

CASH INSTEAD OF SUBSIDY: ESSAYS ON THE IMPACT OF THE 2010 IRANIAN ENERGY SUBSIDY REFORM



Abstract

This PhD thesis examines the impact of the 2010 Iranian energy subsidy removal and cash transfer (SRCT) on the country's macro and micro-economy. The SRCT subsidy reform was unique and ambitious as its main objective was not to stimulate fiscal consolidation but to reduce energy consumption and to distribute subsidies more equally. Specifically, through this reform, the price of energy (i.e., fuels, natural gas, and electricity) increased about 2-fold for gasoline and 21-fold for mazut. Simultaneously, savings from the subsidy removal were redirected to households in the form of an unconditional cash transfer worth 405,000 Iranian Rials (USD 105 in PPP terms) per person per month, or approximately 8% of GDP per capita in 2010. The cash transfer was deemed sufficient to offset the income effect of the subsidy removal and to restore the welfare of the average household (Guillaume et al., 2011)

Globally, removing fossil fuel subsidies is widely promoted due to its alleged environmental benefits. Numerous subsidy reforms have been implemented in this century, i.e., in the Philippines (2001), Brazil (2001,2003), Indonesia (2005), Peru (2010), Mauritania (2011), Yemen

(2005, 2010), Ghana (2005), Niger (2011), and Nigeria (2011) (compiled by IMF, 2013). However, hardly any impact evaluation study has assessed the impact of energy subsidy reforms especially at the micro-level.

This thesis is motivated by the impact evaluation literature, which is at the core of evidence-based policy analysis. The thesis provides a comprehensive inquiry on the impact of the 2010 energy subsidy reform on the macro as well as the micro-economy of Iran highlighting not only the effects of the reform on the economy but also the empirical challenges faced when assessing a universal reform. The first essay examines the short- and long run impact of SRCT on macro indicators. The analysis shows that the negative effect of the energy price increase is larger than the positive effect of the cash transfer. Put differently, SRCT had a short-term negative impact on macro indicators including GDP. The main channel that transmits this negative impact to GDP is through value-added in the industry and service sector. Yet, in the long run, there is no association between the energy subsidy reform and GDP. Moreover, the energy subsidy reform has a short- and long-term inflationary effect.

The second essay examines the impact of SRCT on households' welfare using micro-panel-data on household income and expenditures and exploits the timing and intensity of energy consumption as complementary identification strategies. The findings reveal that also at the micro-level the cash transfer failed to compensate for the negative impact of SRCT. The energy subsidy reform caused, on average, a reduction of 7 to 9 percent in the real consumption of households. The impact is heterogenous across geographical locations, the intensity of energy consumption and income classes showing that those who depended most on energy prior to the reform are more adversely affected.

The third essay focuses on the impact of SRCT on manufacturing firms using panel data of manufacturing firms with 10 workers and more at the 4-digit ISIC code. Since all firms are universally affected by the energy reform, the empirical analysis applies both firm fixed-effects and a difference-in-difference analysis exploiting energy-sensitivity of industries as an identification strategy. The results show that output and value-added of manufacturing firms decreased by at least 3 and 7 percent, respectively. Furthermore, operating surplus (operating surplus that includes non-manufacturing service account too), which is a proxy for profit, shrinks by 9 percent. Manufacturing firms have been affected both directly, through

increasing costs of energy inputs and indirectly through pass-through costs of upstream firms and energy-price-induced demand contraction.

The fourth essay builds on the third essay and compares the emission of air pollutants and CO_2 by manufacturing firms before and after the introduction of the energy subsidy reform using an exploratory empirical approach. The assessment shows that the energy consumption of manufacturing firms did not change but the energy mix switched to cleaner choices, i.e., the share of natural gas and electricity increased as a result of changes in relative prices in favour of cleaner energy. These changes brought about a significant reduction in the emission of both air pollutants and CO_2 . However, these promising results do not hold, if I include in the assessment, the emissions stemming from electricity generation. Once emissions from electricity generation are accounted for, no positive environmental effects are found. These findings challenge the presumed inherent environmental benefits of abandoning fossil fuel subsidies as stand-alone policies.

The fifth essay is a critique of existing country energy classifications. I challenge the comparison of countries' energy intensity in the form of measures, such as energy use per unit of GDP or GDP per unit of energy, that are employed to contrast coequal firms or sectors. Labelling Iran as a high-energy-intensive country contributed to unreasonable expectations about the influence of an energy price reform on energy consumption. I show how misleading the outcome of such a metric can be if we do not incorporate contextual factors such as the availability and affordability of energy.

Overall, this thesis suggests that energy subsidy reforms, even an extreme case such as the Iranian SRCT where all savings of the subsidy removal were redirected to the economy in the form of a cash transfer, are likely to have negative impacts, at least in the short run. The presumed benefits of the energy subsidy reforms might accrue in the long run if a well-designed reform with a well-crafted schedule (i.e., implementation when the economy is booming, and no internal or external shocks are expected) is successfully implemented. Nonetheless, fossil fuel subsidies are not sustainable and subsidy reforms are likely to be implemented by many countries in the future. This thesis provides comprehensive evidence of what economies can expect at different levels and for different actors.

An important take away of this thesis is the need to carefully consider the application of methods that rely on ex-ante parameters and stylized facts, and models that estimate only the direct effect of energy price increases. Such ex-ante models had predicted far more optimistic impacts of SRCT compared to those that materialized and were identified in this thesis relying on ex-post evaluations.