

**Shortening Supply Chains: Experimental Evidence
from Fruit and Vegetable Vendors in Bogota**

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Online Appendices

Appendix 1: Corabastos Market



Rows and rows of warehouses, each specializing in different products



Warehouses are separated by product, selling potatoes, onions and other staples in large sacks.

Appendix 2: Study Timeline

Date	Pre-Intervention		Implementation		Follow-up Surveys						
	Mapping	Baseline	Block roll-out	# Products	2 week	4 week	6 week	10 week	14 week	6 month	12 month
2016 J											
F											
M											
A				5							
M				5							
J				5							
J				5							
A				6 to 7							
S				7 to 10							
O				10 to 14							
N				15 to 20							
D				20							
2017 J				20							
F				20							
M				20							
A				20							
M				20 to 22							
J				22 to 25							
J				25 to 27							
A				27 to 28							
S				28							
O				28							
N				28							
D											

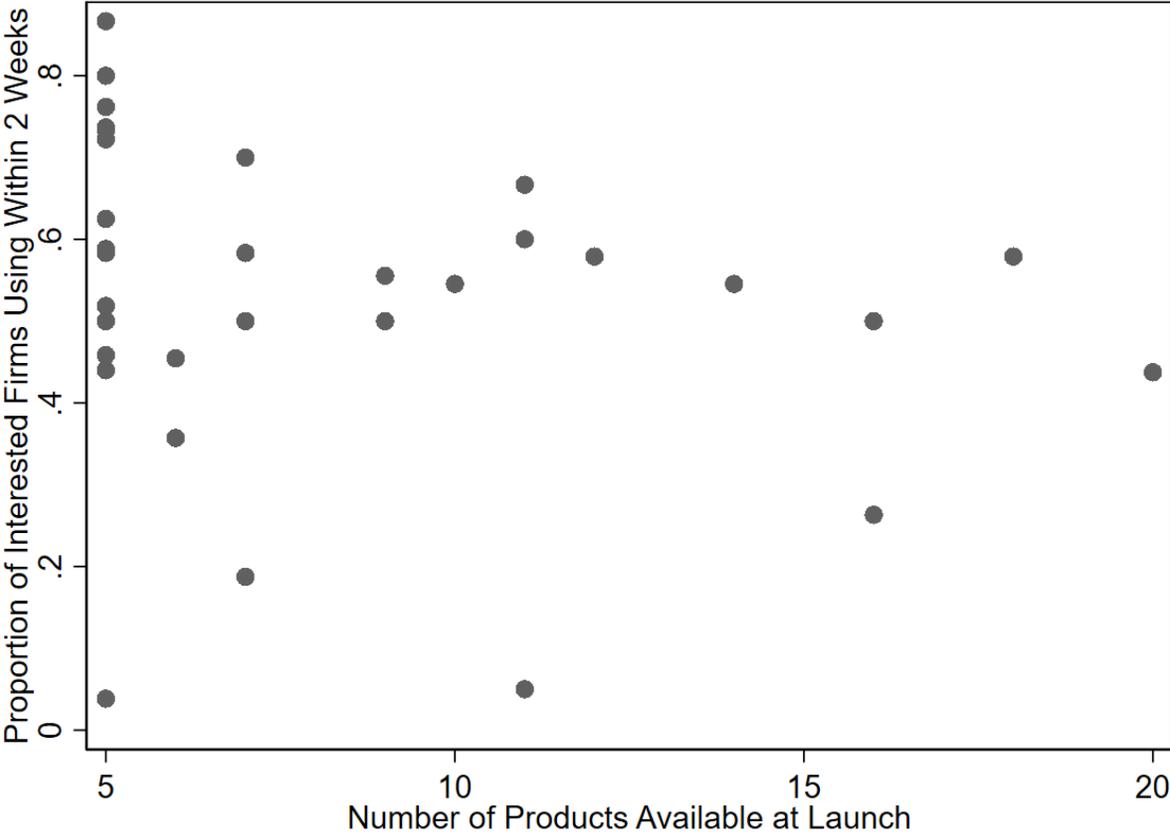
Note: Agruppa ceased operating in January 2018.

