One plus one can be greater than two: evaluating synergies of development programs in Malawi

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Background

- Huge literature on the impact of policy interventions to tackle hunger and poverty (plus several existing systematic reviews)
- Less is known on potential interactions between programs (Veras et al., 2016)
- Analysis of synergies: why should we care?
- Few exceptions in SSA: Carter *et al.* (2015), Ellis and Maliro (2013), Matita and Chirwa (2014), Thome *et al.* (2014).

Objective of the paper

- To study the interplay between the Farm Input Subsidy Program (FISP) and the Social Cash Transfer Program (SCTP) in Malawi
- Impacts on ultra-poor households under three different treatment regimes:
  1. exclusive participation in FISP (α)
  2. exclusive participation in SCTP (β)
  3. simultaneous participation in both (γ)
- Is there any complementarity between the two programs, i.e. $\gamma > \alpha + \beta$

Why Malawi

- Previous involvement in SCTP evaluation
- On-going debate in the region on the effectiveness of input subsidies and cash transfers
- This paper is part of a research work intended to inform FISP review and how it can be coordinated with other agricultural and social protection programs

The Farm Input Subsidy Program

- Initiated in 2005-2006
- Initially aimed to reach approximately 50% of farmers to receive fertilizers for maize production
- Substantial changes in several aspects (objectives, scale, quantity of subsidized fertilizer supplies, voucher distribution system, voucher redemption system)
- In theory FISP targets small family farmers who are resource-poor but own a piece of land
- Broad criteria and variations in the use of the targeting guidelines

The Social Cash Transfer Program

- Unconditional cash transfers
- Targeted to ultra-poor and labour constrained households
- The size of the transfer to each household depends on the number of household members and their characteristics
- A pilot of the program was initiated in 2006 in one district
- As of April 2015, it reached over 100,000 households in 18 out of 28 districts

Econometric method

- Two complications:
  1. 3 treatment regimes instead of one
  2. only inclusion into SCTP is randomized
- Doubly robust method implemented by Uysal (2015)
- It combines regression modeling (based on a DiD approach) and Generalized Propensity Score (GPS) weighting by Imbens (2000) applied to multiple treatments' interventions

Econometric method

- In practice, we estimate a weighted least squares regression with the following minimization problem:

$$\min_{\tilde{\mu}_t, \tilde{\alpha}_t} \frac{1}{N} \sum_{i=1}^{N} \left(\sum_{t=0}^{K} \frac{D_{it}(T_i)}{\hat{r}(t, X_i)} \right) \left(Y_i - \sum_{t=0}^{K} \tilde{\mu}_t D_{it}(T_i) - \sum_{t=0}^{K} D_{it}(T_i)(X_i - \bar{X})' \tilde{\alpha}_t \right)^2 \tag{1}$$

- where $\hat{r}(t, X_i)$ is the GPS estimated via a multinomial logit regression using baseline data

Regression analysis

- The regression equivalent of DiD with covariates and weighting based on GPS is:

$$\begin{aligned} Y_{i,d} = \zeta + \alpha D2014_i + \beta_1 SCTP_{i,d} + \beta_2 (D2014_i * SCTP_{i,d}) + \\ \gamma_1 FISP_{i,d} + \gamma_2 (D2014_i * FISP_{i,d}) + \gamma_3 SCTP_{i,d} \& FISP_{i,d} + \\ \delta (D2014_i * SCTP_{i,d} \& FISP_{i,d}) + \sum \beta X_i + \mu_{i,d} \end{aligned} \tag{2}$$

- $Y_{i,d}$ represents the main outcome variable
- X_i vector of household/community characteristics measured at baseline (i.e. not affected by the treatment)
- Parameters of interest: β_2, γ_2 and δ
- $\delta - \beta_2 - \gamma_2$: complementarity between *SCTP* and *FISP*.
- $\delta - \beta_2$: incremental impact of *FISP* on *SCTP*.
- $\delta - \gamma_2$: incremental impact of *SCTP* on *FISP*

Evaluation design and data

- Data collected from a seventeen-month impact evaluation of a sample eligible to receive SCTP in two districts (Salima and Mangochi)
- These data also provide information about inclusion into FISP
- RCT with delayed entry control group:
  1. Random selection of Traditional Authorities
  2. Random assignment of village clusters into SCTP
- Sample of 1,607 households interviewed at both baseline (July/August 2013) and follow-up (November 2014)
- Four groups:
  1. Control hh: neither received SCTP not FISP (38%)
  2. Treatment SCTP: hh treated exclusively under SCTP (30%)
  3. Treatment FISP: hh treated exclusively under FISP (15%)
  4. Treatment SCT+FISP: hh treated under both programs simultaneously (17%)

