

Discussion of

# Business Training and Spatial Competition in Urban Uganda

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October 2022

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# What are the indirect effects of small business training?

- Many interventions aimed at small businesses in developing countries improve outcomes among recipients

Important question.

One of the first studies to look at spillover (when originally implemented).

Original Design: randomise intensity at the ward level.

Turns out this doesn't work well: ward doesn't capture relevant spillover

—> (must be a common problem)

Solution: market access from trade/urban.

Main comments: this is a special case of richer network interactions.

(1) Is the modelling correct?

(2) is there additional variation in the data that could be used to inform the answer?

+ some quibbling with results.

## What are the indirect effects of small business training?

- Many interventions aimed at small businesses in developing countries improve outcomes among recipients
- Recently, more interest in understanding how business growth affects other market participants
  - ▶ Some channels positive (e.g. knowledge diffusion, increased demand) and others negative (e.g. business stealing)
  - ▶ What is the spatial incidence of these effects? Limited evidence so far is from segregated markets

## What are the indirect effects of small business training?

- Many interventions aimed at small businesses in developing countries improve outcomes among recipients
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  - ▶ What is the spatial incidence of these effects? Limited evidence so far is from segregated markets
- **What are the indirect effects of business training?**
  - ▶ Key for policy questions regarding aggregate impact in many market contexts

## This paper

- We experimentally evaluate direct and indirect effects of business training
- Intervention: classroom training and individual coaching and mentoring for women-owned SMEs in central Uganda
- Design aimed at power for capturing indirect effects
  - ▶ Saturation design with 134 urban neighborhood clusters and  $\sim 1,300$  firms
  - ▶ 9 rounds of detailed follow-up surveys over 4 years
- Our approach: combine tools from spatial literature with experimental variation to understand geographic exposure in an urban setting

# Findings

- Positive effects of program on participants
  - ▶ Persistent improvement in practices, finances, and other outcomes

C2: could provide a bit more evidence?

Training last 16 months, data available for 4 years. Estimates reported average over the whole period. Estimates could mask larger effects during training (or immediately after) and limited effects in the long run.

C3: it seems the data would also allow to look at dynamics.

One would imagine spillover would take time to materialise. This would play out “in reverse” from comment above.

# Findings

- Positive effects of program on participants
  - ▶ Persistent improvement in practices, finances, and other outcomes
- Both positive and negative indirect effects on nearby firms
  - ▶ Little diffusion of business practices
  - ▶ Positive demand agglomeration
  - ▶ Negative competitive pressures

C4: it is likely key to get the modelling right here.  
(more comments below!)

# Findings

- Positive effects of program on participants
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- Both positive and negative indirect effects on nearby firms
  - ▶ Little diffusion of business practices
  - ▶ Positive demand agglomeration
  - ▶ Negative competitive pressures
- Indirect exposure depends on distance and demand elasticity
  - ▶ Indirect effects are very localized in this setting

... I suspect this comes from the pattern of results when considering different " $\sigma$ " ...  
C5: but if spillover are very localised, should we adopt a framework that more explicitly takes into account underlying network and strategic interactions?



## Related literature

- Firm training, mentoring, & consulting, reviewed in McKenzie et al. (2021)
  - ▶ Our direct effect sizes are consistent with the literature
- Indirect effects of interventions with firms
  - ▶ Through networks: Cai & Szeidl (2018) and Hardy & McCasland (2021)
  - ▶ Within sector: Rotemberg (2019) on subsidies
  - ▶ Geographic exposure: Cai & Szeidl (2022) on credit, McKenzie & Puerto (2021) on business training
  - ▶ This paper: spatial dimension in urban setting without segregated markets
- Bring experimental variation to classic IO and geography literatures on agglomeration vs. competition forces driving firm location

