Market information and farmers' access to structured markets

Evidence from an action research experiment in central Malawi

Dennis O. Ochieng, Rosemary Botha and Bob Baulch

International Food Policy Research Institute
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Introduction

- Smallholder farmers (SHF) access to markets is important for agricultural growth, food security and nutrition and poverty reduction.

- Market information is important in facilitating access to markets – it guides decision making on where, what, when and to whom to sell.

- SHF often lack information on prices and market opportunities.

- Structured markets (e.g., commodity exchanges, vertically integrated supply chains, contract farming) can stabilize prices by:
  - ✓ Aggregating large volumes– more predictable prices to farmers/traders
  - ✓ Providing a more predictable trade environment – which facilitates planning of production and marketing

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Introduction continued…

- Despite potential benefits of structured marketing, uptake by SHFs and traders has been minimal in Malawi

  - ✓ 5 percent of total tonnage under WRS belonged to farmers; 5 percent belonged to farmer association (Thunde & Baulch 2019)

  - ✓ 16 percent of small traders had ever used structured trade: Commex, WRS, competitive tenders (Ochieng et. al. 2019)

Theory of change/hypothesis:

Providing information on prices at a local commodity exchange to SHFs and traders would increase sales through commodity exchanges/other structured markets and increase the prices they are paid.

Objectives of the study

To assess the impact of providing price information on:

1. Quantities of maize and soybean sold (small farmers and traders)

2. Sales prices of maize and soybean (small farmers and traders)

3. Quantity sold through commodity exchanges/other structured markets (small farmers and traders)

4. Level of commercialization of small farmers (proportion of harvest sold)

Methods

- Action research experiment

- Purposively sampled 4 districts (Mchinji, Kasungu, Dowa, Ntchisi)

- Selected 2 Farmers Associations (FAs) per district

- 100 farmers/district (50 treated + 50 control farmers)

- Baseline (March – April 2019)=416 farmers and 78 traders

- End-line (September 2019)=399 and 68 traders (4% and 13% attrition)

Figure 1: Study districts and farmer groups
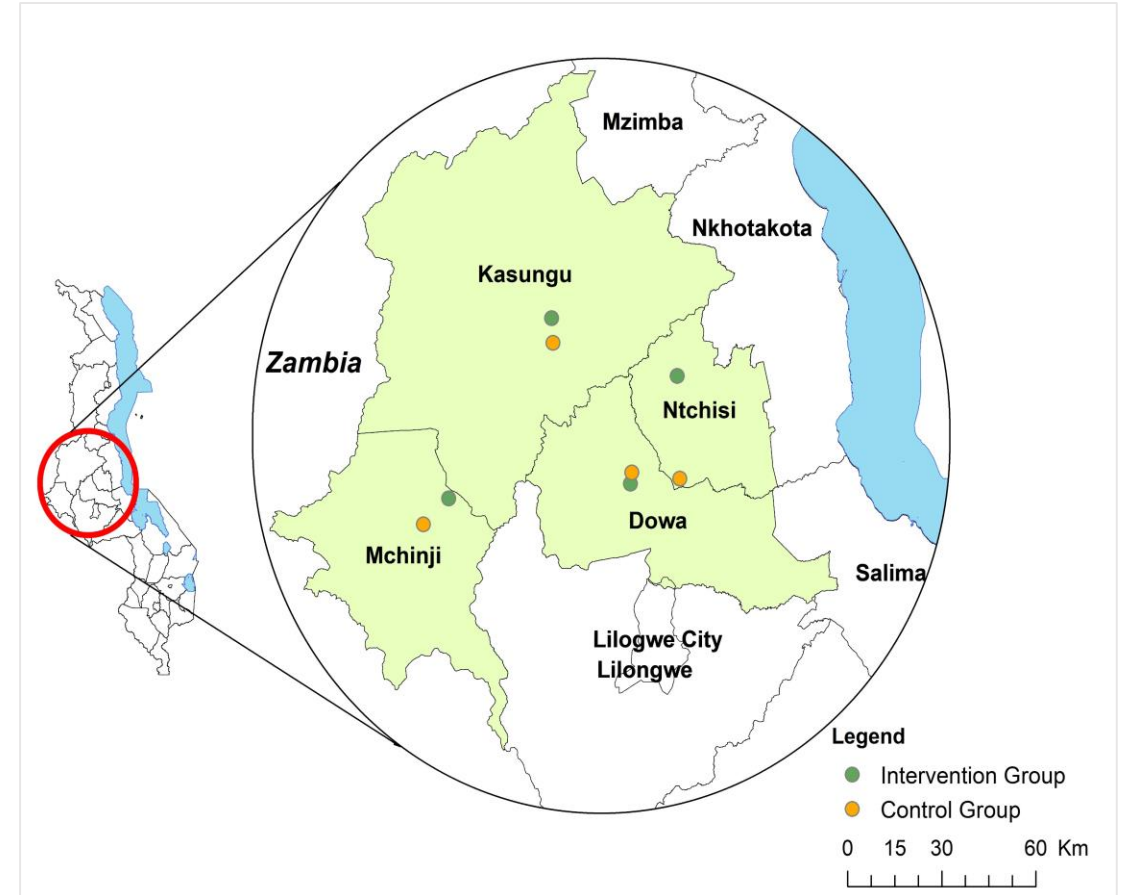
Source: Authors' construction.

