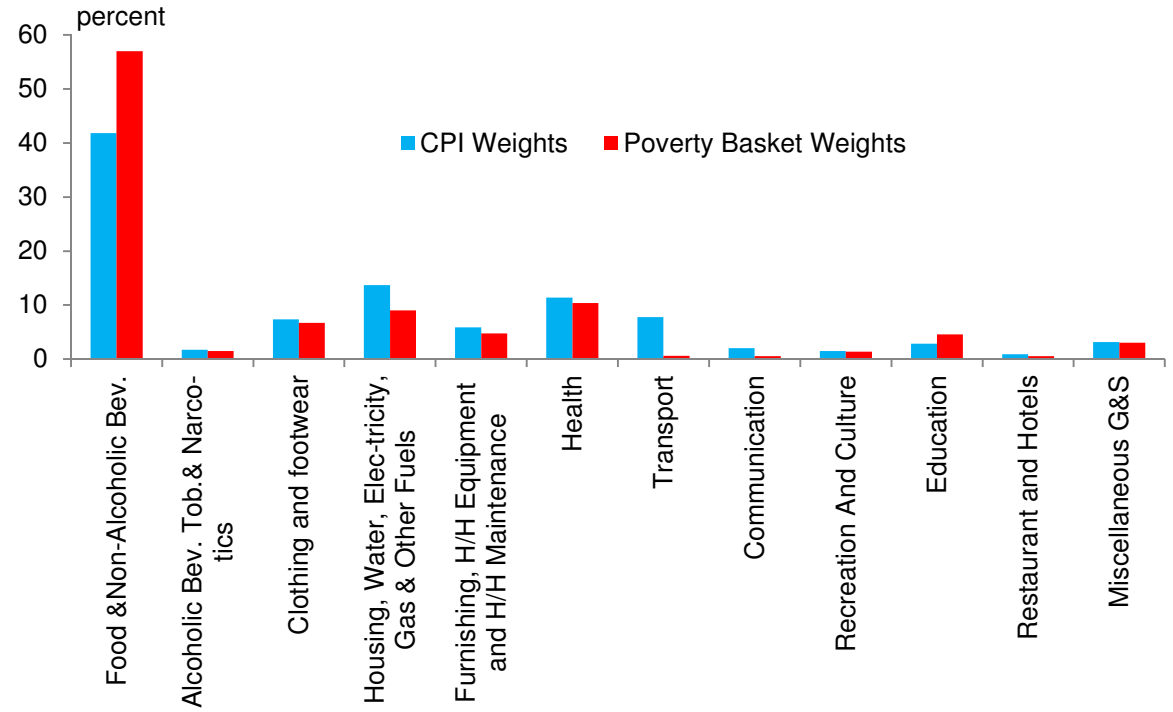
6.20 **The impact of the implicit fiscal subsidy represents a sizeable source of tax expenditure for the government of Sierra Leone.** Between 2010 and 2012, Sierra Leone averaged a revenue-to-GDP share of 15 percent, which places it in the bottom 3 percent of all countries in the world and in Africa, only Madagascar had a lower revenue-to-GDP share. The forgone revenues represent more than half of all the revenues collected from mining royalties. See Figure 5 (shown above) for further detail.

6.21 **The second component of the model incorporates the impact of fuel price changes on inflation.** This is vital to the model because inflation is used to proxy for wages growth and to deflate nominal income growth. It also forms the link between fuel price changes and poverty dynamics as it is the main mechanism through which welfare is impacted.

6.22 **As this analysis focuses on the impact on the poor, poverty basket inflation is used instead of the consumer price index (CPI).** To deflate nominal incomes with the general CPI might be misleading because the consumption bundle of a poor household is often very different from that of a richer household. As an alternative, a series called poverty basket inflation is constructed. A poverty basket uses expenditure items from the Sierra Leone Integrated Household Survey (SLIHS) to construct the weights grouped in the same way as the CPI but for those households who are below the poverty line. Applying these weights to the price indices gives us a measure of inflation across the average purchases of a poor household. The major difference in expenditure patterns is the much larger weight on food in the poverty basket. In the CPI food accounts for around 42 percent of a household's budget whereas it accounts for 57 percent of a poor household's budget. The other major differences are in housing and utilities (13.7 percent in the CPI vs 9.0 percent in the poverty basket) and transport (7.7 percent in the CPI vs 0.6 percent in the poverty basket). See figure 7 below for further details.

[4] Dahl, Carol A. "Measuring global gasoline and diesel price and income elasticities." Energy Policy 41 (2012): 2-13.

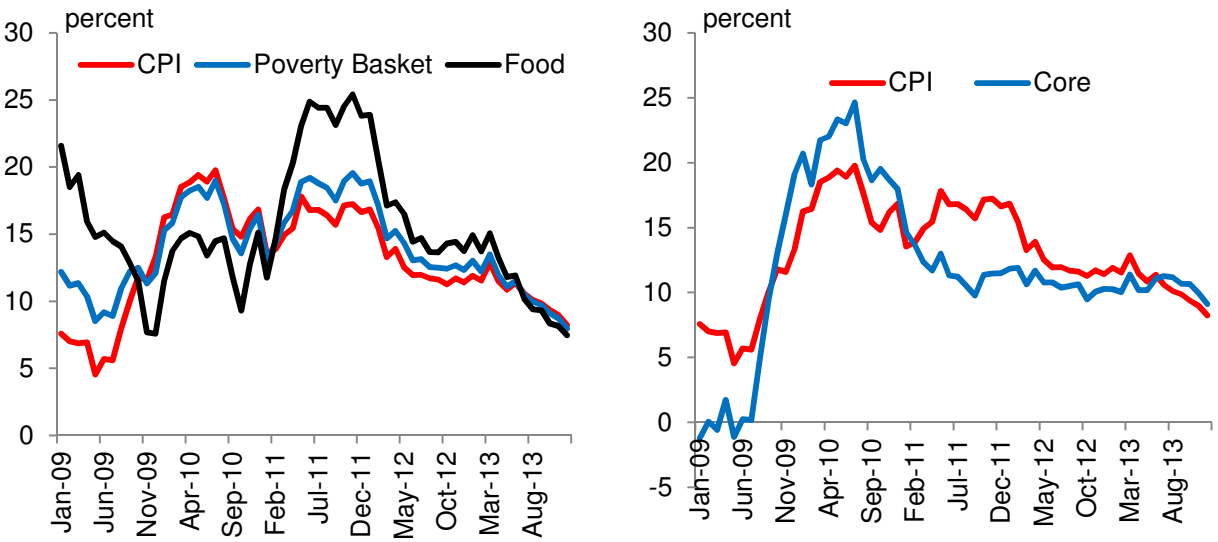
Figure 7. Consumer price and poverty basket weights



Source: World Bank calculations based on SLIHS (2011) and consumer price index.