# Intervention and Experimental Design

# Women Mean Business program implementation

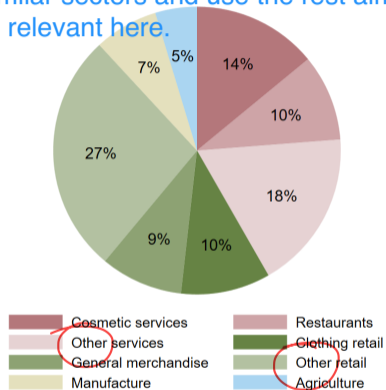
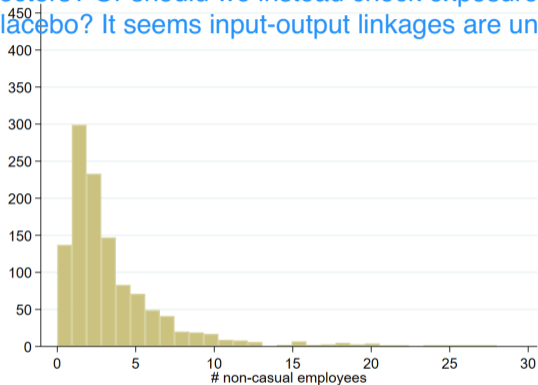
- Women Mean Business (WMB) program run by Technoserve
  - ▶ Medium intensity program targeting mid-size firms relative to literature
  - ▶ Program had classroom (finances, customer care, marketing) and personalized components (business plan development, mentoring) over 16 month period
  - ▶ Open to established women-owned SMEs of any type in central Uganda
- Broad-based recruiting for scale-up and high frequency data
  - ▶ Started with SME census in commercial areas of four cities
  - ▶ Recruitment visits to ~ 5k likely eligible businesses plus blast advertising
  - ▶ Baseline survey with experimental sample of 1,297 eligible applicants and 9 follow-ups surveys over 4 years

We need more detail here.  
How do you go from census, to 5000 then to 1000 sample?

With your definition of treatment intensity, these firms do not play a role. But in practice (i.e., with other models) they will. This needs to be discussed. (You could still use this information, see below)

# Sample firms are SMEs in consumer-facing retail and services

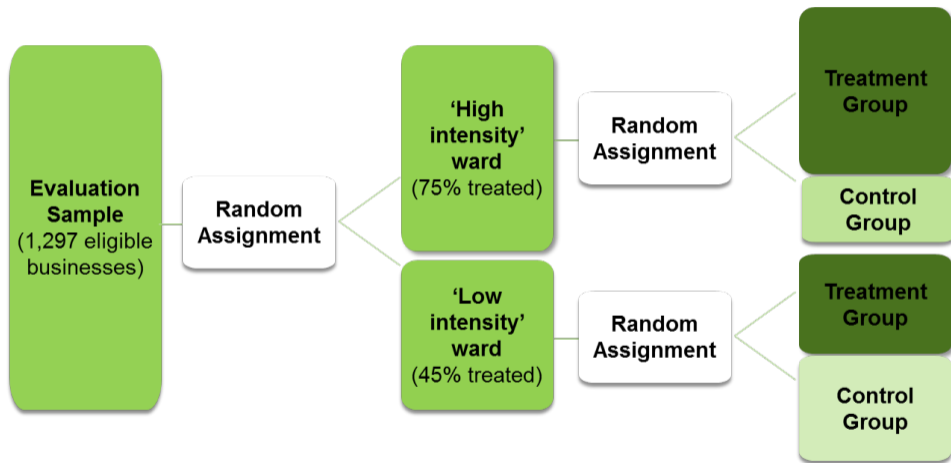
C7: there is huge heterogeneity in the sectoral composition. Do we really expect spillover across sectors? Or should we instead check exposure within similar sectors and use the rest almost as a placebo? It seems input-output linkages are unlikely to be relevant here.



## SUMMARY STATS AND BALANCE

Do you need/want to explore balance w.r.t. expected exposure?  
(Also: seems randomisation at ward level didn't work super well?)

# Experimental design



# Takeup & participation

C6: In a strategic environment, take-up would respond to the likely intensity of spillover ...

