

Poverty Impacts Of Energy Subsidy Reform in Egypt

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Overview

- Background
- Approach to estimating poverty impacts
 - Review of core consumption data
 - SUBSIM
 - CGE
 - Review of options for the mitigation of subsidy reform impacts

Background

- IISD working in partnership with AF Mercados & Environics
 - AF Mercados led in developing an energy system model (ORDENA) that included detailed cost estimates for energy sources
 - IISD led on impact analysis, in partnership with Dr. Heba El-Laithy, University of Cairo
 - Environics led on institutional analysis
- Supporting MoP in a technical project under MENA Transition Fund
- Results of analysis not published and still sensitive – presentation will focus on approach & publically available data

Approach to estimating poverty impacts

- Review of impacts based on:
 - Core consumption data (from ORDENA, HIECS 2015, CGE)
 - Simple non-dynamic models, e.g. SUBSIM modelling
 - Complex dynamic models, e.g. CGE modelling
- Review of capacity for social and economic assistance

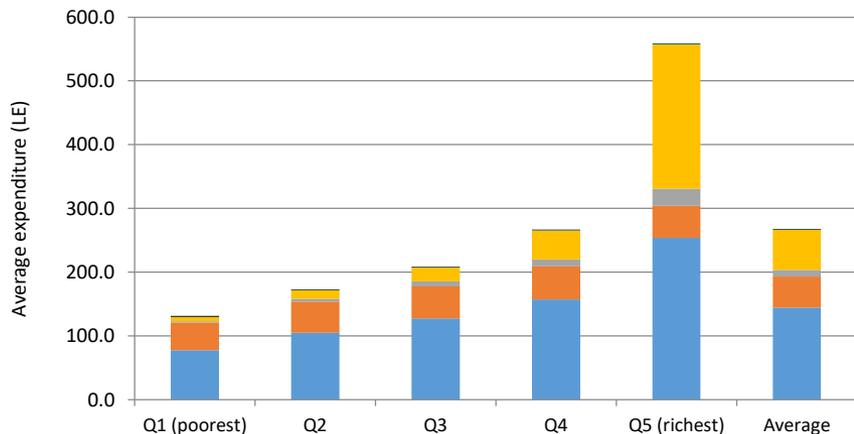
Core consumption data

- Data on direct consumers of energy reveals likely impacts: easy to interpret, few assumptions or technical manipulation
- Important to understand as consumption profiles drive much of the impacts we see through modelling
- Key data sources:
 - Energy system data (in Egypt, from ORDENA)—Largely comprehensive data on consumption by different users
 - HIECS 2015 (basis of SUBSIM)—Detailed data on residential energy and % of households in different pricing tiers for NG & electricity
 - Input-Output 2010/11 (basis of CGE)—Data on energy consumption among economic sectors

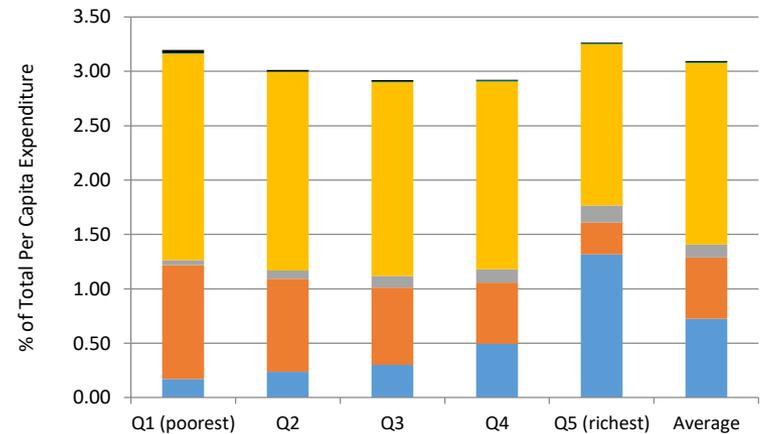
HIECS: Direct Consumption

- Average exp. rises strongly with income; relatively even across quintiles: average ~2.7%
- Gasoline only important to higher-income quintiles; LPG and electricity by far most important for bottom 3 quintiles; Natural gas only a substitute for LPG (cooking) among urban & higher-income

