Decentralization and Efficiency of Subsidy Targeting: Evidence from Chiefs in Rural Malawi

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Introduction

- Public subsidies are a substantial part of what developing country governments do
  - health subsidies, subsidies for agricultural inputs, food distribution
  - e.g. in certain years, Sri Lanka, Malawi and India spend 10-20% of their government's budget on fertilizer subsidies (Wiggins and Brooks 2010).

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- But for the hoped-for impacts to be maximized, need a number of things to hold:
  1. subsidies must be targeted/assigned to those for whom the returns are highest
  2. leakage has to be limited
  3. beneficiaries of subsidized inputs/products must put them to (appropriate) use

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    - e.g. a proxy-means test (PMT): distribute benefits based on expected poverty given asset levels
  - Decentralized allocation: local agent identifies beneficiaries

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- Local leaders may have local information on where returns likely to be higher
- But delegating targeting to local leaders might be subject to elite capture
  - e.g local agent disproportionately allocating subsidies to kins
- In standard models, local leaders accountable to local population and that mechanism can keep them in check / incentivize them to act on local knowledge
  - But in practice often unclear how accountable local authorities are
  - Particularly so in many contexts in Africa, where traditional local authorities (chiefs) typically not elected

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  - Does elite capture trump the benefits of local information because of poor incentives inherent to traditional authority systems?

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- This paper: to what extent does the poor performance of local authorities in the aggregate come from their inefficient allocation of resources/transfers from government?
  - Does elite capture trump the benefits of local information because of poor incentives inherent to traditional authority systems?
  - If so would be bad news for Africa since these systems are in place throughout the continent and typically relied upon for within-village allocation

This paper

- Exploits data on the allocation of farming input subsidies (FISP) and food assistance in Malawi
  - FISP – Large program: ~ 50% of the Agriculture budget and ~ 7% to 10% of the national budget between 2005 - 2013 (Dorward et. al 2013)
  - As in many other African countries, federally funded schemes that rely on local chiefs for beneficiary selection
  - Official goal: target the poor and vulnerable
  - Farming input subsidy program widely criticized for not targeting the (asset-)poor (Dorward et al. 2008, 2013; Kilic et al. 2013)

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- Questions: how well do chiefs target? could a centralized (PMT-based) system do better?
  - Study targeting efficiency along two margins: poverty-targeting (official goal) and productive efficiency
  - Difficult exercise:
    - movement in-and-out of poverty so estimating quality of poverty-targeting requires high frequency consumption data
    - unobservable returns to inputs – will use model to derive predictions and a test for the presence of productive efficiency considerations

Outline

1. Intro
2. Background on local governance and subsidy programs
3. Theoretical Set-up
4. Poverty-Targeting
5. Productive Efficiency Targeting: Theoretical Prediction and Test
6. Conclusion

Background: Governance in Malawi

- Presidential democracy, single federal legislative body; 28 districts at subnational level
- Below the district is the local government (our focus)
  - Co-existence of elected councillors and traditional authorities (chiefs)
  - Local councils have a limited ability to generate revenue from taxes and other fees, the majority of their revenue comes from the central government
  - Chiefs are ex-officio members of local councils, paid a (meager) salary by the government ($6.25/mo)
    - No direct legislative authority, no control over any public funds, and not allowed to raise local taxes (but do occasionally charge fees to villagers)
    - 1998 Decentralisation Policy and Local Government Act: recognised their rights to allocate communal land and adjudicate matters related to customary law

Background: Governance in Malawi

- Elected councillors puppets of party during one-party rule (until 1993)
- After that, problems with elections
- Chiefs perceived as influential and enjoy good popularity (Logan, 2011):
  - 2008-2009 Afrobarometer: 74% of people perceived traditional leaders as having "some" or "a great deal" of influence
    - 71% thought the amount of influence traditional leaders have in governing the local community should increase
    - Not specific to Malawi
  - Also appear able to influence local villagers on who to support in general elections and local government elections (Patel et al., 2007) $\Longrightarrow$ may limit their accountability to elected representatives.

Chiefs

	Village Chiefs (N=57)		Group Village Headmen (N=29)	
	Mean	SD	Mean	SD
Panel A. Chiefs				
Age	52.39	15.29	67.46	14.29
Male	0.84	-	0.79	0.41
Years of education	5.39	3.40	4.07	3.14
Religion				
Christian	0.37	-	n.a	n.a
Muslim	0.63	-	n.a	n.a
For how many years have you lived in this village?	43.47	17.30	n.a	n.a
For how many years have you farmed the land you currently farm?	22.46	12.64	n.a	n.a
For how many years have you been chief?	12.93	11.68	11.61	9.21
How were you selected to be chief?				
Hereditary	0.93	-	0.86	0.35
Appointed by Traditional Authority	0.02	-	0.34	0.48
Appointed by Group Village Head	0.07	-	0	0
Nominated by Dictrict Council			0.03	0.19
Elections were held	0.02	-	0.03	0.19
Self declared village head	0	-	0	0
Other	0	-	0.03	0.19
At the time you became chief, was there someone else considered for the position?	0.07	-	n.a	n.a
If yes: Did others refuse to take the position before the job came to you?	0.8	-	n.a	n.a
Receive a payment *(mswahala)* from the government for work as chief	0.91	-	0.76	-
Panel B. Villages (N=57)				
Number of households in village	340	367		
Number of family clans in village (households that are related to each other)	73	213		
Village population	3727	4650		
Total acres of customary land in village	7491	6785		

Are Chiefs Informed? At least they say they are...

Table 7: Perceived Within-Village Heterogeneity among Village Chiefs

	Mean
Do you know which families in the village are having specific difficulty with money at a given time?	
Not at all	0.05
Only for some	0.19
For the most part	0.16
Yes, I know how everyone is doing	0.60
Do you know who is likely to have money to buy fertilizer for the coming planting season and who will not?	
Not at all	0.23
Only for some	0.12
For the most part	0.16
Yes, I know how everyone is doing	0.49
Can you easily categorize households in the village with land better suited for fertilizer and those with land not so well suited for fertilizer?	
Yes, easily	0.86
Not so easily	0.11
Not at all	0.02
Not sure / don't know	0.02
Can you easily categorize households in the village in two groups, those who work hard in their land and those who don't?	
Yes, easily	0.86
Not so easily	0.12
Not at all	0.02

Background: The Farming Input Subsidy Program (FISP)

"Beneficiaries of the 2009/10 Farm Inputs Subsidy Program will be full time resource poor smallholders Malawian farmers of all gender categories."

"... the following vulnerable groups should also be considered: elderly, HIV positive, female headed households, child headed households, orphan headed households, physically challenged headed households and heads looking after elderly and physically challenged"

(FISP Guidelines 2009/2010)

Background: The Farming Input Subsidy Program (FISP)

- Steps to select beneficiaries:
  1. The central government allocates voucher to districts, and districts to villages, according to the farmer registry
  2. Within each village local authorities (mainly chief) decides who is a beneficiary.
- In our sample, coverage increased steadily from 63% of HHs receiving any input subsidy in 2008 to 82% in 2012
  - Some sharing: ~50% get subsidy voucher directly, ~30% get share from voucher recipient
  - 83% of households say the chief decided who should share with whom

Background: Food Subsidies

- After bad season, food distribution (mostly maize) in late 2012
  - continued in 2013, 2014 but we don't have data on that
- In our sample 59% of households received food transfers in 2012 (34% directly, 25% receive share from other household)
- 74% of villagers in our data report that the chief alone selected recipients
  - chief also decided who should share with whom

Motivating Evidence: Covariates of Subsidy Receipt

Table 5. Multivariate correlates of Subsidy Receipt (not all covariates shown on slides)

	(2)	(3)	(5)	(6)
	Received Input Subsidy (pooled 2011-12 seasons)		Received Food Subsidy (2012 only)	
Time Invariant Household Characteristics				
Related to chief	0.05	0.05	0.11	0.11
	(0.02)**	(0.04)	(0.03)***	(0.05)**
Widowed or divorced female	0.01	0.00	0.00	-0.02
	(0.02)	(0.03)	(0.03)	(0.06)
Household size	0.01	-0.01	0.00	-0.01
	(0.01)**	(0.01)	(0.01)	(0.01)
Respondent age	0.04	0.05	0.06	0.07
	(0.01)***	(0.01)***	(0.01)***	(0.01)***
Log acres farmed	0.01	0.01	0.01	-0.02
	(0.01)	(0.02)	(0.01)	(0.02)
Log durable assets	0.02	0.04	-0.01	-0.04
	(0.01)	(0.02)**	(0.01)	(0.02)*
Expenditures				
Log perishable food PAE expenditures	-0.01	-0.01	-0.02	0.00
	(0.01)*	(0.01)	(0.01)*	(0.02)
Shocks				
Experienced cattle death or crop disease	0.03	0.03	-0.02	-0.05
(past 3 months)	(0.02)*	(0.03)	(0.02)	(0.05)
Respondent missed work due to illness	-0.02	0.00	0.02	0.01
(past month)	(0.02)	(0.03)	(0.02)	(0.04)
Another household member sick	0.00	0.06	0.01	0.03
(past month)	(0.02)	(0.03)**	(0.03)	(0.05)
Returns				
Self-reported returns to fertilizer		0.04		-0.04
are higher than median		(0.04)		(0.04)
Village FE?	Yes	Yes	Yes	Yes
Mean of dependent variable	0.80	0.78	0.59	0.55
Number of observations	2770	1028	1385	514
Number of households	1385	514	1385	514

Outline

Model

- Based on Bardhan and Mookerjee (2006)
- Consider the chief's problem of allocating subsidies across households within a village
- N classes c of households, each with demographic weight β_c

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- Consider the chief's problem of allocating subsidies across households within a village
- N classes c of households, each with demographic weight β_c
- The aggregate supply of subsidies to the village is $\bar{s}$
- Chief maximizes:

$$\sum_c \beta_c \omega_c u_c$$

  subject to $\sum_c \beta_c s_c = \bar{s}$
- ω_c is the relative welfare weight of class c households
  - ω_c may not reflect its role in the political process as in earlier models (Bardhan and Mookherjee, 2000, 2003, 2006) since no election
  - function of preferences of the chief

Model

- CRRA utility function defined over household's total income:

$$u_c = \frac{(y_c + e_c)^{1-\rho}}{1-\rho}$$

  - with $\rho > 0, \neq 1$

- e_c is the income that a representative class c household gets absent any subsidy
- Subsidy s_c enables representative household of class c to generate additional income:

$$y_c = A_c s_c^{\mu}$$

  - A_c = class-specific land productivity and suitability for subsidized inputs
    - $\mu \in (0, 1)$
    - For food subsidy: $\mu = 1$ and $A_c = 1 \, \forall c$

Model

- So chief maximizes:

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- For input subsidy, less clear – in extreme case, if poor have $A_c = 0$, we shouldn't expect chiefs to target them at all

Allowing for redistribution

- If allow ex-post income pooling:

$$\max \sum_c \beta_c \omega_c \frac{(A_c s_c^{\mu} + t_c + e_c)^{1-\rho}}{1-\rho}$$

where t_c is a lump sum transfer (positive or negative).

