

Keeping Up With the Joneses

Ranking Effects on Effort, Cooperation, and Firm Performance

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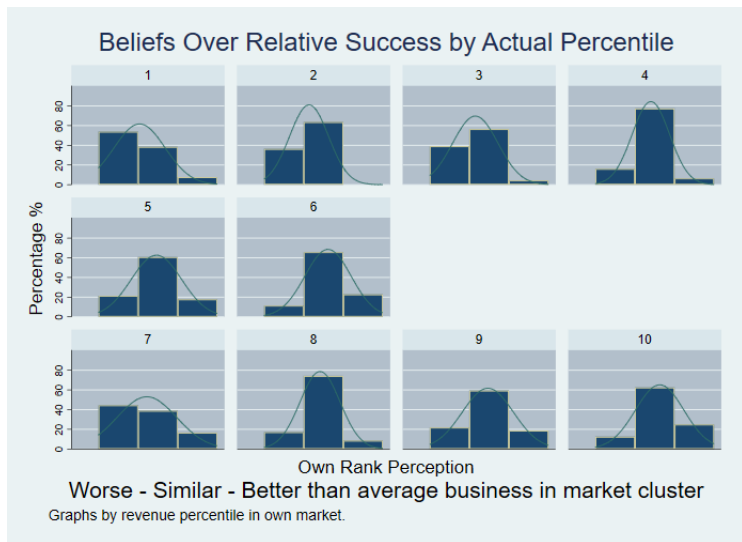
Motivation

Overconfidence

- Overconfidence widespread with robust evidence across different domains and growing literature on economic implications of bias.
 - For example, overconfidence in context of CEO behavior and its consequences for firm outcomes (Malmendier and Tate, 2005).
- Growing evidence that managers make biased decisions and have non-standard beliefs.
 - Evidence typically focused on CEO's in developed countries.
- Growing evidence from least-developed countries on importance of psychological constraints of micro-entrepreneurs.
 - For example, Campos et al. (2017), Sharma and Tarp (2018), among others.

Motivation

Overconfidence in Performance of Micro-Entrepreneurs



Motivation

Potential Mechanisms

Changes in behavior (through correcting beliefs over relative performance) puzzling under standard model but consistent with utility maximizing responses to behavioral anomaly.

- Input factors (likely to be) driven by intrinsic motivation:
 - Effort towards own business: time allocation (extensive margin) and client management (intensive margin). [▶ Go to Effort Graph](#)
 - Strategic cooperation with business network leading to increased knowledge sharing and business partnerships. [▶ Go to Cooperation Graph](#)
- Input factors (likely to be) driven by knowledge sharing:
 - Pricing of products and inventory management,
 - Business practices,
 - Savings and investment behavior.

Research Questions

- ① Does information about relative business success alter beliefs and behavior of micro-firm owners?
 - ① Specifically effort and cooperation choices?
 - ② Are these behavior constraints binding for micro-firm performance?
- ② Does it matter who peers are?

This Paper

- Simple information provision experiment with app. 300 micro-firms in urban market clusters in Mozambique.
- Randomly allocated treatment group:
 - Information about rank regarding week's sales relative to 9 other firms in same sector,
 - Sales distribution of own sector,
 - Sub-treatment with basic information about peer characteristics.
- Differential treatment effect on firm outcomes and potential mechanisms up to 1 year after treatment.
 - Survey data, incentivized behavioral measure, administrative data on revenue.

Data and Sampling Strategy

Country Context: Mozambique

- Conflict-ridden country
 - 10 years of independence,
 - 15 years civil war.



- Social unrest and large migratory flows to urban areas.
- Self-employment concentrated in market clusters that serve geographical neighborhood.

Data and Sampling Strategy

Setting of Market Clusters and Sampling

- Random sampling of 29 market clusters.
 - At least 100 vendors registered,
 - Within city boundaries of Maputo and Matola.
- Exclusion restrictions:
 - Foreigners and “flying” vendors,
 - Business horizon of less than 1 year,
 - Older than 50 years,
 - Fruit/vegetable sellers, restaurants/bars, wholesale merchants, traditional medicine, illegal vending activities.