Absolute expenditure (LE) on energy



Share (%) of total expenditure on energy



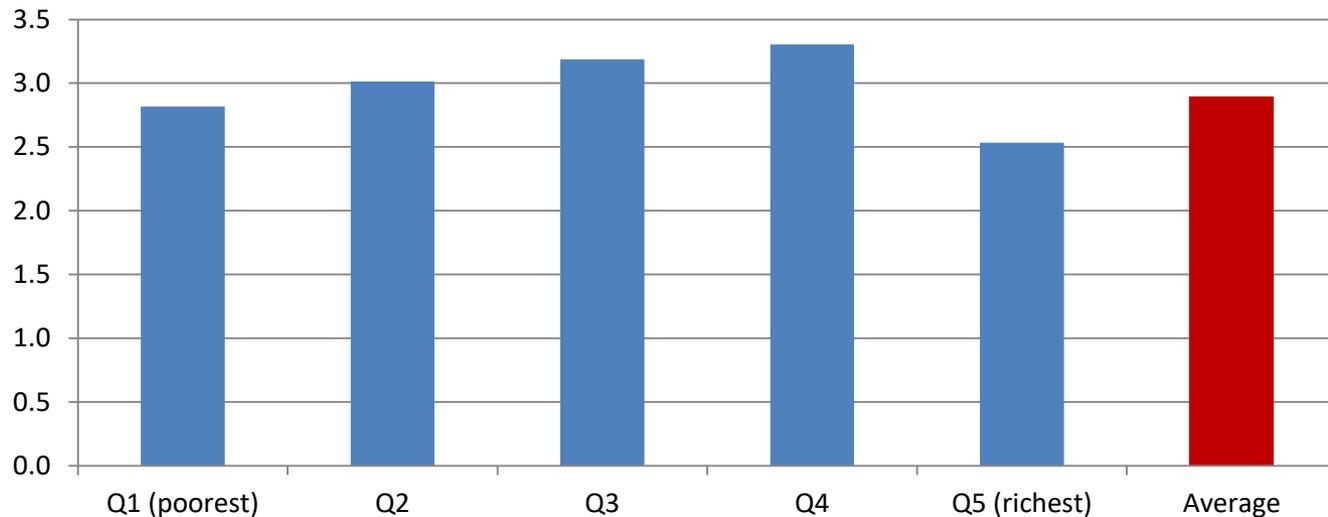
■ Electricity ■ LPG ■ Natural Gas ■ Gasoline ■ Diesel ■ other fuel

