



Refined oil import subsidies removal in Ghana: A 'triple' win?



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ABSTRACT

In this study, claims and counterclaims that fossil fuel subsidies removal yields benefits in terms of budget deficits, energy efficiency and mitigation are assessed. In order to do this, a global computable general equilibrium (CGE) model has been estimated to evaluate the impact of subsidies removal on imported refined oil in Ghana on prices, carbon dioxide (CO₂) emissions, households' demand, firm's production and real GDP. The simulation experiment points to evidence that subsidy removal raises prices, increases the rate of CO₂ emissions, reduces households' demand, reduces aggregate output and affects various sectors differently. The increased rate of CO₂ emissions due to the removal of subsidies is indicative of the existence of the so-called 'green paradox'. These results underscore the fact that a removal of subsidies on fossil fuels may win in some regards but fail in others. A general implication from the applied model, therefore, is one which supports the assertion that removal of subsidies on fossil fuels removal on energy should be implemented along with policies aimed at stimulating economic activities and reducing the level of CO₂ emissions, especially where there is evidence of the 'green paradox'.

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1. Introduction

Ghana is a net oil importer and relies heavily on petroleum products to meet its energy needs (Lin et al., 2014). Increasing pressure on countries to limit their use of fossil fuels and eradicate poverty has incentivized the pursuit of poverty-alleviating mitigation strategies in developing countries; and Ghana is no exception. Achieving green growth pathways can either take the form of massive deployment of renewable energy technologies or improvement in the level of energy efficiency (Wesseh and Lin, 2015). On the contrary, fossil fuel subsidies tend to undermine green development strategies by limiting the attractiveness of renewable energy investment and the need to improve energy efficiency (Lin and Wesseh, 2013a; Wesseh and Lin, 2016a, 2016b; 2016c, 2016d). IEA (2011) estimates that, with a global removal of all fossil fuel subsidies, energy-related CO₂ emissions could be cut by 6.9% by 2020. Moreover, there is a general consensus that these subsidies are inefficient for addressing poverty and their reform creates benefits to develop more effective social policies that seek

the needs of the poor. In Africa for instance, approximately 44.2% of fossil fuel subsidies are enjoyed by the richest 20%. The poorest 20%, on the other hand, benefit only 7.8% of these subsidies (AfDB, 2012).

The objective of this study is to investigate the economy-wide effects of fossil fuels pricing reform in Ghana and how that impacts CO₂ emissions and economic activities in other Sub-Saharan African countries.¹ To the authors' best knowledge and giving the overview of relevant literature discussed in section 3, the present study brings new insights to the existing body of knowledge both in terms of subsidies reform impacts and methodological aspects:

First, this study is one of few academic contributions complementing the literature on fossil fuel subsidies that is currently dominated by institutional studies. Considering the role of fuel subsidies and their implications for economic growth and environmental sustainability, there is no doubt that lasting solutions will require the concerted efforts of both academicians and institutional practitioners. Second, the literature has produced mixed results in terms of the environmental and economic impacts of subsidies removal. Hence, the need for more studies to gauge the existing findings cannot be overemphasized. Third, the existing

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¹ Such an investigation is also driven by the strong connections existing between the use of energy and economic growth (Wesseh and Zoumar, 2012; Lin and Wesseh, 2014; Ngoran et al., 2016).

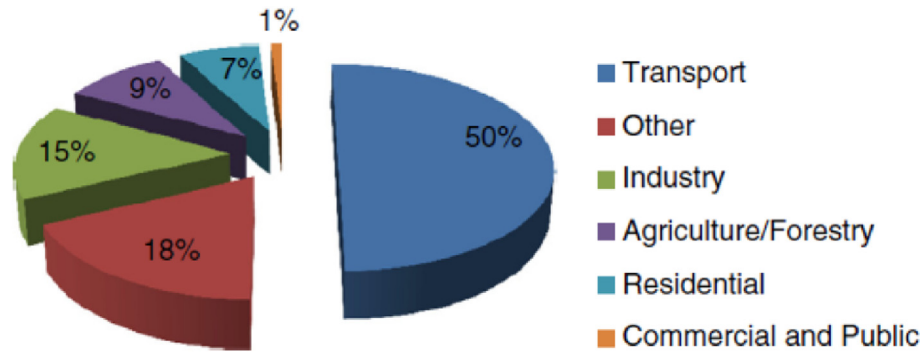


Fig. 1. Ghanaian oil consumption by sectors for 2006.
Source: Lin et al. (2014).