	(1) All treated	(2) High intensity ward No	(3) High intensity ward Yes	(4) Higher education No	(5) Higher education Yes
Participated in $\geq 1$ activity (=1)	0.66 (0.02)	0.67 (0.03)	0.66 (0.02)	0.60 (0.02)	0.81*** (0.02)
Attended $\geq 1$ class (=1)	0.63 (0.02)	0.63 (0.03)	0.64 (0.02)	0.58 (0.03)	0.78*** (0.02)
# of classes attended (cond.)	4.98 (0.09)	4.82 (0.16)	5.07 (0.12)	4.74 (0.15)	5.23** (0.12)
Ever met with coach (=1)	0.62 (0.02)	0.63 (0.03)	0.61 (0.02)	0.54 (0.03)	0.71*** (0.03)
# of times that met with coach (cond.)	4.93 (0.11)	4.80 (0.19)	5.00 (0.14)	4.77 (0.17)	5.11 (0.16)
Received business plan from coach (=1; cond.)	0.88 (0.02)	0.85 (0.03)	0.89 (0.02)	0.86 (0.03)	0.90 (0.02)
Ever met with mentor (=1)	0.51 (0.02)	0.50 (0.03)	0.51 (0.03)	0.45 (0.03)	0.59*** (0.03)
# of times that met with mentor (cond.)	4.05 (0.14)	3.91 (0.26)	4.13 (0.16)	3.85 (0.17)	4.24 (0.21)
Observations	810	288	522	384	358

Ideally you would also check with your exposure measure.

One could imagine an exercise in which a structural model is used to estimate both the extent of spillover but also the costs of take-up and how the two are connected. (See later).

# Empirical Strategy and Results

## Ward saturation is an imprecise exposure measure

- Design intended to vary geographic exposure, but ward-level saturation is a very imprecise measure of actual exposure in our setting
  - ▶ Within ward, variation due to individual random assignment
  - ▶ Across ward, variation due to urban setting – no segregated markets MAP
  - ▶ Wards are heterogeneous in terms of size and business density MAP



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  - ▶ Wards are heterogeneous in terms of size and business density MAP
- Challenging but extremely relevant setting for interventions targeted at firms in developing countries!

Agree. In hindsight, what would you recommend to do?

Is it enough to get geolocation and then do mkt access approach?

Or would have you wanted to better understand network structure at baseline? What are pros and cons?

## Use spatial variation to get better exposure measures

- We expect **demand-side forces** to be major source of indirect effects. These will depend on:
  - ▶ Firm locations *If this is the case, then take-up should depend on exposure. Particularly so if those are localised.*
  - ▶ Consumers' cost of distance to get between firms
  - ▶ Perceived substitutability of firms

for example, consider a differentiated Bertrand duopoly ...

$$\Pi(P_i, P_j; \gamma, A_i) - \Gamma(A_i) \rightarrow \frac{\partial \Pi}{\partial A_i} + \frac{\partial \Pi}{\partial p_i} \cdot \frac{\partial p_i}{\partial A_i} + \frac{\partial \Pi}{\partial p_j} \cdot \frac{\partial p_j}{\partial A_i} = \Gamma'(A_i)$$

*>0*      =0      Strategic effect      Marginal cost of effort (Take-up)

Tightly connected to RF estimates      Seems like you can learn about this!!      Take up / effort is observed

## Use spatial variation to get better exposure measures

- We expect demand-side forces to be major source of indirect effects. These will depend on:
  - ▶ Firm locations
  - ▶ Consumers' cost of distance to get between firms
  - ▶ Perceived substitutability of firms
- Exploit firm location data to create a continuous, distance-weighted measure of individual exposure:

$$E_i = \sum_j \frac{T_j}{d_{ij}^\sigma}$$

Would be natural to let the summation be over firms within the same sector?

Exposure thus depends only on the number and location of treated firms. With indirect network effects, that is no longer true.

- Captures idea that improvements in closer neighbors matter more

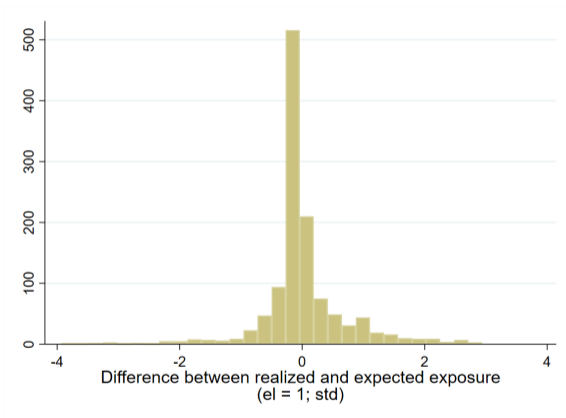
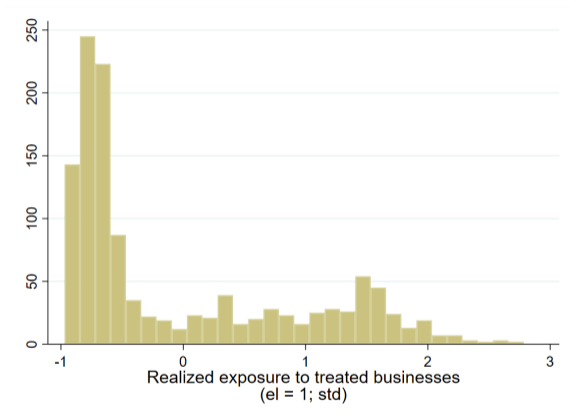
Please elaborate on model you have in mind!