► Go to Market Picture

Data and Sampling Strategy

Data on Firm Outcomes

① Survey data:

- ① Survey self-reports on revenue over last 2 days,
- ② Survey self-reports on profits over last month.

② Monitored revenue data:

- ① Collected during endline visit one year after treatment.
- ② Interviewers monitored firm owner over app. 8 hours.
 - ① Collected data on clients approaching shop and making purchase, items bought, sales units, unit and total prices charged.

Data and Sampling Strategy

Data on Mechanisms

① Survey data:

- ① Effort (extensive and intensive margin),
- ② Business practices,
- ③ Savings and investments.

② Behavioral games data:

- ① Pro-sociality measured with incentivized dictator game at baseline and midline (4 months) visit. [▶ Go to Games Picture](#)

③ Administrative data on pricing:

- ① Average price calculated from total monitored revenue and units sold.

Descriptive Statistics and Randomization Balance

Table 1: Baseline Summary Statistics and Test of Balance for Select Covariates.

	Control			Treatment			All			t-test
	N (1)	mean (2)	se (3)	N (4)	mean (5)	se (6)	N (7)	mean (8)	se (9)	difference (10)
<i>Baseline covariate</i>										
Age	122	33.11	(0.80)	191	34.03	(0.66)	313	33.67	(0.51)	-0.93
Female	125	0.43	(0.05)	191	0.40	(0.04)	316	0.41	(0.03)	0.03
Years of schooling	124	7.97	(0.27)	191	8.09	(0.21)	315	8.04	(0.17)	-0.13
Had any formal business training	124	0.11	(0.03)	191	0.09	(0.02)	315	0.10	(0.02)	0.02
Number of household members	124	5.53	(0.23)	191	6.11	(0.19)	315	5.88	(0.15)	-0.58*
Household expenditures per month	123	6991.28	(338.98)	190	7584.54	(332.33)	313	7351.40	(241.95)	-593.26
Household asset score	125	9.31	(0.19)	191	9.48	(0.16)	316	9.41	(0.12)	-0.16
Years in business	125	7.39	(0.63)	191	8.18	(0.50)	316	7.87	(0.39)	-0.79
Shop asset score (market value in 2016)	125	10529.91	(2409.83)	190	12630.14	(3191.08)	315	11796.72	(2147.19)	-2100.23
Investment in risky lottery	118	5.46	(0.33)	188	5.22	(0.27)	306	5.31	(0.21)	0.23
Sales last two days (winsorized)	98	3282.33	(553.32)	187	3683.90	(408.07)	285	3545.82	(328.09)	-401.58
Profit last two days (winsorized)	95	1500.14	(548.19)	185	1474.97	(398.61)	280	1483.51	(321.85)	25.17
Hours worked per day	123	9.73	(0.15)	189	9.74	(0.11)	312	9.74	(0.09)	-0.01
Days worked per week	124	6.34	(0.07)	188	6.32	(0.08)	312	6.33	(0.06)	0.01
Contribution in dictator game	129	4.56	(0.27)	189	4.36	(0.25)	312	4.40	(0.18)	0.25

Notes: This table shows summary statistics for the full sample of entrepreneurs included in the study as well as summary statistics for the control and the treatment group. Column (8) reports the sample mean. The treatment group includes all subjects that have seen the ranking. Reported is a selection of covariates. Sales, profits, and hours and days worked are winsorized at the 1st and 99th percentile. The value displayed for t-tests are the differences in the means across the groups. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Descriptive Statistics and Randomization Balance

Top vs. Bottom Vendors

Table 2: Difference Between Bottom and Top Vendors for Select Covariates.

