

INTENTIONS TO COORDINATE IN THE FIELD

Angelino Viceisza [Spelman & Duke; t: @aviceisza]

Preliminary and incomplete.

Please do not cite without author permission.

Contact: aviceisz@spelman.edu.

December 2015-January 2016

Kodjo Aflagah [Maryland] Tanguy Bernard [Bordeaux & IFPRI]

Overview

Design

Results

Conclusions & discussion

Extras

overview

motivation 1

1.2 billion people live in extreme poverty, 78% in rural areas & 63% in subsistence agriculture (SSA).

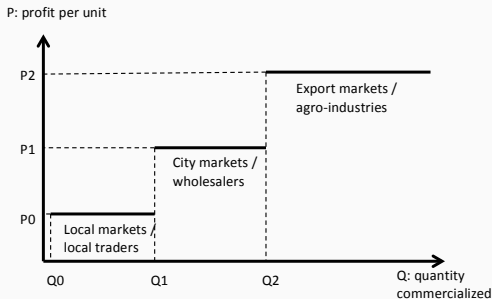
Seminal Q: How to sustainably rise out of poverty?

Answer is complex and multidimensional.

- One piece of the puzzle: Access to *highly profitable* markets.
- For small farmers, such access tends to be infeasible.
- Unless they aggregate...

Argument for *collective market access* → farmer groups.

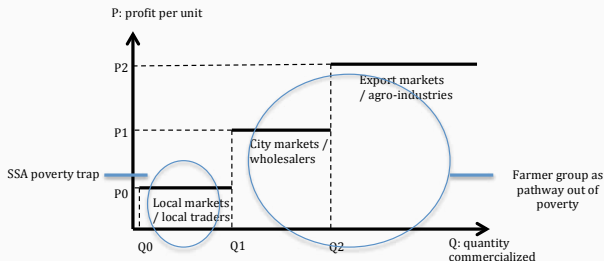
The type of profit function we have in mind:



Evidence consistent with this type of step function:
e.g. Key et al. (2000).

motivation 3

Can farmer groups move individuals from SSA to $Q > Q_2, Q_1$?



Stylistically, two types of factors impact this:

- Demand side: contracts, prices (Ashraf et al., Macchiavello).
- Supply side: group dynamics, access to inputs (Bernard et al., Fafchamps and Hill, Hellin et al., Aldana et al., Bernard and Taffesse, Ragasa and Golan).

questions

We focus on **supply side**: *Selling together* → *coordination*.

Q: Do intentions to coordinate impact actual coordination in the form of collective commercialization of **peanuts**?



Two experiments:

- * Coordination games: intentions, group size & other variations.
- * RCTs: varying intentions revealed in group meetings.

Key design aspects:

Games prior to RCTs and not all groups/individuals exposed.

So, games (1) test-bed, (2) sort mechanisms, (3) shape RCT behavior.

First paper – more policy oriented – main focus: RCT

- Subtle manipulation to status quo – intentions – impacts
(1) coordination (\times group size) & (2) welfare (\times production).
- In this paper, role of games is to explore mechanisms.

Literature 1: Coordination, communication, & development.

Literature 2: Certain papers reviewed by Camerer (2015).

Literature 3: Promises e.g. Charness and Dufwenberg (2006).

Second paper – more methodological – main focus: Games

- How do games impact naturally-occurring behavior?

Literature 1: Generalizability of lab results (Camerer-List debate).

Literature 2: de Arcangelis et al. (2015) & papers in Viceisza (2015).

Feedback Q: *Is this the most interesting way to tell the story?*

Paper 1

- Overall, intentions in RCT have no effect on (1) likelihood of selling or (2) quantities sold through group.
- However, theory predicts & games suggest that, due to strategic uncertainty, this should vary with group size.
- Result 1: Members of largest (smallest) groups sell more (less) through the group when exposed to intentions.
- Result 2: Producers below 2000 kg get higher revenues when the group is exposed to intentions.