You have done a census, contacted 5000 firms, then included 1000 in the sample. It seems this could be tested.

## Account for non-random aspects of variation in spatial exposure

- Treatment is randomly assigned, but distance weighting is not → depends on business location and neighborhood density
- We use Borusyak & Hull (2021) method to control for “expected treatment”  $\mu_i$ 
  - ▶ In practice, we estimate  $\mu_i$  through a rerandomization routine
  - ▶ Saturation design leads to greater deviations from  $\mu_i$  than under individual-level randomization alone
  - ▶ Identification comes from differences between expected and realized random exposure to treated businesses

# Identification from expected vs. realized random exposure



## New specification captures spatial aspect of indirect effects

Could try  $E_i$  defined over same sector and run an horse race

$$y_{it} = \alpha + \beta_1 T_i + \beta_2 E_i + \beta_3 \mu_i + \gamma_1 y_{i0} + pair_i + survey_t + \epsilon_{it}$$

- $y_{it}$  is outcome,  $T_i$  is assignment to treatment,  $pair_i$  are ward randomization pair FE and  $survey_t$  are survey round FE
- $\beta_1$  is direct effect and  $\beta_2$  indirect effect
- Choice about distance elasticity  $\sigma$ 
  - ▶ First show one value as an example, then explore range

If  $E_i$  correlated with take-up, one could look at interactions between  $E_i$  and  $T_i$

# WMB exposure effects: Business practices

Exposure calculated with elasticity  $\sigma = 2.5$

	(1) <b>Business practices: std index (cols 2-9)</b>	(2) Record keeping: std index	(3) Business planning: std index	(4) Use of financial services: std index	(5) Supply management: std index	(6) Monthly advert. expenses (PPP USD)	(7) Customer care: std index	(8) HR training: # new methods	(9) Formality: std index
Treatment	0.51*** (0.04)	0.21*** (0.04) [0.001]	1.06*** (0.05) [0.001]	0.04 (0.04) [0.420]	0.17*** (0.05) [0.002]	0.76* (0.41) [0.134]	0.20*** (0.05) [0.001]	0.01 (0.03) [0.781]	0.10 (0.07) [0.258]
Exposure to treated businesses	0.00 (0.02)	0.02*** (0.01) [0.013]	-0.03 (0.03) [0.381]	0.04** (0.02) [0.089]	-0.03 (0.03) [0.420]	-0.39** (0.17) [0.062]	0.01 (0.04) [0.807]	-0.04 (0.04) [0.465]	-0.00 (0.02) [0.807]
Expected exposure	-0.01 (0.02)	-0.00 (0.01)	-0.01 (0.02)	0.00 (0.01)	0.00 (0.02)	0.03 (0.05)	-0.01 (0.03)	0.02 (0.03)	-0.01 (0.01)
Observations	9,575	9,575	7,435	5,312	6,354	6,326	9,574	3,075	1,042
Unique businesses	1,157	1,157	1,157	1,146	1,141	1,149	1,157	1,074	1,042
Follow-up mean (C-LI)	0.00	-0.22	-0.03	0.36	0.13	4.50	0.40	0.47	-0.35
Follow-up SD (C-LI)	1.27	0.96	1.11	1.12	1.53	12.70	1.47	0.64	0.98

