



Measuring the Incidence of Fuel Subsidies

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Welfare impact of fuel subsidy reform



Higher domestic prices affect consumers through two channels

Direct effect from increase in price of fuels consumed by households

Indirect effect from increase in prices of goods and services that use fuel as inputs

- Indirect effect often substantial; in some cases, over 50 percent of total consumption of fuel is as intermediate product

Identify magnitude of the required price increase



- This requires a reference price (PW) for each fuel product**
 - For a *net importer* of the refined fuel product, PW is the international price fob plus the cost of transporting the product to the country's border (c.i.f price)
 - For a *net exporter* of the refined fuel product, PW is the international price fob at the country's border
- Domestic and transport margins, and existing or desired tax levels should be added to the reference price**
 - The required price increase is the gap relative to the retail fuel prices

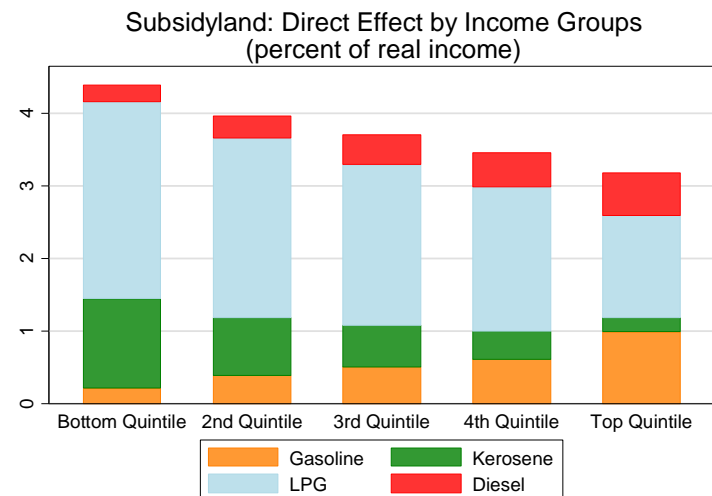
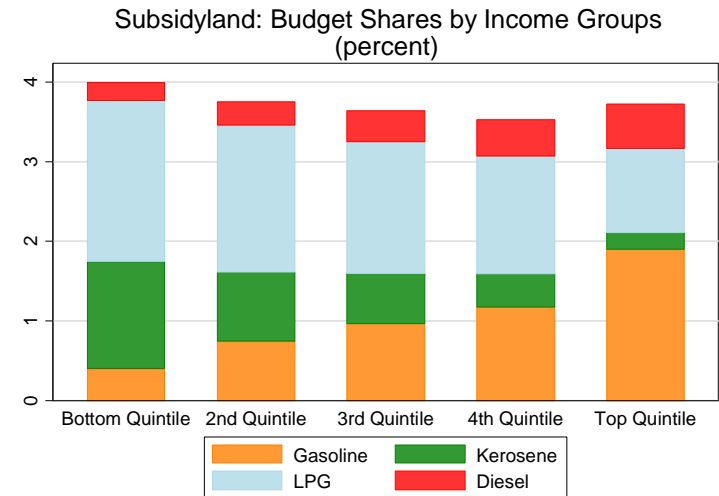


Input-Output approach: calculate direct effect

- Need *household survey* with information on different fuel expenditures**
- For each household, calculate *budget shares* as expenditure on fuel divided by total household consumption**
- Multiply *required price increases* by budget share to get approx. real income impact**
- Look at *distribution* of percentage real income effect across income groups**

Magnitude of direct effect

- ❑ **Total fuel budget shares varied from 3.5 to 4 percent, with the poorest quintile having the highest budget share for kerosene and LPG**
 - ❑ Therefore, a 50 percent increase in average fuel price implies a 1.8 to 2 percent decrease in real incomes
- ❑ **Example: required price increases to achieve full pass-through in Subsidyland:**
 - ❑ Gasoline (52 percent), Kerosene (92 percent), LPG (134 percent), Diesel (105 percent)
- ❑ **Direct effect found to have bigger effect on lower-income groups, reflecting importance of kerosene and LPG, which are relatively heavily subsidized**