6.23 **Though there is substantial correlation, the CPI and Poverty Weights basket move separately.** As food consumption comprises the largest share of the poverty basket, when food inflation is especially high, the poverty basket inflation rate will be higher than the CPI inflation rate. Figure 8 below compares the year-on-year growth in the CPI, the Poverty Basket, and food price inflation.

Figure 8. Alternative measures of inflation



Source: World Bank calculations based on SLIHS (2011) and consumer price index.

6.24 **In the absence of detailed wage data, core inflation is used as a proxy for wage growth.** The ideal method of construction for wage growth would be measures of wages by different sectors of the economy, such as agriculture, industry, etc. As this information is not available for Sierra Leone, a proxy is constructed using the interaction between core inflation growth, which serves as a proxy for general wage growth, and the nominal growth in each sector of the economy. The methodology for constructing core inflation follows that of CPI construct only with the exclusion of volatile items. In this case, food and transport are excluded from the core measure. The removal of food results in a very low rate of core inflation in early 2009 and a higher rate in 2010 when food prices were moderating. In general, however, core inflation is lower than CPI.

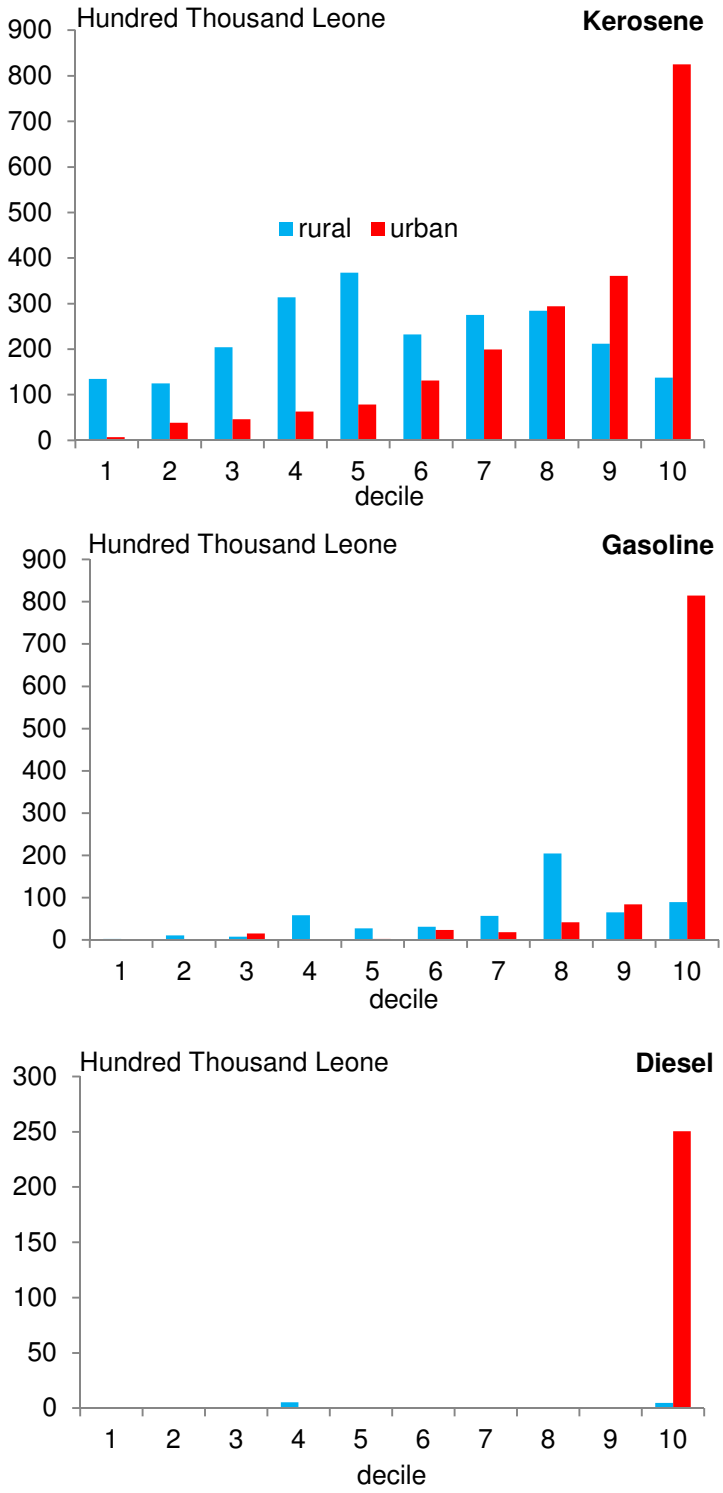
6.25 **As a final component, it is necessary to estimate the pass-through of fuel prices to inflation.** A simple linear regression is used to examine the impact of fuel price changes on each of the three measures of prices. The estimated coefficients are comparable to previous analysis from the developing world, and are consistent with the weights of each fuel type from the household survey. The pass-through coefficients of fuel prices into inflation are found in table 3 in the appendix.

6.26 **The final output of the model is to use the above to estimate the poverty impacts of price changes.** The exposure of the poor to price changes is two-fold. First, there is the direct impact of changes in prices on fuel items consumed by the poor. These effects tend to be less than secondary effects, such as increases in food prices due to increased transportation costs, as the majority of fuel items are consumed by wealthy urban households. See Figure 9 for the breakdown of total consumption by fuel type and consumption decile.

6.27 **To translate the macroeconomic findings to the microeconomic level, the impact of price changes is applied to the household level data from the 2011 SLIHS.** This is done by assigning each household to one of the three main sectors of the economy: agriculture, industry, and services.[5] Household incomes are assumed to grow in-line with the growth in the sector they are employed in, combined with a measure of general wage inflation. The nominal increase in expenditure is then deflated using the poverty basket inflation measures to project real expenditure. With this information standard poverty measures, such as the headcount, poverty depth, and poverty severity can be calculated.

6.28 **In addition to the poverty impacts, the model is also able to calculate the cost of offsetting social transfers.** The transfer size is defined as a lump sum transfer to eligible households at set intervals. The targeting mechanism can also be set to different eligibility criteria in terms of total consumption level (assuming perfect targeting). In addition to the poverty impact of the transfer, it is also possible to calculate the overall fiscal cost of such a program. Tables 4 and 5 in the appendix detail poverty and fiscal impacts, respectively.

