Energy Policy 96 (2016) 491–503

Contents lists available at ScienceDirect

Energy Policy

journal homepage: www.elsevier.com/locate/enpol

Incidence and impact: The regional variation of poverty effects due to fossil fuel subsidy reform

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HIGHLIGHTS

- Fossil fuel subsidy reforms can induce significant distributional shifts and price shocks.
- There is significant regional variation of a reform's effects on poverty rates.
- Compensation is key to protect livelihoods and win public support for reform.
- Compensation schemes must be carefully tailored to account for regional variation.

ARTICLE INFO

Article history:
Received 25 February 2016
Received in revised form
13 June 2016
Accepted 14 June 2016
Available online 24 June 2016

Keywords:
Fossil fuel subsidies
Reform
Cash transfers
Poverty
Regional variation

ABSTRACT

Since fossil fuel subsidy reforms can induce significant distributional shifts and price shocks, effective compensation and social protection programs are crucial. Based on the statistical simulation model by Araar and Verme (2012), this study estimates the regional variability of direct welfare effects of removing fuel subsidies in Nigeria. Uncompensated subsidy removal is estimated to increase the national poverty rate by 3–4% on average. However, uniform cash compensation that appears effective at the national average, is found to fail to mitigate price shocks in 16 of 37 states – thus putting livelihoods (and public support for reforms) at risk. States that are estimated to incur the largest welfare shocks, coincide with hotspots of civil unrest following Nigeria's 2012 subsidy reform attempt. The study illustrates how regionally disaggregated compensation can be revenue neutral, and maintain or reduce pre-reform poverty rates in all states. Overall, it highlights the importance of understanding differences in vulnerability, and designing tailored social protection schemes which ensure public support for subsidy reforms.

1. Introduction

Fossil fuel subsidies have been documented to be highly regressive, as they predominantly benefit the rich, thus having substantial implications for the distribution of wealth. The reason is that high-income households consume larger quantities of subsidised products – energy in particular – thus siphoning off a disproportionately large share of overall subsidies (Arze del Granado et al., 2012). As a necessary consequence the removal of fuel subsidies is also likely to trigger significant distributional impacts and income shocks. If unmitigated, these adverse effects can be felt across all income groups, with the poorest being particularly vulnerable.

Nigeria's attempted fuel subsidy removal in 2012 illustrates how the mis-management of such adverse effects can jeopardise entire reforms: the government's decision to remove subsidies on fossil fuel imports caused fuel prices to more than double. Strikes and violent public protests followed, prompting the government to immediately reintroduce subsidies (Bazilian and Onyeji, 2012; Siddig et al., 2014). Similarly, governments of Bolivia (2010), Cameroon (2008), Venezuela (1989), and Yemen (2005 and 2014) were all forced to abandon reform attempts following heavy public protests, particularly by low-income population groups (IEA, 2014; Segal, 2011).

These cases confirm that it is critical to understand the incidence of existing subsidy benefits, and the potential welfare impacts of a reform. Carefully designed compensation measures are essential for mitigating energy price shocks, ensuring the affordability of fuel, and protecting livelihoods of vulnerable households (Ruggeri Laderchi et al., 2013). Indeed, several

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http://dx.doi.org/10.1016/j.enpol.2016.06.025

successful subsidy reforms have demonstrated that – besides timely and credible communication of reform benefits – effective compensation is crucial for securing public support for reform (IMF, 2013a; Vagliasindi, 2012).

This paper focuses on Nigeria, and uses the statistical simulation model by Araar and Verme (2012) to estimate the regional variability of direct welfare effects of removing fuel subsidies. It finds that an uncompensated removal of fuel subsidies can increase the national poverty headcount rate by 3–4%. The paper investigates different compensation strategies and their effect on poverty rates both at the national and state level.

Crucially, this paper shows that uniform cash compensation that appears effective when considering national averages, fails to mitigate price shocks in 16 of 37 states – thus putting livelihoods at risk, and provoking public opposition. Notably, states identified to incur the largest price shocks were hotspots of violent public protests in 2012. As an alternative, this paper illustrates how a regionally disaggregated compensation strategy can ensure for all states that price shocks are mitigated, and poverty rates either unchanged or lower than before the reform. Overall, the analysis shows the need for thorough, disaggregated analyses of subsidy reforms, and tailored reform strategies.

The remainder of this paper is structured as follows: Section 2 provides more detailed information about Nigeria's fossil fuel sector and subsidy program. Section 3 presents a disaggregated analysis of energy consumption patterns in Nigeria to highlight underlying inequalities. Section 4 presents an empirical subsidy simulation: Section 4.1 presents the methodology, followed by an outline of the (hypothetical) reform scenarios in Section 4.2. Section 4.3 presents the results both at the national level (4.3.1) and disaggregated to the state-level (4.3.2). Section 5 concludes.

2. Fuel subsidies in Nigeria

As a developing country with substantial fossil resource wealth and a mixed track record of fiscal prudence and transparency, Nigeria is a frequently cited case for studying fossil fuel subsidies and natural resource management more generally.