Paper 2

- Thus far, all we know is that those who participated in the game are more likely to sell collectively, but no proper interactions and game-treatment distinctions yet.

design



May-June 2013: Games

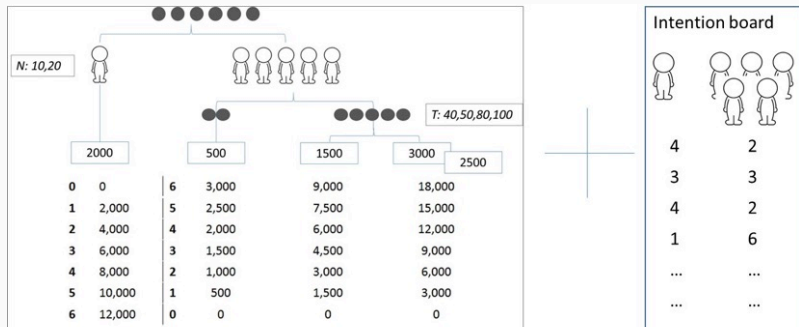
1. Pre- and post-surveys.
2. Stag-hunt coordination: $N_{FG} = 28$, $N_{EG} = 56$, $N_i = 839$.
3. Between: Intentions & EG size; Within: other variations. →

November-December 2013: RCTs

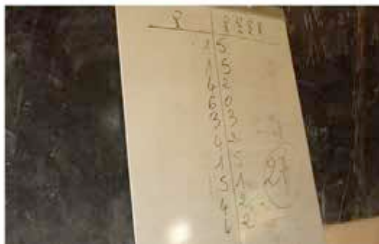
1. Intentions: $N_{FG} = 79$ (incl. 28 above), $N_i = 898$.
2. Between: Control & 3 treatments (varying intentions). →

2013-...

1. Post-surveys.
2. Administrative data on past commercialization (pending).
3. NSF proposal under review to collect long-run data/expand. →



- Variations: (1) baseline ($N_{EG} = 28$, $N_i = 429$),
 (2) intentions ($N_{EG} = 28$, $N_i = 410$), (3) EG size (10, 20),
 (4) threshold ($T \in \{40, 50, 80, 100\}$), (5) premium (\$2500 or \$3000),
 (6) risk (50% premium = \$1500).



Key aspects:

- Classroom-style with boxes as dividers.
- Pencil & paper.
- Instructions + Visual aids (previous slide) + Scenette/role play.
- Within-subjects treatments across 4 rounds (no feedback).
- Real money to indicate payoffs.

Pre- & post-questionnaire.

Duration: 2.5 – 3 hours.

Average earnings: 9500 West African francs (CFA) \sim 20 USD
compared to daily wage “equivalent” of 6500-7000 CFA.



Table 1: Treatments

Treatment	In common	What is revealed?		
$A(N_{FG} = 17)$	Training + Intentions elicited	–	–	–
$B(N_{FG} = 21)$	Training + Intentions elicited	Aggregate intentions	–	–
$C(N_{FG} = 20)$	Training + Intentions elicited	Aggregate intentions	Distribution	–
$D(N_{FG} = 21)$	Training + Intentions elicited	Aggregate intentions	Distribution	Leader vs. Member

Total number of individuals across all treatments: $N_i = 898$.

Main outcomes

- Likelihood of selling through FG/PO.
- Quantity sold through FG/PO.
- Difference b/w intention & quantity sold through FG/PO.
- Collected by means of post-surveys and to be confirmed by means of booklets & administrative data.

Timeline

1. Two leaders per FG/PO trained.
2. Leaders held feedback meeting.
3. Enumerators collected intentions from all who produced peanuts in 2013.
 - *Based on the quantity that you expect to harvest, what quantity do you intend to sell?* Let subject report by sales to FG/PO, trader or market; home consumption; stock; other.
4. People were informed that in a subsequent meeting a related message would be communicated to them, so they were encouraged to attend (balanced across treatments).
5. A meeting was held where intentions were revealed as in Table 1.