# WMB exposure effects: Financial outcomes

Exposure calculated with elasticity  $\sigma = 2.5$

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Financial outcomes: std index (cols 2-7)	Business in operation (=1)	Monthly revenue (PPP USD)	Monthly profit (PPP USD)	Monthly take home (PPP USD)	Business grew since 2013 (=1)	Business more profitable since 2013 (=1)
Treatment	0.10** (0.04)	0.01 (0.01) [0.255]	812.21** (405.73) [0.134]	114.63* (62.05) [0.135]	35.48* (18.37) [0.134]	0.07** (0.03) [0.134]	0.08** (0.03) [0.127]
Exposure to treated businesses	0.02** (0.01)	0.00 (0.00) [0.436]	281.80** (120.59) [0.127]	16.01 (20.45) [0.475]	1.16 (7.11) [0.872]	-0.01* (0.01) [0.170]	-0.01 (0.01) [0.273]
Expected exposure	0.01 (0.01)	0.00** (0.00)	37.51 (140.74)	4.60 (18.97)	-1.19 (5.94)	0.04*** (0.01)	0.04*** (0.01)
Observations	17,012	5,307	16,583	16,260	14,110	1,044	1,044
Unique businesses	1,155	1,123	1,151	1,151	1,149	1,044	1,044
Follow-up mean (C-LI)	-0.15	0.94	4,713.94	916.61	395.78	0.57	0.54
Follow-up SD (C-LI)	0.89	0.24	7,412.51	1,345.34	394.93	0.50	0.50



# WMB exposure effects: Production inputs

Exposure calculated with elasticity  $\sigma = 2.5$

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total expenses last month (PPP USD; cols 2-5)	Stock expenses last month (PPP USD)	Employee expenses last month (PPP USD)	Equipment expenses last month (PPP USD)	Other expenses last month (PPP USD)	# non-casual employees	Property replacement value (PPP USD)
Treatment	507.22** (254.56)	311.29 (216.25) [0.262]	33.24 (21.92) [0.262]	2.22 (2.28) [0.442]	129.48*** (42.33) [0.033]	0.40** (0.20) [0.195]	5,168.83* (2,982.70) [0.206]
Exposure to treated businesses	59.82 (49.89)	72.81** (33.80) [0.195]	-2.22 (9.89) [0.898]	-0.95* (0.51) [0.196]	-1.34 (14.16) [0.925]	-0.11 (0.10) [0.394]	997.34 (2,764.75) [0.863]
Expected exposure	46.31 (45.86)	24.39 (30.21)	10.20 (8.46)	-0.67 (0.54)	16.17 (19.08)	0.21** (0.10)	1,072.81 (1,669.74)
Observations	9,420	9,420	9,420	9,420	9,420	8,528	991
Unique businesses	1,239	1,239	1,239	1,239	1,239	1,155	991
Follow-up mean (C-LI)	2,708.45	1,681.01	369.68	19.38	638.38	2.84	23,103.30
Follow-up SD (C-LI)	4,391.64	3,671.40	663.55	118.03	910.23	4.62	43,467.59

# WMB exposure effects: Business operations

Exposure calculated with elasticity  $\sigma = 2.5$

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	# daily customers	Weighted price index (log)	Weighted avg markup (log)	Weighted unit cost index (log)	Total units sold (log)	Introduced product in last 3m (=1)	Stopped offering product in last 3m (=1)
Treatment	2.45 (1.60) [0.300]	0.03 (0.05) [0.770]	0.01 (0.02) [0.770]	0.02 (0.06) [0.892]	0.11 (0.08) [0.331]	0.00 (0.01) [0.958]	0.00 (0.01) [0.892]
Exposure to treated businesses	0.54* (0.30) [0.208]	-0.04* (0.02) [0.208]	-0.02*** (0.01) [0.022]	-0.04*** (0.02) [0.022]	0.08*** (0.02) [0.001]	-0.01 (0.01) [0.712]	0.00 (0.00) [0.958]
Expected exposure	0.00 (0.16)	-0.02 (0.03)	0.02 (0.01)	-0.00 (0.02)	0.02 (0.02)	0.01 (0.01)	-0.00 (0.00)
Observations	9,520	7,998	7,986	7,985	7,998	9,574	9,574
Unique businesses	1,155	1,143	1,143	1,143	1,143	1,157	1,157
Follow-up mean (C-LI)	16.56	9.59	0.63	8.99	5.84	0.28	0.08
Follow-up SD (C-LI)	33.23	1.85	0.55	1.83	1.90	0.45	0.28