- If there is perfect income pooling, objective function becomes $\max \sum_c (A_c s_c^{\mu})$
  - So we would expect the allocation of fertilizer subsidies to be entirely driven by productive efficiency since redistribution would happen ex post.
- With imperfect income pooling, somewhere in-between

Data

- Panel data of 1,387 households in 57 villages in rural Malawi
  - Representative sample of unbanked households (over 80% of households in rural Malawi)
- Conducted 4 rounds of surveys between January 2011 and April 2013, with an average of 6 months between survey rounds
  - Each survey round, information on food expenditures over past 30 days
    - basis for "optimal" (consumption-based) allocation; perishable foods, as more income elastic (Ligon, 2015).
  - Maybe our data on per capita food expenditures is badly measured / overly noisy
    - Alternative measures of poverty: food security ▸ Correlations
- Additional round (wave5) in Summer 2014 with random subset of 600 households
  - more pointed questions on subsidy allocation, beliefs on land-specific returns to inputs

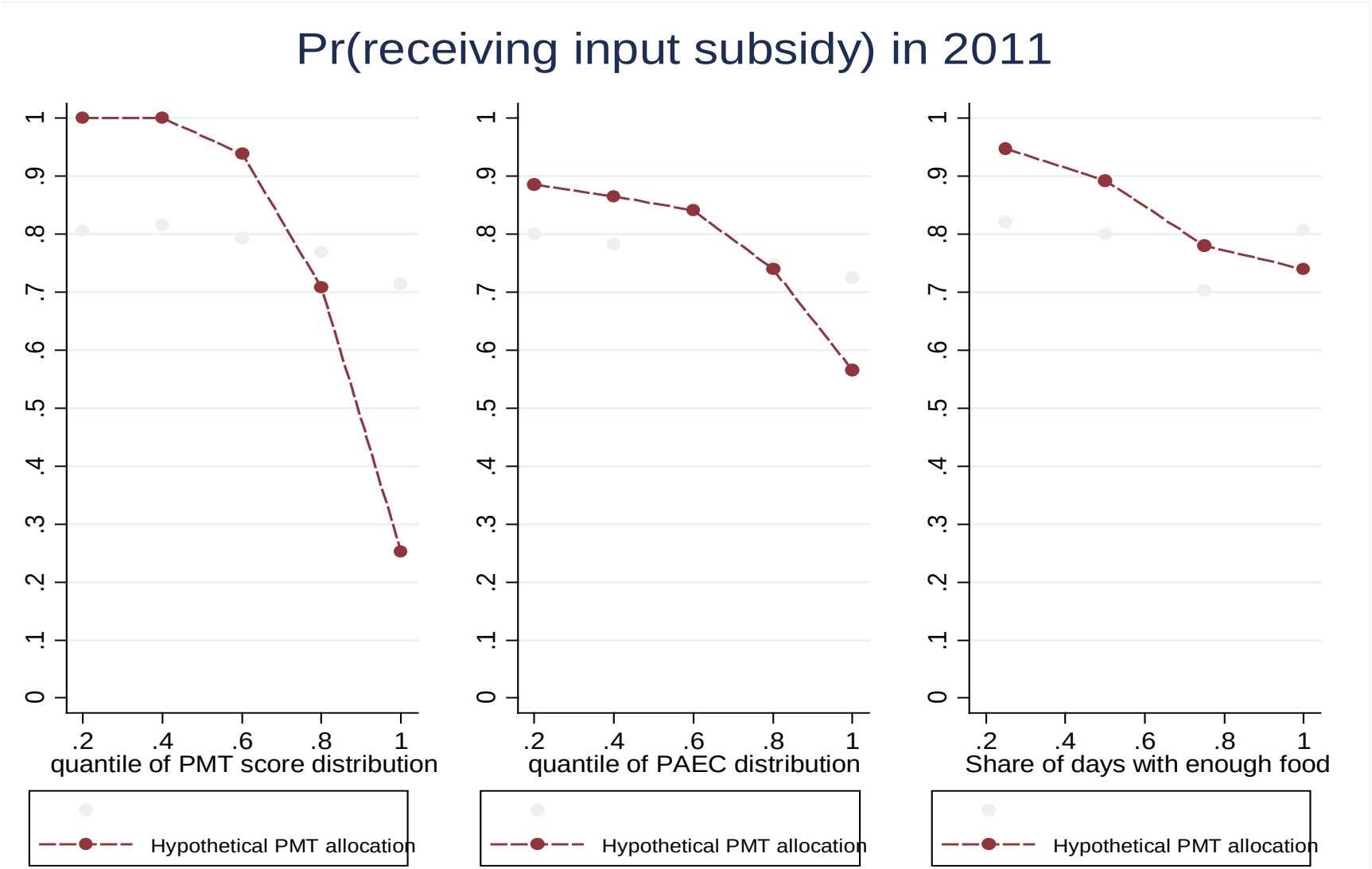
Sample Characteristics

Independent Variables	Mean	Std. Dev.
Panel A. Time-Invariant Baseline Variables		
Related to chief	0.27	0.45
Years of education (highest level of education completed)	4.94	3.48
Widowed or divorced female	0.28	0.45
Household size	4.64	2.09
Number of children	2.58	1.71
Respondent age	39.50	16.29
Reads or writes chichewa	0.59	0.49
Log acres of land owned	0.55	0.89
Log household asset index	3.87	1.15
Mud/dirt floor or worse	0.90	0.30
Thatch roof	0.77	0.42
Mud brick walls or worse	0.39	0.49
Owns land	0.97	0.17

Sample Characteristics

	Mean	Std. Dev.	Correlation between rounds
Panel B. Time-varying Variables			
Per adult equivalent total expenditures (monthly)	12.60	15.16	0.27
Per adult equivalent total food expenditures (monthly)	9.00	9.41	0.26
Per adult equivalent food expenditures on perishables (monthly)	2.56	3.35	0.36
Shocks			
Experienced drought or flood (past 3 months)	0.09	0.29	0.06
Experienced cattle death or crop disease (past 3 months)	0.15	0.36	-0.06
Lost employment or business (past 3 months)	0.03	0.17	-0.01
Respondent was sick (past month)	0.40	0.49	0.22
Respondent missed work due to illness (past month)	0.25	0.43	0.13
Other household member was sick (past month)	0.61	0.49	0.23
Report being worried about having enough food to eat (past month)	0.68	0.47	0.14
Number of observations	2,769		

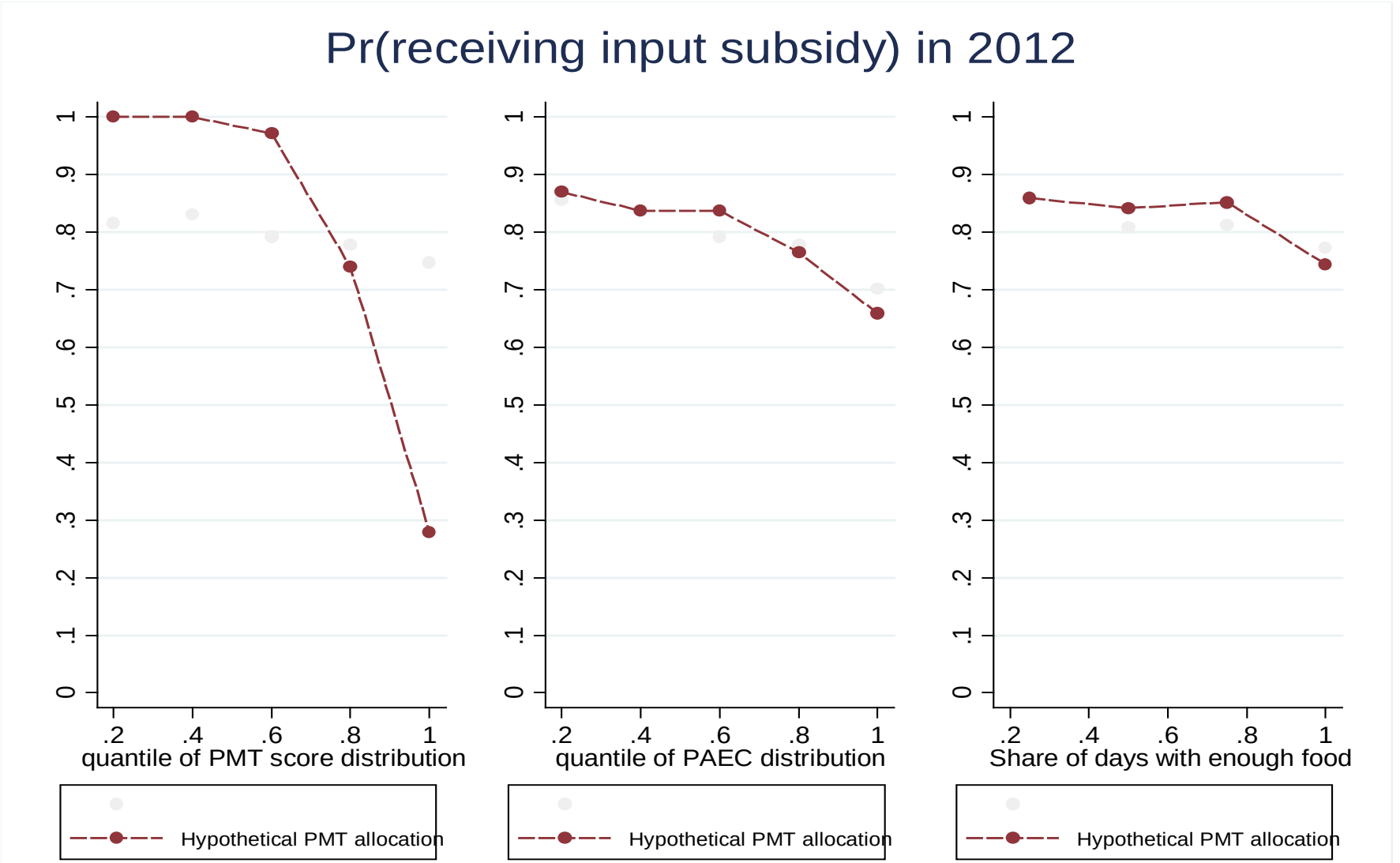
What would a PMT-based allocation look like?



Unobservables

- As evidence from figure, PMT score and consumption are not that highly correlated
  - Not specific to Malawi – R-squared of a regression of expenditures on baseline demographics and assets yields an R-squared of 0.2 in Kenya/Uganda too
  - Kilic et al. report R-squared of 0.48 in IHS2 dataset in Malawi – will try using IHS3 next
  - Alatas et al. 0.48 in Indonesia
- In addition, people commonly move into and out of eligibility
  - Along PAEC criterion, 27.4% of households in sample qualified change eligibility status from one year to the next

What would a PMT-based allocation look like?



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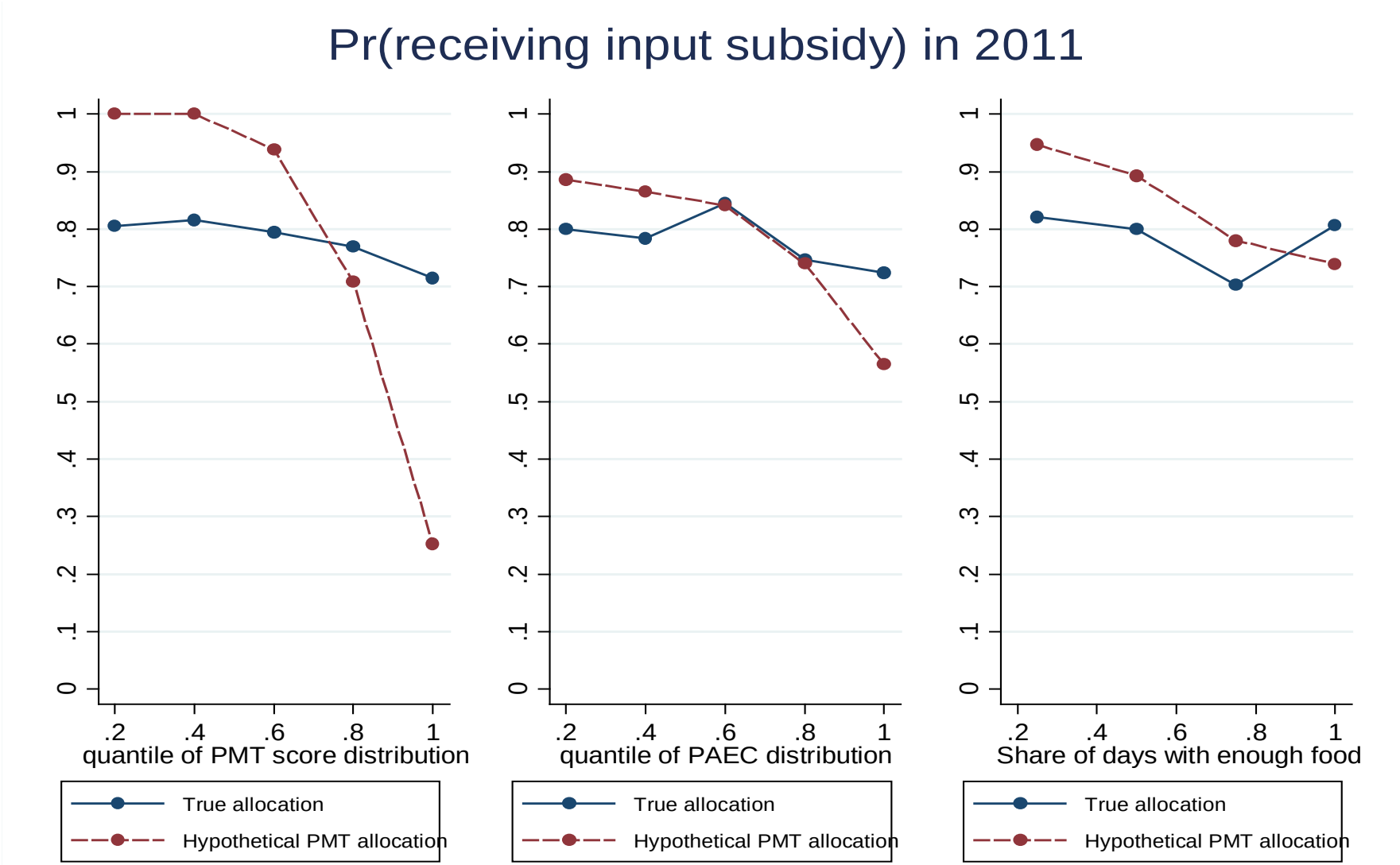