Appendix 3: More on Take-up

Take-up rates of Agruppa did not vary with number of products available at the time it was launched in a market block

Figure A3 shows the proportion of firms initially expressing interest in Agruppa that make a purchase within two weeks of launching Agruppa in their block, against the number of different products Agruppa was selling at the time of this launch. The first 15 weeks only had the core 5 products of potatoes, onions, spring onions, plantains and tomatoes, and then other products were phased in. A fitted regression has slope -0.0097 (s.e. 0.006), so that there is a small and statistically insignificant association between take-up rates and number of blocks.

Figure A3: No relationship between take-up rates and the number of products available



How do baseline daily Corabastos shoppers compare to non-daily shoppers among interested firms?

Take-up, and persistence of usage of Agruppa was most strongly correlated with whether the firms went to Corabastos daily at baseline. Table A3 shows that the firm owners going daily were more likely to be male, had higher household incomes, and the firms were larger in size (employees) and more profitable, and located closer to Corabastos. They derive more of their sales from core Agruppa products.

Table A3: Comparison of Baseline Daily Corabastos Shoppers to Non-daily Shoppers amongst Firms Interested in Agruppa

	Go Daily to Corabastos	Go less than Daily to Corabastos	p-value
<i>Owner Characteristics</i>			
Owner is female	0.26	0.38	0.000
Age of Owner	40.5	42.7	0.006
Has primary education or less	0.49	0.44	0.104
Has high school education	0.43	0.46	0.353
Has post high school education	0.08	0.11	0.242
Household size	2.90	2.97	0.556
Has a child under 18 in household	0.56	0.53	0.317
Is the main income earner	0.92	0.86	0.002
Household monthly income (USD)	498	402	0.070
Below the Colombian poverty line	0.36	0.42	0.192
<i>Firm Characteristics</i>			
In business 5 years or less	0.34	0.33	0.810
Any paid employees	0.48	0.27	0.000
Number of core Agruppa products sold	4.50	4.26	0.000
Distance to Corabastos (km)	3.55	4.21	0.000
Days per week visiting Corabastos	7.00	2.98	0.000
Travel time to Corabastos (minutes)	23.74	26.37	0.028
Weekly sales (USD)	1302	1122	0.671
Weekly profits (USD)	178	110	0.001
Proportion of sales from core Agruppa	0.55	0.49	0.027
Sample Size	410	673	

Appendix 4: Survey Response Rates and Attrition

Table A4.1: Proportion of Firms Interviewed by Survey Round

	Week 2	Week 4	Week 6	Week 10	Week 14	Six months	1 year	At least once
Firms interested in Agruppa								
in Control Blocks	0.82	0.82	0.77	0.76	0.70	0.75	0.74	0.97
in Treatment Blocks	0.84	0.86	0.81	0.80	0.74	0.80	0.77	0.98
p-value of equality	0.056	0.002	0.040	0.069	0.057	0.116	0.502	0.260
Firms not interested in Agruppa								
in Control Blocks	0.62	0.72	0.72	0.69	0.66	0.63	0.73	0.97
in Treatment Blocks	0.68	0.68	0.71	0.74	0.69	0.58	0.63	0.95
p-value of equality	0.322	0.296	0.628	0.017	0.880	0.099	0.000	0.256

Table A4.2: Proportion of Firms Reporting Prices for at least one Agruppa product by Survey Round

	Week 2	Week 4	Week 6	Week 10	Week 14	Six months	1 year	At least once
Firms interested in Agruppa								
in Control Blocks	0.80	0.80	0.77	0.75	0.70	0.79	0.82	0.996
in Treatment Blocks	0.83	0.84	0.79	0.79	0.73	0.79	0.86	1.000
p-value of equality	0.105	0.028	0.194	0.083	0.123	0.708	0.099	0.061
Firms not interested in Agruppa								
in Control Blocks	0.60	0.72	0.71	0.68	0.66	0.63	0.82	1.000
in Treatment Blocks	0.68	0.67	0.70	0.72	0.67	0.63	0.81	1.000
p-value of equality	0.163	0.265	0.514	0.055	0.933	0.788	0.757	

Note: Table A4.2 is for all firms, and does not condition on being interviewed. Prices could still be collected in some cases where the firm owner refused to be interviewed, which is why the proportion of firms reporting prices can be higher than the proportion interviewed in a round.