	Bottom			Median & Top			t-test
	N	mean	se	N	mean	se	difference
	(1)	(2)	(3)	(4)	(5)	(6)	(10)
<i>Baseline covariate</i>							
Age	107	33.07	(0.94)	206	33.99	(0.60)	-0.92
Female	107	0.46	(0.05)	208	0.39	(0.03)	0.07
Years of schooling	107	8.08	(0.29)	208	8.03	(0.20)	0.05
Formal business training	107	0.09	(0.03)	208	0.11	(0.02)	-0.01
Household size	107	5.89	(0.26)	208	5.88	(0.18)	0.01
Years in business	107	6.44	(0.68)	209	8.60	(0.47)	-2.16***
Risk preferences	106	5.22	(0.37)	207	5.37	(0.25)	-0.15
Investment (past 6 months)	78	0.50	(0.06)	138	0.52	(0.04)	-0.02
Hours worked per day	106	9.45	(0.15)	206	9.88	(0.11)	-0.43**
Dictator game contribution	107	4.15	(0.31)	211	4.589	(0.23)	-0.44
Sales last two days	101	948.00	(91.11)	184	4971.79	(474.24)	-4023.79***
Profit last two days	99	22.85	(245.09)	181	2282.43	(469.54)	-2259.58***

Notes: This table shows summary statistics for firms in the bottom of the distribution and the median and top. The bottom group includes all subjects that fall below the 50th percentile. Reported is a selection of covariates. Sales, profits, and hours and days worked are winsorized at the 1st and 99th percentile. The value displayed for t-tests are the differences in the means across the groups. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Baseline Intervention

Folha de Tabela de Classificação - Projecto Formação Empresarial em Moçambique - NOVAFRICA

NOME DO MERCADO: MAZAMBANE

Numero da Entrevista: 7085

Tratamento: 2

SAPATOS, CHINELOS E MALAS

NOME: MARIA SILVA

CONTACTOS: 123456789

Tabela de Classificação

	NOME	IDADE	GÉNERO	VENDAS POR SEMANA
1	XXX			25,400.00
2	XXX			17,520.00
3	XXX			12,600.00
4	XXX			9,780.00
5	XXX			6,900.00
6	XXX			5,810.00
7	MARIA SILVA			4,700.00
8	XXX			3,900.00
9	XXX			1,450.00
10	XXX			1,103.00

Peer Characteristics Intervention

Folha de Tabela de Classificação - Projecto Formação Empresarial em Moçambique - NOVAFRICA

NOME DO MERCADO: MAZAMBANE

Numero da Entrevista: 7085

Tratamento: 3

SAPATOS, CHINELOS E MALAS

NOME: MARIA SILVA

CONTACTOS: 123456789

Tabela de Classificação

	NOME	IDADE	GÉNERO	VENDAS POR SEMANA
1	XXX	34	FEMININO	25,400.00
2	XXX	35	MASCULINO	17,520.00
3	XXX	24	MASCULINO	12,600.00
4	XXX	27	MASCULINO	9,780.00
5	XXX	42	FEMININO	6,900.00
6	XXX	24	MASCULINO	5,810.00
7	MARIA SILVA	39	FEMININO	4,700.00
8	XXX	29	MASCULINO	3,900.00
9	XXX	21	FEMININO	1,450.00
10	XXX	20	MASCULINO	1,103.00

Results

Firm Outcomes

	Reported Revenue		Monitored Revenue		Profits	
	(1)		(2)		(3)	
Treatment	1,625.329**		1,147.305**		1,258.342**	
	738.791	0.089	504.858	0.089	574.832	0.089
TopFirm	-1,109.733		945.842***		2,641.663***	
	967.258	0.218	345.562	0.000	545.821	0.000
Treat*TopFirm	-2,272.688*		-1,458.057**		-1,285.727	
	1,326.708	0.168	644.685	0.059	841.165	0.168
Mean - Bottom	1,395.586		939.250		2,330.000	
Mean - Top	3,852.858		1,844.727		4,944.581	
Obs. (cluster)	818 (315)		275 (275)		537 (303)	