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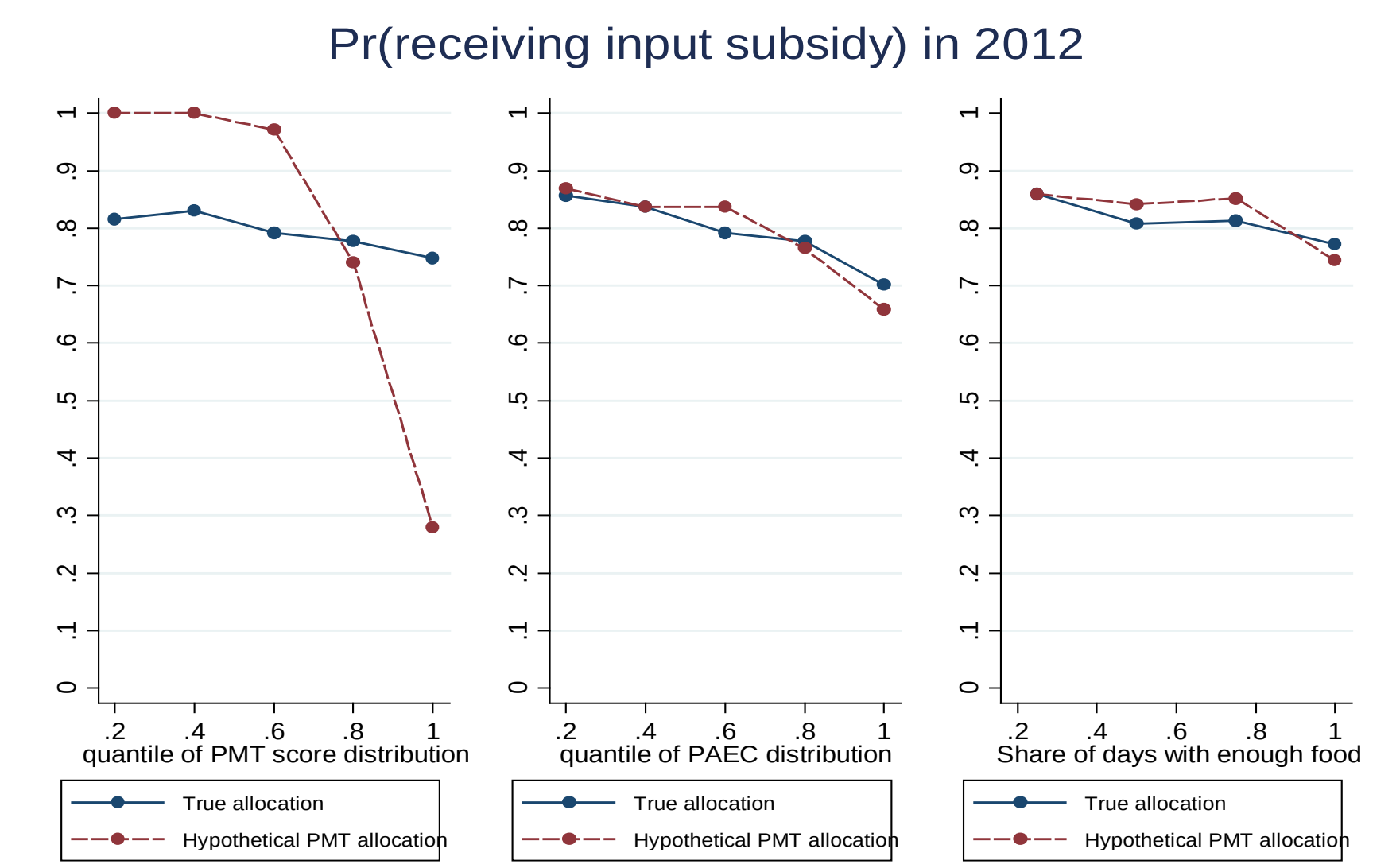
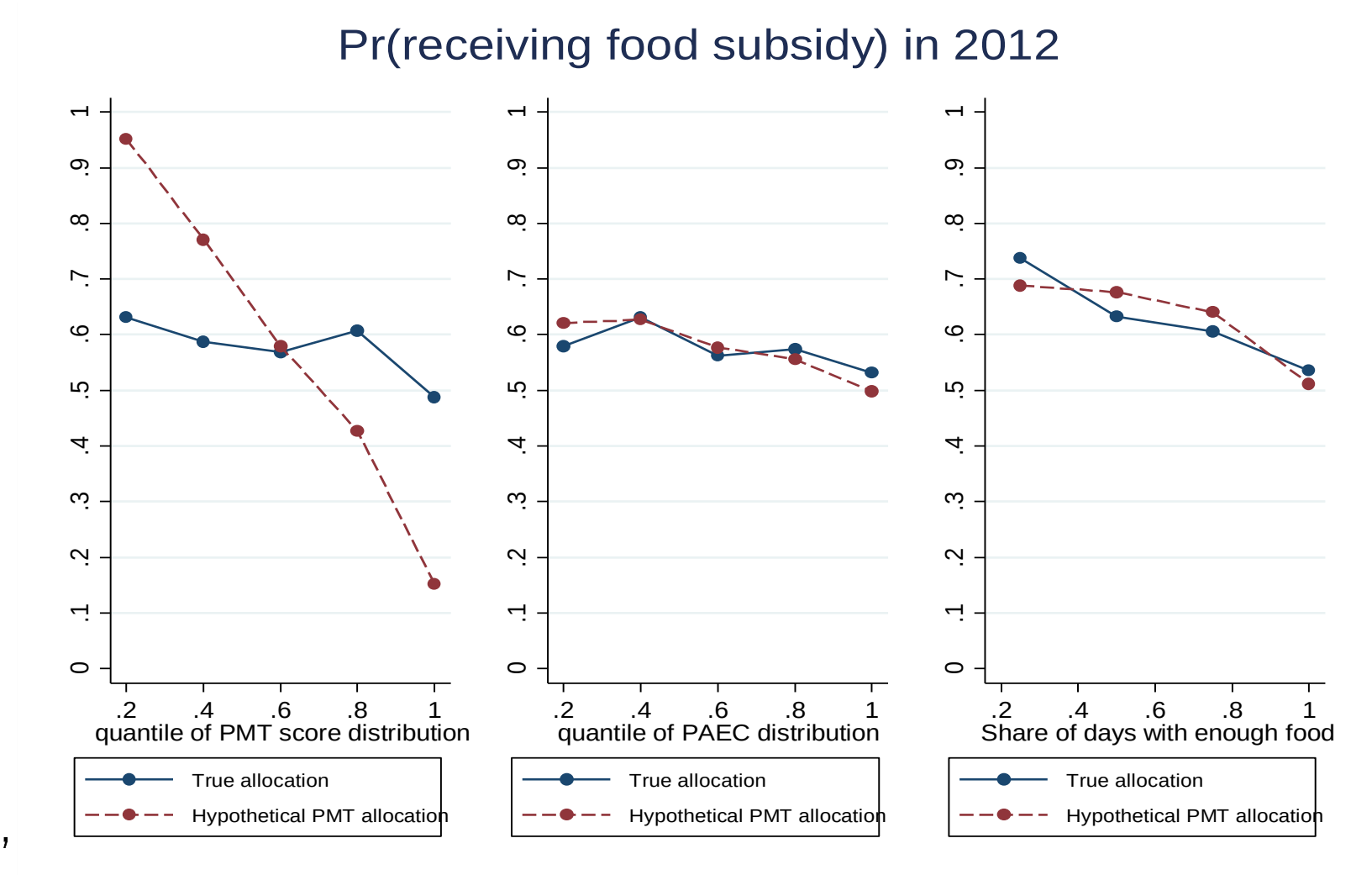