Training

1. Benefits of commercializing together.
2. Computing quantity required for aggregation to be beneficial.
3. Feedback meeting to other members.
4. End of training was used to teach the leaders how to fill a booklet to keep records of the contribution of each member.
5. All FGs/POs were promised a reward of FCFA 10,000 for completing the booklets. All were eventually paid.

rect hypotheses

- H1: **Premium effect** ($B - A$): Intended aggregate amount reveals likely premium.
- H2: **Conformity effect** ($C - B$): Distribution of intentions reveals what is acceptable/the norm.
- H3: **Identity effect** ($D - C$): Distribution of intentions by leaders/members reveals “identity” of the norm.
- H4: **Information effect** ($B \cup C \cup D - A$): Having some form of intentions (additional info) impacts behavior.
- H5: **Strategic uncertainty effect**: As suggested by games, there should be interactions between intentions & group size.
- H6: **Belief-based mechanisms**: Post-survey proxies along the lines of promise-keeping, guilt, shame, etc.



results



Table 2: Balance tests across treatments, individual level

	N_i	All	A	B	C	D	p -val diff
Age	898	46.24	45.70	46.93	48.04	44.38	0.02**
Sex (1=male; 0=female)	889	0.67	0.70	0.64	0.70	0.65	0.36
Leader (1=yes, 0=no)	889	0.19	0.22	0.19	0.18	0.18	0.70
Size of land (ha)	889	4.29	4.01	5.54	3.70	3.76	0.45
Risk (1 to 5)	889	2.80	2.80	2.71	2.85	2.84	0.74
Generosity (1 to 7)	889	2.91	3.18	2.88	2.65	2.99	0.00***
Patience (1 to 5)	889	2.52	2.54	2.52	2.72	2.31	0.12
Federation (1=CCPA, 0=FEGPAB)	889	0.53	0.48	0.54	0.56	0.54	0.50
PO exposed to lablike exp.: 1=yes; 0=no	898	0.33	0.42	0.29	0.28	0.33	0.01**
2013 harvest (kg)	889	1719.05	1967.40	1433.07	1864.13	1665.89	0.25
Expected 2014 harvest (kg)	889	1697.33	1773.30	1808.53	1704.92	1498.28	0.73
Intended to coll. com. : 1=yes, 0=no	889	0.84	0.81	0.87	0.84	0.85	0.36
Intentions coll. com. (kg)	889	1014.91	956.04	992.51	1111.32	994.33	0.85
Intentions indiv. com. (kg)	889	154.94	222.15	213.92	120.28	64.65	0.17
Farmed other crops : 1=yes, 0=no	889	0.58	0.60	0.62	0.56	0.53	0.26
Attended int. revelation meeting: 1=yes; 0=no	898	0.59	0.57	0.57	0.61	0.61	0.71

The last column is obtained by running a one-way ANOVA test, with standard errors clustered at the FG/PO level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Similar results hold if we compare A against $B \cup C \cup D$.

Table 3: Balance tests across treatments, FG/PO level

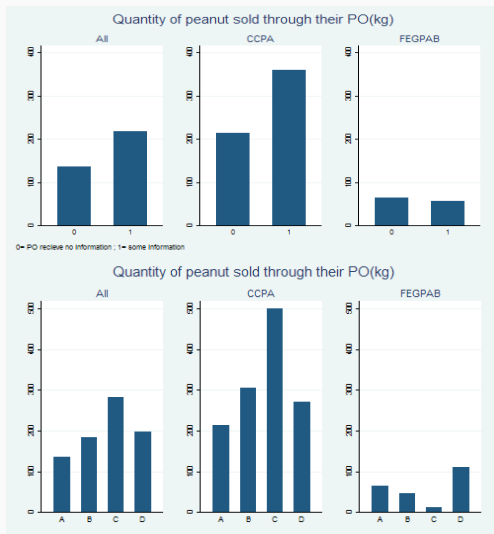
	N_{FG}	All	A	B	C	D	p -val diff
# interviewed	78	28.18	27.00	30.71	27.26	28.35	0.91
# with no intent to coll. com.	77	24.23	22.06	25.95	23.53	24.95	0.92
Aggregated intentions	77	27170.46	23384.62	26627.14	29425.85	28816.28	0.94
Mean of intentions	77	981.63	823.33	825.32	1,404.22	878.86	0.43
Mode of intentions	77	977.92	558.82	671.43	1,700.00	970.00	0.35
Median intentions	77	645.10	490.44	523.57	997.50	569.38	0.45
Leader's mean int.	76	1204.32	1162.75	821.88	1707.37	1161.18	0.29
Leader's modal int.	76	1834.14	1629.41	1297.62	2613.68	1830.79	0.42
Leader's median int.	76	1060.36	916.97	705.14	1533.47	1108.16	0.30
Simple member's mean int.	77	943.29	761.84	819.57	1354.16	837.09	0.47
Simple's member modal int.	77	929.22	476.47	752.38	1597.37	865.00	0.43
Simple member's median int.	77	618.12	443.09	525.83	977.37	522.50	0.46
% that attended revelation meeting	77	0.59	0.57	0.57	0.60	0.61	0.86