Figure 9. Consumption by Decile, Urban/Rural, and Fuel



Source: Calculations based on SLIHS (2011)

[5] For those households who did not have sufficient information on their occupation, it is assumed that their incomes grow at the average rate of the three sectors (weighted by their share of value-added). The same method is used for those households where the head of the household was not identified.

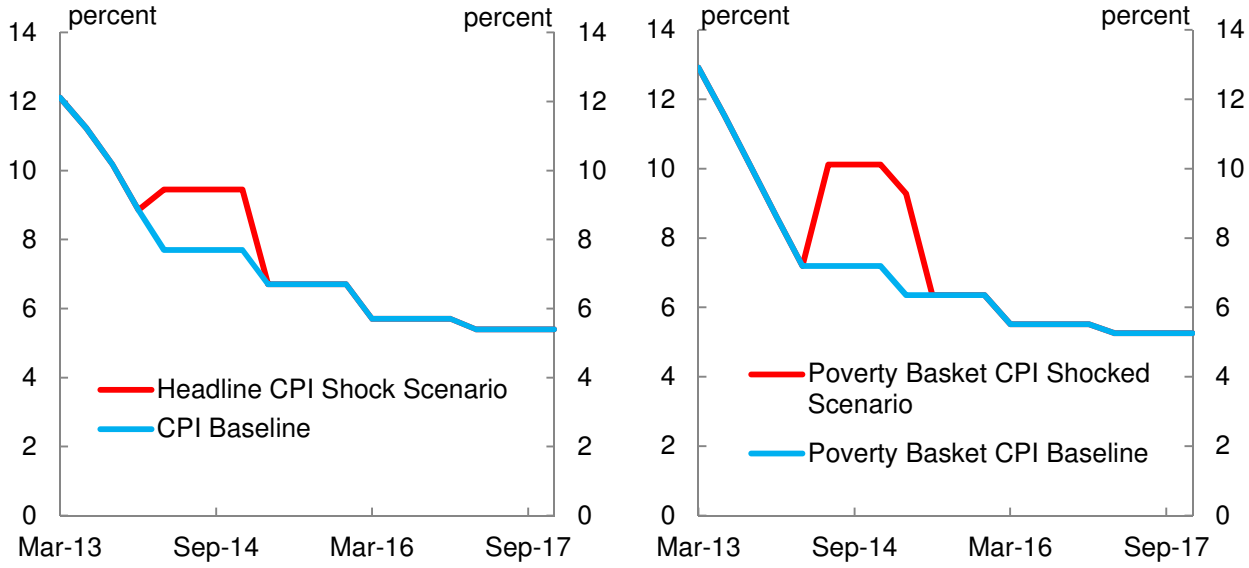
SCENARIO ANALYSIS

Scenario 1. Full Pass-Through to Consumer Prices

6.29 **One option of fuel price reform would be to allow 'full pass through' of the economic price to the retail price.** This would then equate the retail and commercial prices in other words, retail consumers would face the same level of taxes as commercial users. Full pass through would increase prices for consumers by approximately ten percent for gasoline and 20 percent for diesel and kerosene. From the current base price of 4500 Leone per liter, gasoline would increase to 5051 Leone, diesel would increase to 5504 Leone, and kerosene would increase to 5469 Leone. Implementing a policy change to allow full pass-through of economic prices for all retail prices throughout 2014 would result in a fiscal saving (increased revenues) of around 194 billion Leone in 2014, or 45 million USD. The accumulated savings over the four years amount to 1031 billion Leones, or 237 million USD.

6.30 **Full pass through would increase both the CPI and Poverty Basket Inflation index.** According to the model, the consumer price inflation rate would increase by around 1.8 percentage points above the baseline rate in the first year while the poverty basket inflation rate would increase by around 2.9 percentage points. As the price rises are one-off events, after the first year the effect on inflation is zero, however, the price level is assumed to be permanently higher. The impact on CPI and Poverty Basket Inflation is shown in Figure 10 below. One point in favor of efforts to reform fuel prices in Sierra Leone is the current trajectory for inflation. With prices generally forecast to decline in the coming years, reforming prices now would simply slow down the decline in prices.

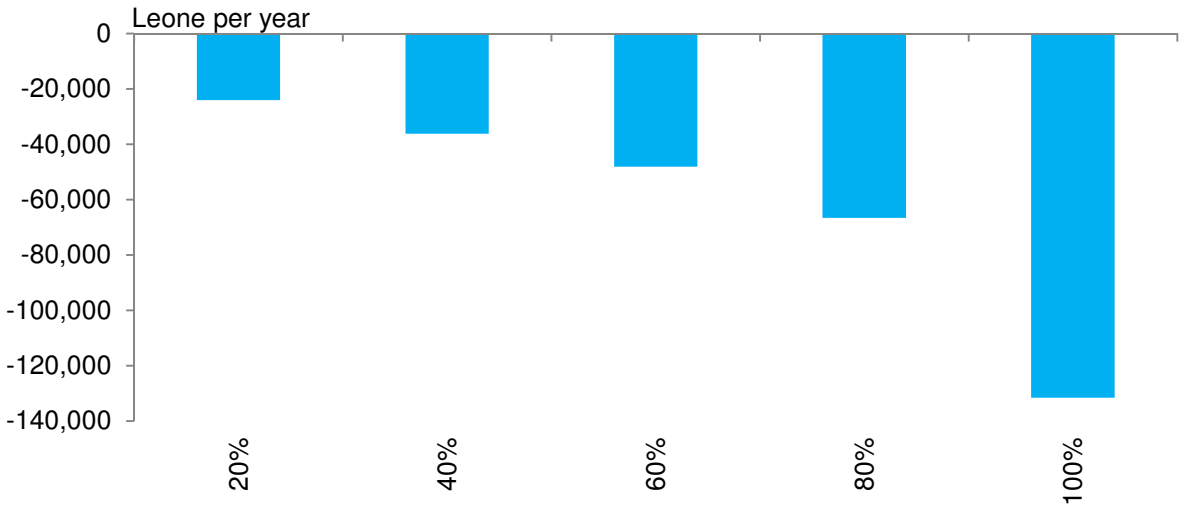
Figure 10. Impact of Full Pass-Through on Inflation



Source: World Bank calculation

6.31 **The poverty rate increases by a modest 1.0 percentage point by 2016.** The change in poverty rate is low due to the distributional impacts of the change. As noted above, most fuel is consumed by the top deciles of urban areas. As seen in Figure 11 below, the reduction in the average expenditure is highest in the top quintile where fuels are consumed in greater quantity.