Results

Some Mechanisms

	Workhours		Workdays		Pro-Sociality	Average Pricing
	(1)		(2)		(3)	(4)
Treatment	0.862**		0.401**		2.062**	56.760
	0.346	0.030	0.163	0.030	0.843	35.155
TopFirm	0.864***		0.490***		1.982**	119.852
	0.316	0.010	0.176	0.010	0.815	78.761
Treat*TopFirm	-1.370***		-0.397*		-1.680	-85.465
	0.407	0.000	0.228	0.079	1.102	105.665
Mean - Bottom	9.271		5.983		2.767	101.215
Mean - Top	10.301		6.333		4.549	219.248
Obs. (cluster)	865		864		565	263

Results

Other Mechanisms

- Weak evidence on imitation of **bookkeeping** and **business measures** behavior.
 - [▶ Go to Bookkeeping](#)
- Some evidence on better **inventory** management.
 - [▶ Go to Inventory Management](#)
- Weak evidence on imitation of **savings behavior** and increase in **demand for loans**.
 - [▶ Go to Savings and Loans](#)
- Weak evidence on decrease in **equipment investments** but increase in **product diversification investments**.
 - [▶ Go to Investments](#)
- Weak evidence on improved **client management** and sales (**intensive margin of effort**).
 - [▶ Go to Client Management](#)

Results

Additional Impact of Peer Information & Female Leaders on Firm Outcomes

	Reported Revenue		Monitored Revenue		Profits	
	(1)		(2)		(3)	
Treatment	2,262.170***		992.897*		1,163.777*	
	829.773	0.020	574.473	0.069	595.265	0.069
Treat*TopFirm	-1,860.055		-1,306.275*		-1,119.981	
	1,302.907	0.277	669.851	0.129	881.738	0.277
PeerInformation	-2,373.271***		61.386		-833.833	
	831.703	0.000	552.171	0.861	666.394	0.366
PeerInformation*FemaleLeader	4,399.194**		1,128.804		3,206.334**	
	1,935.754	0.079	1,130.143	0.337	1,384.025	0.079
Mean - Bottom	1,414.870		951.875		2,409.455	
Mean - Top	3,736.427		1,555.628		4,926.083	
Obs.	739		244		474	

Additional Results and Robustness Checks

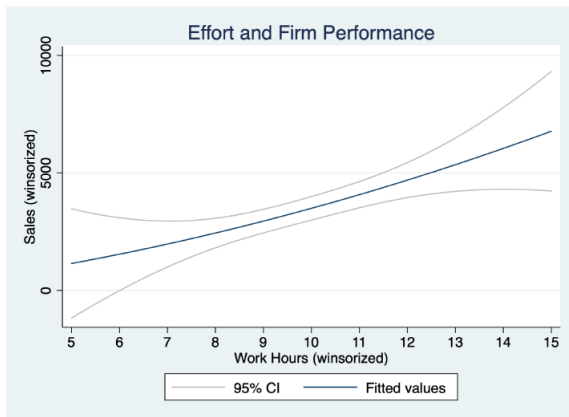
- **Mechanisms of additional impact of peer information and female leaders** consistent with mechanisms from main analysis.
- **Dynamic effects analysis** suggests that firm outcomes increase in short-run in survey data and persist after one-year in administrative data.
 - Extensive margin of effort increased over both time periods, pro-sociality and price effects available for one time period only.
- **Gender heterogeneous results** show that treatment increases firm outcomes for both men and women although much stronger for female business owners.
 - Positive effects of showing female leadership in main mechanisms driven by women.
- **Differential attrition** does not drive effects and provides evidence for higher survival rates of treated firms.
 - [▶ Go to Differential Attrition](#)

Conclusion

- Paper finds indirect evidence of managerial mistakes and biased decision-making in context of micro-entrepreneurs in developing countries.
 - These biases have large economic consequences for least productive firms.
 - With implications for income of (likely) ultra-poor households.
- Simple information treatment exploiting baseline data increases firm inputs related to intrinsic motivation.
 - Increasing strategic cooperation (as measured through pro-sociality indicator) likely leads to increased skills and higher average pricing.

