Measuring the Incidence of Fuel Subsidies

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Benedict Clements

Division Chief
Fiscal Affairs Department
International Monetary Fund
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
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
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!