Table A4.3: Proportion of Firms Reporting Profits and Sales by Survey Round

	Week 2	Week 4	Week 6	Week 10	Week 14	Six months	1 year	At least once
Firms interested in Agruppa								
in Control Blocks	0.38	0.40	0.32	0.27	0.25	0.37	0.51	0.90
in Treatment Blocks	0.37	0.36	0.31	0.25	0.25	0.44	0.53	0.91
p-value of equality	0.958	0.241	0.781	0.280	0.583	0.042	0.746	0.752
Firms not interested in Agruppa								
in Control Blocks	0.24	0.36	0.24	0.18	0.17	0.22	0.44	0.80
in Treatment Blocks	0.26	0.21	0.18	0.17	0.15	0.23	0.39	0.81
p-value of equality	0.417	0.000	0.058	0.340	0.358	0.878	0.362	0.805

Note: Table A4.3 does not condition on being interviewed, so incorporates both cases where the firm owner was not interviewed (as in Table A4.1) as well as item non-response conditional on being interviewed.

Appendix 5: Individual Items in Work-Life Stress Index

Table A5: Impact on Quality of Life and Work-Life Balance among Interested Firms

	Not Satisfied with Life	Not Satisfied with Work	Work is Frequently Stressful	Work Stressful Most days	Tired Most Days	Upset in Last Week	Lack time Most Days	Frequently No Time for Family	Work-Life Stress Index
PANEL A: IMPACT AT 6 MONTH FOLLOW-UP									
ITT: Assigned to Treatment	-0.013 (0.013)	-0.015 (0.014)	-0.011 (0.025)	0.008 (0.019)	-0.046 (0.029)	-0.082* (0.047)	-0.053* (0.030)	-0.058* (0.029)	-0.037*** (0.009)
LATE: Used Agruppa in Last Week	-0.046 (0.044)	-0.052 (0.051)	-0.039 (0.085)	0.027 (0.064)	-0.162 (0.102)	-0.281* (0.163)	-0.184* (0.107)	-0.202* (0.103)	-0.130*** (0.034)
Control Mean	0.108	0.095	0.256	0.147	0.261	0.584	0.258	0.398	0.263
Sample Size	851	851	847	847	846	770	770	844	851
PANEL B: IMPACT AT 12 MONTH FOLLOW-UP									
ITT: Assigned to Treatment	-0.006 (0.019)	0.025 (0.029)	-0.011 (0.028)	0.019 (0.026)	-0.022 (0.031)	0.001 (0.036)	-0.061** (0.029)	-0.029 (0.029)	-0.014 (0.017)
LATE: Used Agruppa in Last Week	-0.033 (0.109)	0.141 (0.165)	-0.063 (0.159)	0.107 (0.151)	-0.129 (0.172)	0.004 (0.203)	-0.338** (0.156)	-0.168 (0.168)	-0.082 (0.096)
Mean	0.126	0.138	0.259	0.198	0.316	0.375	0.344	0.399	0.269
Sample Size	831	830	830	828	828	762	762	827	831

Notes:

Regressions control for baseline value of outcome variable and for randomization pair.

Robust standard errors in parentheses, clustered at the block level. *, **, *** denote significance at the 10, 5, and 1 percent levels.

All outcomes are binary variables, except work-life stress index, which is the average index of the first eight columns.

Quality of life and work-life balance questions were not asked in the short-term high-frequency surveys.