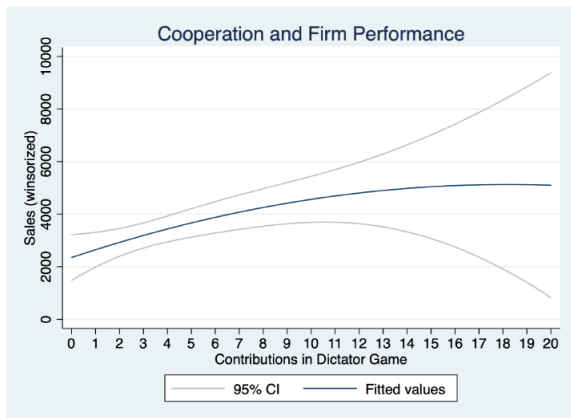
Thank you!

Effort and Revenues



Notes: This figure plots the quadratic relationship between effort and firm revenue at baseline for around 600 micro-firms. Both hours worked and revenue data are winsorized at the 1st and 99th percentile. Sales are reported in the Mozambican local currency, Meticaís.

Pro-Sociality and Revenues



Notes: This figure plots the quadratic relationship between cooperation and firm revenue at baseline for around 600 micro-firms. Revenue data is winsorized at the 1st and 99th percentile. Sales are reported in the Mozambican local currency, Meticaís. Respondents could share any amount between 0 and 20 with the recipient in an incentivized dictator game. Units reported are the number of tokens shared where each token is worth 20MZN for recipients and 10MZN for dictators.

Typical Market Vendor Stand



Dictator Games



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Bookkeeping and Business Measures

	Books 1	Books 2	Books 3	Measures 1	Measures 2	Measures 3
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.062	0.202	-0.094	-0.105	-0.242	-0.139
	0.124	0.139	0.117	0.136	0.150	0.106
TopFirm	0.031	0.135	-0.117	-0.238*	-0.226	-0.037
	0.125	0.135	0.118	0.130	0.143	0.102
Treat*TopFirm	-0.048	-0.164	0.073	0.093	0.238	0.062
	0.150	0.166	0.145	0.166	0.179	0.129
Mean - Bottom	0.333	0.241	0.448	0.607	0.643	0.633
Mean - Top	0.420	0.366	0.446	0.420	0.544	0.603

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Inventory Management

	Compare Prov.	Negotiate	Days with Stock	No Products
	(1)	(2)	(3)	(4)
Treatment	0.006	0.037	24.701**	-0.077
	0.110	0.109	12.169	0.091
TopFirm	0.026	0.081	13.996*	-0.165**
	0.106	0.105	7.765	0.084
Treat*TopFirm	-0.045	-0.136	-26.532*	0.125
	0.132	0.131	15.608	0.102
Mean - Bottom	0.531	0.500	16.710	0.250
Mean - Top	0.554	0.578	23.145	0.084

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Savings Behavior and Demand for Loans

	Total Savings	Bank Loan	Rejected Loan
	(1)	(2)	(3)
Treatment	936.451	0.011	0.037
	3,513.069	0.035	0.048
TopFirm	1,232.345	-0.020	0.065
	3,816.907	0.034	0.044
Treat*TopFirm	-8,349.768	-0.052	-0.056
	6,096.656	0.050	0.058
Mean - Bottom	3,140.741	0.051	0.000
Mean - Top	8,490.046	0.038	0.032

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Investments

	Bought Equipment	Number of Products	Added Products
	(1)	(2)	(3)
Treatment	-0.084	2.911	0.051
	0.059	2.037	0.065
TopFirm	-0.106*	2.463	0.118*
	0.057	1.685	0.064
Treat*TopFirm	0.089	-2.256	-0.120
	0.068	2.985	0.080
Mean - Bottom	0.186	7.153	0.203
Mean - Top	0.076	9.457	0.318

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Client Management and Salesmanship

	Feedback Lost Clients	Sales Share	Individual Sales
	(1)	(2)	(3)
Treatment	0.157	0.029	0.682
	0.118	0.064	3.428
TopFirm	0.128	0.004	1.060
	0.115	0.063	3.120
Treat*TopFirm	-0.154	-0.055	-1.783
	0.142	0.074	3.710
Mean - Bottom	0.419	0.545	11.033
Mean - Top	0.554	0.516	11.468

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