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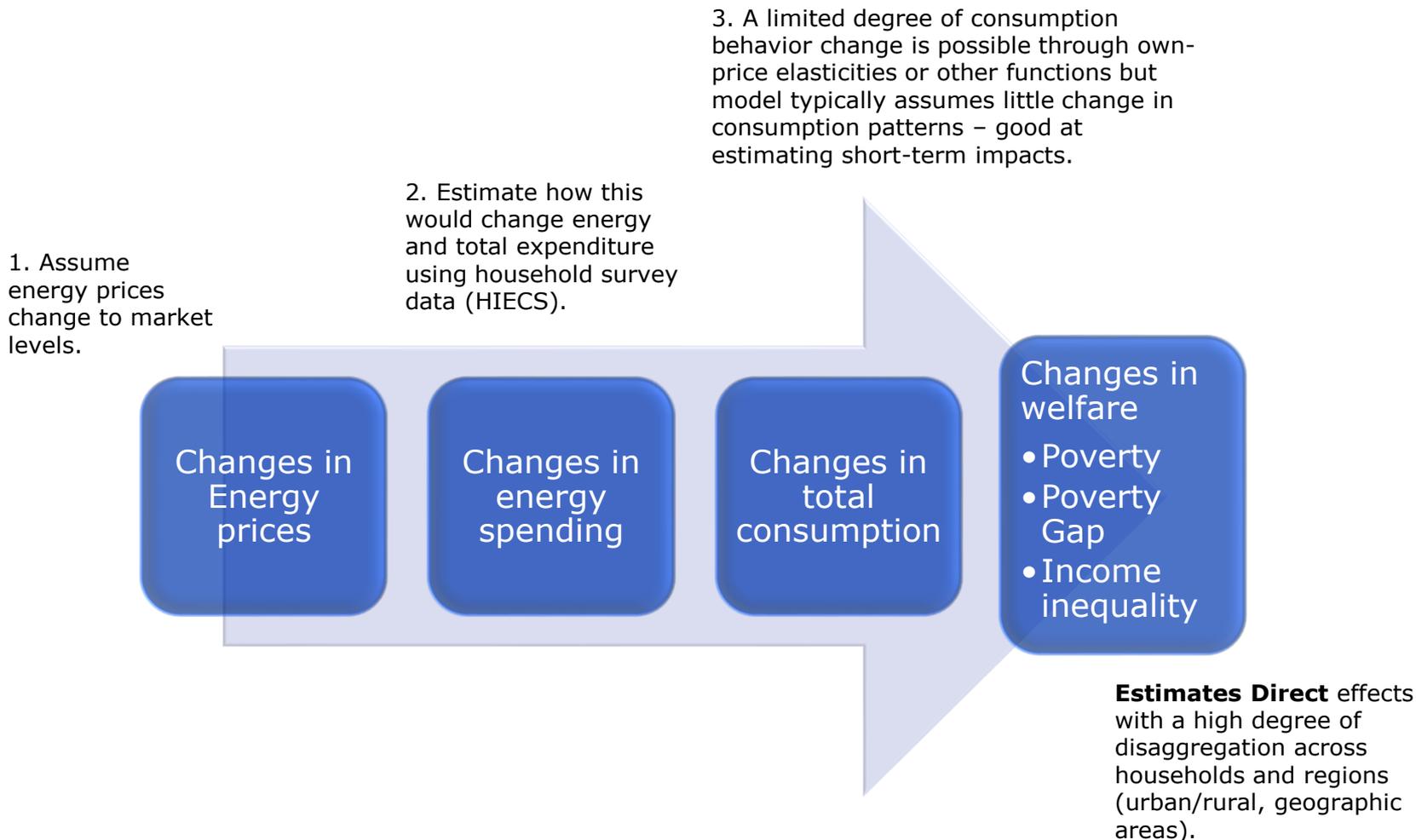
HIECS: Indirect Consumption

- On average, expenditure on transport services is 2.9% of total
- Almost all households use transportation services (98%), with lowest share among Q5 households (95%)
- Suggests indirect impacts on cost of transport services may be significant

Average Share of Total Expenditure (%) per Capita on Transport, by Quintile



SUBSIM Analysis



Indirect effects—i.e. only price changes for energy products considered; price impacts on other goods (e.g. through inflation)—can be estimated separately through: i) a second round of SUBSIM modelling, combined with Input-Output (IO) tables; and/or ii) CGE analysis led by Ministry of Petroleum.