Household expenditure - total

Table 1: Impact on total expenditure per adult equivalent MWK real values (1 USD=329.5 MWK)

	All		Labor unconstrained		Labor constrained	
		Baseline mean		Baseline mean		Baseline mean
SCT*d2014	9480.7**	46207.2	7092.7	38001.4	13290.7**	56296.2
	[2.19]		[1.37]		[2.08]	
FISP*d2014	-1592.2	50496.0	-7879.5	45677.7	6388.6	55867.3
	[-0.48]		[-1.62]		[1.08]	
Joint impact SCT&FISP	10696.8**	51667.8	12625.7*	40800.7	10656.9**	64295.1
	[2.04]		[1.79]		[2.05]	
Incremental impact of FISP on SCT	1216.1		5533.0		-2633.7	
	[0.32]		[1.33]		[-0.44]	
Incremental impact of SCT on FISP	12288.9**		20505.3**		4268.4	
	[2.24]		[3.35]		[0.57]	
Complementarity	2808.3		13412.6*		-9022.3	
	[0.55]		[2.26]		[-1.09]	
R2	0.1671		0.1292		0.2666	
Observations	3214		1806		1408	

Household expenditure - Food

Table 2: Impact on expenditure per adult equivalent by items

	All	Labor unconstrained	Labor constrained
Food			
SCTP*d2014	5020.7	2803.4	7984.1*
	[1.34]	[0.61]	[1.74]
FISP*d2014	-794.6	-6198.5	5565.4
	[-0.25]	[-1.38]	[1.08]
Joint Impact SCTP&FISP	5538.9*	6616.2	5666.6
	[1.40]	[1.11]	[1.26]
Incremental impact of FISP on SCTP	518.3	3812.7	-2317.5
	[0.18]	[1.14]	[-0.41]
Incremental impact of SCT on FISP	6308.6	12814.7**	101.3
	[1.57]	[2.62]	[0.02]
Complementarity	1287.9	10011.2*	-7882.8
	[0.3]	[1.86]	[-1.06]
R2	0.1742	0.104	0.2522
Observations	3124	1806	1408

Table 3: Impact on expenditure per adult equivalent by items

	All	Labor unconstrained	Labor constrained
Health			
SCTP*d2014	574.702	497.461	632.908
	[1.51]	[1.42]	[0.92]
FISP*d2014	-554.987	-417.04	-762.646
	[-0.86]	[-0.80]	[-0.50]
Joint impact SCTP&FISP	980.121**	1018.868	808.837
	405.419	521.406	175.930
Incremental impact of FISP on SCTP	[0.81]	[0.82]	[0.21]
	1535.108*	1435.907**	1571.48
Incremental impact of SCTP on FISP	1535.108*	1435.907**	1571.48
	[1.94]	[2.04]	[1.02]
Complementarity	960.406	938.446	938.58
	[1.16]	[1.2]	[0.53]
Education			
SCTP*d2014	210.792***	-38.447	456.396***
	[2.98]	[-0.28]	[3.41]
FISP*d2014	-117.666*	-328.706**	117.8
	[-1.84]	[-2.53]	[0.94]
Joint impact SCT&FISP	281.521***	142.917	426.356**
	[2.84]	[1.19]	[2.30]
Incremental impact of FISP on SCTP	70.729	181.363	-30.039
	[0.63]	[1.18]	[-0.54]
Incremental impact of SCTP on FISP	399.187***	471.622***	308.556*
	[4.1]	[3.5]	[1.68]
Complementarity	188.395	510.069**	-147.839
	[1.51]	[2.5]	[-0.81]
R2	0.143	0.154	0.175
Clothing and footwear			
SCTP*d2014	1031.314***	1033.338***	1007.661***
	[6.76]	[5.05]	[4.08]
FISP*d2014	167.566**	26.962	410.703**
	[2.38]	[0.25]	[2.22]
Joint impact SCT&FISP	980.496***	1061.451***	880.214***
	[5.95]	[5.42]	[3.72]
Incremental impact of FISP on SCTP	-50.818	28.113	-127.447
	[-0.34]	[0.13]	[-0.58]
Incremental impact of SCTP on FISP	812.929***	1034.49***	469.5115
	[4.46]	[5.08]	[1.56]
Complementarity	-218.385	1.151	-538.1498
	[-1.25]	[0]	[-1.85]

