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

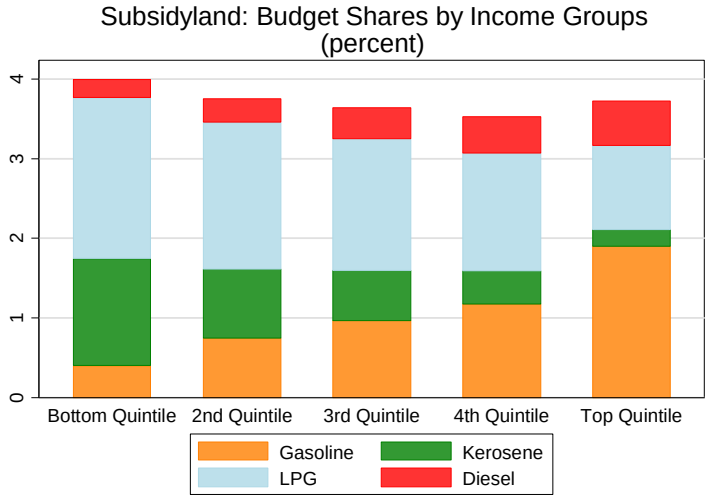
- **This requires a reference price (PW) for each fuel product**
  - For a *net importer* of the refined fuel product, PW is the international price fob plus the cost of transporting the product to the country's border (c.i.f price)
  - For a *net exporter* of the refined fuel product, PW is the international 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

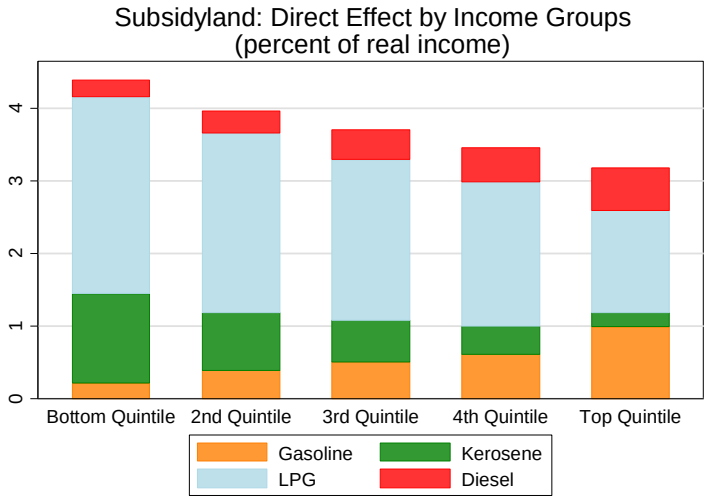
Input-Output approach: calculate direct effect