Same for Food Subsidies



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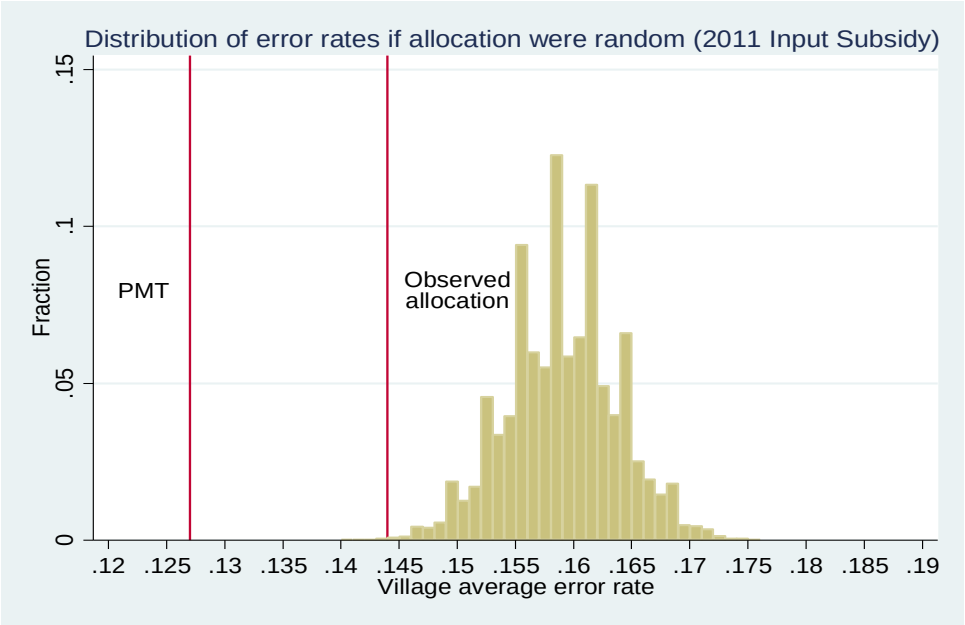
Distribution of error rates if allocation were random (2011 Input Subsidy)
Fraction
0
.05
.1
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PMT
Observed allocation
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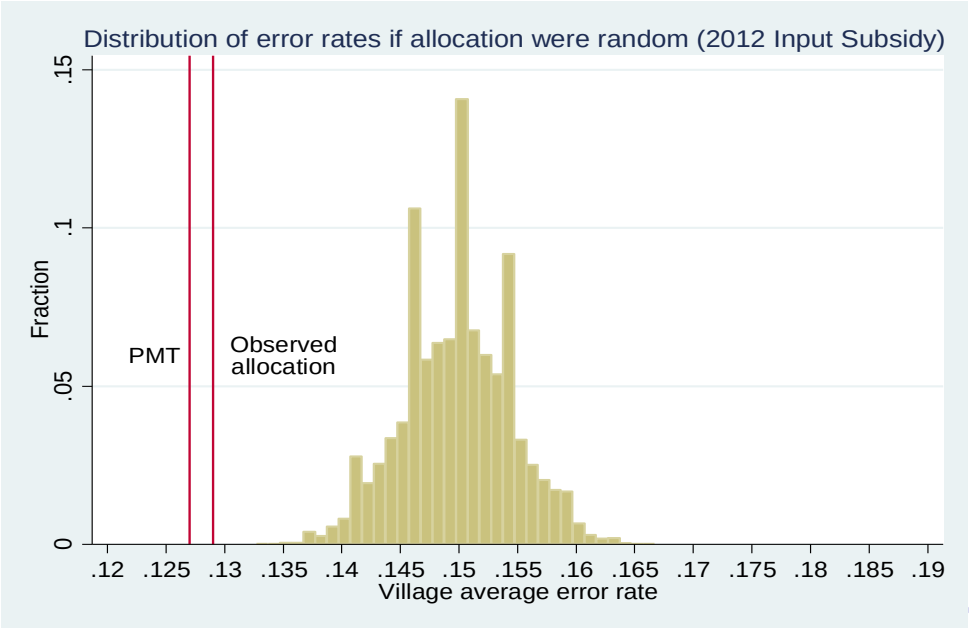
Village average error rate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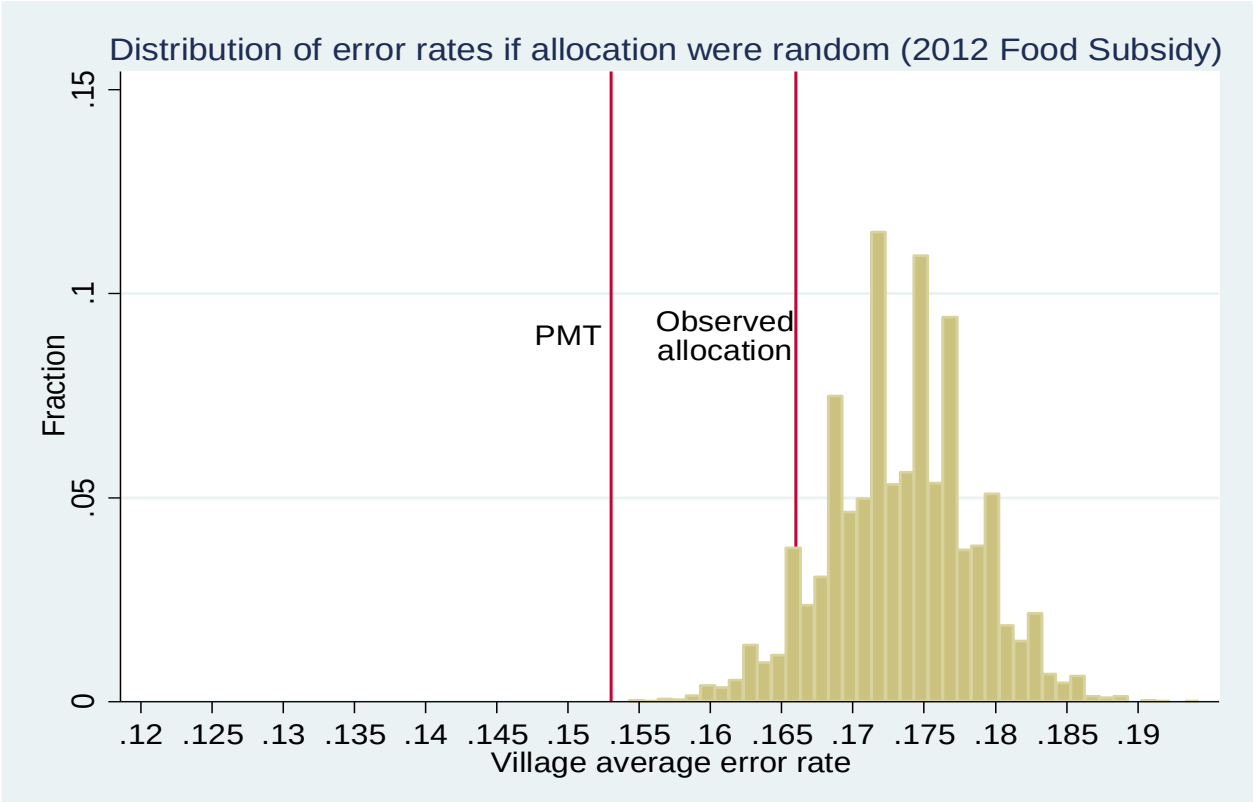
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Recall

- Chief maximizes:

$$\sum_c \beta_c \omega_c \frac{(A_c s_c^{\mu} + e_c)^{1-\rho}}{1-\rho}$$

subject to $\sum_c \beta_c s_c = \bar{s}$

- Taking the ratio of the first order conditions for two classes of households c and d yields:

$$\left(\frac{\omega_c}{\omega_d}\right)^{-\frac{1}{\rho}} \left(\frac{A_c}{A_d}\right)^{-\frac{1}{\rho}} \left[\frac{A_c s_c^{\left(\mu-\frac{\mu-1}{\rho}\right)} + e_c s_c^{-\frac{\mu-1}{\rho}}}{A_d s_d^{\left(\mu-\frac{\mu-1}{\rho}\right)} + e_d s_d^{-\frac{\mu-1}{\rho}}}\right] = 1 \qquad (1)$$

- For food subsidies, where $A_c = 1$ and $\mu = 1$ for all classes, this simplifies to:

$$\left(\frac{\omega_c}{\omega_d}\right)^{-\frac{1}{\rho}} = \left[\frac{f_d + e_d}{f_c + e_c}\right]$$

where f_c and f_d denote the amounts of food subsidy received by each class.

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where f_c and f_d denote the amounts of food subsidy received by each class.

- Plug relative welfare weight $\frac{\omega_c}{\omega_d}$ from the food subsidy allocation equation into equation 1 and obtain:

$$\left[\frac{f_d + e_d}{f_c + e_c}\right] \left(\frac{A_c}{A_d}\right)^{-\frac{1}{\rho}} \left[\frac{A_c s_c^{\left(\mu-\frac{\mu-1}{\rho}\right)} + e_c s_c^{-\frac{\mu-1}{\rho}}}{A_d s_d^{\left(\mu-\frac{\mu-1}{\rho}\right)} + e_d s_d^{-\frac{\mu-1}{\rho}}}\right] = 1 \qquad (2)$$

- Thus by observing the realized subsidy distributions (s_d, s_c, f_c, f_d) as well as the realized outside incomes (e_c, e_d), we can back out the extent to which relative productivity $\left(\frac{A_d}{A_c}\right)$ matters in the chief's allocation decision.

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- Note 1: timing

- Note 2: no redistribution tool available to chief; will relax this assumption later

- Thus by observing the realized subsidy distributions (s_d, s_c, f_c, f_d) as well as the realized outside incomes (e_c, e_d), we can back out the extent to which relative productivity $\left(\frac{A_d}{A_c}\right)$ matters in the chief's allocation decision.
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- Note 1: timing
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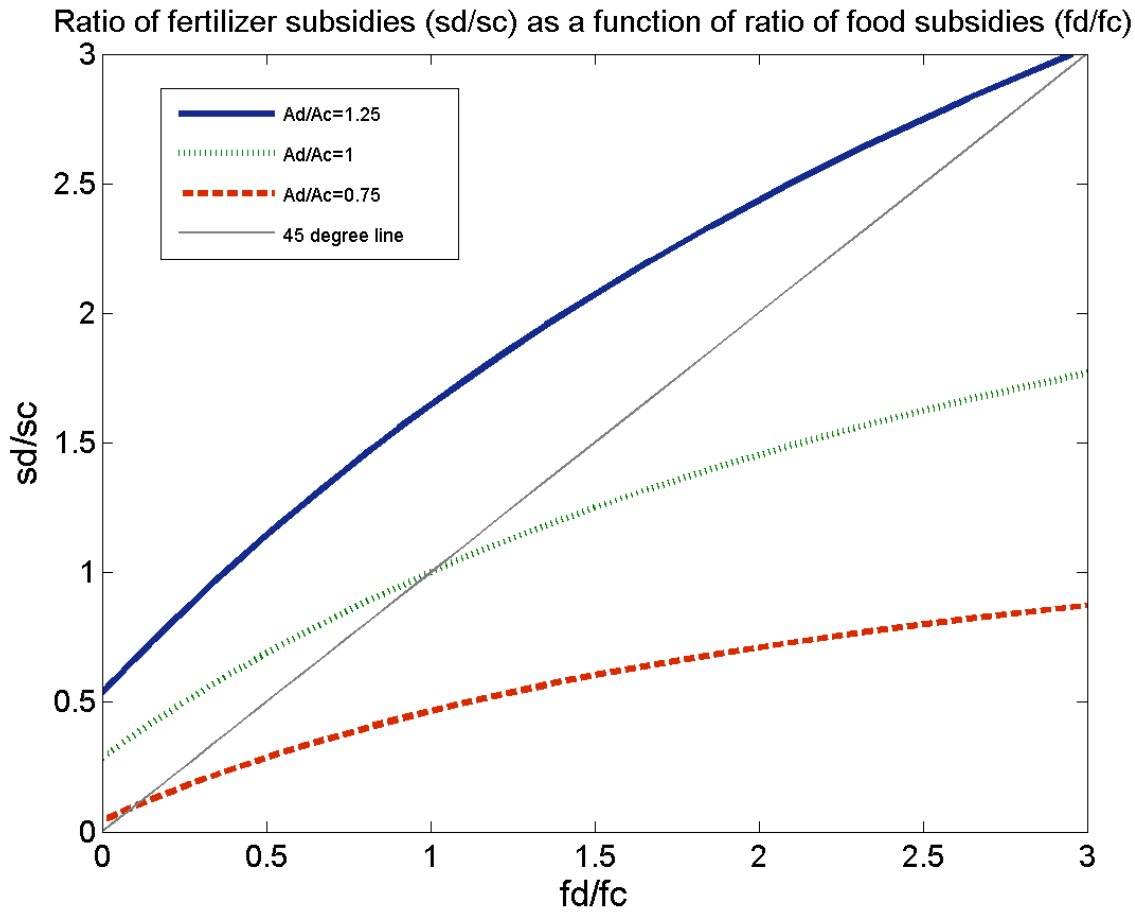
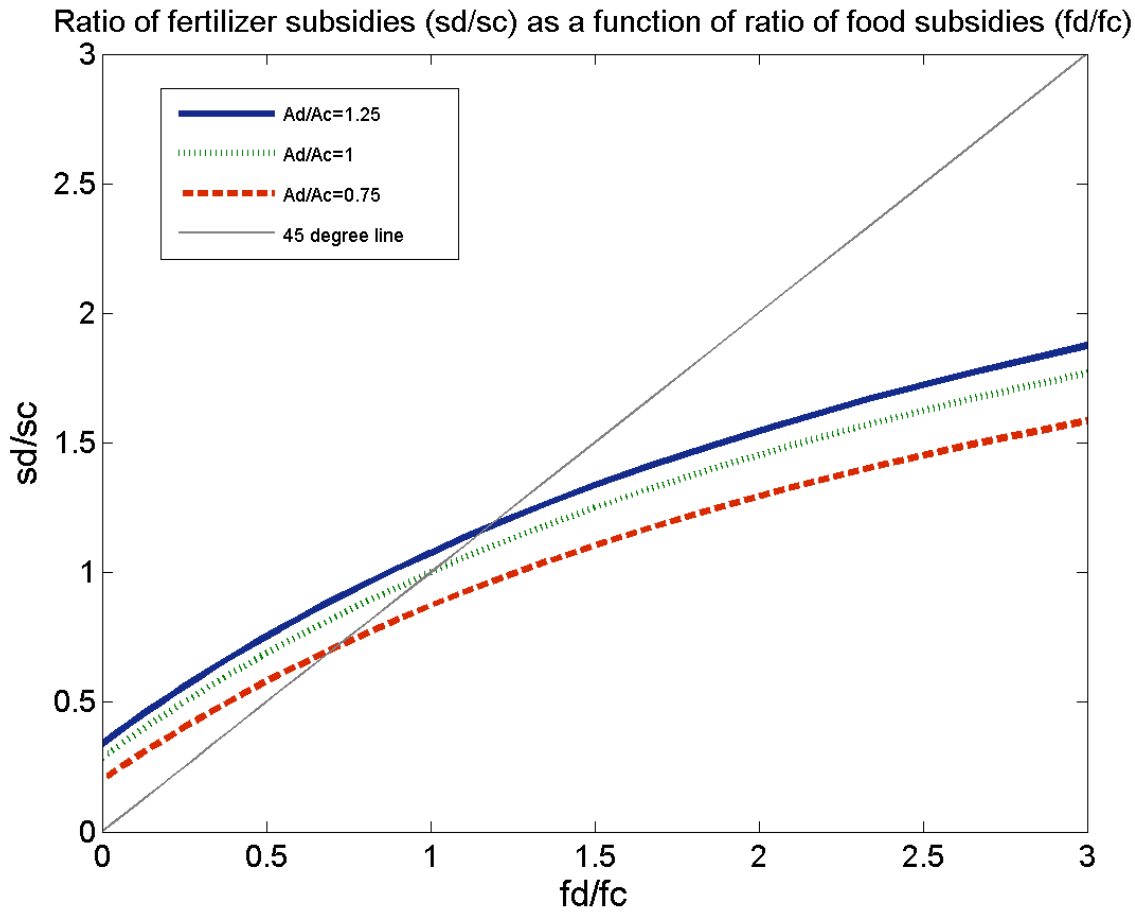
- Note 3: no price effects; will relax this assumption later
- Note 4: no productive response to nutrition; will relax this assumption later

