Supply-side Crowding-out and Crowding-in Effects of Malawi's Farm Input Subsidy Program on Private-Sector Input Marketing: A quasi-experimental field study

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Introduction

- Adoption of the World Bank and IMF's SAPs led to substantial increase in private sector participation in the input markets. This paradigm change was expected to facilitate the development of well-functioning markets and enhance farmers' access to fertilizers thereby enhancing agricultural production (Gregory and Bumb, 2006).
- However, input markets in most countries of SSA remain underdeveloped. This influenced many SSA governments to intervene in the market to provide free or subsidized inputs to smallholders in an attempt to enhance access to these inputs.
- The subsidized inputs are sometimes distributed through private retailers (Ghana, and Nigeria), or government parastatals (Zambia, and Ethiopia), or both (Malawi).

Motivation

- Prior to the 2015/16 pilot, the retail sale of subsidized fertilizer under FISP had been done solely by government through its network of SFFRFM and ADMARC market depots, except for a brief interlude during the 2006/07 and 2007/08 seasons.
  - Major distributors and cooperatives were allowed to sell subsidized fertilizer to smallholders. However, independent agro-dealers were not involved in the distribution and sale of subsidized fertilizers.
- During the 2015/16 season, the GoM allowed some larger-scale private-sector input distributors to sell FISP fertilizer in 12 out of 28 districts at their retail outlets on a pilot basis, while smaller-scale independent agro-dealers were excluded from participating in the pilot.
  - SFFRFM and ADMARC were responsible for selling subsidized fertilizers in the remaining 16 districts.
- Farm input subsidies should be temporary and used as a vehicle to develop a robust input supply market (Morris et al., 2007).
  - If the FISP helps crowd-in commercial input sales, then private sector involvement in the FISP could be viewed as a stepping towards an exit strategy as private retailers can meet the needs of farmers.
  - Conversely, if the FISP crowds-out or displaces commercial input sales, this would suggest that the program is undermining the long-term viability of the input supply chain, and
- Raises questions about whether or not the private sector would be able to meet farmers' input needs if the FISP was to end.

Independent agro-dealer

Major distributor

Objective

- To analyze the extent to which the reforms to Malawi's FISP enacted during the 2015/16 season increases (crowds-in) or decreases (crowds-out) commercial sales by private input suppliers.

Methods

- We use three waves of nationally representative panel data from private input retailers in Malawi collected in three consecutive agricultural seasons of 2013/14, 2014/15, and 2015/16.
- We use our data from before and after the policy change to apply a quasi-experimental, difference-in-differences estimator to measure the effect of the FISP program on commercial fertilizer sales for the retail outlet i of a large-scale distributor as follows:

$$C_i = \beta_0 + \beta_1 P_i + \beta_2 D_i + \beta_3 t_i + \beta_4(P_i * t_i) + \beta_5(D_i * t_i) + \beta_6 X_i + \varepsilon_i \ldots \ldots \ldots [1]$$

- C represents total fertilizer sales for each retail outlet. The constant is represented by β_0, and $\beta_1 - \beta_6$ are all unknown parameters to estimate while ε_i is a random error term. Participation in the FISP pilot by the retail outlet is represented by P_i and FISP pilot districts are denoted by D, and the year dummy t varies by year but is the same for the treated and control firms. A range of control variables is denoted by X.

- The effect of the FISP pilot on independent agro-dealer firm i is modelled as follows:

$$C_i = \alpha_0 + \alpha_1 D_i + \alpha_2 t_i + \alpha_3(D_i * t_i) + \alpha_4 X_i + \mu_i \ldots \ldots \ldots \ldots \ldots \ldots \ldots [2]$$

- where C represents commercial fertilizer sales. The other variables in equation 2 are the same as in equation 1, while α_0 is a constant and $\alpha_1 - \alpha_4$ are parameters to estimate, and μ represents the random error term

Results

Table 1: Impact of FISP pilot on volume of total fertilizer sales for large-scale distributors

Dependent variable: log of total fertilizer sales (subsidized + commercial) in kg	DD estimator	
	Coefficients	Std. Errors
Covariates:		
=1 if participated in FISP pilot	-0.138	0.154
=1 if season is 2013/14	-0.359*	0.177
=1 if season is 2015/16	-0.018	0.253
=1 if in FISP pilot district	-0.338	0.215
Program direct impact (ATT):		
=1 if participated in FISP pilot * =1 if season is 2015/16	1.476***	0.409
Program indirect impact (ATT):		
=1 if in FISP pilot district * =1 if season is 2015/16	0.129	0.333
Log of average fertilizer selling price (MK/kg)	-0.447	0.500
Log of distance to ADMARC/SFFRFM (KM)	-0.0339	0.081
Number of years store has been operating in market center	0.0167*	0.009
Number of other input dealers at market center	0.0136	0.027
Number of farm families per extension planning area	0.0173**	0.006
Region:		
=1 if Northern region	0.869***	0.285
=1 if Central region	0.783***	0.132
Constant	13.17***	2.934

Table 2: Impact of FISP pilot on commercial fertilizer sales by independent agro-dealers

Dependent variable: log of commercial fertilizer sales (kg)	DD estimator	
	Coefficients	Std. Errors
Covariates:		
=1 if in FISP pilot district	0.062	0.178
=1 if season is 2013/14	0.012	0.276
=1 if season is 2015/16	0.694***	0.208
Program impact (ATT):		
=1 if in FISP pilot district * =1 if season is 2015/16	-0.533**	0.235
Log of average fertilizer selling price (MK/kg)	-0.869	0.510
Log of distance to ADMARC/SFFRFM (KM)	0.031	0.043
Log of store size (m²)	0.221***	0.043
Number of other dealers at market center	0.053***	0.016
Number of years store has been operating in market center	0.021**	0.009
Store ownership =1	-0.374***	0.118
Number of full time employees	0.161**	0.064
Region:		
=1 if Northern region	0.231	0.162
=1 if Central region	0.204	0.127
Constant	11.806***	3.032

Policy Implications

- Government of Malawi should continue increase the volume (quota) of FISP fertilizer that is allocated to the private sector for selling fertilizers to smallholders. An important step for Malawi to develop the private sector capacity in the input market.
- There is a need to provide support to independent agro-dealers to allow them to remain competitive, and build their capacity over time. E.g. linking agro-dealers to warehouses to increase their storage capacity, improve the rural road network to allow agro-dealers to expand their operation to rural remote areas, linking them to financial institutions and guarantee credit extended to agro-dealers for the growth of their businesses.
- Government should allow the independent agro-dealers to continue retailing FISP seed to smallholders in the future. After building agro-dealers' capacity, government should consider allowing them to retail FISP fertilizer. This will maintain the viability of these local entrepreneurs.

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