Appendix 6: ITT and LATE Impacts on Prices and Mark-ups

Table A6: Impact on Prices and Mark-ups on Core Agruppa Products

	Onions			Potatoes			Plantains			Tomatoes			Spring Onions		
	Buy Price	Sell Price	Mark-up	Buy Price	Sell Price	Mark-up	Buy Price	Sell Price	Mark-up	Buy Price	Sell Price	Mark-up	Buy Price	Sell Price	Mark-up
PANEL A: AVERAGE IMPACT OVER ALL ROUNDS															
ITT	-0.079*** (0.019)	-0.026*** (0.009)	0.043*** (0.016)	-0.055*** (0.008)	-0.032*** (0.008)	0.025*** (0.009)	-0.050*** (0.007)	-0.027*** (0.008)	0.012 (0.009)	-0.039*** (0.007)	-0.013* (0.007)	0.025*** (0.007)	-0.060*** (0.010)	-0.012 (0.009)	0.045*** (0.008)
LATE	-0.225*** (0.060)	-0.082*** (0.028)	0.120** (0.046)	-0.155*** (0.028)	-0.099*** (0.026)	0.071*** (0.026)	-0.145*** (0.025)	-0.087*** (0.026)	0.033 (0.027)	-0.134*** (0.030)	-0.047* (0.027)	0.087*** (0.027)	-0.175*** (0.035)	-0.038 (0.028)	0.129*** (0.026)
Control Mean	7.165	7.616	0.502	6.724	7.143	0.454	7.356	7.813	0.439	4.736	5.702	0.280	7.484	7.795	0.370
Sample Size	3945	5916	3933	2260	3395	2255	3377	4822	3370	3061	4118	3056	3953	5823	3941
PANEL B: SHORT-TERM IMPACT OVER WEEKS 2, 4 and 6															
ITT	-0.095*** (0.022)	-0.017 (0.013)	0.078*** (0.017)	-0.063*** (0.011)	-0.046*** (0.011)	0.021 (0.014)	-0.053*** (0.010)	-0.025** (0.009)	0.013 (0.011)	-0.072*** (0.019)	-0.036** (0.015)	0.029* (0.017)	-0.077*** (0.015)	-0.023* (0.012)	0.043** (0.016)
LATE	-0.234*** (0.063)	-0.047 (0.034)	0.188*** (0.047)	-0.152*** (0.034)	-0.127*** (0.030)	0.051 (0.037)	-0.133*** (0.027)	-0.073** (0.028)	0.032 (0.029)	-0.193*** (0.054)	-0.111** (0.044)	0.077* (0.045)	-0.186*** (0.037)	-0.063* (0.032)	0.103*** (0.038)
Control Mean	7.221	7.616	0.484	6.973	7.291	0.415	7.604	7.933	0.355	7.435	7.823	0.440	7.498	7.799	0.395
Sample Size	1662	2621	1654	993	1593	990	1319	2100	1314	933	1495	929	1622	2576	1616
PANEL C: MEDIUM-TERM IMPACT OVER WEEKS 10, 14, and 26															
ITT	-0.067** (0.026)	-0.033*** (0.010)	0.020 (0.022)	-0.043*** (0.012)	-0.018* (0.009)	0.027** (0.013)	-0.055*** (0.009)	-0.033*** (0.012)	0.011 (0.013)	-0.060*** (0.016)	0.003 (0.013)	0.059*** (0.018)	-0.058*** (0.016)	-0.007 (0.012)	0.059*** (0.013)
LATE	-0.186** (0.080)	-0.106*** (0.036)	0.054 (0.063)	-0.132*** (0.040)	-0.060* (0.031)	0.083** (0.038)	-0.154*** (0.029)	-0.105*** (0.039)	0.030 (0.037)	-0.171*** (0.051)	0.012 (0.044)	0.168*** (0.055)	-0.167*** (0.048)	-0.024 (0.039)	0.166*** (0.039)
Control Mean	6.944	7.518	0.572	6.536	7.033	0.493	7.283	7.778	0.470	7.407	7.836	0.439	7.337	7.700	0.376
Sample Size	1613	2497	1609	999	1517	997	1418	2048	1416	994	1498	993	1627	2461	1621
PANEL D: ONE-YEAR IMPACT															
ITT	-0.075*** (0.017)	-0.030* (0.016)	0.026 (0.021)	-0.049*** (0.017)	-0.026* (0.015)	0.012 (0.014)	-0.043*** (0.012)	-0.018 (0.021)	0.021 (0.024)	n.a.	n.a.	n.a.	-0.029 (0.018)	-0.005 (0.012)	0.013 (0.013)
LATE	-0.388*** (0.103)	-0.160* (0.088)	0.136 (0.107)	-0.179** (0.074)	-0.101 (0.062)	0.044 (0.053)	-0.230*** (0.079)	-0.096 (0.112)	0.110 (0.130)	n.a.	n.a.	n.a.	-0.166 (0.112)	-0.027 (0.065)	0.072 (0.078)
Control Mean	7.558	7.936	0.383	6.469	6.931	0.459	6.991	7.542	0.551				7.783	8.082	0.300
Sample Size	659	792	659	250	269	250	630	667	630				694	780	694