- 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**



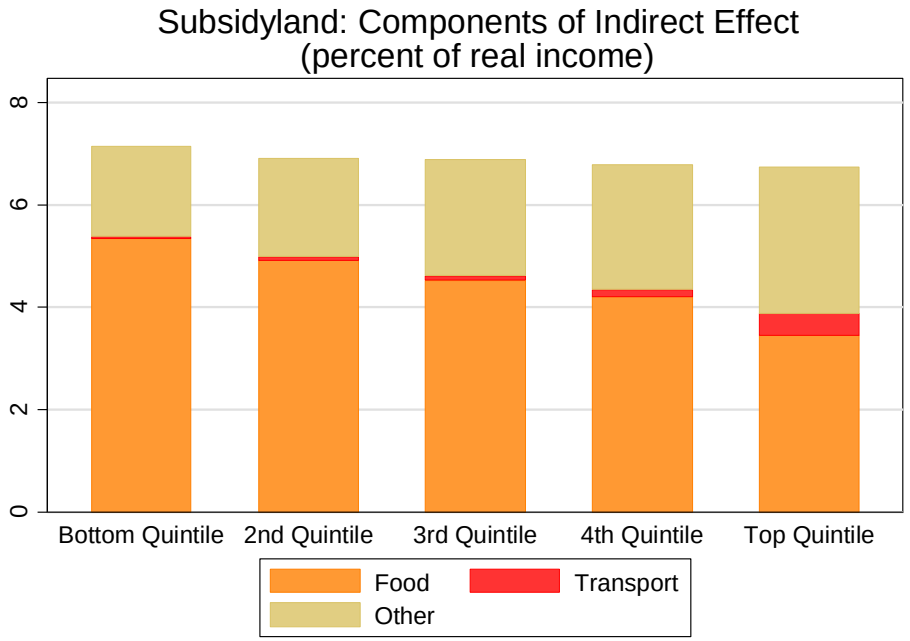


Input-output approach: calculate indirect effect

- 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

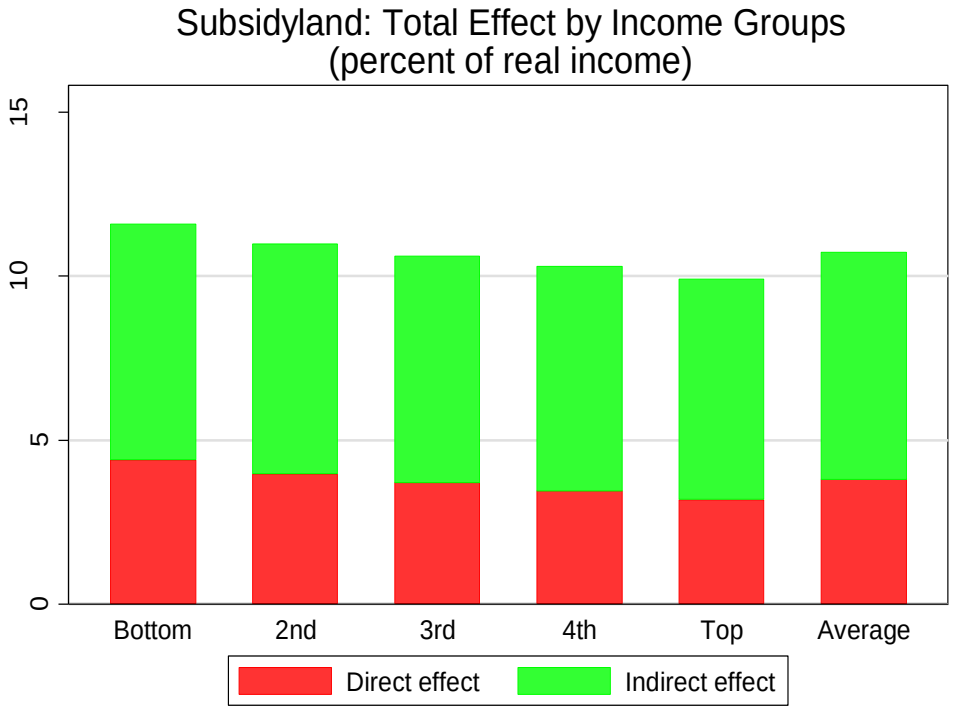
Magnitude of indirect effect

- **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**



Magnitude of total effect

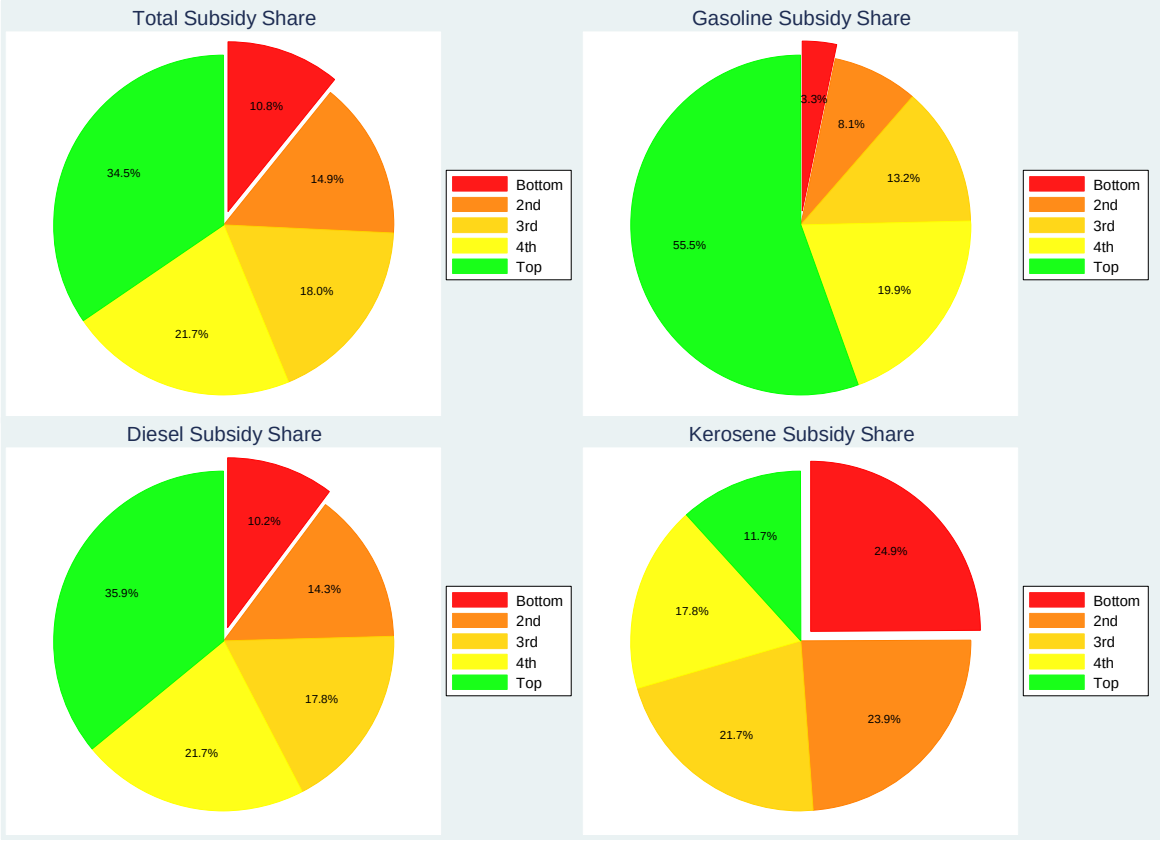
- Add the indirect and direct effect to get total impact of fuel price increase on household real incomes
- Total effect ranged from 10-11.5 percent in Subsidyland
- Largest effect on is on the poor, reflecting role of higher kerosene and LPG price increases



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!