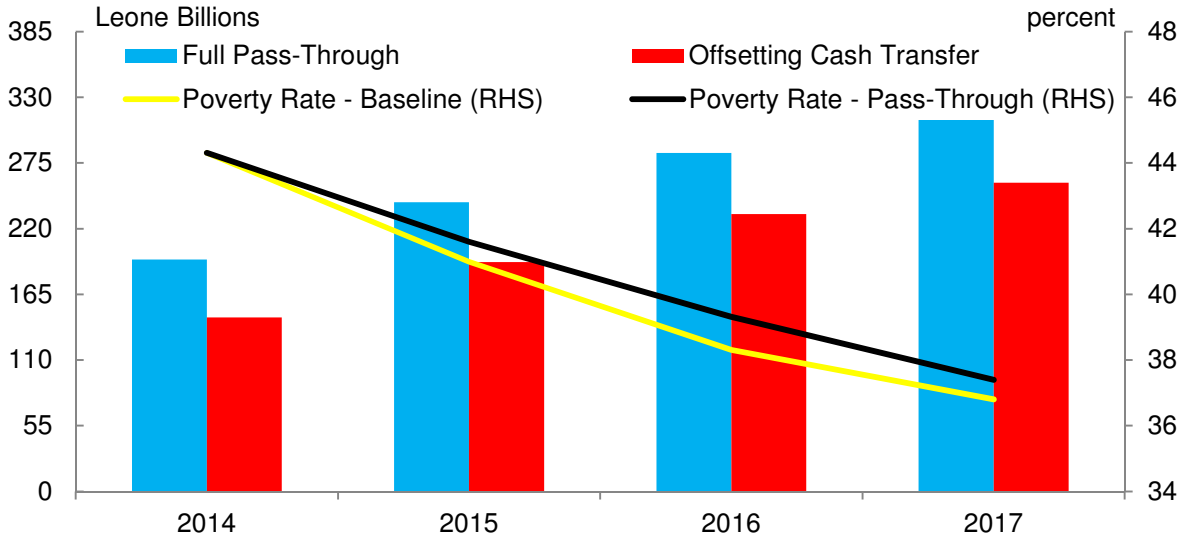
Figure 11. Impact of Fuel Price Rises on 2015 Real Expenditure by Quintile



Source: World Bank calculation and SLIHS (2011)

6.32 **The impact of fuel price reform on the poor can be mitigated using cash transfers.** Though further analysis would be needed to determine the most effective amount and targeting of a cash transfer, for the purpose of demonstration a cash transfer of 25,000 Leone is given to those in the bottom 15 percent of the population. This fraction of the population is chosen as it represents approximately the proportion living under the extreme poverty line. In Sierra Leone this equates to around 1.1 million people or 156,000 households. Figure 12 outlines the fiscal impact of implementing the cash transfer program. The program would cost around 50 billion Leone per year, which is much less than the savings from removing the tax concessions.

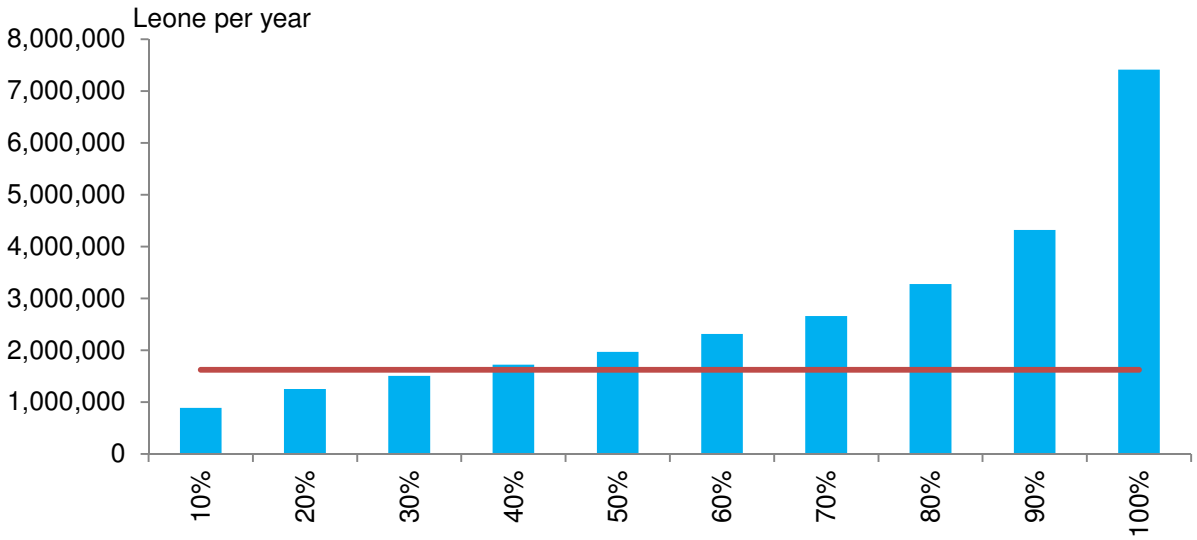
Figure 12. Fiscal and Poverty Impacts from Full pass through of consumer prices (with and without offsetting cash transfer)



Source: World Bank calculation

6.33 **Figure 12 does not show the impact on the poverty rate of the cash transfer as it is marginal.** This is because by targeting only the poorest 15 percent of the population, only a very large transfer would raise them above the poverty line. We can see this by examining real expenditure by decile (Figure 13). Those in the bottom 10 percent are around 700,000 Leone below the poverty line, so only a very large transfer would move them above the poverty line.

