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Fossil fuel subsidy reforms and their impacts on firms

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ABSTRACT

While the potential adverse effects of fossil fuel subsidy reform are well documented for households, the literature has largely ignored the effect of subsidy reform on firms' competitiveness. This paper discusses how firms are affected by, and respond to, energy price increases caused by subsidy reforms. It highlights that cost increases (both direct and indirect) do not necessarily reflect competitiveness losses, since firms have various ways to mitigate and pass on price shocks. This paper presents and discusses direct and indirect transmission channels for price shocks, and firms' response measures: absorbing cost shocks into profits, inter-fuel substitution, increasing energy and material efficiency, and passing on price increases. It argues that further micro-econometric studies using enterprise surveys are essential for quantifying the role of these mechanisms, and for designing policy measures that ensure that competitiveness losses due to subsidy reforms are minimised.

1. Introduction

In early 2016, the Kingdom of Saudi Arabia announced a significant reduction in fossil fuel subsidies (FFS) as a way to compensate shrinking government revenues – and the associated fiscal pressures – due to lower oil prices. As subsidies were removed across a range of fuel types, the subsequent price hikes hit consumers and industries to varying degrees. Gasoline prices increased by about 50%, mainly affecting motorists (MEES, 2016). A 67% increase in natural gas prices principally affected electricity generators and industrial sectors. One of the highest price increases (133%) was for ethane – a key input for the petro-chemical sector.

Soon after, some of the largest petro-chemical firms published estimates for the likely impacts on their production costs or profits (MEES, 2016). Several of these firms estimated the adverse impact on profits ranging from 6.5% to 44.1% relative to 2014. The Saudi Cement Company expected production costs to increase by $18.1 m as a direct consequence of FFS removal (Trade Arabia, 2015). While these self-reported figures may not be consistently comparable, they highlight a common political economy challenge of FFS removal: firms – and in particular energy intensive industries – tend to oppose FFS removal and exert their political clout to do so. Indeed, concerns about competitiveness and profitability have been a key argument of political opponents of FFS reform.

However, focussing on energy cost increases alone yields an incomplete picture of the effects of FFS reform on the competitiveness of firms – both direct and indirect transmission channels for energy prices must be considered, as well as firms' ability to respond. The ability to respond depends on various mechanisms used by firms to mitigate (or pass on) price shocks – and thus is crucial for estimating the net impacts on firms' competitiveness.

While the adverse effects of FFS removal are increasingly well understood for households, the existing literature has largely ignored the effect of subsidy reform on firms. This gap in the evidence base must be addressed in order to enable policy makers to design and implement FFS reforms more effectively.

This article outlines the most important transmission channels for energy price shocks, and response measures used by firms. In doing so, this article provides (i) a systematic conceptual framework for disentangling the effects of FFS reform and firms' response measures, (ii) guidance for future research by offering an overview of the main empirical methodologies for analysing these effects, and (iii) a discussion of key policy implications.

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2. Background

A comprehensive body of literature documents the economic, social, and environmental costs of FFS, and argues that by removing FFS these costs could be avoided (Coady et al., 2015; Arze del Granado et al., 2012; IEA, 2014; Rentschler and Bazilian, 2016). The political economy challenges of subsidy reform are increasingly well understood as case studies of past reforms are studied and lessons learnt (Commander, 2012; Fattouh and El-Katiri, 2015; Kojima, 2016; Strand, 2013).

A crucial factor in determining political economy challenges and public opposition to reforms are the potentially substantial adverse effects on livelihoods due to rising energy prices. Studies have shown how compensation schemes can protect vulnerable households from energy price shocks associated with FFS reform – and how this can increase public acceptance of subsidy reform (Arze del Granado et al., 2012; Rentschler, 2016; Ruggeri Laderchi et al., 2013).

However, with a strong focus on households, research has given far less attention to the potential impacts of FFS reform on firms. This is true despite concerns about competitiveness and profitability, which have been an important argument of political opponents of subsidy reform (Hayer, 2017; IMF, 2016a, 2016b). Particularly, energy intensive manufacturing firms have been argued to experience substantial changes to their cost structures, with adverse implications for profitability (Bazilian and Onyeji, 2012). Evidently such effects can have knock-on effects on economic activity, employment, and thus on households (Kilian, 2008).