Methods continued…

The Intervention
- Weekly price information from a local commodity exchange was provided to treated SHFs through SMS during the 2019 main harvest season.
- Price info was also shared through the farmers associations in the fortnight meetings.

Farm household survey data: socioeconomic activities; maize and soybean trading; access to structured markets; market information sources, incomes (2017/2018 and 2018/2019 agricultural seasons)

Trader surveys: maize and soybean sales; sales through structured markets, market information sources i.e., commodity exchanges

Methods continued…

- Balance tests: show covariate imbalance between treatment and control groups

- Kernel Propensity Score Matching (PSM); was used to correct for the imbalance and create statistically comparable groups

- Difference-in-Difference approach with two rounds of data was used to estimate the impact of the intervention on farmers

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Findings

Descriptive statistics

- About 80 percent of HH heads were men

- HH heads' age=47 years

- HH size=5 members with a generally high dependency ratio (1:3)

- Average farm size =3.8 acres with a low level of crop diversity

Table 1: Profile of farmers

Variable	Full sample
Age of head	47.38 (13.79)
Gender of head	0.80 (0.01)
Education of head	6.50 (3.60)
Family size	5.37 (1.95)
Dependency ratio	0.32 (0.21)
Farm size	3.76 (4.01)
Number of crops	2.92 (0.03)
Distance_market	4.83 (5.30)
Distance_whse	1.68 (3.12)
Off-farm income (dummy)	0.41 (0.49)
Household income	413.14 (926.78)
Market availability	0.64 (0.02)
Maize sold	284.63 (25.38)
Soybean sold	897.92 (23.16)
Maize selling price	126.83 (1.89)
Soybean selling price	209.51 (2.28)
Maize commercialization	0.16 (0.20)
Soybean commercialization	0.77 (0.23)

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Findings continued…

Descriptive statistics

- Infrastructure is important to facilitate trade

- Farmers had access to roads, public transport system and extension services.