Figure 13. 2015 Real Expenditure by Decile



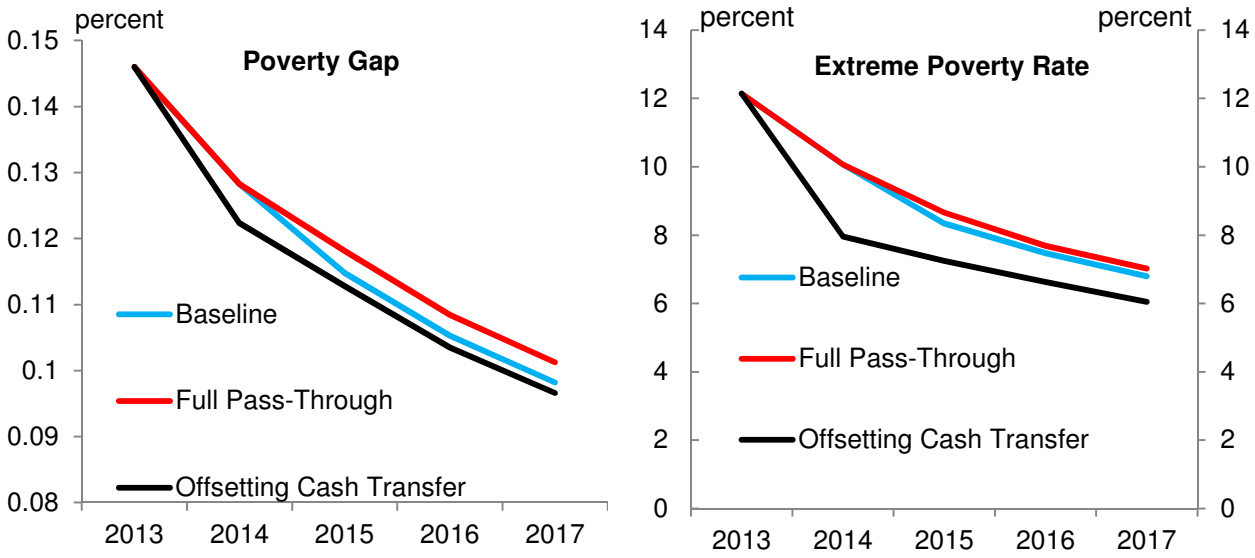
Source: World Bank calculation and SLIHS (2011)

6.34 **However, the poverty rate is only one measure of poverty.** The poverty gap measures how far below the poverty line the poor are on average. This measure of poverty lies between zero and 100 percent, where zero indicates that no one is below the poverty line and 100 percent meaning everyone has zero income. We can use the poverty gap to estimate the total income required to bring the poor in the population above the poverty line. In 2013, with a poverty gap of around 15 percent, this would require around 237,000 Leone per household, or around 258 billion Leone (59 million USD) in total for 2013.[6]

6.35 **We can also examine the impact on the extreme poverty rate (those living under 58 US cents per day).** Figure 14 shows both measures before and after the reform and the impact of the cash transfer. The impact of the cash transfer on the poor can clearly be seen. The poverty gap under the baseline scenario and the cash transfer are very close. The extreme poverty rate, as seen in the right-hand chart is much lower under the cash transfer than the baseline as the transfer was targeted at the bottom 15 percent, which greatly reduces extreme poverty.

[6] To obtain this estimate we multiply the poverty gap in 2013 (0.146) by the poverty line (1,625,568 Leone) to get 237,297 Leone. Multiplying this by the number of households (1085551) gets us the total amount of 258 billion Leone.

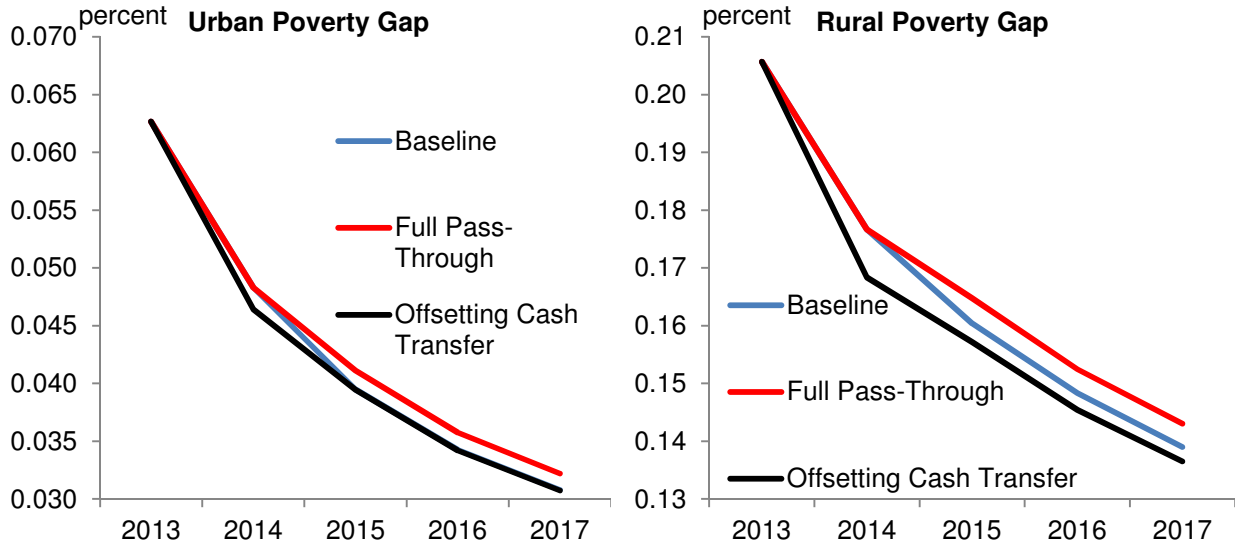
Figure 14. Effect of Reform on the Poverty Gap and Extreme Poverty Rate



Source: World Bank calculation

6.36 **We can also examine the impact on the poverty gap in urban and rural areas.** In urban areas the poverty gap is almost the same under the baseline and the cash transfer. In rural areas however, where the depth of poverty is greater, the cash transfer does not fully offset the impact on the poverty gap.

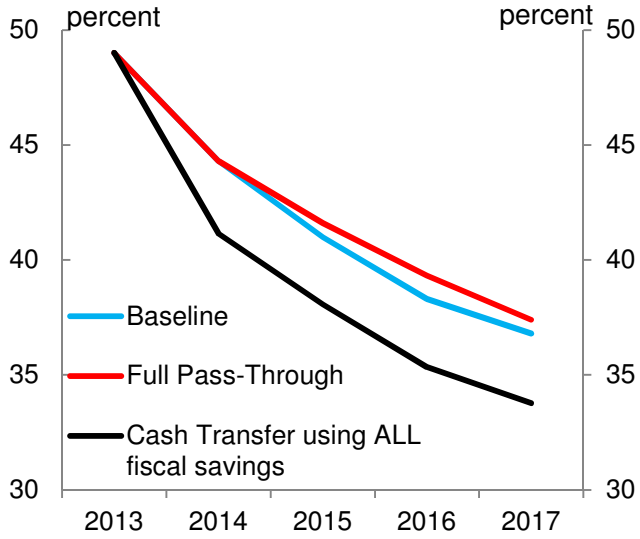
Figure 15. Effect of Reform on Urban and Rural Poverty Gap Measures



Source: World Bank calculation

6.37 **In the event that all the fiscal savings in the full pass-through scenario were put into a cash transfer to the bottom 50 percent of households the impact on the poverty rate would be significant.** The simulation results in a gradually increasing transfer, starting at 30,000 Leone per household in 2014, rising to 44,000 Leone per household in 2017. The transfer increases because the annual fiscal savings are increasing because of the assumption that fuel consumption growth increases faster than nominal income growth. The result is that the poverty rate is around 3 percentage points lower than the baseline poverty rate and almost 4 percentage points lower than without cash transfers after full pass-through.