Nigeria extracts 2.5 m barrels of oil a day, which account for 70% of government revenues and 95% of total exports (GSI, 2012; IMF, 2013b). These oil exports make Nigeria the fifth largest oil exporter in the world. Despite abundant energy resources, only 55% of Nigerians have access to electricity (34% in rural areas); annual per capita electricity consumption in 2012 was 155 kW h, compared to 4405 kW h in South Africa (World Bank, 2015). And electricity supply is not only elusive, but also unreliable: chronic underinvestment and corruption in the electricity sector mean that the average Nigerian enterprise experiences over 36 power outages a month, wiping out 4% of annual GDP. Similar problems plague the country's four national oil refineries, which operate at just 20–30% capacity. While over 70% of fuel consumption is met by imports, shortages are endemic (IMF, 2013a; World Bank, 2015).

Through the Petroleum Products Pricing Regulatory Agency, Nigeria maintains artificially low energy prices – most notably for kerosene and petrol (GSI, 2012). The gap between fuel import costs and regulated prices are financed through the Petroleum Support Fund, which administers fuel subsidies.[1] Fig. 1 provides estimates of the overall volume of the subsidy program, as well as fuel prices per litre; the reliability of these figures remains

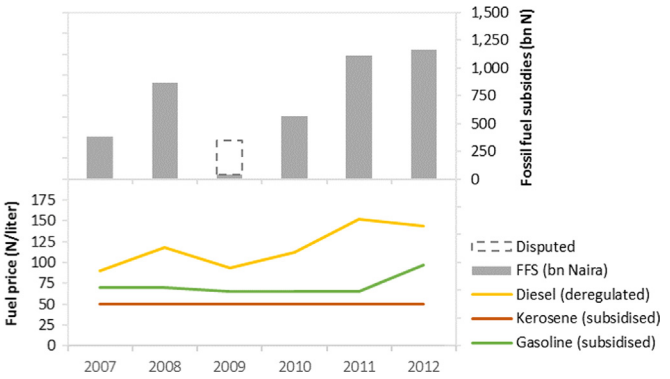

Fig. 1. Fossil fuel subsidies in Nigeria: *Upper panel*: Estimated annual fossil fuel subsidies, primarily for oil and oil derivatives (millions of Naira). Uncertainty persists over the amount of subsidies paid after a presidential directive in 2009 to suspend kerosene subsidies. *Lower panel*: Prices for diesel, petrol and kerosene in Naira per liter. (IEA, 2014; IMF, 2013).

uncertain due to conflicting information from different national authorities and large-scale subsidy theft (GSI, 2012; also see Section 4.2).[2]

At nearly 5% of GDP in 2011 subsidies are a significant expense for the government (IMF, 2013a); and fail to reach Nigerians in more than one sense: As with all fossil fuel subsidy schemes, the direct financial benefits to households are concentrated on the rich, thus failing to benefit the absolute poor (which constitute 61% of the population).[3] In addition, a complex and opaque system of intermediary dealers and political influence means that, instead of lowering the market price, subsidies are often privately appropriated before the fuel reaches the market. For kerosene, anecdotal evidence suggests that the subsidised rate of N50 per litre is in fact only available to privileged individuals, while regular consumers often pay prices between N120 and N250 (Udo, 2015). Finally, rampant fuel smuggling means subsidy benefits are leaking out of the country. Mlachila et al. (2016) estimate that over 80% of petrol consumed in Benin in 2011 was smuggled from Nigeria (about 60% in Togo).

Facing mounting fiscal pressures and recognising the inefficiencies of its subsidy scheme, Nigeria attempted a radical subsidy reform in 2012. While the need for such reform was pressing, the government failed to garner sufficient public support for its reform efforts. Public opposition to the reform had two key reason in particular: (i) A lack of credibility and transparency with respect to the handling of reform revenues, and (ii) inadequate plans for compensation and social protection, resulting from a poor understanding of the needs and vulnerability of affected energy consumers. Subsidy removal was met with extensive strikes and violent public protests, and prompted the government to swiftly reintroduce subsidies (Bazilian and Onyeji, 2012; Siddig et al., 2014).

3. Understanding energy demand

Understanding the patterns of energy consumption is crucial for understanding who stands to lose most from subsidy removal, and designing effective social protection schemes. This paper uses the Harmonized Nigeria Living Standard Survey of 2009/2010,

[1] The Petroleum Support Fund is managed by the Petroleum Products Pricing Regulatory Agency, and receives a set allocation in the federal budget. Contributions to the fund are made by the federal, state, and local governments. Moreover, the fund is supplemented by subsidy "surpluses", which essentially occur when international market prices exceed the government-set fuel price (GSI, 2012).

[2] For instance, there is conflicting information on the amount of subsidies provided following a 2009 government decision to remove kerosene subsidies (GSI, 2012). The NNPC maintains that N310 bn in subsidies have been paid out, but disputes between different authorities persist.

[3] This figure is based on the absolute poverty definition, using an absolute poverty line of N54,401 (NBS, 2010).