The last column is obtained by running a one-way ANOVA test.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Similar results hold if we compare A against $B \cup C \cup D$.

descriptives 1

Quantity sold: no intentions/info (A) vs. some ($B \cup C \cup D$)



descriptives 2

By group size: below median (< 24) vs. above (≥ 24)

Quantity sold: no info/signals (A) vs. some info/signals ($B \cup C \cup D$)

- This is only for graphing purposes, since in regs we interact with continuous version.

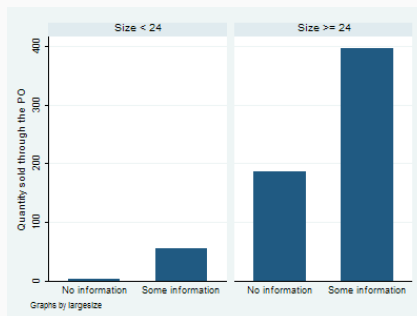


Table 4: Impact of intentions ($B \cup C \cup D$ v. A) on quantity sold through PO

Variables	(1)	(2)	(3)	(4)
Intentions	81.53 (110.988)	-359.271 (172.234)**	-273.534 (177.018)	-185.601 (114.076)
Size		-1.278 (2.872)	-2.124 (3.685)	-1.137 (1.265)
Intentions \times Size		15.042 (4.615)***	13.297 (5.397)**	11.305 (4.981)**
Constant	136.657 (97.921)	171.714 (149.741)	110.883 (203.328)	29.376 (68.185)
R^2	0.00	0.11	0.20	0.11
N	898	889	889	597
Controls	No	No	Yes	Yes
PO in games?	Mixed	Mixed	Mixed	No

Standard errors clustered at PO level.

Intentions: $B \cup C \cup D$.

Group size: range=5–91; mean=28; median=24; sd=17.66.

Mean of dependent variable ~ 200 kg.

Table 5: Impact of intentions (B , C , D v. A) on quantity sold through PO

Variables	(1)	(2)	(3)	(4)
B	48.282 (122.216)	-363.270 (200.919)*	-397.838 (218.560)*	-357.394 (210.232)*
C	147.081 (163.204)	-508.278 (170.694)***	-386.942 (173.680)**	-66.132 (95.774)
D	60.547 (111.456)	-200.649 (160.053)	-44.053 (163.797)	-218.377 (69.673)***
Size		-1.278 (2.878)	-1.202 (3.721)	-0.731 (1.243)
$B \times \text{Size}$		13.391 (5.996)**	15.621 (6.739)**	14.383 (7.314)*
$C \times \text{Size}$		23.552 (5.195)***	20.587 (5.320)***	6.267 (4.817)
$D \times \text{Size}$		8.814 (3.304)***	4.570 (4.896)	15.646 (3.612)***
Constant	136.657 (98.040)	171.714 (150.081)	60.666 (199.729)	33.330 (57.037)
R^2	0.01	0.14	0.23	0.13
N	898	889	889	597
Controls	No	No	Yes	Yes
PO in games?	Mixed	Mixed	Mixed	No

Standard errors clustered at PO level.