- $\mu = 0.9, A_c = 2, e_c = 10, f_c + f_d = 10, s_c + s_d = 15$
- $\rho = 0.5$
- Equally poor ($e_d = e_c$)



- $\mu = 0.9, A_c = 2, e_c = 10, f_c + f_d = 10, s_c + s_d = 15$
- $\rho = 1.2$
- Equally poor ($e_d = e_c$)



Model Prediction

Prediction 1

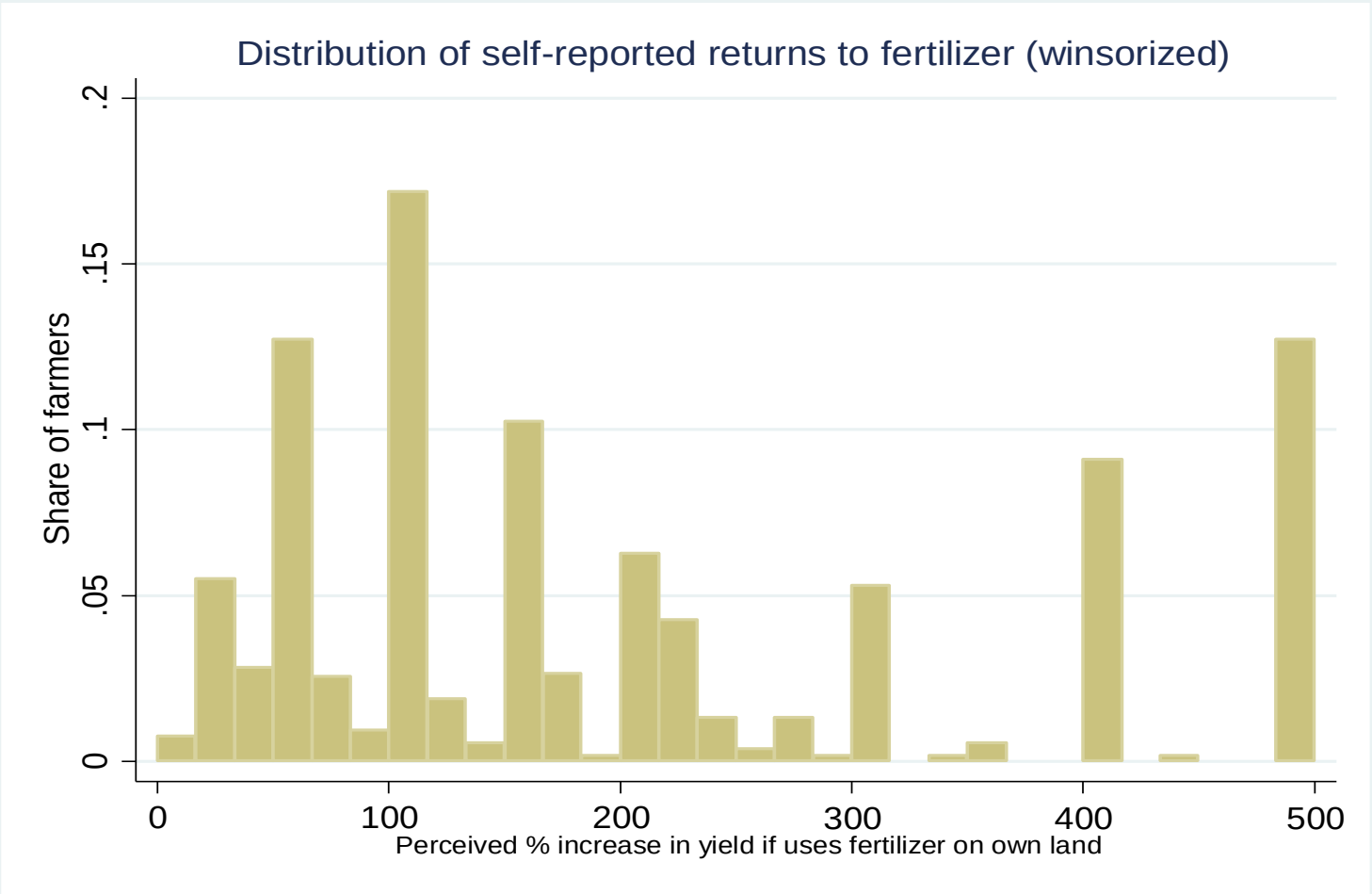
If chiefs take into consideration productive efficiency when allocating farming subsidies, $d\left(\frac{s_d}{s_c}\right) / d\left(\frac{f_d}{f_c}\right)$ *increases as* $\frac{A_d}{A_e}$ *increases.*

Testing Predictions

- Consider c =non-kins, d =chief's kins
- To test prediction, need measure of productivity: are the returns to fertilizer lower or higher for kins?
- During wave 5 of survey, subset of farmers were asked the following questions:
  - How much maize would you get out of your land if you used no fertilizer at all? (y_o)
  - How much maize would you get out of your land if you used fertilizer on all of your land at planting? (y_1)
- Compute the self-reported returns to fertilizer as $(y_1 - y_0)/y_0$.
- Take average gap in this measure across groups
  - kins vs non-kins

Reported returns are large but not toooo crazy

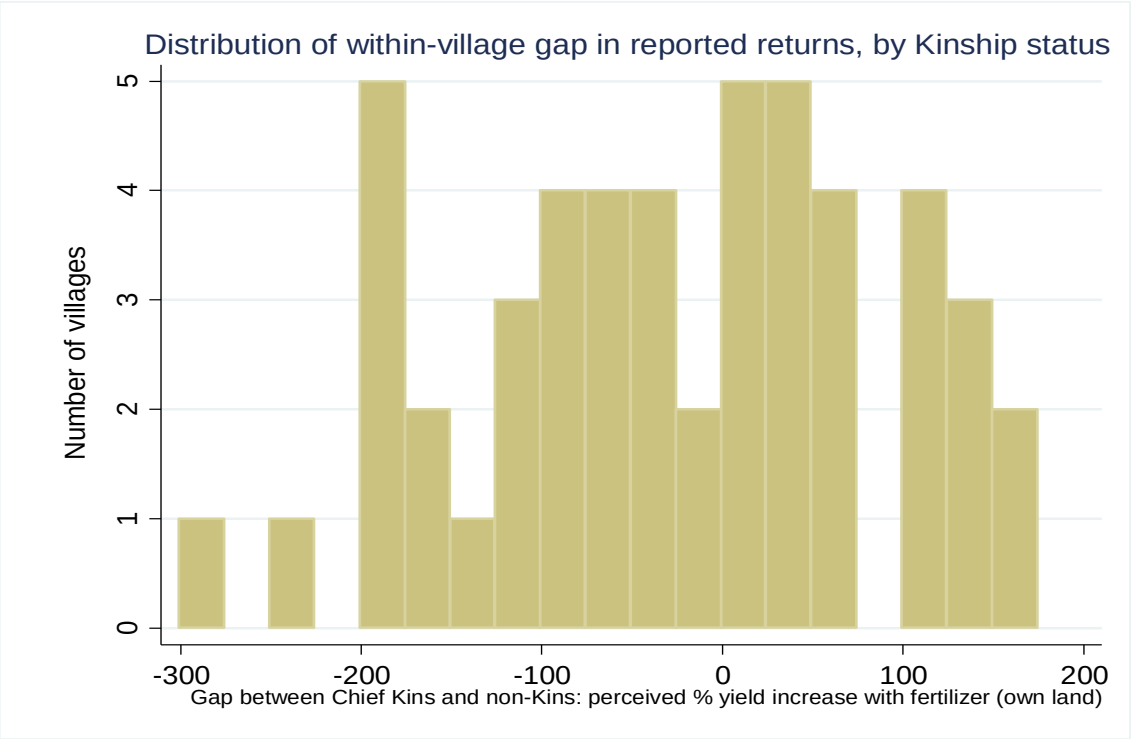
Panel A. Distribution of Self-Reported Returns to Fertilizer



- (Duflo, Robinson, Kremer (2009): +63%)

There is heterogeneity in class-gaps across villages

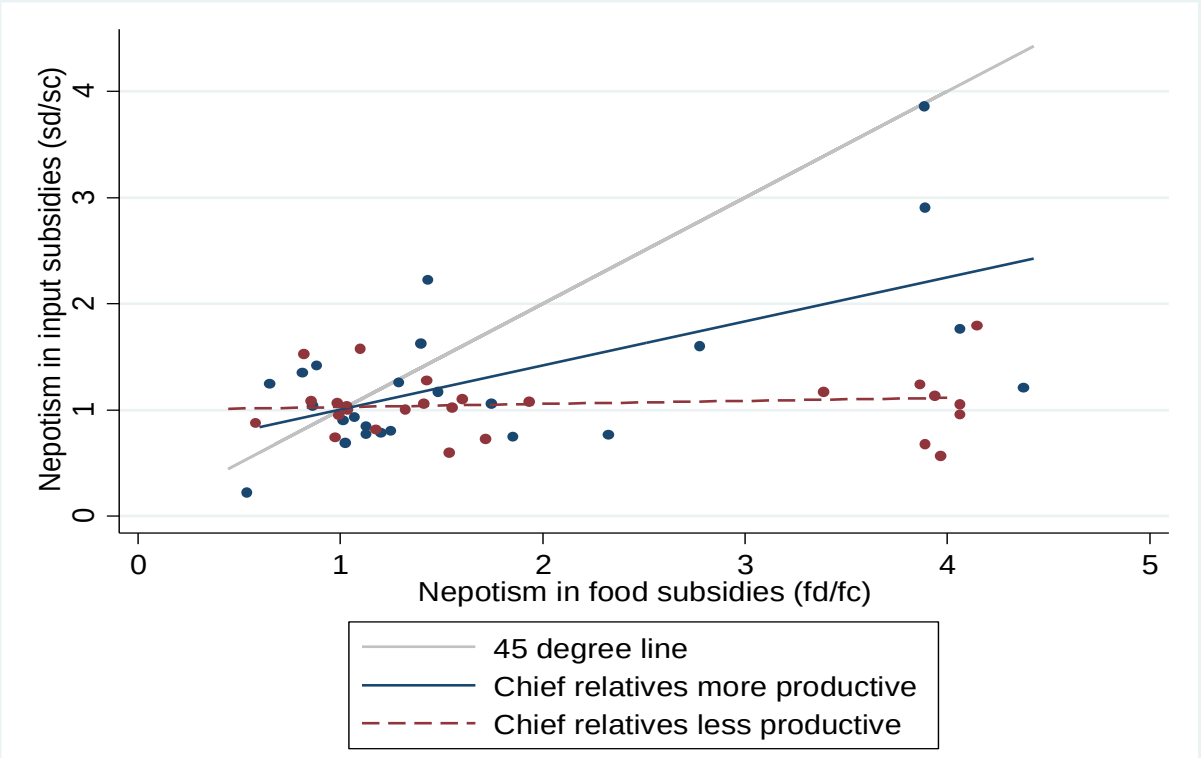
Panel B2. Chief relatives vs. Others



Testing Prediction 1

- Prediction holds when consider c=non-relatives, d=relatives

Panel B. Chief relatives vs. Others



Recall: Model with redistribution tool

- If allow ex-post income pooling:

$$\max \sum_c \beta_c \omega_c \frac{(A_c s_c^{\mu} + t_c + e_c)^{1-\rho}}{1-\rho}$$

where t_c is a lump sum transfer (positive or negative).