Table 4: Impact on value of production MWK real values (1 USD= 329.5 MWK)

	All		Labor unconstrained		Labor constrained	
		Baseline Mean		Baseline Mean		Baseline Mean
SCTP*d2014	1359.978	9143.033	2421.597*	10501.45	67.177	7472.863
	[0.97]		[1.75]		[0.03]	
FISP*d2014	5079.694***	9570.896	5954.431***	11169.23	2806.269	7789.116
	[3.74]		[5.54]		[1.08]	
Joint impact SCT&FISP	7702.45***	9830.867	7798.565***	11101.51	7196.608***	8354.416
	[6.29]		[5.87]		[4.00]	
Incremental impact of FISP on SCTP	6342.471***		5376.968***		7129.431***	
	[6.93]		[3.68]		[3.97]	
Incremental impact of SCTP on FISP	2622.755*		1844.134		4390.339**	
	[1.81]		[1.30]		[1.99]	
Complementarity	1262.777		-577.463		4323.162	
	[0.78]		[-0.35]		[1.31]	
R2	0.275		0.313		0.284	
Observations	3,214		1,806		1,408	

Table 5: Impact on livestock expenditures and sales

	Expenses			Sales		
	All	Labor unconstrained	Labor constrained	All	Labor unconstrained	Labor constrained
SCTP*d2014	1172.647***	1395.706***	761.950***	-78.668	-44.992	-247.801
	[5.95]	[6.07]	[2.83]	[-0.54]	[-0.18]	[-1.23]
FISP*d2014	232.985***	493.282***	32.287	57.964	231.508	62.384
	[2.96]	[3.66]	[0.28]	[0.37]	[0.76]	[0.27]
Joint impact SCTP&FISP	1688.574***	1478.082***	1997.143***	395.800*	383.684	335.607
	[5.89]	[3.92]	[6.19]	[1.98]	[1.05]	[1.06]
Incremental impact of FISP on SCTP	515.926*	82.3756	1235.193***	474.468**	428.676	583.408
	[1.82]	[0.2]	[4.68]	[2.03]	[1.08]	[1.57]
Incremental impact of SCTP on FISP	1455.59***	984.800**	1964.855***	337.836*	152.176	273.224
	[5.04]	[2.52]	[5.33]	[1.7]	[0.5]	[0.8]
Complementarity	282.941	-410.906	1202.906***	416.505	197.167	521.024
	[0.99]	[-0.94]	[3.83]	[1.50]	[0.43]	[1.17]
R2	0.1879	0.1887	0.2714	0.0528	0.0677	0.1323
Observations	3214	1806	1408	3214	1806	1408