Using a computable general equilibrium (CGE) model for Vietnam, Willenbockel and Hoa (2011) suggest that firms can cope with moderate energy price increases (5–10% per year) using common energy efficiency measures. In Egypt, a doubling of energy prices due to subsidy removal is estimated to reduce profit margins of firms in energy intensive sectors, e.g. in the cement (29–39% reduction), fertiliser (22%), and steel sectors (13%) (Khattab, 2007). Jamal and Ayarkwa (2014) provide evidence from Ghana suggesting that firms are strongly affected by the indirect effects of subsidy reform, as the costs of transportation and raw materials increase, while consumers' purchasing power decreases. Tambunan (2015) makes the same observation using data on Indonesian small enterprises, and emphasises that the ultimate effect of subsidy removal depends crucially on firms' ability to mitigate price shocks – which in turn can be strengthened by dedicated policy measures.

Studies on the impact of environmental taxes on firms also offer relevant insights. In a comprehensive literature review, Dechezlepretre and Sato (2014) assess the empirical evidence on the effect of environmental taxes on competitiveness, for a wide range of industries and countries. They conclude that – unlike market conditions and skills – environmental taxes (and regulation more generally) do not have a large adverse effect on firm or country-level indicators of competitiveness. In an empirical study on Germany, Flues and Lutz (2015) show that electricity taxes (EUR 20.5/MWh, or 32–68%) did not negatively affect common competitiveness indicators of firms, such as turnover, exports, value added, investment, and employment. In a review of earlier literature, Zhang and Baranzini (2004) also conclude that overall, the competitiveness losses due to carbon taxes are small and in many cases insignificant.

Arlinghaus (2015) reviews the empirical literature on the effects of carbon taxes on various indicators of competitiveness. The author concludes that studies consistently fail to identify any significant adverse competitiveness effect from the introduction of carbon taxes. This observation holds across various indicators of competitiveness, including employment, output, profits, and exports. Several other studies also conclude that stricter environmental policies have little adverse effect on competitiveness; and – in line with the Porter Hypothesis – find that some firms may even be able to increase their productivity (Albrizio et al., 2014; Ekins and Speck, 2010; Enevoldsen et al., 2009; Porter, 1990).

Reviewing the empirical literature on the determinants of competitiveness, Dethier et al. (2011) find that other factors such as infrastructure, finance, security, competition, and administrative capacity play a far more significant role than energy prices in determining firms' performance. A key reason is that energy costs tend to constitute a relatively small share of total production costs – e.g. typically 5% or lower in EU manufacturing sectors (Bergmann et al., 2007; Ro, 2013; Wilting and Hanemaaijer, 2014).

Conceptually, energy price increases due to FFS removal are directly comparable to energy price increases due to carbon or energy taxes. However, it should be noted that price increases due to subsidy removal can be particularly large: While depending on fuel-specific subsidisation rates, subsidy reforms have caused energy price increases of 100% and more in the past (Fattouh et al., 2016; Rentschler and Bazilian, 2016). This emphasises that case-specific analyses of FFS reforms are crucial.

3. Transmission channels and response measures

In the case of households, the literature on FFS reforms typically distinguishes direct and indirect price effects; i.e., the extent to which energy price changes *directly* affect households by increasing the cost of energy consumption, and *indirectly* by increasing the cost of other goods and services. In the case of firms these two transmission channels also apply. In addition to these transmission channels, several response measures play a crucial role in determining the net effect of subsidy removal on firms.

This section discusses the transmission channels for energy price shocks, and presents four common response measures (Fig. 1). As we discuss, empirical analyses of enterprise surveys can help to shed light on these aspects, and identify differences across sectors and regions. In the case of larger, publicly listed firms similar analyses can be conducted using balance sheets and accounts; this is of particular relevance when an economy or sector is dominated by few large firms which are in a strong political position to oppose reforms.

3.1. Transmission channels of energy price increases

1) Direct channel

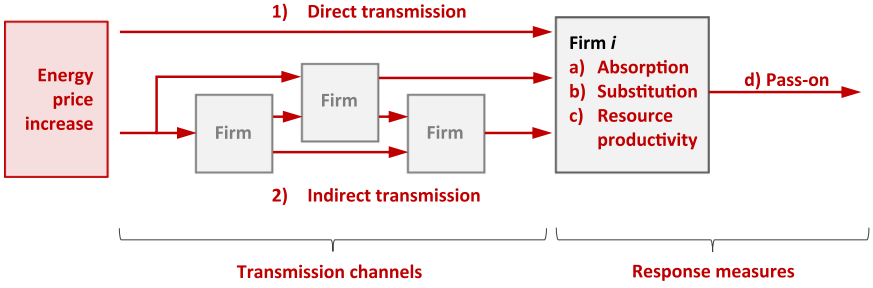

Fig. 1. Energy price shocks due to subsidy removal: Channels for shock transmission and response measures.