## Interpreting direct and indirect effects

- WMB program improved practices and financial outcomes of recipients, **effects persistent** → strong first stage
- Not shown*

## Interpreting direct and indirect effects

- WMB program improved practices and financial outcomes of recipients, effects persistent → strong first stage
- Indirect effects operating through multiple mechanism
  - ▶ Little evidence of transmission of practices/knowledge **Agreed!!**
  - ▶ **Demand agglomeration**: increase in customers, quantities and stocks, revenues
  - ▶ **Competitive pressures**: lower prices and markups, some evidence of cost cutting

### Not fully persuaded

Given results, I would focus on a simple mechanisms in which treated firms can invest in A at a cost (take-up) and expands, and this leads other firms to scale down / expand less.

You can clearly ignore spillover through management (which would be a confounder)

And I'm not sure the data really support the agglomeration part. So, for simplicity, maybe ignore it?

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- On net, no apparent indirect effect on profits
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- On net, no apparent indirect effect on profits
  - ▶ Indirectly affected firms get a (relatively) smaller slice of a bigger pie
- Using only ward-level randomized saturation as measure of indirect exposure fails to capture these patterns **RESULTS**

## How local are indirect effects?

- Choice of  $\sigma$  matters for both level and precision of estimates
  - ▶ A higher distance elasticity assigns greater weights to very local exposure
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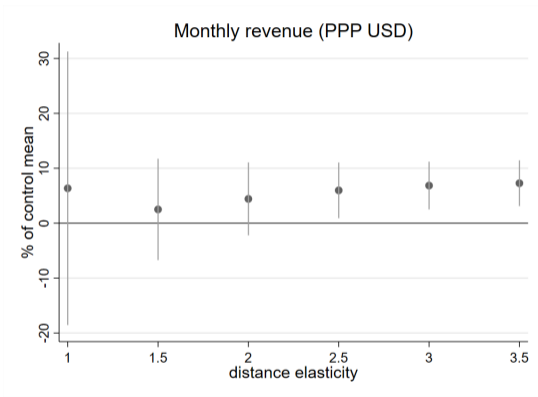
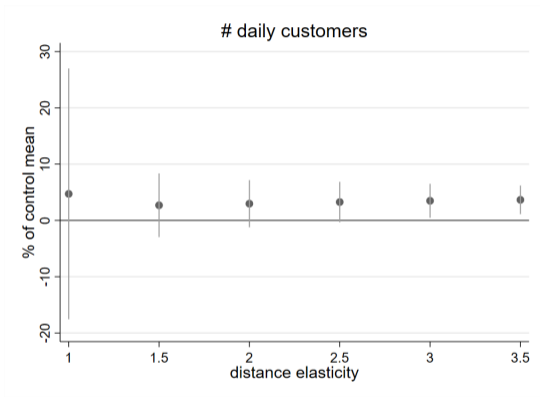
## How local are indirect effects?

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  - ▶ But captures variation from a smaller set of businesses
- For now, we are agnostic about the “correct” elasticity and instead explore how different values affect our conclusions
- (In progress: plugging experiment into a framework that lets us interpret  $\sigma$  and estimate an internally consistent value)

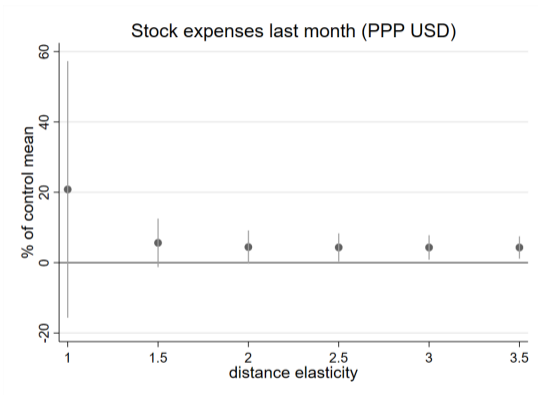
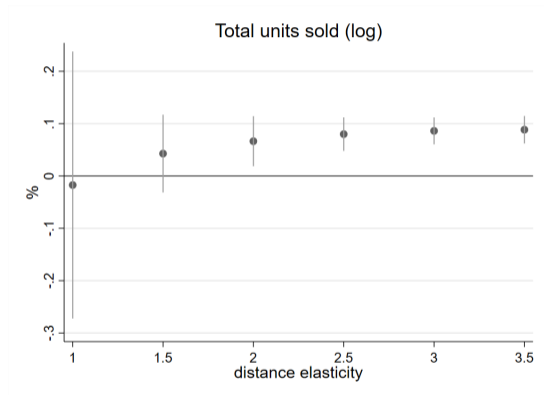
Because of the inclusion of  $\sigma=1$ , the figures are not super easy to read.