Table 6: Impact on livestock

	% of households which own:			Quantity		
	All	Labor unconstrained	Labor constrained	All	Labor unconstrained	Labor constrained
Chicken						
SCTP*d2014	0.196***	0.150***	0.236***	0.931***	0.698**	1.365***
	[3.81]	[2.77]	[3.20]	[3.03]	[2.62]	[3.04]
FISP*d2014	0.103***	0.134**	0.029	0.276*	0.408	-0.067
	[2.80]	[2.29]	[0.77]	[1.96]	[1.34]	[-0.31]
Joint impact SCTP&FISP	0.244***	0.230***	0.263**	1.677***	1.511***	1.828***
	[4.31]	[4.54]	[2.72]	[3.90]	[4.19]	[3.03]
Incremental impact of FISP on SCTP	0.047**	0.080*	0.027	0.746*	0.814**	0.463
	[2.32]	[1.81]	[0.46]	[1.90]	[2.68]	[0.98]
Incremental impact of SCTP on FISP	0.141**	0.095	0.234**	1.400***	1.104**	1.894**
	[2.56]	[1.43]	[2.13]	[3.29]	[2.39]	[2.85]
Complementarity	-0.055	-0.054	-0.002	0.469	0.406	0.529
	[-1.35]	[-0.71]	[-0.03]	[1.20]	[1.06]	[1.08]
Goats and sheeps						
SCTP*d2014	0.108***	0.114***	0.075*	0.145	0.263*	0.03
	[3.99]	[2.99]	[1.91]	[1.36]	[1.84]	[0.35]
FISP*d2014	0.062*	0.099	0.025	0.145	0.294	0.021
	[2.01]	[1.53]	[0.59]	[1.30]	[1.46]	[0.19]
Joint impact SCTP&FISP	0.238***	0.185***	0.300***	0.694***	0.758***	0.452***
	[5.79]	[3.75]	[5.93]	[3.93]	[2.99]	[4.18]
Incremental impact of FISP on SCTP	0.131***	0.071	0.226***	0.549**	0.495**	0.422***
	[4.31]	[1.44]	[6.35]	[2.96]	[2.15]	[4.87]
Incremental impact of SCTP on FISP	0.176***	0.086	0.276***	0.549**	0.464*	0.431***
	[3.70]	[1.24]	[4.48]	[2.89]	[1.73]	[3.60]
Complementarity	0.069*	-0.028	0.201***	0.404*	0.201	0 .401**
	[1.71]	[-0.34]	[3.44]	[1.86]	[0.68]	[2.91
Pigeons, doves or ducks						
SCTP*d2014	0.007	0.006	0.001	0.136*	0.263**	-0.083
	[0.48]	[0.37]	[0.06]	[1.71]	[2.33]	[-0.83]
FISP*d2014	-0.005	-0.006	-0.006	0.065	0.143	-0.045
	[-0.38]	[-0.27]	[-0.34]	[1.21]	[1.20]	[-0.63]
Joint impact SCTP&FISP	0.060**	0.064*	0.052*	0.280**	0.336**	0.238*
	[2.55]	[1.84]	[1.71]	[2.74]	[2.09]	[1.80]
Incremental impact of FISP on SCTP	0.053*	0.058*	0.051	0.144	0.072	0.320*
	[1.91]	[1.7]	[1.28]	[1.15]	[0.45]	[1.67]
Incremental impact of SCTP on FISP	0.064**	0.070*	0.057*	0.215**	0.192	0.283*
	[2.65]	[1.9]	[1.7]	[2.12]	[1.32]	[1.81]
Complementarity	0.057*	0.064	0.056	0.079	-0.071	0.365*
	[1.89]	[1.5]	[1.31]	[0.58]	[-0.38]	[1.73]

Conclusions

- These findings challenge important notions underling the approach to poverty reduction in Malawi
- The achievement of the objective of FISP and SCTP among poor households is best done by combining these programs such that a household participates in both programs simultaneously
- Positive synergies between SCTP and FISP in increasing expenditure, value of agricultural production, agricultural activities, livestock, and weakly, in improving food security

Conclusions

- SCTP provides liquidity and certainty for poor households and small family farmers, allowing them to invest in agriculture, human capital development and better manage risk
- FISP can promote growth in the productivity of small family farmers by addressing structural constraints that limit access to inputs and markets
- Impact results obtained through simple programs' overlap. What effects can be achieved from aligning/coordinating the two interventions?

Limitations of the study

- Given the required eligibility criteria for inclusion into SCTP, our sample is representative of the lower income quantile of the population in Malawi
- Not able to control for previous participation into FISP

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- PtoP publications: ▸ http://www.fao.org/economic/ptop/publications/reports/en/
- From Evidence to Action: the Story of Cash Transfers and Impact Evaluation in Sub-Saharan Africa: ▸ link

Thank you

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Table: Anova test for difference between groups of intervention: control, SCT, FISP, SCT+FISP (weights adjusted)