- If there is perfect income pooling, objective function becomes $\max \sum_c (A_c s_c^{\mu})$
  - So we would expect the allocation of fertilizer subsidies to be entirely driven by productive efficiency since redistribution would happen ex post.
- With imperfect income pooling, somewhere in-between

Model with redistribution tool

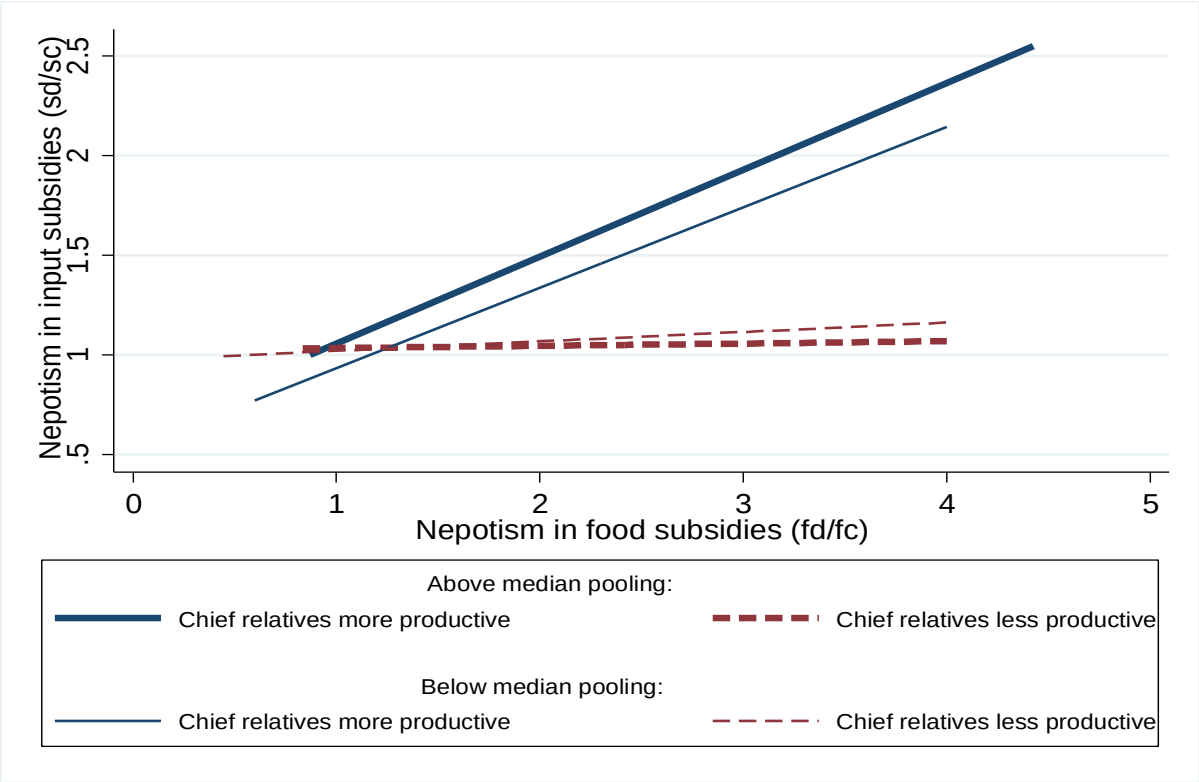
Prediction 2

If chiefs take into consideration productive efficiency when allocating farming subsidies, $d\left(\frac{s_d}{s_c}\right)/d\left(\frac{f_d}{f_c}\right)$ increases as $\frac{A_d}{A_e}$ increases, but the more so the more income pooling there is at the village level.

Testing Prediction 2: Income pooling

- Prediction holds when consider c=non-relatives, d=relatives

Panel B. Chief relatives vs. Others



Robustness of prediction and Test

- Next, we'll see that test remains valid if:
  - allows for endogenous prices
  - allows for productive response to nutrition

Extenstion 1: Model with endogenous prices

- What if local production affect local prices?

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- 85% of farmers in our sample don't sell any maize; 90% of farmers are *net buyers* of maize and other crops

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- So if local production affect prices, then: more efficient allocation of subsidies $\Rightarrow\uparrow$ total local production $\Rightarrow\downarrow$ local prices $\Rightarrow\uparrow$ real income

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- 85% of farmers in our sample don't sell any maize; 90% of farmers are *net buyers* of maize and other crops
- So if local production affect prices, then: more efficient allocation of subsidies $\Rightarrow\uparrow$ total local production $\Rightarrow\downarrow$ local prices $\Rightarrow\uparrow$ real income
- So effect of productive efficiency targeting is magnified: gives the chief even more reason to target based on productive efficiency

Model with endogenous prices

- New FOC:

$$\beta_c \omega_c \left(\frac{(A_c s_c^{\mu} + e_c)}{p} \right)^{-\rho} \left(\frac{\mu A_c s_c^{\mu-1} (p + \alpha(A_c s_c^{\mu} + e_c))}{p^2} \right)$$
$$+ \sum_{d \neq c} \beta_d \omega_d \left(\frac{A_d s_d^{\mu} + e_d}{p} \right)^{-\rho} \left(\frac{\alpha \mu A_c s_c^{\mu-1}}{p^2} \right) = \lambda \beta_c$$

- New ratio of FOC:

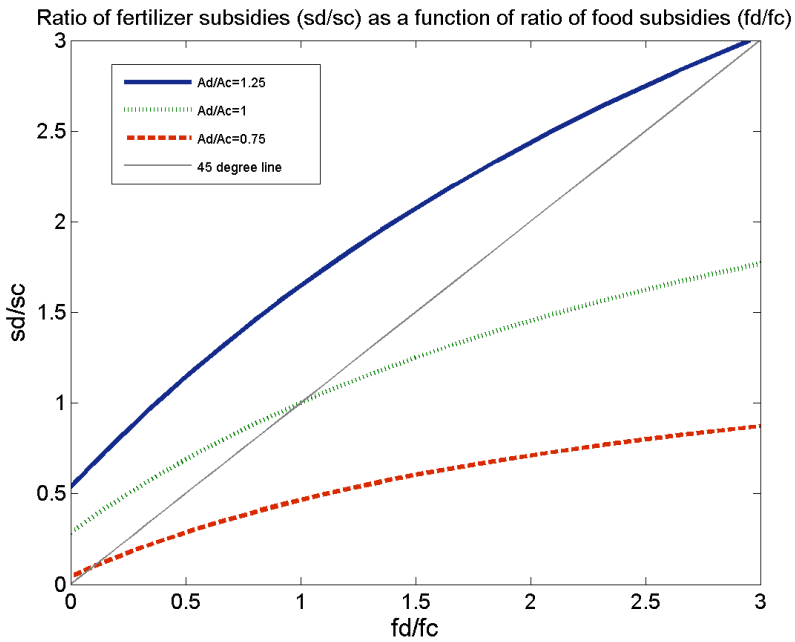
$$\frac{A s_c^{\mu-1} [\beta_c \omega_c (A_c s_c^{\mu} + e_c)^{-\rho} (p + \alpha(A_c s_c^{\mu} + e_c)) + \alpha \beta_d \omega_d (A_d s_d^{\mu} + e_d)^{-\rho}]}{A s_d^{\mu-1} [\beta_d \omega_d (A_d s_d^{\mu} + e_d)^{-\rho} (p + \alpha(A_d s_d^{\mu} + e_d)) + \alpha \beta_c \omega_c (A_c s_c^{\mu} + e_c)^{-\rho}]} = \frac{\beta_c}{\beta_d}$$

- Predictions hold

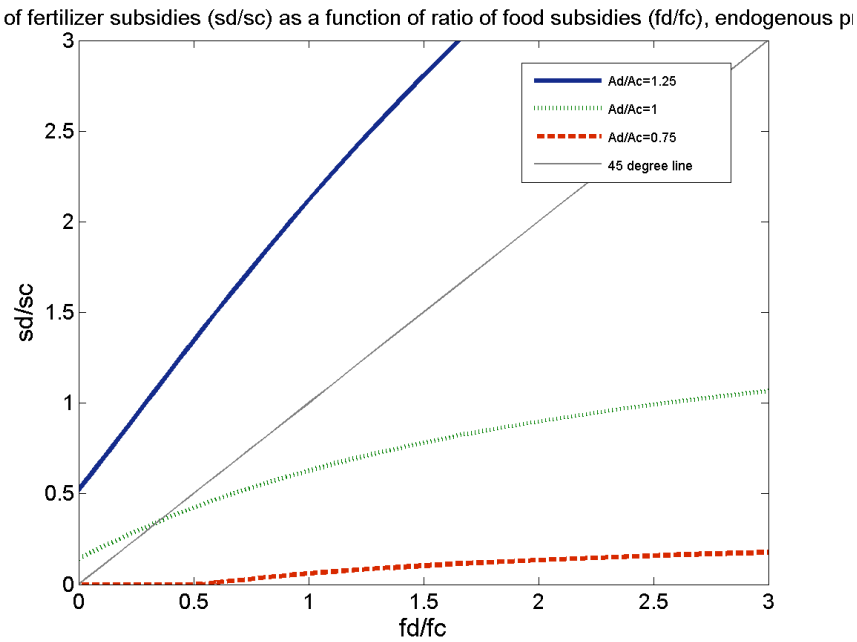
With endogenous prices

- $\mu = 0.9, A_c = 2, e_c = 10, f_c + f_d = 10, s_c + s_d = 15, \rho = 0.5$
- Equally poor ($e_d = e_c$)

No price effect (earlier graph)