- About 20 percent did not own storage facilities

**Figure 2: Farmers' access to infrastructure**
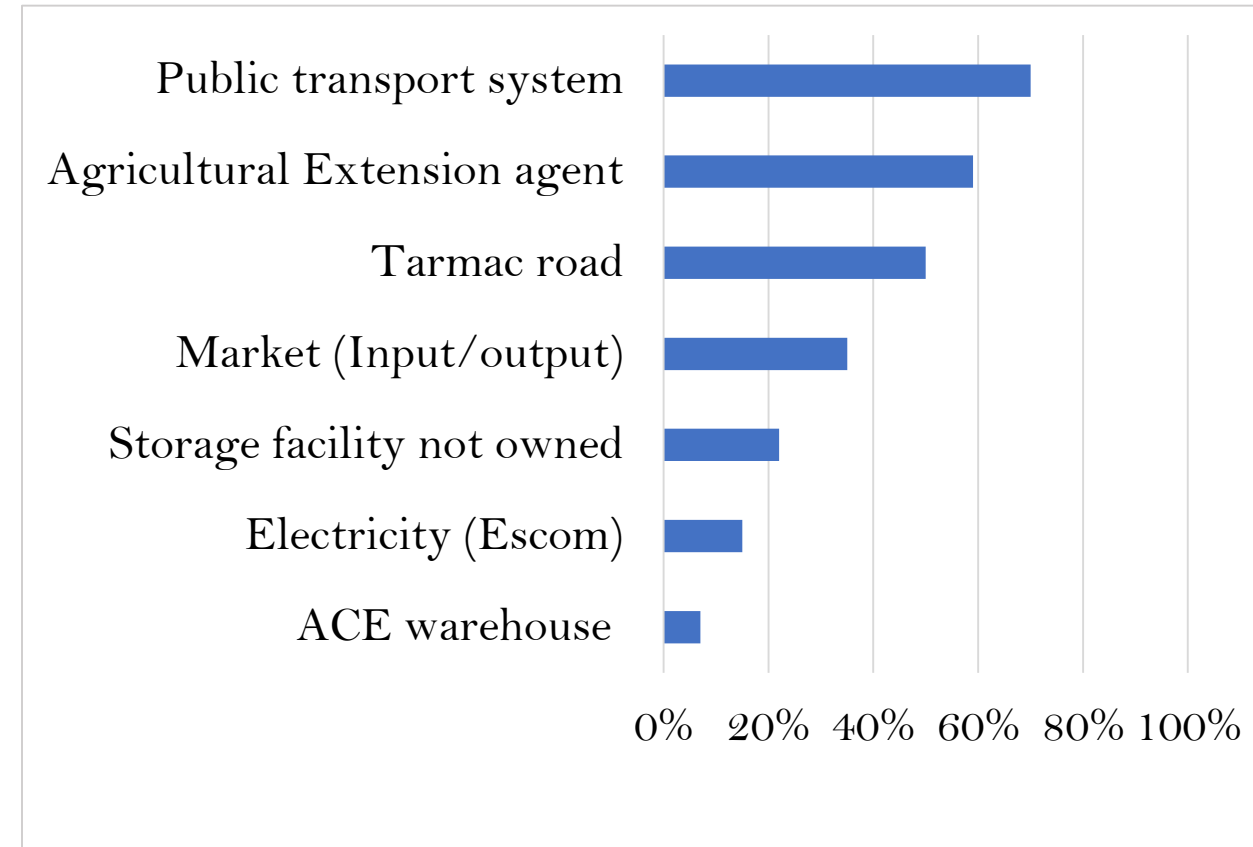
Means for Treatment and Control Groups differ for some variables

- Balance tests are rejected for education of head, family size, farm size, soybeans sold and soybean price.

- Some of the differences in means (e.g., farm size, soybeans sold) are large

Table 2: Balance tests

Variable	Treated	Control	Mean difference (Control-Treated)
Age of head	46.68 (13.90)	48.08 (13.67)	1.39
Gender of head	0.79 (0.40)	0.81 (0.39)	0.01
Education of head	6.82 (3.51)	6.18 (3.66)	-0.64**
Family size	5.49 (1.92)	5.25 (1.98)	-0.24*
Dependency ratio	0.33 (0.19)	0.31 (0.22)	-0.02
Farm size (acres)	4.29 (4.99)	3.22 (2.55)	-1.07***
Number of crops	2.97 (0.05)	2.87 (0.04)	-0.09
Distance_market	4.57 (4.57)	5.10 (5.92)	0.53
Distance_whse	1.85 (3.59)	1.50 (2.57)	-0.35
Off-farm income (dummy)	0.39 (0.49)	0.44 (0.49)	0.05
Household income	448.81 (941.87)	377.04 (910.98)	-71.76
Market availability	0.64 (0.02)	0.64 (0.02)	-0.00
Maize sold (kgs)	291.87 (41.81)	277.29 (28.60)	-14.58
Soybean sold (kgs)	530.03 (41.86)	256.14 (13.59)	-273.90***
Maize selling price	128.47 (2.75)	125.11 (2.58)	-3.37
Soybean selling price	217.89 (3.21)	200.32 (3.15)	-17.57***
Commercialization level	0.16 (0.20)	0.16 (0.20)	-0.00
Soybean commercialization	0.80 (0.21)	0.74 (0.24)	-0.06***