	C	SCT	FISP	SCT&FISP	F-test	P-value>F
single head of hh	0.748	0.730	0.751	0.740	0.18	0.9117
female head of hh	0.851	0.838	0.820	0.837	0.49	0.692
age of head of hh	54.495	54.161	55.087	54.719	0.15	0.927
num members in the hh	4.633	4.633	4.454	4.544	0.59	0.618
num members in the hh: 0-5 years old	0.783	0.769	0.728	0.771	0.27	0.846
num members in the hh: 6-12 years old	1.250	1.256	1.162	1.195	0.74	0.527
num members in the hh: 13-17 years old	0.905	0.905	0.873	0.891	0.11	0.956
num members in the hh: 18-64 years old	1.178	1.196	1.195	1.170	0.07	0.976
num members in the hh: ¿=65 years old	0.517	0.508	0.496	0.517	0.12	0.951
num orphans in the hh	1.099	1.084	1.019	1.035	0.23	0.874
yrs of education head of hh	1.272	1.296	1.245	1.385	0.28	0.840
hh severely labor constrained	0.456	0.449	0.473	0.463	0.17	0.914
hh consumption - total	164515	154514	163867	160597	0.56	0.639
hh consumption - food and beverages	127622	118177	124934	125508	0.75	0.523
Household owns or cultivates land	0.919	0.932	0.937	0.933	0.4	0.754
Total plot area operated within hh	1.210	1.238	1.220	1.247	0.13	0.944
HH has plot that is irrigated	0.045	0.045	0.051	0.066	0.76	0.515
HH applies chemical fertilizer	0.276	0.270	0.353	0.424	9.59	0.000
HH applies organic fertilizer	0.278	0.265	0.315	0.329	1.72	0.161
HH uses pesticides	0.015	0.030	0.040	0.030	1.5	0.212
HH uses improved or hybrid seed	0.283	0.271	0.328	0.348	2.51	0.057
HH planted maize	0.872	0.872	0.877	0.884	0.12	0.951
HH planted groundnut	0.094	0.091	0.089	0.136	2.23	0.083
HH planted pigeon pea	0.098	0.111	0.068	0.115	2.14	0.094
Value of production	9506	9143	9571	9831	0.35	0.786
HH owns hand hoe	0.813	0.814	0.837	0.855	1.18	0.317
HH owns axe	0.100	0.081	0.093	0.100	0.37	0.771
HH owns panga knife	0.192	0.226	0.242	0.217	1.02	0.383
HH owns sickle	0.126	0.128	0.107	0.085	1.6	0.187
HH owns chickens now	0.126	0.128	0.107	0.085	1.6	0.187
HH owns goat or a sheep now	0.064	0.054	0.051	0.083	1.38	0.246
Total HH Expenditure for livestock	87.79	97.95	43.83	80.277	0.86	0.462
Total HH livestock sales	275.48	321.27	119.46	293.949	1.63	0.180
obs	616	485	239	267		

Table: Impact on food security

	All	Labor unconstrained	Labor constrained
Worry about lack of food			
SCTP*d2014	-0.091**	-0.095**	-0.084
	[-2.17]	[-2.12]	[-1.57]
FISP*d2014	-0.046	-0.070**	0.002
	[-1.51]	[-2.28]	[0.04]
Joint impact SCT&FISP	-0.076	-0.109*	-0.043
	[-1.68]	[-1.72]	[-0.76]
Incremental impact of FISP on SCTP	0.015	-0.014	0.04
	[0.58]	[-0.29]	[0.72]
Incremental impact of SCTP on FISP	-0.030	-0.039	-0.045
	[-0.70]	[-0.62]	[-0.59]
Complementarity	0.06	0.056	0.038
	[1.56]	[0.92]	[0.44]
Number of meals per day			
SCTP*d2014	0.226***	0.174**	0.278***
	[3.51]	[2.36]	[3.03]
FISP*d2014	0.054	-0.016	0.131
	[0.92]	[-0.13]	[1.57]
Joint impact SCT&FISP	0.244***	0.226**	0.237***
	[3.25]	[2.17]	[2.88]
Incremental impact of FISP on SCTP	0.018	0.05	-0.04
	[0.3]	[0.64]	[-0.42]
Incremental impact of SCTP on FISP	0.190**	0.241**	0.11
	[2.79]	[2.04]	[0.87]
Complementarity	-0.036	0.07	-0.17
	[-0.42]	[0.46]	[-1.34
Caloric intake in the past 7 days			
SCTP*d2014	187.382**	119.382	280.131**
	[2.13]	[1.24]	[2.24]
FISP*d2014	-12.874	-57.596	63.059
	[-0.29]	[-0.70]	[0.74]
Joint impact SCT&FISP	188.926	175.909	267.392**
	[1.40]	[1.03]	[2.14]
Incremental impact of FISP on SCTP	1.54	56.53	-75.80
	[0.01]	[0.4]	[-0.51]
Incremental impact of SCTP on FISP	201.80	233.50	-12.74
	[1.43]	[1.26]	[-0.11]
Complementarity	14.42	114.12	-75.80
	[0.12]	[0.71]	[1.54]

Table: Impact on food security (cont'd)

