

Do Fertilizer Subsidies Improve Food Security & Well-being? Evidence from Malawi

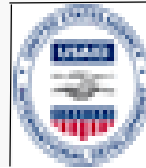


J. Ricker-Gilbert
T.S. Jayne

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MICHIGAN STATE
UNIVERSITY



USAID
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I. Introduction

“Malawi Shows Obama’s Goal for African Self-Reliance is Possible”

-Bloomberg News: July 19, 2009

Fertilizer Subsidies = provide fertilizer to farmers below commercial market price to grow staple crops.

Other Countries

- Kenya
- Tanzania
- Uganda
- Zambia

•Malawi : Subsidies= 15% of Gov.
Budget in 2009

•Zambia: Subsidies= 20% of Gov.
Budget in 2008

I. Introduction

Goal of Fertilizer Subsidies Is to increase food security and well-being for small producers.

Ways to Measure Improvements in Well-being

- Improvements to subsidy recipients over time
- Spill over effect to well-being of the community

This study focuses on the dynamic effects of how subsidy recipient's well-being changed over time.

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Outline

1. Introduction
2. Previous Literature
3. Our Contribution
4. Background on Malawi Subsidies
5. Conceptual Framework
6. Hypotheses
7. Methodology
8. Data
9. Results
10. Future Work/Conclusions

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II. Previous Literature

Focus on farm-level impacts from subsidy

- **Displacement**
(Xu et al. 2009, Ricker-Gilbert & Jayne 2009)
- **Production/Yield Effects**
(Ricker-Gilbert, Jayne & Black 2009)
- **Policy Papers on Impacts – Conflicting conclusions**
(Sanchez et al. 2009, Harrigan 2008, GRAIN 2010)

III. Our Contribution

Policy

First to use HH panel data to move subsidy debate beyond farm level issues to look at household issues

Methodological/Empirical

Measuring dynamic effects with panel data

IV. Background

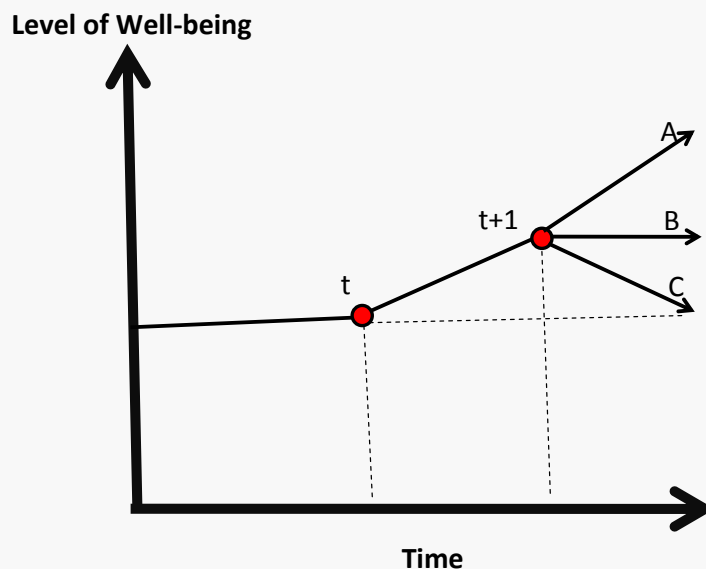
Fertilizer Subsidy Allocation in Malawi

- Distributed regional level based on area under cultivation
- Methods for local coupon allocation had the potential to vary across villages.
 - Village leaders & distribution committee
 - Need to understand who was targeted?

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V. Conceptual Framework

(Jacobson et al. 1993; Feder et al. 2003; Kirimi 2008)



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VI. Hypotheses

1. H_{o_1} : Fertilizer Subsidies have no contemporaneous effect on well-being
2. H_{o_2} : Fertilizer Subsidies have no dynamic effect on well-being

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VII. Methodology

A model of well-being (Y)

$$Y_{it} = \beta_0 + \beta_1 \text{Subfert}_{it} + \beta_2 \text{Subfert}_{it-j} + \beta_5 \text{Land}_{it} + \beta_6 \text{HH_characteristics}_{it} + \beta_7 \text{Year}_{it} + \beta_8 \text{Region}_i + C_i + V_{it}$$

For HH (i) at time (t)

Blue indicates dummy variable

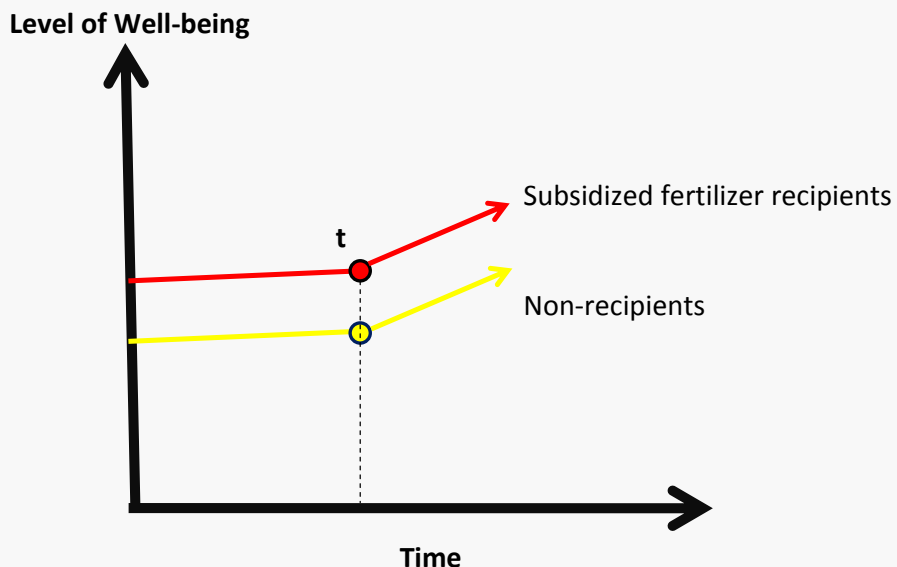
Test H_{o_1} : $\beta_1 = 0$ Contemporaneous benefit