CGE Analysis

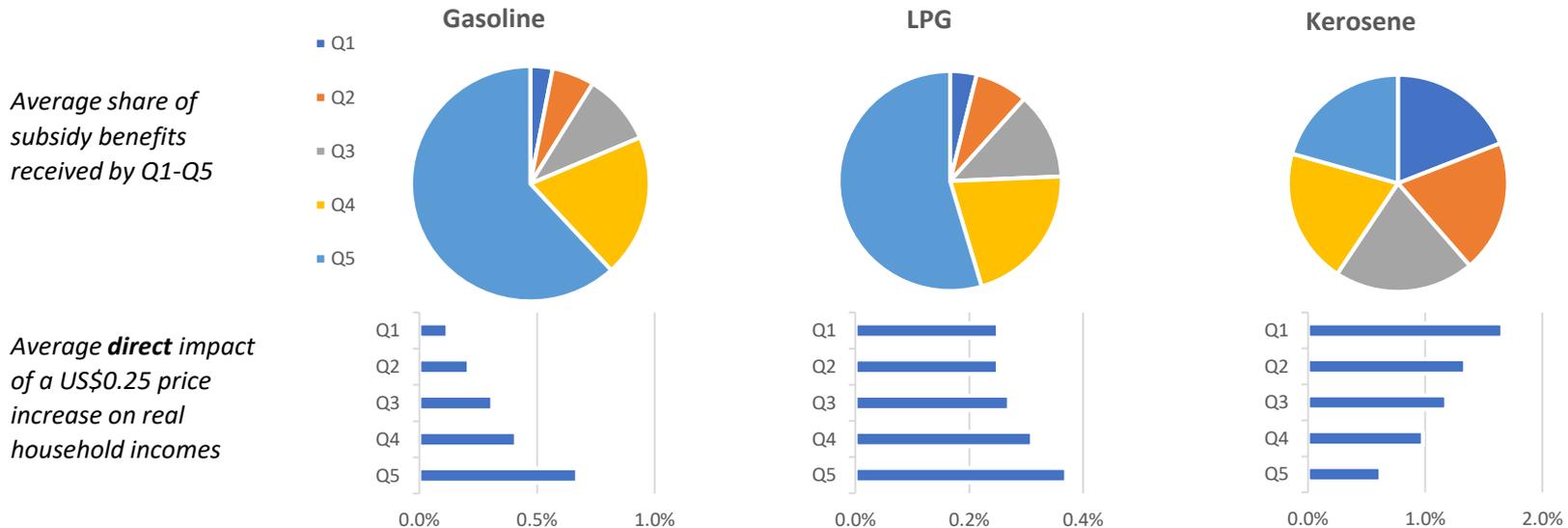
- The analysis was conducted with an economy-wide static Computable General Equilibrium (CGE) representation of the Egyptian Economy.
- The model includes 56 productive sectors—11 energy subsectors and 45 non-energy sectors.
- The model also includes a detailed household breakdown (10 household groups, 5 urban and 5 rural).
- The base year of the model is 2010/11, based on the Social Accounting Matrix published by the Central Agency for Public Mobilization and Statistics (CAPMAS).

Challenges to modelling

- Reliable energy system data—Good data required on energy consumption
- Requirement to update underlying data sources
 - Basis databases underlying models are often updated only rarely, e.g. latest input-output model for Egypt at this of analysis was from 2010/11
 - But major changes can have taken place since then – e.g. energy price adjustments in 2014, 2016, 2017; and major currency devaluation in late 2016; as well as changing trends in world prices for crude oil and natural gas
- Energy disaggregation of CGE model—typically only very simple disaggregation of the energy sector (e.g. by petroleum, natural gas, electricity) making it challenging to model price impacts of individual products

Typical results

- Many countries see similar pattern: most benefits go to rich; but large impacts as a % of poor household budgets
 - Direct impacts—costs of energy
 - Indirect impacts—often ~x2 direct impacts
 - Short-term shock followed by adjustment & income growth



Review of existing capacity

- Identify major tools available for social protection
- Evaluate based on : coverage; effectiveness; targeting; political acceptance



Monitoring and evaluation

- Important to continue monitoring impacts as reform is implemented
- Can be challenging to get good data: typically, national household surveys only conducted every two or three years
- Recommend deploying small, modular surveys in months following reform to collect reliable data on impacts
- Important to define energy poverty
 - E.g. in Europe, many countries define as ~10% income on energy
 - Research required to identify nationally appropriate thresholds

Thank you

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