	All	Labor unconstrained	Labor constrained
Caloric intake from purchased food			
SCTP*d2014	181.329**	90.501	345.121***
	[2.23]	[0.93]	[4.32]
FISP*d2014	54.114	0.919	128.241
	[0.82]	[0.01]	[1.47]
Joint impact SCT&FISP	211.552**	163.367	294.328***
	[2.09]	[1.49]	[2.79]
Incremental impact of FISP on SCTP	30.22	72.87	-50.79
	[0.42]	[1]	[-0.55]
Incremental impact of SCTP on FISP	157.44	162.45	166.087
	[1.58]	[1.39]	[1.58]
Complementarity	-23.89	71.95	-179.03
	[0.24]	[0.65]	[-1.44]
Caloric intake from produced food			
SCTP*d2014	-41.163	-18.085	-77.454
	[-0.71]	[-0.29]	[-1.33]
FISP*d2014	-6.951	-6.514	-21.837
	[-0.38]	[-0.26]	[-1.03]
Joint impact SCT&FISP	-29.016	4.027	-63.326
	[-0.52]	[0.08]	[-0.90]
Incremental impact of FISP on SCTP	12.147	22.112	14.128
	[0.78]	[0.90]	[0.48]
Incremental impact of SCTP on FISP	-22.066	10.541	-41.489
	[-0.41]	[0.21]	[-0.63]
Complementarity	19.098	28.626	35.965
	[0.84]	[0.84]	[1]
Caloric intake from gifts			
SCTP*d2014	-4.915	-2.845	-7.85
	[-1.29]	[-0.81]	[-1.68]
FISP*d2014	3.677*	1.431	6.655***
	[1.78]	[0.50]	[3.04]
Joint impact SCT&FISP	-1.503	-1.061	-1.84
	[-0.37]	[-0.26]	[-0.39]
Incremental impact of FISP on SCTP	3.412*	1.784	6.010***
	[1.73]	[0.58]	[2.96]
Incremental impact of SCTP on FISP	-5.180	-2.492	-8.495
	[-1.18]	[-0.50]	[-1.91]
Complementarity	-0.265	0.353	-0.645
	[-0.1]	[0.09]	[-0.23]

Table: Index of agricultural assets

	All	Labor unconstrained	Labor constrained
SCTP*d2014	0.029***	0.043***	0.007
	[3.58]	[4.07]	[0.58]
FISP*d2014	0.023***	0.036***	0.003
	[2.85]	[3.00]	[0.27]
Joint impact SCT&FISP	0.042***	0.050***	0.026**
	[5.18]	[4.09]	[2.17]
Incremental impact of FISP on SCTP	0.014*	0.007	0.019*
	[1.79]	[0.68]	[1.73]
Incremental impact of SCTP on FISP	0.020**	0.014	0.029**
	[2.21]	[1.08]	[1.97]
Complementarity	-0.009	-0.029*	0.022
	[-0.80]	[-1.79]	[1.18]
R2	0.1881	0.1708	0.2480
Observations	3214	1806	1408