Matching used to ensure treatment and control groups are statistically similar

Before   After

treated   control
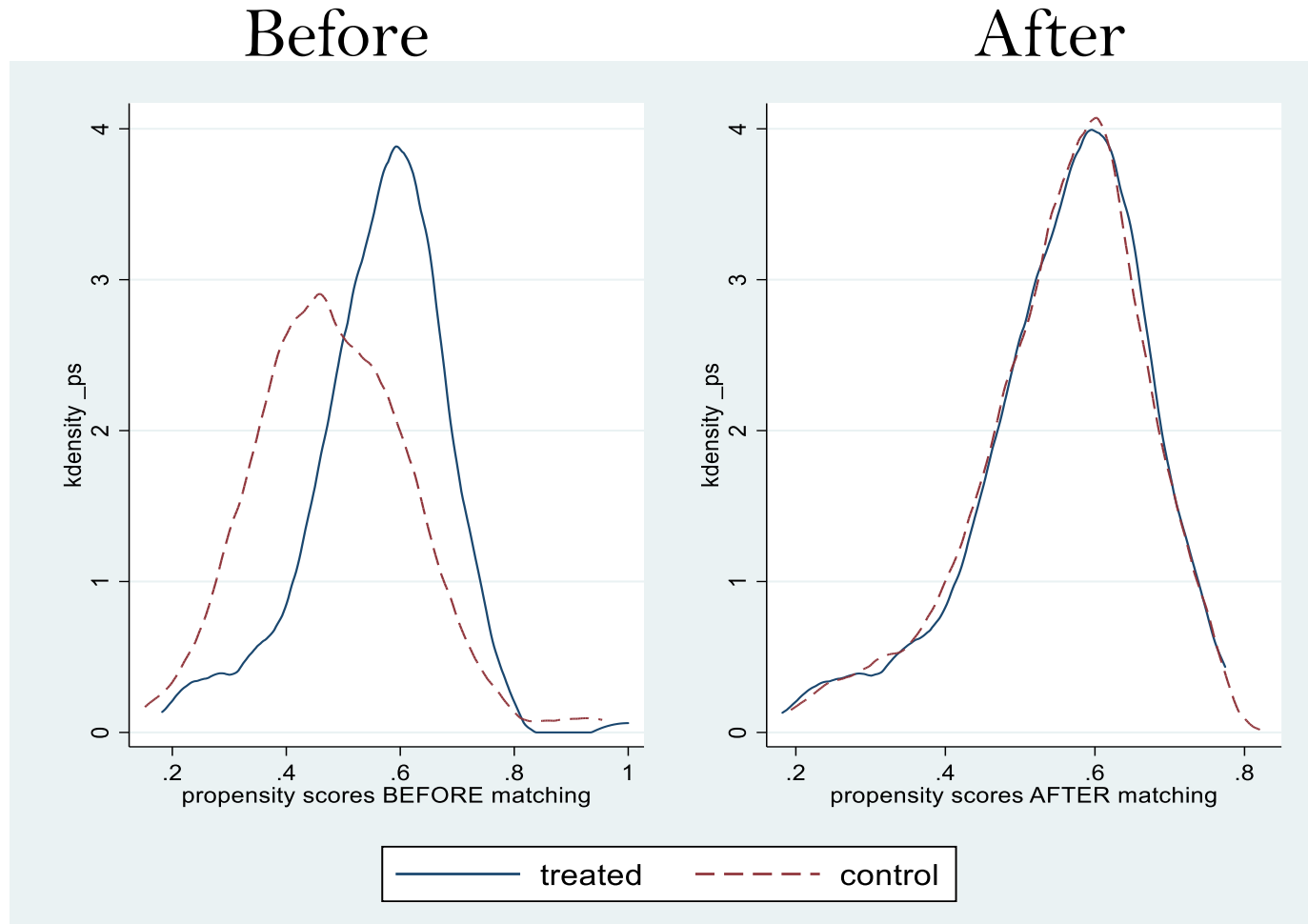
Findings continued…

Impact on quantities sold & selling prices

- Significant <u>reduction</u> in quantity of maize sold
  - ✓ SHF may have target income

- No significant impact on quantity of soybean sold

- Positive but not statistically significant on prices farmers received
  - ✓ Camacho and Conover (2019)
  - ✓ Tadesse and Bhahigwa (2015)
  - ✓ Fafchamps and Minten (2014)

Table 3: Impact on quantities sold and prices of maize and soybean

	Quantity sold (kgs)			Selling price (MWK/kg)		
	Before	After	DiD	Before	After	DiD
Maize						
Coefficient	87.80	–68.5	**-156.3****	2.86	9.32	6.46
Std.error	95.89	81.97	50.10	6.78	9.25	13.53
N	391	407	797	214	220	434
Soybean						
Coefficient	281.80	226.8	–55.02	9.78	26.33*	16.54
Std.error	183.94	200.5	59.76	16.21	13.14	11.05
N	380	371	751	357	353	710

Source: IFPRI survey (2019)
Note: DiD = difference in difference estimates; before = before the intervention; after = after the intervention; means and standard errors are estimated by linear regressions.

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Findings continued…

__Impact on sales through structured markets and commercialization__

- No statistically significant effect on sales through structured markets or commercialization rate

Table 4: Impact on sales thru structured markets and commercialization

		Sales through structured markets			Commercialization rate		
		Before	After	DiD	Before	After	DiD
Maize							
	Coefficient	0.04	0.03	-0.02	0.03	-0.01	-0.04
	Std.error	0.04	0.03	0.01	0.05	0.03	0.04
	N	408	389	797	406	389	795
Soybean							