Figure 16. Poverty Rate with complete cash transfer



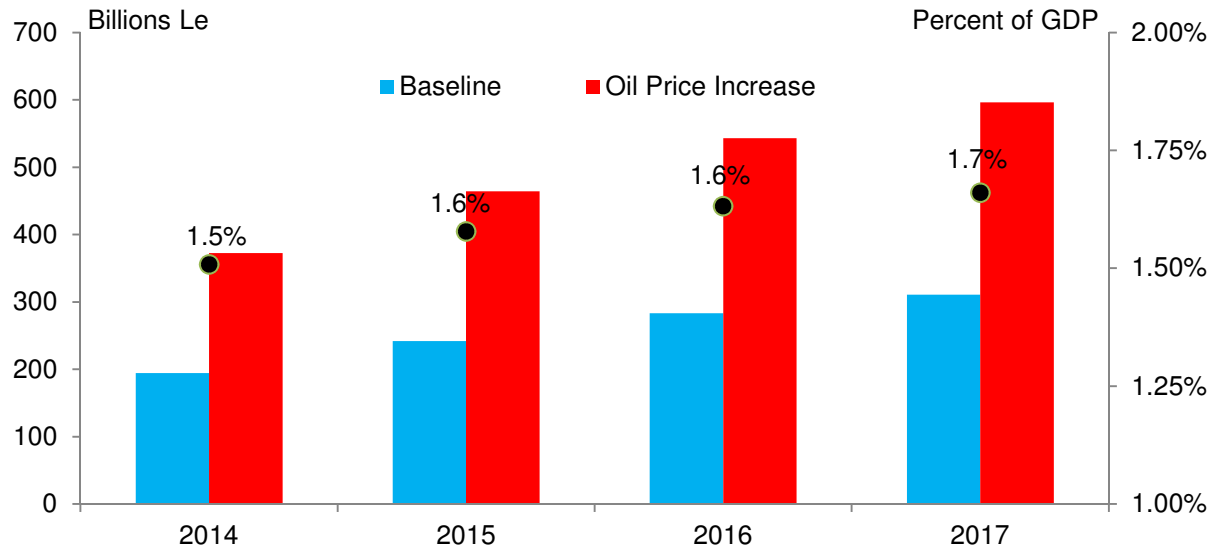
Source: Sierra Leone Petroleum Unit

Scenario 2. Increase in International Oil Prices

6.38 **The current fuel pricing system for retail consumers is based on a fixed price, which means the government is the one exposed to ballooning costs due to either an exchange rate depreciation or oil price increase.** As an example we consider the impact of a 15 percent increase in the Platts price benchmarks for the three types of fuel (See box 1 for a summary of the impacts from an exchange rate appreciation). Retail prices in this scenario remain fixed, which means the gap between the retail price and economic price increases – leading to larger tax expenditure. With the increase in oil prices the commercial gasoline price increases to 5663 Leone per liter while commercial diesel increases to 6233 Leone per liter.

6.39 **The increase in the gap between commercial and retail prices increases tax expenditures on fuel.** In 2014 this amounts to an increase in tax expenditures of 178 billion Leone or 41 million USD. Over the period 2014-2017 the additional expenditures amount to 946 billion Leone or 217 million USD. Compared to the baseline under which the tax expenditure reached 0.9 percent on GDP in 2017, with the increase in oil prices the cost reaches 1.7 percent of GDP in 2017.

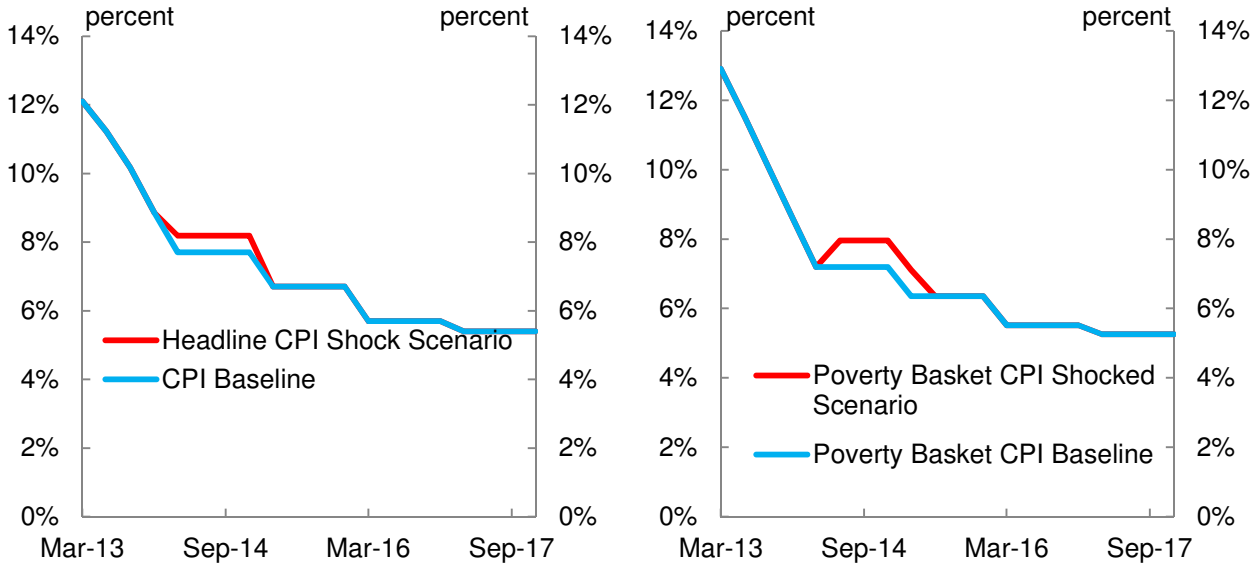
Figure 17. Increased tax expenditure on fuels from an increase in international oil prices



Source: World Bank calculation

6.40 **Although retail prices are constant, businesses pass on some of their increased fuel prices into consumer prices.** According to the model, the consumer price index would increase by around 0.5 percentage points above the baseline rate in the first year while the poverty basket inflation rate would increase by around 0.8 percentage points. The impact on CPI and Poverty Basket Inflation index is shown in Figure 18 below.