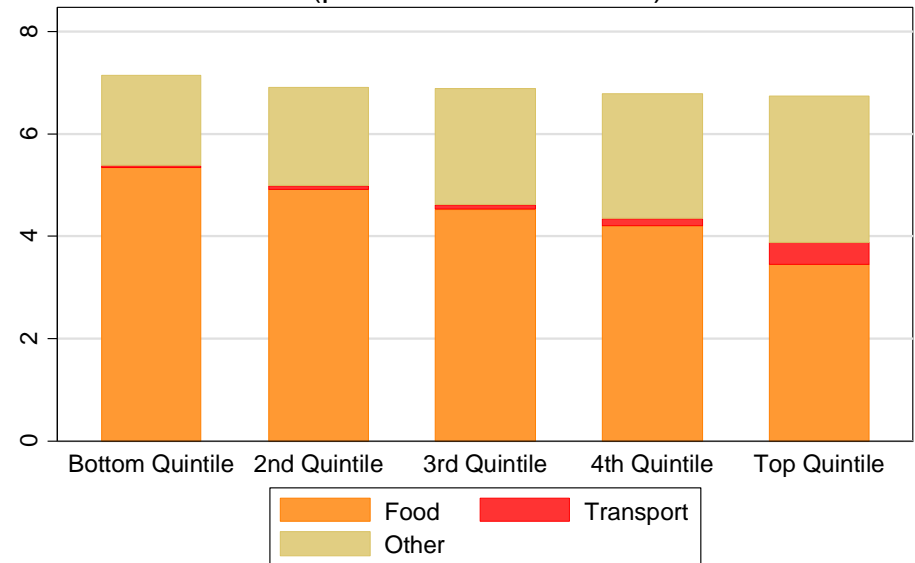
Input-output approach: calculate indirect effect

- An *input-output table* and a simple model can be used to calculate the increase in prices for other goods and services from higher fuel costs
- Aggregate household consumption data to get *budget shares* for input-output sectors
- Multiply budget shares by *percentage price increases* to get percentage real income effect
- Aggregate to get total indirect effect and look at *distribution* across different income groups

Magnitude of indirect effect

- ❑ Diesel is typically the most important intermediate fuel input
- ❑ Indirect effect at least as large as direct effect and approximately neutral incidence
- ❑ Most of indirect effect comes through higher food costs

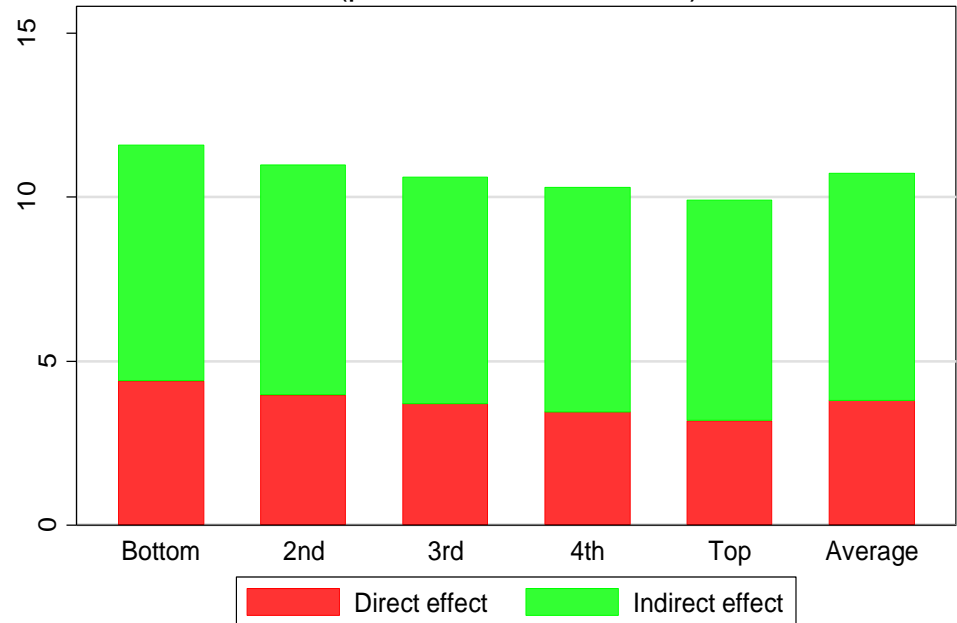
Subsidyland: Components of Indirect Effect
(percent of real income)



Magnitude of total effect

- ❑ Add the indirect and direct effect to get total impact of fuel price increase on household real incomes
- ❑ Total effect ranged from 10-11.5 percent in Subsidyland
- ❑ Largest effect on is on the poor, reflecting role of higher kerosene and LPG price increases