Test H_{o_2} : $\beta_2 = 0$ Long term benefit

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VII. Methodology

Dealing with C_i (time constant unobservables)

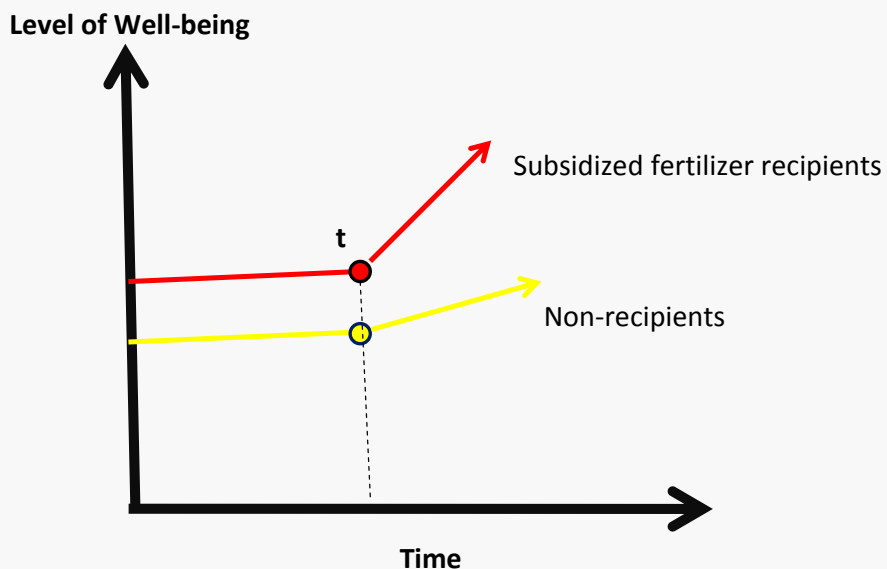


Fixed effects (linear) or Correlated Random Effects can deal w/ different intercept problem provided unobservable slopes are the same

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VII. Methodology

Dealing with V_{it} (time varying unobservables)



Must Use IV methods to deal with different slopes caused by unobserved changes over time.

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VIII. Data

Three waves of household level panel data

- First survey collected during 2002/03 & 2003/04 season

Subsidy scaled up during 2005/06 season

- Second survey collected during 2006/07 season
- Third survey collected during 2008/09 season
- Fertilizer recall questions asked for years between survey
- Nationally representative
- 1,210 HH made all three waves of panel.

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IX. Results

Characteristics of Household Who Received and Did Not Receive Fertilizer Subsidy in 2009

	Top 28% of Subsidy Recipients	Bottom 72% of Subsidy Recipients	HH that did not receive the subsidy
# of HH in Group	258	655	297
Mean Kg of Sub Fert Received	231	92	0
Mean Value of Assets	14,477	9,813	8,607
Landholding in HA	1.54	1.17	1.11
% Female Headed HH	23	31	32
% of HH earning Ganyu Wages	34	47	52
Mean Annual Earnings from Ganyu	12,953	8,750	9,046
Year's HH head has lived in Village	33	32	27

IX. Results Well-being Effects

Fertilizer Subsidy Impact on Assets (Livestock & Durables)

HH Assets in Malawian Kwacha	Error term correlation ignored	Correlation with C_i controlled	Correlation with C_i and V_{it} controlled
Explanatory Variables			
(Ho1) Subsidized fertilizer t	1.61	-8.41	-64.88
Subsidized fertilizer t-1	4.29	52.94	125.14
Subsidized fertilizer t-2	1.16	8.77	-64.66
Subsidized fertilizer t-3	15.15	64.68	127.78
(Ho2) Overall F-test of 3 lags	20.59	108.85	188.25

Red indicates subsidized fertilizer statistically significant at 10% level or lower

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IX. Results Well-being Effects

Fertilizer Subsidy Impact on Food Security

Was HH Food Consumption Adequate (binary)?	Error term correlation ignored	Correlation with C_i controlled
Explanatory Variables		
(Ho1) Subsidized fertilizer t	0.000	0.000
Subsidized fertilizer t-1	0.001	0.001
Subsidized fertilizer t-2	0.000	0.000
Subsidized fertilizer t-3	0.000	0.000
(Ho2) Overall F-test of 3 lags	0.004	0.004

Red indicates subsidized fertilizer statistically significant at 10% level or lower

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IX. Results Well-being Effects

Fertilizer Subsidy Impact on Subjective Life Satisfaction

How Happy are you with your life? (1 to 5)	Error term correlation ignored	Correlation with C_i controlled
Explanatory Variables		
(Ho1) Subsidized fertilizer t	0.000	0.000
Subsidized fertilizer t-1	0.002	0.002
Subsidized fertilizer t-2	0.000	0.000
Subsidized fertilizer t-3	0.0001	64.68
(Ho2) Overall F-test of 3 lags	0.003	0.000

Red indicates subsidized fertilizer statistically significant at 10% level or lower

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X. Future Work & Conclusions

Future Work

- Test more well-being indicators
- Measure spillover effects

Conclusions

- Recipients and non-recipients different
- Subsidies have some dynamic effect on food security
- When error term correlation is controlled, subsidies have no significant effect on assets accumulation or happiness over time.

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Thank you for your time!



rickergi@msu.edu