With price effect



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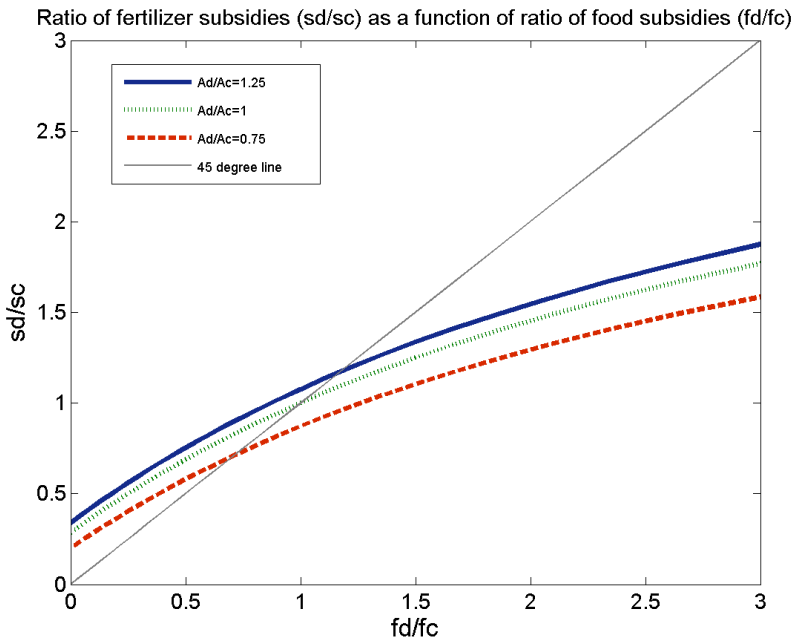
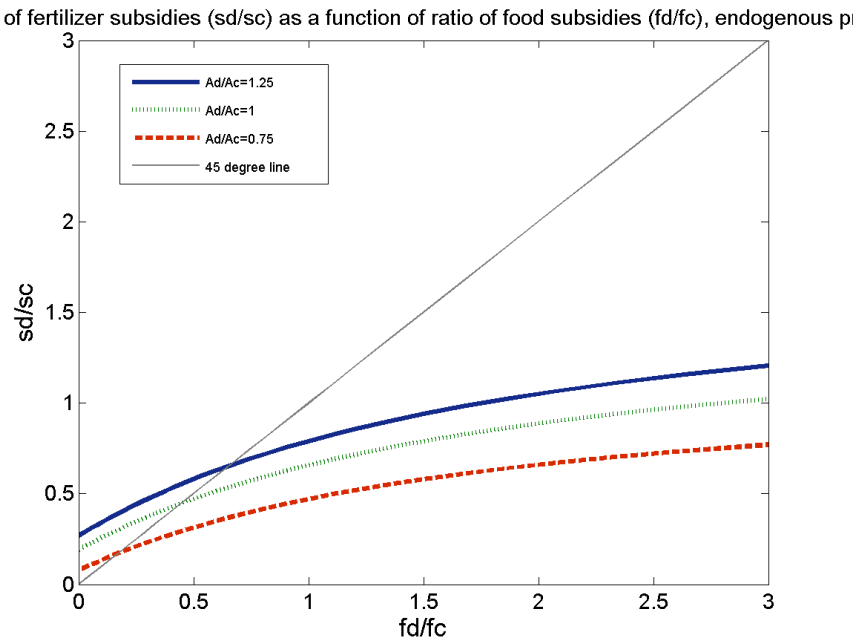


With price effect



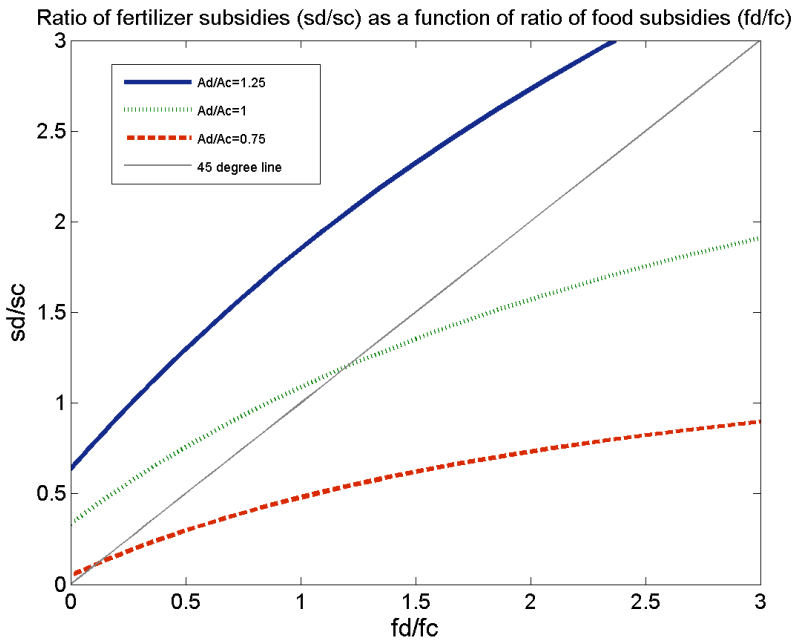
Extension 2: With productive response of nutrition

- If allow food subsidies to have differential impact depending on nutritional status (i.e. for really poor, food subsidy boosts productivity)
- then negative correlation between relative productivity of inputs and relative productivity of food (assuming complementarity between inputs and effort)
  - if i'm too malnourished to be good farmer, will get lower returns to inputs
- so slope between $\frac{f_d}{f_c}$ and $\frac{s_d}{s_c}$ even steeper if inputs allocated based on productive efficiency
  - if the least poor were favored in terms of food *even though* the returns to food subsidies are lower for them, then it means they have a very high welfare weight, and thus productive efficiency considerations will lead to the non-poor getting relatively *more* input subsidies since they have higher returns and those returns are heavily weighted (provided ρ is not too high)

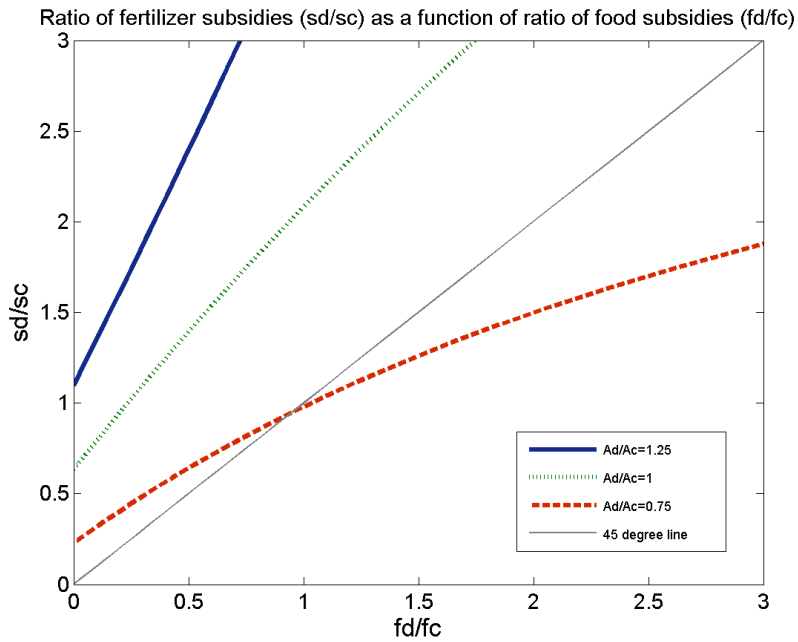
Extension 2: With productive response

- $\mu = 0.9, A_c = 2, e_c = 10, f_c + f_d = 10, s_c + s_d = 15, \rho = 0.5$
- Case 1: group 2 richer ($e_d = 1.2e_c$), group c's productivity function of nutrition

No productive response (earlier graph)



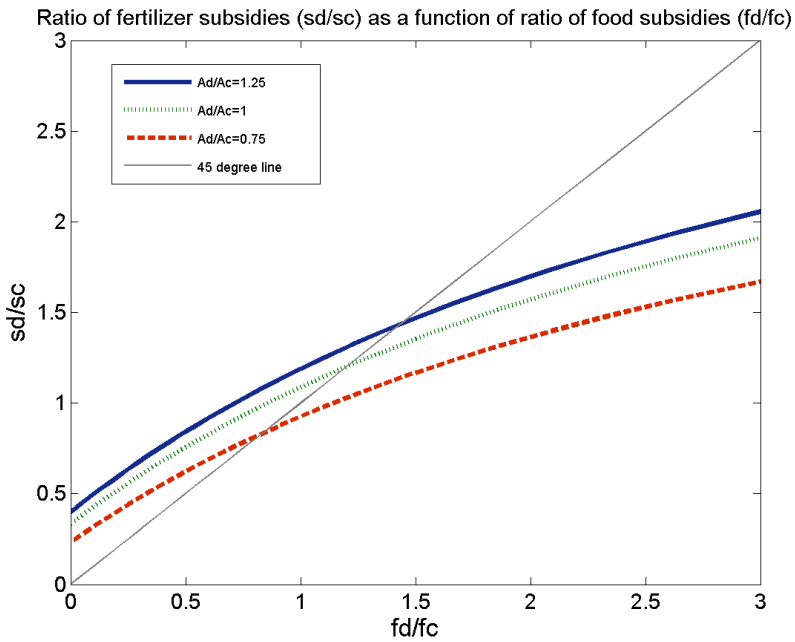
With productive response



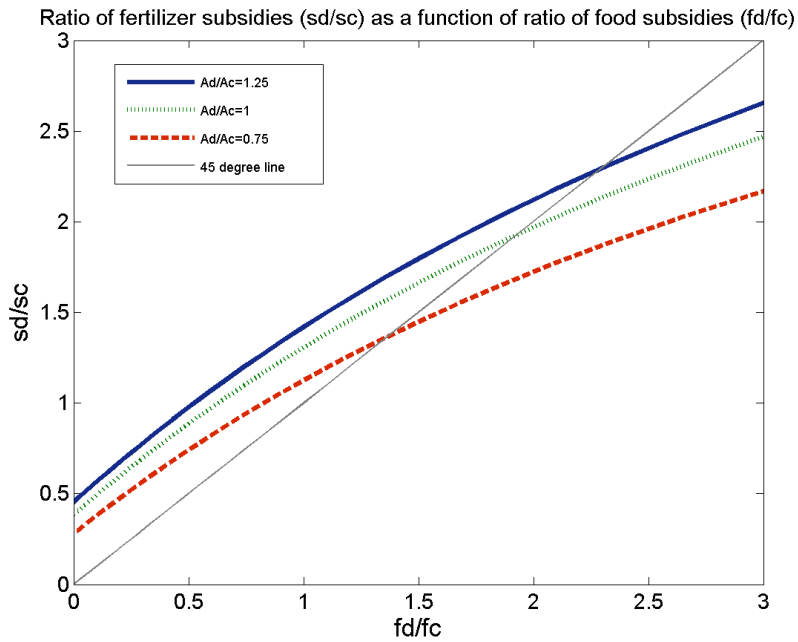
With productive response

- $\mu = 0.9, A_c = 2, e_c = 10, f_c + f_d = 10, s_c + s_d = 15, \rho = 1.2$
- Group d richer ($e_d = 1.2e_c$), group c's productivity function of nutrition

No poductive response (earlier graph)



With productive response



Recap

- Evidence consistent with some chiefs targeting input subsidies based in part on productive efficiency

Conclusion

- Chiefs target very differently than PMT
- Yet poverty-targeting efficiency is not that far off, even just a year out. Why?
  - fundamental relationship between assets /observables and expenditures is not strong, and varies with shocks
    - PMT by definition cannot deal with this
    - Likely a common problem in developing countries
  - chiefs target kins who should not be eligible, but they also take into account other factors
- For chiefs, some of the mistargeting in poverty could be due to productive efficiency considerations
  - So on the whole chiefs may be better performing: despite lack of accountability, benefits of local knowledge could trump elite capture

Thank you!

Comments: pdupas@stanford.edu

Related Literature

- Targeting efficiency
  - Overall evidence is mixed (Pan and Christiaensen 2011)
  - Sometimes decentralization better
    - Albania, cash transfers (Alderman 2002)
    - Bangladesh, Food-for-education program (Galasso and Ravallion 2005)
  - Sometimes decentralization worse
    - Local infrastructure in rural China (Park and Wang 2010)
- Elite capture
  - Sometimes a big problem
    - In Tanzania, elected village officials were found to capture 60% of the distributed input vouchers (Pan and Christiaensen 2011)
    - In Uganda, only 13% of education grants were received by schools. Remaining was captured by local (district) officials and politicians (Reinikka and Svenson 2004)
  - Sometimes not
    - In Indonesia, eliminating elite capture would only improve welfare by less than one percent (Alatas et al. 2013)

Background: The Input Subsidy Program in Malawi

"Beneficiaries of the 2009/10 Farm Inputs Subsidy Program will be full time resource poor smallholders Malawian farmers of all gender categories."