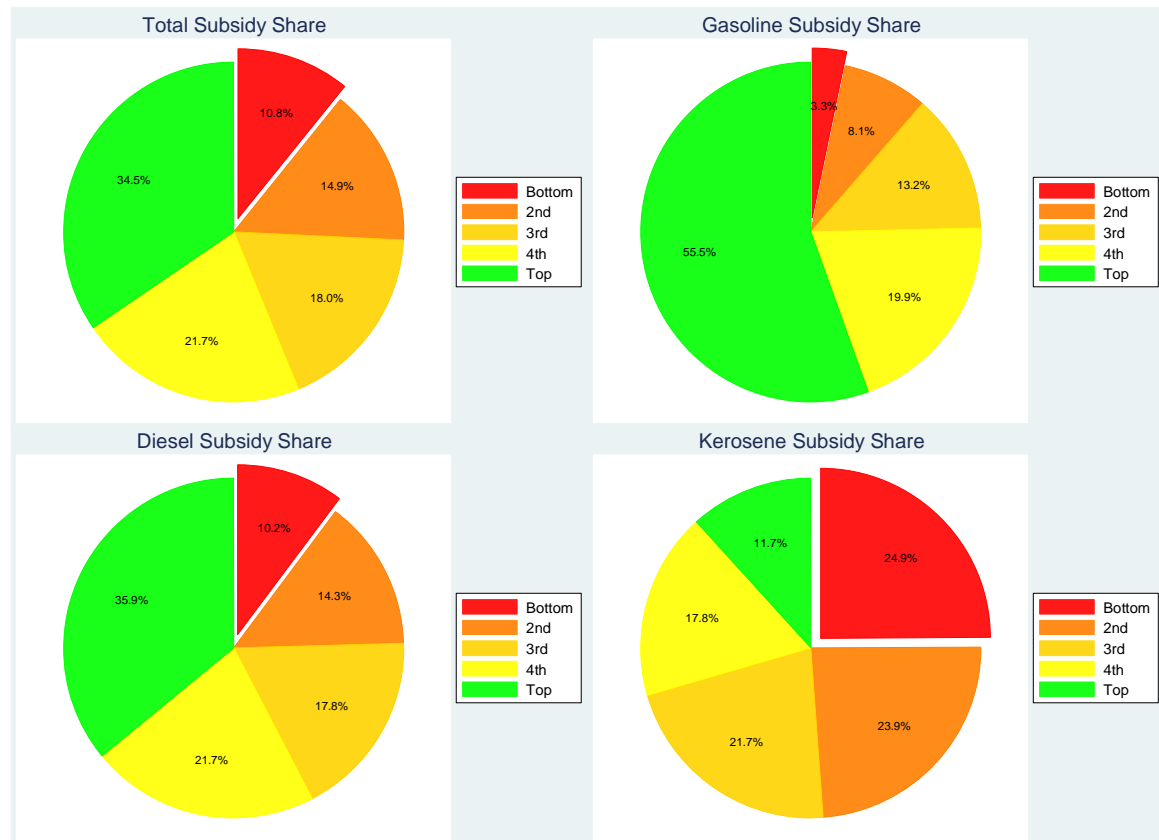
Subsidyland: Total Effect by Income Groups
(percent of real income)



Evaluate targeting efficiency

- ❑ Calculate the share of the total subsidy (or, equivalently, the burden of subsidy removal) accruing to each income group
- ❑ Can do this separately for each product as well as the direct, indirect and total effects

Subsidyland: Share of Fuel Subsidies by Income Groups





Input-output approach vs. CGE model

❑ Limitations of input-output approach

- ❑ Assumes input costs are pushed fully through to output prices, except in controlled sectors
- ❑ Ignores substitution effects and labor market effects of producer price changes

❑ Advantages of input-output approach

- ❑ Provides reliable analysis on the short-run impact of fuel price increases as demand for fuel products is price inelastic
 - In the medium/long run, the impact on household welfare may be smaller
- ❑ Avoids arbitrary assumptions on price elasticities
- ❑ Requires less data, thus suitable for countries with data limitations
- ❑ Provides quick analysis and valuable information to inform policies
- ❑ Easy to implement and can help build capacity in countries



Thanks!