Are you showing results are robust? But then, how does this square with your view that effects are localised? If they are, then isn't a network model (possibly with strategic interaction) a better depiction than a “market access” one?

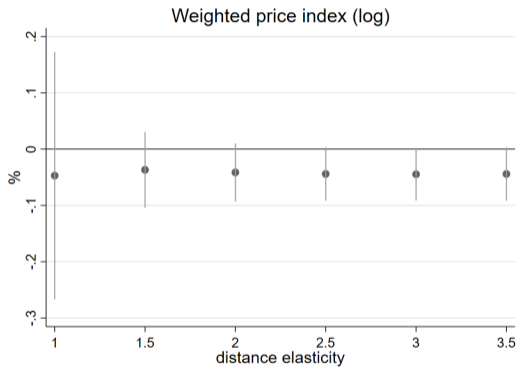
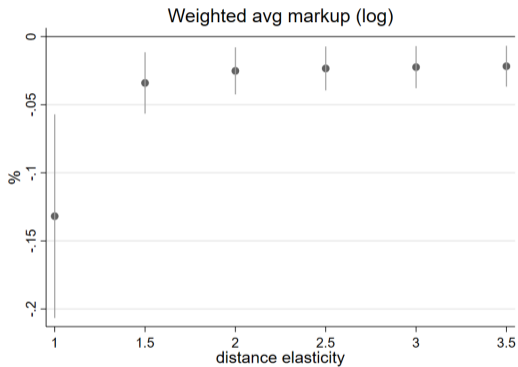
# Exposure to treatment generates positive demand spillovers...



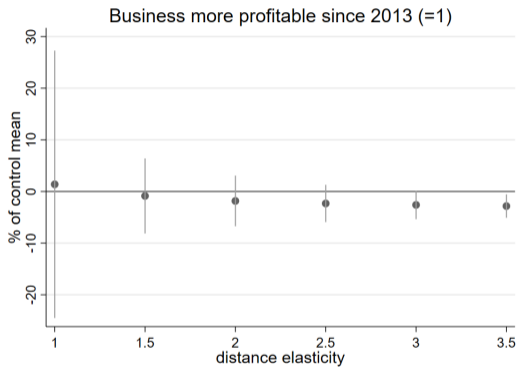
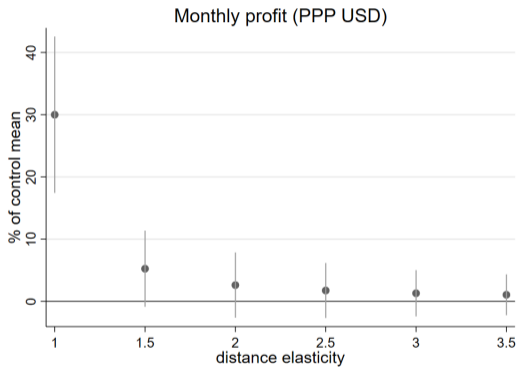
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# ...but also competitive pressure



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## Next Steps and Conclusion

## Next steps

- Are indirect effects driven by exposure to **same-** or **other-sector** neighbors?
- Heterogeneity by baseline agglomeration across sectors – are **positive demand spillovers** larger in some sectors?
- Plug into **simple modeling frame** work to:
  1. Estimate and interpret internally consistent distance elasticity
  2. Bound aggregate implications from policymaker perspective

I think this is a very good idea!



Meh...



This is quite key.