Notes:

All regressions control for baseline value of the outcome variable, randomization pair, survey round fixed effects, and daily fixed effects.

Robust standard errors in parentheses, clustered at the block level. *, **, and *** denote significance at the 10, 5, and 1 percent levels respectively.

All prices are expressed in log Colombian pesos per kilogram, and are for a specific variety and size, n.a. denotes not available.

Fewer observations are available for buy prices than sell prices, since sell prices can be observed in many cases when owner does not record or report their buying price.

Mark-up is the difference between the log of the input purchase price and the sale price.

Appendix 7: Impact on Quality

In the six month and twelve month surveys, our enumerators examined the produce being sold for quality, rating it in four dimensions observable to customers: whether the produce was firm or soft to the touch, whether it has the right color or is over- or under-ripe or spotty, whether the produce is faulty in any way, and whether the shape is regular or misshapen. We use these four measures to form a score from 0 (all of these defects exist) to 4 (none of these defects exist) for each of the core Agruppa products. Table A7 shows the resulting ITT impacts. We see no significant impact on product quality for four out of five products, and a small, but statistically significant, improvement in plantain quality.

Table A7: Impact on Produce Quality

	Onions	Plantains	Potatoes	Tomatoes	Spring Onion
Offered Agruppa	-0.003 (0.035)	0.097** (0.046)	-0.071 (0.046)	-0.066 (0.075)	-0.035 (0.030)
Mean	3.882	3.778	3.881	3.849	3.831
Sample Size	1558	1316	679	441	1537

Notes:

ITT impacts shown, pooling together six and twelve month surveys. Quality was not measured in high-frequency short-term follow-up surveys.

Regressions control for survey round, randomization pair, and daily fixed effects.

Robust standard errors clustered at the block level in parentheses.

*, **, *** denote significance at the 10, 5, and 1 percent levels respectively.

Appendix 8: Impact on Quantities

Table A8: ITT Impacts on Log Quantities

	Onions	Potatoes	Plantains	Tomatoes	Spring Onions
Panel A: Pooled over all rounds					
Offered Agruppa	-0.017 (0.042)	0.050 (0.058)	0.113** (0.045)	0.011 (0.031)	0.024 (0.043)
Mean	2.913	4.732	3.674	2.308	2.776
Sample Size	4326	2439	3547	3248	4290
Panel B: Short-term (weeks 2, 4, 6)					
Offered Agruppa	-0.031 (0.058)	0.044 (0.088)	0.174** (0.067)	0.037 (0.064)	0.022 (0.072)
Mean	3.499	5.257	4.303	3.905	3.359
Sample Size	1850	1105	1467	1034	1809

Notes: Quantities are measured in kilograms and are for daily sales.

All regression control for baseline mean, randomization pair, survey round fixed effects, and daily fixed effects.

Robust standard errors in parentheses, clustered at the block level.

*, **, and *** denote significance at the 10, 5, and 1 percent levels respectively.