Table: Impact on crop production

	Land size for each crop:			% of households engaged in:			Quantity produced		
	All	Labor unconstrained	Labor constrained	All	Labor unconstrained	Labor constrained	All	Labor unconstrained	Labor constrained
Maize production									
SCTP*d2014	0.039	0.037	0.029	-0.001	-0.004	-0.008	18.767	19.641	12.244
	[0.50]	[0.49]	[0.26]	[-0.03]	[-0.19]	[-0.15]	[1.22]	[1.29]	[0.52]
FISP*d2014	0.08	-0.03	0.177*	0.067**	0.014	0.112**	65.581***	61.179***	61.037***
	[1.06]	[-0.33]	[1.78]	[2.48]	[0.72]	[2.52]	[6.42]	[5.97]	[4.49]
Joint impact SCT&FISP	0.189***	0.206**	0.161*	0.033	0.003	0.081	81.418***	76.181***	82.667***
	[2.79]	[2.34]	[1.65]	[0.98]	[0.10]	[1.64]	[4.32]	[3.70]	[4.28]
Incremental impact of FISP on SCTP	0.15***	0.17**	0.13*	0.034	0.007	0.089	62.651***	56.540***	70.423***
	[4.25]	[2.62]	[1.94]	[1.52]	[0.28]	[2.99]	[5.40]	[3.29]	[4.08]
Incremental impact of SCTP on FISP	0.109	0.24**	-0.016	-0.034	-0.011	-0.031	15.837	15.002	21.629
	[1.5]	[2.27]	[-0.16]	[-0.94]	[-0.39]	[-0.56]	[0.78]	[0.70]	[0.97]
Complementarity	0.069	0.20*	-0.045	-0.033	-0.007	-0.023	-2.93	-4.639	9.386
	[0.82]	[1.77]	[-0.36]	[-0.94]	[-0.22]	[-0.4]	[-0.19]	[-0.25]	[0.43]
Grandnut production									
SCTP*d2014	0.061*	0.075	0.05	0.090*	0.089	0.088	7.954**	8.654	7.076*
	[1.84]	[1.68]	[1.33]	[1.86]	[1.44]	[1.54]	[2.23]	[1.68]	[2.01]
FISP*d2014	0.068***	0.077**	0.064*	0.082***	0.096**	0.082**	7.861**	6.145	9.508**
	[3.36]	[2.65]	[1.94]	[4.04]	[2.42]	[2.37]	[2.33]	[1.25]	[2.16]
Joint impact SCT&FISP	0.074**	0.115**	0.015	0.105**	0.105*	0.100*	9.038**	9.372**	8.112**
	[2.07]	[2.59]	[0.38]	[2.14]	[1.74]	[1.99]	[2.38]	[2.19]	[2.21]
Incremental impact of FISP on SCTP	0.013	0.040	-0.035	0.015	0.017	0.012	1.084	0.718	1.035
	[0.44]	[1.2]	[-0.84]	[0.34]	[0.31]	[0.19]	[0.47]	[0.27]	[0.24]
Incremental impact of SCTP on FISP	0.006	0.038	-0.050	0.022	0.009	0.018	1.177	3.227	-1.397
	[0.15]	[0.81]	[-0.94]	[0.45]	[0.14]	[0.3]	[0.25]	[0.60]	[-0.25]
Complementarity	-0.055	-0.037	-0.01*	-0.067	-0.079	-0.069	-6.777	-5.428	-8.472
	[-1.5]	[-0.82]	[-1.82]	[-1.43]	[-1.2]	[-0.95]	[-1.63]	[-0.98]	[-1.39]
Pigeon pea production									
SCTP*d2014	0.003	0.048	-0.079	0.016	0.102**	-0.109	1.506	2.648	-0.09
	[0.07]	[1.02]	[-1.57]	[0.30]	[2.05]	[-1.57]	[0.85]	[1.25]	[-0.06]
FISP*d2014	0.071*	0.092**	0.029	0.094**	0.095**	0.071	3.706***	3.916**	3.039**
	[1.92]	[2.23]	[0.53]	[2.23]	[2.33]	[1.18]	[2.85]	[2.43]	[2.31]
Joint impact SCT&FISP	-0.004	0.01	-0.032	0.001	0.027	-0.035	1.929	1.405	2.28
	[-0.10]	[0.13]	[-0.69]	[0.01]	[0.49]	[-0.64]	[1.30]	[0.82]	[1.13]
Incremental impact of FISP on SCTP	-0.007	-0.039	0.047	-0.015	-0.074**	0.074	0.424	-1.243	2.37
	[-0.34]	[-0.76]	[1.3]	[-0.86]	[-2.49]	[2.16]	[0.41]	[-0.76]	[1.40]
Incremental impact of SCTP on FISP	-0.075	-0.082	-0.060	-0.094	-0.067	-0.105	-1.776	-2.511	-0.759
	[-1.33]	[-0.94]	[-1.02]	[-1.56]	[-1.04]	[-1.58]	[-0.97]	[-1.15]	[-0.34]
Complementarity	-0.078*	-0.13*	0.019	-0.110**	-0.169***	0.004	-3.282**	-5.159**	-0.669
	[-1.74]	[-1.75]	[0.28]	[-2.48]	[-3.18]	[0.05]	[-2.14]	[-2.40]	[-0.32]
Nkhwani production									
SCTP*d2014	-0.034	-0.059	-0.019	-0.086*	-0.122*	-0.069	-0.954	-2.396	0.366
	[-1.07]	[-1.19]	[-0.54]	[-1.89]	[-1.95]	[-1.52]	[-0.66]	[-1.28]	[0.25]
FISP*d2014	0.012	-0.032	0.061	0.001	-0.043	0.06	1.849	0.339	3.651***
	[0.33]	[-0.62]	[1.63]	[0.03]	[-0.86]	[1.06]	[1.45]	[0.19]	[2.81]
Joint impact SCT&FISP	-0.009	-0.055	0.035	-0.07	-0.104	-0.057	-0.3	-2.457	1.856
	[-0.22]	[-1.03]	[0.87]	[-1.28]	[-1.39]	[-1.36]	[-0.19]	[-1.26]	[1.19]
Incremental impact of FISP on SCTP	0.026	0.004	0.054	0.015	0.018	0.012	0.653	-0.061	1.489
	[1.16]	[0.18]	[1.34]	[0.57]	[0.42]	[0.38]	[0.90]	[-0.09]	[1.14]
Incremental impact of SCTP on FISP	-0.021	-0.024	-0.026	-0.072	-0.061	-0.117*	-2.149	-2.796	-1.795
	[-0.48]	[-0.47]	[-0.51]	[-1.28]	[-0.86]	[-1.77]	[-1.44]	[-1.53]	[-0.96]
Complementarity	0.01	0.036	-0.007	0.014	0.061	-0.048	-1.195	-0.399	-2.162