	Coefficient	0.07	0.18	0.11	0.07	0.04	-0.03
	Std.error	0.04	0.16	0.17	0.04	0.07	0.06
	N	408	389	797	370	368	738

Source: IFPRI survey (2019)
Note: DiD = difference in difference estimates; before = before the intervention; after = after the intervention; means and standard errors are estimated by linear regressions.

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Findings continued…

Before/After comparison between baseline and end line

- Awareness of ACE increased by 25 percent

- Use of ACE services increased by 62 percent

- Sales prices increased for both maize and soybean

Table 5: Traders (Mean comparison tests)

Variables	Baseline (n=78)	Endline (n=68)	Difference (Endline-Baseline)
Proportion of traders aware of ACE	71.79	97.06	**25.27*****
Proportion of traders that used ACE services	21.43	83.33	**61.9*****
Maize Sales (in MT)	200.34	215.47	**15.13***
Soybean Sales (in MT)	246.96	90.89	-156.07
Maize price	139.10	201.43	**62.33*****
Soybean price	205.14	293.04	**87.9*****
Sales share of maize through structured markets (%)	17.94	23.40	5.46
Sales share of soybean through structured markets (%)	22.37	23.89	1.52

Source: IFPRI survey (2019)
Note: Mean difference tests done by Wilcoxon rank test for matched samples

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Summary and conclusions

- Significant reduction in quantity of maize sold by farmers.

- Increase in maize and soybean selling prices for traders.

- Need to sensitize small farmers and traders on the quality and quantity standards required for structured markets.

- Provision of price information alone is not enough to facilitate small farmers' use of structured markets.

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