Group size: range=5-91; mean=28; median=24; sd=17.66.

Mean of dependent variable \sim 200kg.

Table 6: Welfare effects: impact of intentions on total overall revenues

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intentions	30.142 (14.522)**	31.179 (13.916)**	32.258 (14.126)**	32.675 (13.699)**	44.642 (25.006)*	33.389 (12.919)**	19.363 (31.506)
'14 harvest (kg)	0.155 (0.007)***	0.155 (0.007)***	0.155 (0.008)***	0.155 (0.008)***	0.155 (0.009)***	0.161 (0.006)***	0.161 (0.007)***
Intentions × harvest	-0.015 (0.008)*	-0.015 (0.008)*	-0.015 (0.008)*	-0.016 (0.008)*	-0.016 (0.008)*	-0.015 (0.006)**	-0.015 (0.006)**
Size		-0.653 (0.380)*	-0.680 (0.390)*	-0.709 (0.451)	-0.300 (0.796)	0.012 (0.659)	-0.398 (0.881)
Intentions × Size					-0.453 (0.873)		0.504 (1.021)
PO exposed to LFE			6.076 (10.709)	7.391 (11.185)	8.202 (11.411)		
Constant	-45.504 (12.693)***	-28.577 (15.314)*	-30.668 (16.007)*	-38.325 (20.303)*	-49.182 (25.782)*	-40.169 (24.911)	-28.043 (27.100)
R^2	0.95	0.95	0.95	0.95	0.95	0.96	0.96
N	893	893	893	884	884	596	596
Controls	No	No	No	Yes	Yes	Yes	Yes
PO in games?	Mixed	Mixed	Mixed	Mixed	Mixed	No	No

Standard errors clustered at PO level.

Group size: range=5-91; mean=28; median=24; sd=17.66.

Mean of dependent variable (total overall revenues) ~ 258,000 CFA.

Distribution of '14 total harvest: mean = 1959.80, range = [5, 37890].

other findings & pending checks

Limited impacts on likelihood of selling to the group.

Pending checks

1. Paper 1

- Welfare effects on profits?
- Mechanisms via belief-based proxies.
- Reconciling administrative data.
- Past commercialization behavior.

2. Paper 2

- Exploring individual-level exposure to games.
- Exploring across-group exposure to games.
- Linking intentions/actions in game with intentions/actions in RCT.
- Duration between games and RCT – individual-level variation.

conclusions & discussion

Paper 1

- Overall, intentions in RCT have no effect on (1) likelihood of selling or (2) quantities sold through group.
- However, theory predicts & games suggest that, due to strategic uncertainty, this should vary with group size.
- Result 1: Members of largest (smallest) groups sell more (less) through the group when exposed to intentions.
- Result 2: Producers below 2000 kg get higher revenues when the group is exposed to intentions.

Paper 2

- Thus far, all we know is that those who participated in the game are more likely to sell collectively, but no proper interactions and game-treatment distinctions yet.

Subtle & non-costly manipulation to status quo seems to have strong impact on both coordination/collective commercialization & welfare/total revenues.

NSF proposal: one attempt to expand to Kenya and Nigeria and also collect long-run data in Senegal.

Q remains: Demand side? Also complicated – contract farming etc.

Methodological: Potential power of lab experiments to impact behavior & build institutions.

First paper – more policy oriented – main focus: RCT

- Subtle manipulation to status quo – intentions – impacts
(1) coordination (\times group size) & (2) welfare (\times production).
- In this paper, role of games is to explore mechanisms.

Literature 1: Coordination, communication, & development.

Literature 2: Certain papers reviewed by Camerer (2015).

Literature 3: Promises e.g. Charness and Dufwenberg (2006).

Second paper – more methodological – main focus: Games

- How do games impact naturally-occurring behavior?

Literature 1: Generalizability of lab results (Camerer-List debate).

Literature 2: de Arcangelis et al. (2015) & papers in Viceisza (2015).