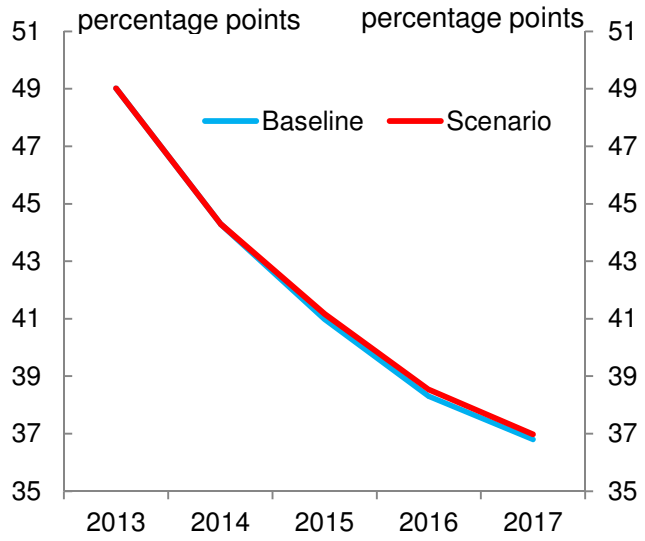
Figure 18. Inflation impacts of an increase in oil prices



Source: World Bank calculation

6.41 **The modest increase in consumer and poverty inflation translates into a small increase in the poverty rate.** The first year after oil prices rise, the poverty rate is 0.2 percentage points higher than the baseline.

Figure 19. Poverty Rate with higher oil prices



Source: Sierra Leone Petroleum Unit

Box 1 The effects of an exchange rate appreciation on tax expenditures

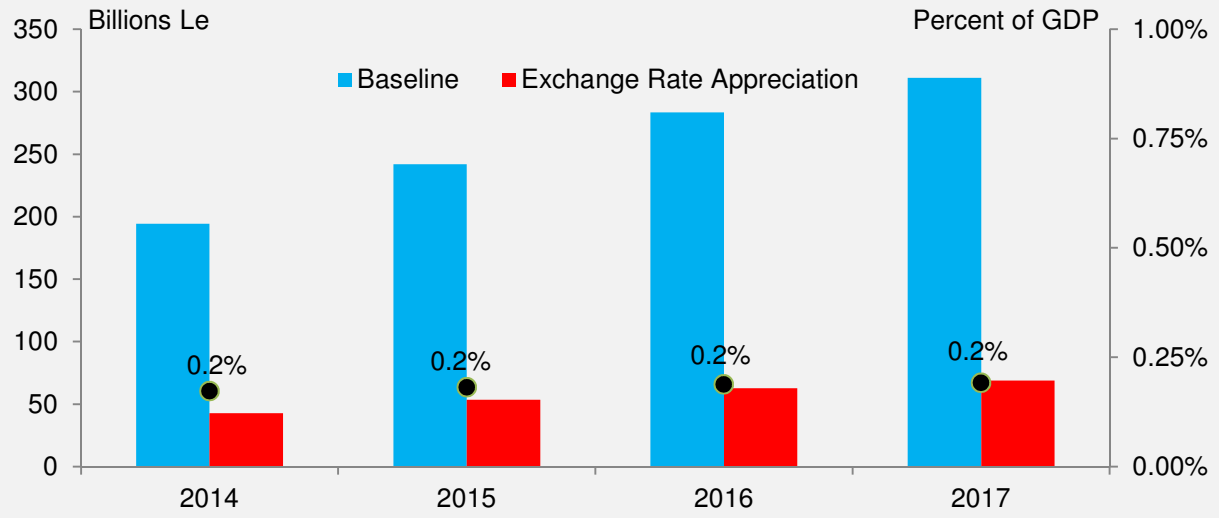
Growth in Sierra Leone's economy has surged in recent years, in part, due to the coming on stream of iron ore production. The inflow of foreign direct investment to finance the iron-ore sector has widened the current account deficit, which increased to around 45 percent of non-iron ore GDP in 2011.

Such large inflows of foreign capital put pressure on the exchange rate to appreciate. While the real effective exchange rate has appreciated in the last few years, the nominal exchange rate has been fairly stable. In the baseline scenario simulating the tax expenditure on fuel we leave the nominal exchange rate constant.

This box considers a scenario in which the exchange rate appreciates by 15 percent against the US dollar. The effect of such a shock in the model is similar to the effect of a change in the oil price. The appreciation of the exchange rate will lead to a reduction in domestic price that is paid to import fuels into Sierra Leone. This will lower commercial prices while leaving retail prices unchanged. The commercial price for gasoline would fall to around 4518 Leone per liter while the commercial price for diesel would fall to 4910 Leone per liter. This means the outstanding implicit subsidy for gasoline would only be 18 Leone per liter – effectively wiping out the entire tax expenditure on gasoline. Meanwhile, retail diesel prices would continue to attract an implicit subsidy of 410 Leone per liter and would be the majority share of the total tax expenditure on fuel.

The appreciation of the exchange rate would reduce tax expenditures by around 803 billion over 4 years. In 2014 tax expenditures fall to 43 billion Leone, a reduction of 152 billion Leone or 41 million USD (Figure 20). Compared to the baseline scenario under which tax expenditures rise to around 0.9 percent of GDP by 2017, they are a relatively constant 0.2 percent of GDP if the exchange rate depreciates by 15 percent.

Figure 20: Reduced tax expenditure on fuels from an exchange rate appreciation



Source: World Bank calculation

Some of the reduction in commercial prices will flow through into lower consumer prices for all goods. According to the model, the consumer inflation will fall by 0.4 percentage points while poverty basket inflation will fall by 0.6 percentage points.

The reduction in consumer prices causes a small reduction in the poverty rate compared to the baseline. The appreciation of the exchange rate results in the poverty rate falling by almost 0.2 percentage points compared to the baseline.

POLITICAL ECONOMY CONSIDERATIONS IN SIERRA LEONE

Beyond purely those included in the economic model above, there are other considerations in undertaking fuel price reform. Subsidy reforms are usually difficult to implement and are often marred by general discontent, political opposition, and sometimes riots. The failure of many fuel subsidy reform attempts can be strongly associated with a failure to appreciate the political economy dimensions of the reform. The myriad stakeholders that are likely to be negatively affected cannot be ignored and instead should be included throughout the design and implementation phases. In addition to the political economy barriers, design and implementation of the fuel subsidy reforms can often place the administrative, technical and coordination capacities of the government to its limits. These factors combined help explain why many governments hesitate to undertake such reforms despite the strong economic and welfare arguments in favor of undertaking such reform. Fortunately for Sierra Leone, it has the benefit of taking away the relevant lessons learnt from many countries that have either successfully or unsuccessfully attempted to reform their fuel subsidy policies.