Table: Impact on cultivated land

	All	Labor unconstrained	Labor constrained
SCTP*d2014	0.077	0.205	-0.074
	[0.61]	[1.39]	[-0.42]
FISP*d2014	0.236*	0.248	0.174
	[1.77]	[1.40]	[1.29]
Joint impact SCT&FISP	0.293*	0.273	0.298*
	[1.70]	[1.29]	[1.85]
Incremental impact of FISP on SCTP	0.216	0.07	0.372**
	[1.09]	[0.31]	[2.5]
Incremental impact of SCTP on FISP	0.057	0.03	0.124
	[0.31]	[0.12]	[0.8]
Complementarity	-0.020	-0.18	0.198
	[-0.08]	[-0.65]	[0.96]
R2	0.1025	0.1070	0.1799
Observations	3214	1806	1408

Table: Impact on agricultural input

	% of households which use:			Quantity used		
	All	Labor unconstrained	Labor constrained	All	Labor unconstrained	Labor constrained
Chemical fertilizers						
SCTP*d2014	0.058	-0.004	0.096	2.378	1.171	2.305
	[0.85]	[-0.04]	[1.01]	[0.99]	[0.34]	[0.65]
FISP*d2014	0.472***	0.354***	0.562***	21.638***	15.819***	26.205***
	[7.95]	[3.55]	[13.88]	[7.80]	[3.57]	[7.93]
Joint impact SCTP&FISP	0.338***	0.284***	0.435***	21.952***	21.792***	22.380***
	[5.03]	[3.78]	[4.17]	[7.46]	[6.20]	[4.96]
Incremental impact of FISP on SCTP	0.279***	0.288**	0.339**	19.574***	20.621***	20.075***
	[4.04]	[2.97]	[2.82]	[5.49]	[4.08]	[3.8]
Incremental impact of SCTP on FISP	-0.134**	-0.07	-0.127	0.314	5.972	-3.825
	[-2.12]	[-0.89]	[-1.26]	[0.10]	[1.51]	[-0.9]
Complementarity	-0.192**	-0.066	-0.223*	-2.063	4.802	-6.13
	[-2.09]	[-0.49]	[-1.75]	[-0.47]	[0.77]	[-1]
Organic ferlizers				Value		
SCTP*d2014	0.046	-0.009	0.122	213.131*	207.302	208.637*
	[0.64]	[-0.09]	[1.50]	[1.92]	[1.38]	[1.79]
FISP*d2014	-0.082	-0.072	-0.083	-201.953**	-178.551*	-221.040***
	[-1.35]	[-0.85]	[-1.46]	[-2.65]	[-1.81]	[-2.81]
Joint impact SCTP&FISP	-0.069	-0.158	0.077	114.853	91.057	162.463
	[-0.75]	[-1.32]	[0.94]	[0.93]	[0.56]	[1.39]
Incremental impact of FISP on SCTP	-0.115	-0.149	-0.045	-98.278	-116.246	-46.175
	[-1.81]	[-1.36]	[-0.70]	[-1.04]	[0.65]	[-0.63]
Incremental impact of SCTP on FISP	0.013	-0.086	0.160*	316.806***	269.607**	383.503***
	[0.16]	[-0.81]	[1.86]	[2.94]	[1.96]	[3.38]
Complementarity	-0.033	-0.077	0.038	103.675	62.305	174.866*
	[-0.36]	[-0.53]	[0.46]	[0.86]	[0.31]	[1.77]
Pesticides						
SCTP*d2014	-0.004	-0.02	0.012			
	[-0.25]	[-0.74]	[0.95]			
FISP*d2014	-0.01	-0.023	0.001			
	[-0.74]	[-1.16]	[0.06]			
Joint impact SCTP&FISP	0.031	-0.004	0.062**			
	[1.60]	[-0.15]	[2.68]			
Incremental impact of FISP on SCTP	0.035**	0.015	0.051*			
	[2.39]	[0.54]	[1.94]			
Incremental impact of SCTP on FISP	0.041**	0.019	0.062**			
	[2.46]	[0.77]	[2.33]			
Complementarity	0.045**	0.039	0.05			
	[2.36]	[1.21]	[1.61]			