Feedback Q: *Is this the most interesting way to tell the story?*

extras



Table 7: Average sample characteristics

Variables	Overall	Baseline	Intentions	Difference
Gender (1=female)	0.53 (0.50)	0.57 (0.02)	0.48 (0.03)	0.10** (0.03)
Land size (hectares)	4.81 (5.42)	4.52 (0.26)	5.11 (0.27)	-0.60 (0.37)
Koranic school (1=yes)	0.61 (0.49)	0.61 (0.03)	0.60 (0.03)	0.01 (0.05)
Groundnut harvest (kg)	1487.48 (2425.96)	1400.39 (129.70)	1576.32 (111.87)	-175.93 (171.54)
Trust	2.69 (1.44)	2.66 (0.07)	2.72 (0.07)	-0.07 (0.10)
Generosity	1.40 (0.61)	1.42 (0.03)	1.37 (0.03)	0.05 (0.04)
Risk aversion	3.10 (1.45)	3.14 (0.07)	3.07 (0.07)	0.07 (0.10)
Patience	1.53 (1.75)	1.58 (0.09)	1.47 (0.09)	0.11 (0.12)
<i>N</i>	839	429	410	839

** Significantly different from zero at 5% level based on two-sided *t*-test.

Trust is a survey-based measure asking about trust towards a random group member.

Generosity is based on a hypothetical dictator game.

Risk aversion is based on a hypothetical Binswanger-style (1980) lottery choice.

Patience is based on a hypothetical, typical multiple price list.

Table 8: Impact of intentions & group size on chips sent to group

Variables	(1)	(2)
Intentions	0.401 (0.191)**	-0.778 (0.632)
Group size	0.015 (0.231)	-0.844 (0.338)**
Intentions \times Size		1.687 (0.592)***
R^2	0.10	0.10
N	3312	2112
<i>Rounds</i>	4	4
Controls	Yes	Yes
Threshold per person	Nonconstant	Constant (4 or 5)

Standard errors clustered at session level.

Controls: gender, age, educ, land size, trust, risk, time, altruism.



group size distribution

```
. summarize N if POlevel == 1
```

Variable	Obs	Mean	Std. Dev.	Min	Max
N_int	79	28	17.66352	4	91

```
. summarize N if POlevel == 1 , detail
```

Size of PO					
	Percentiles	Smallest			
1%	4	4			
5%	8	5			
10%	12	8	Obs		79
25%	16	8	Sum of Wgt.		79
50%	24		Mean		28
		Largest	Std. Dev.		17.66352
75%	38	68			
90%	48	77	Variance		312
95%	68	88	Skewness		1.540631
99%	91	91	Kurtosis		5.631671



revenue & harvest distribution

```
. sum totalsalesrevenue
```

Variable	Obs	Mean	Std. Dev.	Min	Max
totalsales~e	893	258.2331	478.3126	0	4737

```
. sum c26
```

Variable	Obs	Mean	Std. Dev.	Min	Max
c26	898	1959.798	3242.652	5	37890



behavioral measures impacted by intervention? 1

Table 9: Impact of treatment on post-measure of risk

Variables	(1)	(2)	(3)	(4)	(5)
PO received some info	0.056 (0.135)	0.373 (0.265)	0.368 (0.262)	0.380 (0.237)	0.117 (0.217)
R^2	0.00	0.00	0.00	0.03	0.04
N	898	889	889	889	597

Table 10: Impact of treatment on post-measure of time

Variables	(1)	(2)	(3)	(4)	(5)
PO received some info	-0.135 (0.128)	-0.267 (0.318)	-0.209 (0.318)	-0.122 (0.282)	0.046 (0.346)
R^2	0.00	0.00	0.00	0.07	0.05
N	898	889	889	889	597

behavioral measures impacted by intervention? 2

Table 11: Impact of treatment on post-measure of altruism

Variables	(1)	(2)	(3)	(4)	(5)
PO received some info	-0.032 (0.125)	-0.075 (0.263)	0.084 (0.240)	0.099 (0.205)	0.379 (0.200)*
R^2	0.00	0.00	0.01	0.08	0.06
N	898	889	889	889	597