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## Low world oil prices: A chance to reform fuel subsidies and promote public transport? A case study for South Africa

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### ABSTRACT

Since the fall in world oil prices in June 2014, the economic and political settings for fossil fuel subsidy reforms have changed. As in many developing economies, in South Africa oil price subsidies are criticized as an inefficient policy instrument because they hamper economic growth, contradict objectives of climate change mitigation and mainly benefit high income households which can afford to own a car.

Public transportation services are the mobility option for poorer South African households, but are often unavailable and unaffordable due to insufficient governmental subsidization. Thus, the inefficient fuel subsidies and the insufficient subsidies for public transportation have complementary adverse effects on inequity with respect to the welfare of poor households and their mobility.

In this study, a computable general equilibrium model simulates the decrease in world oil prices, the reduction in fuel subsidies and two options for reallocation of these subsidies to support the transport sector: either as consumer price support or as subsidies to production in the passenger transport sector. The simulations indicate improved affordability and availability of public transportation services and clearly show positive impacts for the economy, unemployment and household income. They also give some clues on how to improve the transport system in South Africa to pre-empt the situation when oil prices pick up again.

### 1. Introduction

After four years of relative stability, world crude oil prices fell sharply between June 2014 and January 2015. The drop was much greater than that of non-oil commodity prices (Baffes et al., 2015; Fantazzini, 2016). The drivers explaining this historically significant price drop include: OPEC's abandoning a production target (November 2014); the unexpectedly high supply from geopolitically conflicted regions (Libya, Iraq, Ukraine); the appreciation of the US dollar; the increased supply from unconventional sources (US shale oil, Canadian oil sands, biofuels) and reduced demand growth due to the low growth of developing and emerging economies. The high level of supply (particularly due to higher than expected shale oil production) and muted global oil demand (due to the low economic growth of developing economies) leads us to expect oil prices to remain below the historical average, between \$60 and \$80 per barrel in the medium term (World Bank Group, 2016; Baumeister and Kilian, 2016).

The fall in oil prices has changed the context to allow for a reform (i.e. reduction) of the criticized fuel subsidy with a limited impact on the prices paid by consumers. In many developing and developed countries, subsidies to consumption and/or production of

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fossil fuels keep fuel prices artificially low in order to provide basic energy and transport services to low income households and to increase their living standards (Barany and Grigonyte, 2015; OECD, 2015). Fuel subsidies often represent large amounts of public money and exceed 5% of GDP in some developing countries (Baffes et al., 2015; Barany and Grigonyte, 2015; OECD, 2015).

Researchers criticize fossil fuel subsidies as a policy instrument not only because of the high governmental expenditures. Fuel subsidies distort market price signals and are characterized by low efficiency in the use of road space and fossil fuel resources. Fossil fuel subsidies even incentivize wasteful consumption and thus act contrary to environmental and climate change mitigation policies. Furthermore, fuel subsidies often create social inequity between rich and poor. They provide more benefits to the high income households, which can afford to drive a car, than to the low income households. Thus, as an instrument to support low income households, fossil fuel subsidies are not effective and even act contrary to the policy objective of more equity (Arze del Granado and Gillingham, 2012). In many developed and developing countries, public approval, vested interests and institutional capacity hamper reasonable reforms of fossil fuel subsidies to gain benefits for economic, environmental and social equity (Dennis, 2016; Keho, 2016; Rentschler, 2016; Baffes et al., 2015; Barany and Grigonyte, 2015; Benes et al., 2015; Gunningham, 2013; Ellis, 2010).

The reallocation of savings arising from reduced fuel subsidies towards more efficient development programs could create growth and more equity (Baffes et al., 2015; OECD, 2015; Benes et al., 2015; Dartanto, 2013). While criticizing the subsidization of fuels as inequity-increasing and inefficient support of private transport, development programs in public transport services could help to improve mobility in a much more efficient and equal way. South Africa is an interesting case study for three main reasons.

First, although South Africa is among the 15 most energy- and greenhouse gas-intensive economies (Adom, 2015), the government still subsidizes fossil fuel consumption through exemptions from the value added tax (VAT) on petrol (OECD, 2015). According to the International Energy Agency (IEA, 2014), fuel subsidies represent around 0.6% of South African gross domestic product (GDP).

Second, only about one-quarter (26.1%) of South African households have access to a car and benefit from this VAT exemption as a fuel consumption subsidy (Walters, 2013). Therefore, the fuel subsidy supports the mobility of higher income households, which can afford to own a car, thus contributing to the already high degree of inequality in the country.

Third, public transport services are pointed out to be expensive and not reliable in the country (Statistics South Africa, 2014). Use of such services accounts for an aggregated 3.1% of total costs in household budgets (Statistics South Africa, 2012); the budget share is 1% among the richest households but around 7% of the household budget of the poorest households. Besides affordability of prices, the transport system also lacks accessibility and availability (Walters, 2013) and thus is of relatively low efficiency and effectiveness (FFC, 2014). Households point to the availability of buses as the main problem. They are also dissatisfied with the level of crowding on buses (Statistics South Africa, 2014). Thus, reallocation of fuel subsidies to the transport sector makes sense in this country as it could improve affordability and availability of buses for passengers.

Our study evaluates the impacts of a reallocation of fossil fuel subsidies, in a context of reduced world oil prices faced by South Africa as a study case, using a computable general equilibrium (CGE) model. CGE models are comprehensive tools that capture the relationships between economic activities and economic agents with given macroeconomic constraints. They allow us to simulate the fall in world oil prices and two options to reallocate the fuel subsidies.

We analyse the economic impacts of policy options, which simultaneously address the reform of inequity-increasing and inefficient fuel subsidies and the support of insufficiently developed public transportation services. The analysis of the results provides information on the suitability of the policy reforms by answering the following questions:

- Can the simulated policy options improve the public transport sector with respect to the problems of affordability and availability?
- What are the impacts on the key macroeconomic variables (GDP, unemployment, household income and consumption, and CO<sub>2</sub> emissions) and on intersectoral spillover effects?

The rest of the paper is organized as follows. Section 2 describes briefly the situation of fuel subsidies and public transport in South Africa. Section 3 presents an overview of recent studies on oil prices and subsidies reforms in developing countries. Section 4 describes the modelling framework and the scenario assumptions. Section 5 analyses and discusses the results, while Section 6 draws conclusions for policy implications and further research.

## 2. Fossil fuel subsidies and the public transport sector in South Africa: An overview

### 2.1. Subsidies on consumer petrol prices in South Africa

Compared with other developing countries such as Malaysia (Solaymani and Kari, 2014) or Nigeria (Siddig et al., 2014), fossil fuel subsidies are not that high in South Africa, at 0.6% of South African GDP (IEA, 2014). However, they still represent a significant expenditure for the South African government and contribute to the already high degree of inequality between rich and poor. In South Africa, subsidies on fuel consumption are in the form of not collecting the VAT on petrol consumption. In the year 2011–2012, these consumer price subsidies totalled 15,914 million ZAR (about 1.5 billion US dollars) and involved fuels (petrol, diesel) and illuminating paraffin (Green Fiscal Policy Network, 2016).

In South Africa, only 26.1% of households have access to a car and these households benefit most from this VAT exemption as a fuel consumption subsidy (Walters, 2013). According to the National Travel Survey (Statistics South Africa, 2014), a personal car is the main (61.6%) mode of commuting only among the 5th income quintile of households. Table 1 presents the modes of commuting by income quintile according to Kerr (2015). For the poor households in lower income quintiles the number one mode of commuting

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