"... the following vulnerable groups should also be considered: elderly, HIV positive, female headed households, child headed households, orphan headed households, physically challenged headed households and heads looking after elderly and physically challenged"

(FISP Guidelines 2009/2010)

Results: Year by year

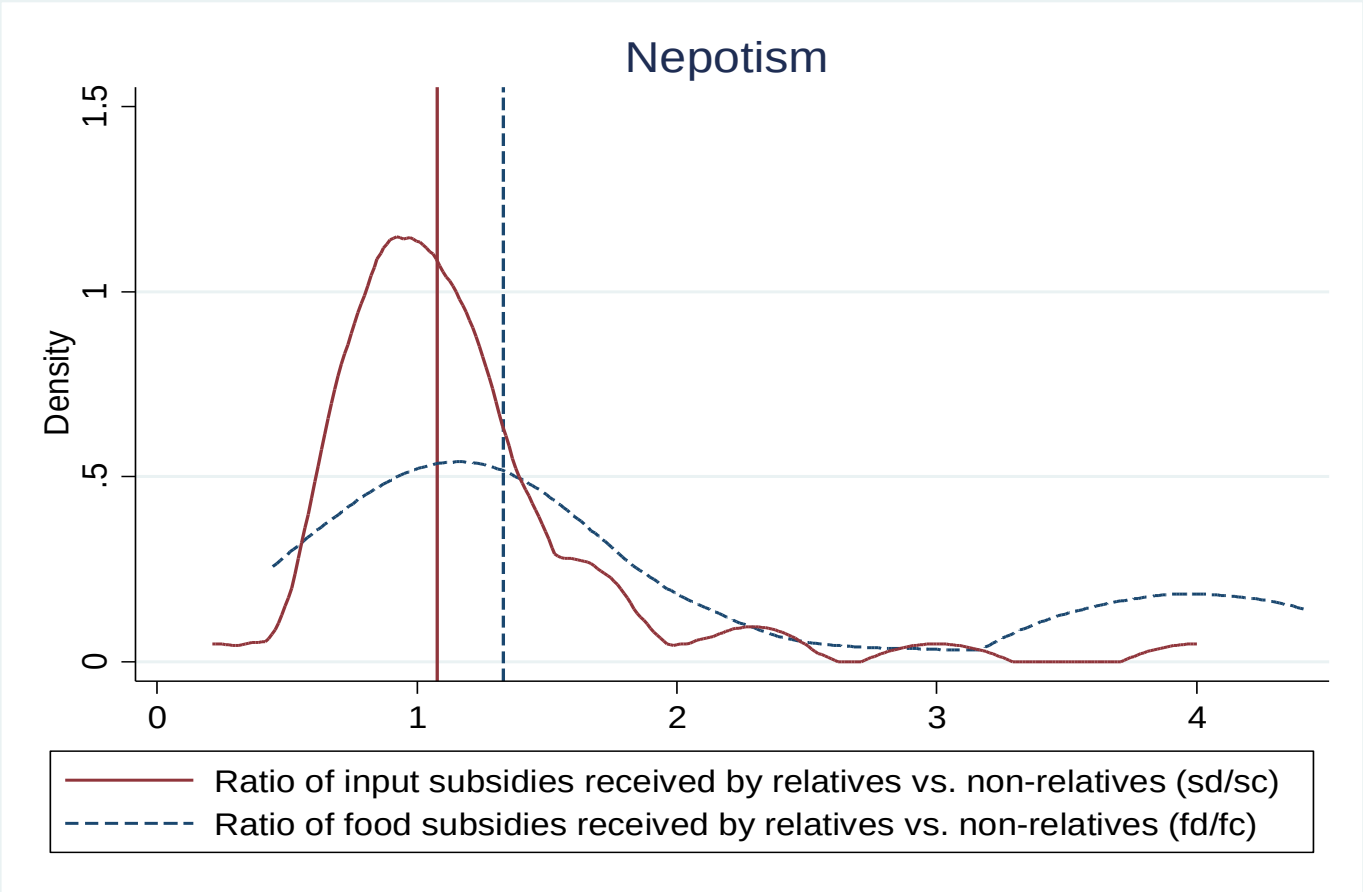
Appendix Table A3. Correlations between percentiles of distribution across survey rounds: C

	(1)	(2)
	In bottom X percentile of PAEC distribution in 2011?	
	No	Yes
25th percentile		
In bottom X percentile of PAEC distribution in 2012?		
No	0.61	0.16
Yes	0.16	0.08
50th percentile		
In bottom X percentile of PAEC distribution in 2012?		
No	0.31	0.20
Yes	0.20	0.28
75th percentile		
In bottom X percentile of PAEC distribution in 2012?		
No	0.12	0.15
Yes	0.15	0.58

Notes: Number of observations = 1,387.

Ratios

Figure A3: Distributions of Nepotism Measures Across Villages



Results: Targeting

- Who is left out/favored by one scheme vs. the other?
- Approach:
  - controlling for whether a respondent should (or should not have qualified), what characteristics predict not receiving the subsidy under the chief allocation vs. the PMT?
- Results:
  - Chiefs
    - clearly favor relatives
    - also seem to favor older households (possibly as part of eligibility rule)
  - PMT
    - By definition, PMT overexcludes people who consume less than predicted by assets
    - Here that shows up in the housing index and being widowed

What do households say?

	Relatives	Non relatives	Diff Rel vs. Non-Rel	
	Mean	Mean	Coeff.	Std. Err.
What criteria is used to select input subsidy beneficiaries?				
Poorest households	0.77	0.68	0.083*	0.043
Households with more children	0.05	0.06	-0.016	0.02
Households that recently experienced a negative shock	0.11	0.10	0.008	0.029
Households with more land for farming	0.02	0.01	0.01	0.014
Households with better land quality	0	0		
Households with land wgere fertilizer is most effective at increasing yield	0	0		
More hard working farmers	0.13	0.13	-0.005	0.025
Female headed households	0.15	0.10	0.05*	0.029
The elderly	0.44	0.41	0.033	0.047
Other	0.48	0.53	-0.056	0.042
Do you think the input subsidy vouchers are allocated in a good way?				
Yes, very good	0.63	0.63	0.005	0.039
Somewhat good	0.3	0.29	0.013	0.044
Not so good	0.05	0.08	-0.025	0.024
Very bad	0.01	0.01	0.007	0.009

What do households say?

	Relatives	Non relatives	Diff Rel vs. Non-Rel	
	Mean	Mean	Coeff.	Std. Err.
What is your definition of a "good" allocation?				
An allocation that benefits the poorest	0.41	0.49	-0.078	0.076
An allocation that increases the total yield in the village so that there is more food to share	0.03	0.09	-0.057	0.059
An allocation that rewards those who work hard	0.01	0.04	-0.03	0.059
An allocation that provides at least some inputs to the most number of households	0.34	0.38	-0.044	0.074
On a scale from 1 to 5, how much do you agree with the selection of input subsidy beneficiaries, including any potential sharing?	3.66	3.62	0.049	0.123

	Exclusion Errors			
Subsample	Those qualified under PAEC			
Dep. Var	Did *not* receive input subsidy		Did *not* receive food subsidy	
Allocation	True (chief)	PMT	True (chief)	PMT
Baseline variables				
Related to chief	-0.06	-0.03	-0.08	-0.01
	(0.02)***	(0.02)	(0.03)***	(0.03)
Widowed or divorced female	0.02	-0.09	0.03	-0.09
	(0.02)	(0.02)***	(0.03)	(0.04)**
Household size	-0.01	0.01	0.00	0.02
	(0.00)**	(0.01)	(0.01)	(0.01)**
Respondent age (divided by 10)	-0.05	0.01	-0.05	0.00
	(0.01)***	(0.01)	(0.01)***	(0.01)
Reads or writes chichewa	-0.04	0.01	-0.03	-0.02
	(0.02)	(0.02)	(0.03)	(0.04)
Owns land	-0.27	-0.15	-0.34	-0.21
	(0.10)***	(0.11)	(0.09)***	(0.15)
Log acres of land owned	0.01	0.04	0.03	0.06
	(0.01)	(0.01)***	(0.02)	(0.02)***
Mud/dirt floor or worse	0.01	-0.02	-0.01	0.07
	(0.03)	(0.04)	(0.05)	(0.06)
Thatch roof	-0.04	-0.15	0.01	-0.11
	(0.02)	(0.03)***	(0.05)	(0.05)**
Mud brick walls or worse	0.08	-0.04	0.06	-0.06
	(0.02)***	(0.02)**	(0.05)	(0.04)*
Variables from monitoring surveys				
Experienced drought or flood (past 3 months)	0.00	-0.01	-0.04	-0.04
	(0.03)	(0.03)	(0.04)	(0.04)
Experienced cattle death or crop disease (past 3 months)	-0.04	0.04	-0.04	0.02
	(0.02)**	(0.02)	(0.03)	(0.03)
Respondent missed work due to illness (past month)	0.04	-0.01	-0.01	0.04
	(0.02)**	(0.02)	(0.03)	(0.03)
Another household member sick (past month)	0.01	0.02	0.02	0.00
	(0.02)	(0.02)	(0.04)	(0.03)
Variable from wave 5 only				
Self-reported returns to fertilizer are higher than median	-0.06	-0.02	0.06	-0.03
	(0.04)	(0.03)	(0.04)	(0.05)
Observations	2145	2145	795	795
Number of households	1229	1229	795	795
Mean of dep. Var.	0.16	0.15	0.27	0.27

Exposure to Subsidy Programs

	Mean	Std. Dev.
Panel C. Exposure to subsidy programs		
Received input subsidy in 2008	0.63	0.48
Received input subsidy in 2009	0.68	0.47
Received input subsidy in 2010	0.75	0.43
Received input subsidy in 2011	0.78	0.41
Received input subsidy in 2012	0.82	0.39
Received input subsidy all 5 years	0.54	0.50
Never received input subsidy	0.09	0.29
Quantity of fertilizer received in 2011 if any (kgs)	75.44	28.85
Quantity of fertilizer received in 2012 if any (kgs)	63.61	25.48
Quantity of seeds received in 2011 if any (kgs)	9.00	26.93
Quantity of seeds received in 2012 if any (kgs)	6.79	19.35
Received food subsidy in 2012	0.59	0.49
Quantity of maize received in 2012 if any (kgs)	100.71	50.54

Table A2. Correlations between food expenditures and reported need in the last 30 days

	(1)	(2)	(3)	(4)	(5)	(6)
	Baseline			Follow-up 1		
	Dep. Var: Number days HH had to reduce number of meals					
Log Perishable food exp.	-0.76			-0.68		
	(0.11)***			(0.13)***		
Log Total food exp.		-0.84			-0.49	
		(0.14)***			(0.18)***	
Food share of exp.			-0.89			1.26
			(0.98)			(1.34)
Observations	1383	1383	1383	1385	1385	1385
R-squared	0.04	0.02	0.00	0.02	0.01	0.00
Mean of Dep. Var.	3.26	3.26	3.26	4.63	4.63	4.63
	Dep. Var: Number of days HH had to limit portion size					
Log Perishable food exp.	-0.92			-0.92		
	(0.13)***			(0.16)***		
Log Total food exp.		-0.82			-0.91	
		(0.17)***			(0.23)***	
Food share of exp.			-0.37			2.5
			(1.19)			(1.74)
Observations	1380	1380	1380	1385	1385	1385
R-squared	0.04	0.02	0.00	0.02	0.01	0.00
Mean of Dep. Var.	4.76	4.76	4.76	7.83	7.83	7.83

Back