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What is best practice in identifying economic incidence of input subsidies (fertilizer/seed)? In what context?

- Large scale up of input subsidies in Africa since 2006
- 7 countries spending US \$2billion in 2012
- Most are “targeted” programs
 - Distribution not random
 - Makes evaluation difficult
- Nation-wide programs
 - Malawi 60-70% of households participate
 - Potentially large “spill-over” effects



$$Y_{it} = f(Z_{it}, X_{it}, \varepsilon_{it})$$

Is **Z** number of vouchers, kilograms of subsidized fertilizer purchased, kilograms of subsidized fertilizer applied to maize?

- If number of vouchers, (eligibility effect)
 - how to account for resale and sharing of fertilizer?
- If kilograms of subsidized fertilizer (participation effect)
 - Is that really measuring the effect of the gov't program?

Since vouchers and fertilizer not distributed randomly, how to control for potential correlation between Z_{it} and ε_{it} ?

$$Y_{it} = f(Z_{it}, X_{it}, \varepsilon_{it})$$

- Advantage if household panel data available.
 - Use household fixed effects or first differencing to deal with time-constant unobservable factors.
- IV estimation: challenge of finding a good instrument.
 - Modeling subsidized seed and fertilizer = multiple instruments
- Potential RCT: Z = voucher eligibility IV for fertilizer acquisition: Local Average Treatment Effects (LATE)
 - Are you studying a population of interest?
 - External validity?

Returns to maize production from additional kg of subsidized fertilizer in Malawi

Covariates ¹	FD	Panel Quantile Regression				
	Cond. mean est.	10%tile	25%tile	50%tile	75%tile	90%tile
Kg sub. fertilizer	2.71***	0.86***	1.50***	2.28***	3.52***	5.00***

- Returns to subsidized fertilizer are small but positive and statistically significant
- Returns higher at the top of maize production distribution than at bottom
 - mean return higher than median return
- People at bottom poorer, lower management ability and worse soil fertility.

Note: *, **, *** indicates that corresponding coefficients are significant at the 10%, 5%, and 1% level respectively; other controls included in model

How should different types of ag. subsidies be modeled given the general lack of data in surveys on which farmers are benefiting from these programs?

- National production estimates may be politicized
- Household-level data likely more objective and accurate (still could be subject to measurement error)
- Gates foundation funded, World Bank implemented LSMS surveys providing a great deal of useful information.

What options are available to take into account behavioral response and general equilibrium effects?

- Large scale program, could have “spill-over” effects.

BENEFITS

1) lower maize prices

- evidence suggest small downward effects

2) higher wage rates

- evidence suggests small upward effects

COSTS

3) leakages

- evidence suggests may be quite large

4) crowding out

- evidence suggest may be significant

Thank you for your time!



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