studies for African countries are not just few but focus exclusively on how price increases due to subsidies removal affects households' income. In as much as these studies do present significant policy implications, they ignore impacts on very key variables like sectoral output, terms-of-trade and real GDP. The present study would therefore step into this gap. Fourth, existing studies for Africa tend to lower the scope of policy implications by providing no insights on the effects of fuel subsidies reform on environmental quality despite the fact that mitigation serves as one of the key motivations for fossil fuel subsidies reform. The present study therefore proves valuable in this respect. Fifth, unlike the existing studies for Africa which, in most cases, utilize very basic modeling techniques, the approach in the present study represents a more comprehensive framework that incorporates, into the computable general equilibrium model (CGE), intermediate inputs in production and distinguishes between households, trade, capital creation and government. Finally, unless the existing studies for African countries, which fail to distinguish between countries and their trading partners, the global CGE model applied in this study links the Ghanaian economy to neighboring countries and the rest of the world. This offers opportunities for evaluating how domestic policies in Ghana impact neighboring countries and major trading partners.

The remainder of the article is organized as follows. Section 2 provides details surrounding Ghanaian fossil fuel subsidies reform process. Section 3 reviews the relevant literature. Section 4 discusses the methods and data used. Simulation results are documented in section 5. In section 6, results from the simulation experiment are discussed. Section 7 draws the conclusions and provides limitations and directions for further research.

2. Fossil fuel subsidies and Ghanaian reform process

This section profiles a closer look at Ghanaian fossil fuel subsidies scale, the country's reform process and social programs implemented to mitigate the impacts of price reform on the poor.

2.1. Scale of refined oil import subsidies in Ghana

The period spanning 2000–2012 has witnessed substantial difference between import cost and administered price (before taxes and margins); thus, suggesting a substantial amount in subsidies on petroleum products. In fact, the total amount of subsidies paid by the government in 2004 was approximately 2.2% of GDP; meanwhile, an additional 1% of GDP was required to facilitate running of the state-owned Tema Oil Refinery (TOR). Coody and Newhouse (2006) compared the actual prices of petroleum products to their formula prices and documented the required increase

in prices mitigated due to government subsidies. Accordingly, the total amount of subsidies, relative to the formula price, were 17%, 49%, 67%, 50% and 108% for petrol, kerosene, diesel, fuel oil and liquefied petroleum gas (LPG) respectively. As would be discussed later, since the Ghanaian government has planned to continue its policy of cross-subsidization of LPG and kerosene, only ratios for petrol, diesel and fuel oil are included with the calculation for total subsidies for refined oil imports. Using Fig. 1, and given that kerosene and LPG are mainly consumed by the residential sector, it is possible to estimate the scale of subsidies on imported refined oil (excluding kerosene and LPG) utilizing weighted averages. Hence, the total amount of subsidies on imported refined oil can be approximated as follows:

$$\text{Refined oil subsidies} = \left(\frac{(0.17+0.67+0.50)}{3} \right) \times (0.93) \approx 42\%.$$

In the modeling exercise, a 42% shock to tax on imports of refined oil would therefore implemented as a means of simulating the removal of subsidies on refined oil imports in Ghana.

2.2. Subsidies removal

The reform of Ghana's fossil fuel pricing structure came not without several failed attempts. In 2001, an automatic mechanism linking domestic oil prices to world oil prices was set. This led to a rise in ex-refinery petroleum prices. To mitigate the impact of high prices on poor households, kerosene and liquid petroleum gas (LPG), mainly consumed by low-income groups were cross-subsidized. By the close of 2002, however, increasing international oil prices and their bearing on domestic prices pressurized the Ghanaian government to abolish the new price mechanism. The resulting upward sparrow in TOR's debt encouraged the government to reintroduce the pricing mechanism at the beginning of 2003. This reform in the pricing structure led to a 90% rise in fuel prices, thus, causing real income to fall by 8.5% on average (Laan et al., 2010). Despite cross-subsidization of kerosene and LPG, low-income households were hardest hit by the hike in fuel prices (IMF, 2006). The approaching of national elections coupled with public dissatisfaction over rising fuel prices caused the government to abandon the reform again in 2004 (see Fig. 2).

Given the huge burden on public financial resources, the Ghanaian government was determined that subsidies on fossil fuels had to be removed. However, strong opposition from the public against its removal meant that, if the government would succeed in its effort, then a stronger and more pragmatic case against fossil fuel subsidies was needed to win the support of the public. For this reason, help was requested from the IMF. As was mentioned, a case study examining the implications of subsidies removal on various sectors of the economy was conducted; and

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