

# Presentation at 2013 World Bank Conference on Equity & Commitment to Equity in Fiscal Policy

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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  $\varepsilon_{it}$  ?

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

- 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 <sup>1</sup>	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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