For example, with regard to the scale of reform countries have varied their approach ranging from small and incremental approaches to large-one off changes. Historically, there have been examples of each approach being effective. For example in gasoline prices reform, China and South Africa did small monthly increases, Qatar undertook a 25 percent in prices in 2011, Indonesia undertook a 45 percent increase in 2013, Jordan increased their prices by 76 percent before in 2008, Nigeria doubled their prices in 2005, and in 2010 Iran increased gasoline prices 400 percent and diesel prices by 2200 percent. In most countries the scale of the reform will depend on a complex balance of political will, fiscal conditions and macroeconomic objectives.

Another key element to the design of the reform is how to manage the impact on vulnerable and poor households – a critical consideration in Sierra Leone where half the population is poor. In practice there have been large variations in the amount of cash transfers offered by governments and again this is a function of the scale of the reform, fiscal conditions and the political economy context. For example in Mexico it was 4 USD a month and 10 USD a month per household in Indonesia in 2005 whereas in Iran it is 240 USD per month for a household of six. In Indonesia and Iran, the quantum for cash transfers appears to have been arbitrary and based primarily on the distribution of a proportion of subsidy savings rather than an assessment of the impact of higher energy prices on households or household need. Political considerations appear to have been a highly influential factor in determining the magnitude of payments in Iran, despite inflationary pressures. Alternatively, transfers by Mexico's Oportunidades program are household-specific, with payments increasing with recipients' needs. In addition to the size of the transfer is the question on who should receive it. The advantage of targeting the cash transfer is that it is fiscally cheaper; however every cash transfer program is imperfect. The unavoidable errors in leakage and coverage may be interpreted as corruption, and regardless would dilute the poverty reducing impact of a cash transfer program. Indonesia has a proxy means test to determine eligibility for their cash transfer program while Iran ultimately determined the cost of targeting was politically too high and the cost of a universal transfer was not fiscally restrictive.

Business will also be affected by energy reforms. Designing appropriate policy for businesses or industry will be politically and economically sensitive. In circumstances where businesses are not supported and

allowed to adjust prices due to their higher input costs, they will suffer to the extent that households were not compensated for the higher prices. Where households are compensated then there will be a point at which the higher prices businesses charge will remain affordable to a degree to households. Exporting business will suffer as the international price would not have changed and they will be forced to become more competitive or reduce profits or exit the market.

A survey of cross country experience produces a long-list of policy options undertaken by governments which include:

- Consultation with industry is necessary to identify the likely impacts of higher diesel prices.
- Rations of subsidized fuel for a limited time to sensitive industries—such as agriculture, fishing, trucking companies and public transport—can reduce opposition to reform, inflationary impacts and any "price squeeze" in these sectors.
- Other means to assist industry include the provision of low interest loans, direct financial transfers, funding for the adoption of energy efficient technology and reductions in government fees or taxes.

Any attempt to reform fuel prices will depend on detailed analysis on the macroeconomic, fiscal and household welfare impacts such as the analysis conducted in earlier sections. Just as important, however, will be elements of the design of the reform which are closely linked to the complex political economy considerations that are at play in the country. This will be no different in Sierra Leone.

CONCLUSIONS & RECOMMENDATIONS

This chapter has outlined a framework for analyzing fuel subsidies in Sierra Leone. At current levels, tax expenditures on fuels are around 152 billion Leone, which represents a sizeable amount when compared to other significant revenue sources. However, given the strong projected growth in incomes, this expenditure will grow in both nominal terms and as a share of GDP, reaching 0.9 percent of GDP in 2016 from 0.7 percent in 2013.

This chapter outlined the sensitivity of this tax expenditure to external factors such as the international oil price and the exchange rate. A 15 percent increase in oil prices will result in a near doubling of tax expenditures from 1031 billion Leone to 1976 billion Leone over the period 2014-2017.

The analysis presented in this chapter showed that removing the fuel subsidies to retail prices would result in a small increase in the poverty rate. Compared to projections from the model without fuel subsidy reform, the poverty rate is around 1.0 percentage point higher in 2016. However, with a properly targeted (and administered) cash transfer, the poverty impact could be offset while still delivering a significant increase in revenue.

Appendix

Table 1: Economic Price of Fuel – As of December 30, 2013

		Petroleum	Diesel	Kerosene
CIF (Freetown)	USD per MT	1,044.9	992.7	1079
Charges	USD per MT	69.6	66.3	71.2
Landed Costs	USD per MT	1114.6	1059	1150.1
Conversion	Liter / MT	1,362	1162.2	1248.5
Landed Cost	USD / LITER	0.818	0.911	0.921
Exchange Rate Adjustment	Leone / USD	4350	4350	4350
Landed Cost	Leone / LITER	3,559.7	3963.4	4007.3
Landed Costs	Leone / LITER	1495.3	1544.5	1465.9
Economic Price	Leone / LITER	5051	5504	5469
Retail Price	Leone/ LITER	4500	4500	4500
Tax Expenditure	Leone/ LITER	551	1004	969

Source: Petroleum Unit

Table 2: Key Assumptions for Fuel Consumption Growth Projections

	2013	2014	2015	2016	2017
Real GDP (percent per annum)	**13.3**	**14.0**	**12.4**	**7.7**	**5.2**
Agriculture	4.5	4.8	4.8	5.6	5.6
Industry	53.8	42.2	28.1	9.6	2.3
Services	6.0	6.8	7.8	8.2	8.0
Exchange Rate (Leone per USD)	4350				
Platts Prices (USD per Mt)					
Gasoline	958.4				
Diesel	929.7				
Kerosene	1016.0				
Population Growth (percent per annum)	1.9	2.6	2.6	2.6	2.6

Note that the current assumption in the baseline for the exchange rate and Platts prices is constant over the projection period.

Source: World Bank calculations based on IMF, Petroleum Unit and World Bank data

Table 3: Pass-through of Fuel Prices into inflation

	Consumer Prices	Poverty Basket	Core Inflation
Gasoline	2.6 %	4.0%	2.5%
Diesel	4.7 %	7.2%	4.5%
Kerosene	5.6 %	9.7%	5.5%

Table 4: Poverty Impact of Possible Interventions

	2014	2015	2016	2017
Baseline	44.3	41.0	38.3	36.8
Full pass-through into retail prices	44.3	41.6	39.3	37.4
20 percent exchange rate depreciation	44.3	41.2	38.5	37.0

Table 5: Fiscal Cost (in billions of Leone.) of Transfers to Poor Households (25000 Leone per month)

Targeting	2014	2015	2016	2017
Bottom 15 percent	48.7	49.9	51.2	52.6
Bottom 30 percent	96.7	99.2	101.8	104.4
Bottom 50 percent	161.5	165.7	170.0	174.4