I am not sure the mkt access one is the most compelling  
(And it seems to throw away a lot of info)

## Conclusion

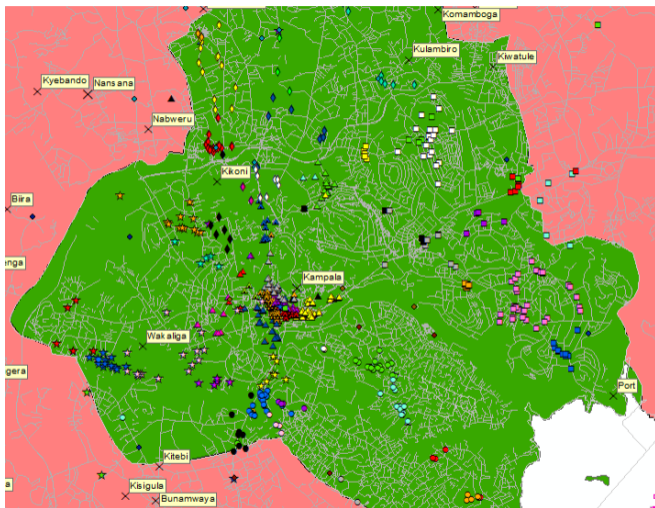
- Training was good for participating SMEs, but policy makers need to know what that does to the whole market
- We bring experimental variation to old questions about spatial agglomeration and competition, in a setting with complex geography
- Evidence of both agglomeration and competition in the effects on indirectly exposed firms
- Both forces operate on a very local basis in this urban retail setting
- Right specification is key to measurement



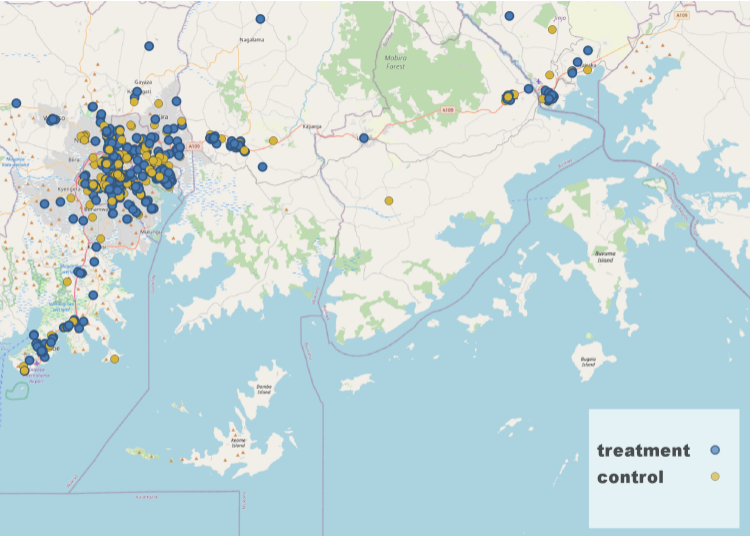
# Summary statistics and balance

	(1)	(2)	(3)	(4)
	Business treatment status		Ward-level intensity	
	Control	Treat - Control	Low	High - Low
Completed higher education (=1)	0.47	0.00 (0.02)	0.49	-0.03 (0.05)
Household assets (std index)	-0.00	0.00 (0.06)	0.02	-0.06 (0.06)
Business age in 2012 (years)	7.30	0.56* (0.33)	7.14	1.07*** (0.26)
Monthly revenue (PPP USD)	5,773.30	560.98 (445.94)	6,007.74	61.92 (497.72)
Monthly profit (PPP USD)	1,117.99	74.84 (110.21)	1,167.28	-26.79 (68.03)
# bus. branches	1.16	0.01 (0.04)	1.18	-0.04* (0.02)
# non-casual employees	4.27	-0.62 (0.70)	4.26	-0.57 (0.46)
Keeps records (=1)	0.83	-0.03 (0.02)	0.81	-0.00 (0.02)
Applied for a loan in last year (=1)	0.29	0.02 (0.03)	0.26	0.07*** (0.02)
Observations	482	779	619	642
p-value: multivariate orthogonality test		0.357		0.000

## Firms may be close to firms in other wards



# Sample spread through central Uganda



## WMB effects: Business practices

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<b>Business practices: std index</b>	Record keeping: std index	Business planning: std index	Use of financial services: std index	Supply management: std index	Monthly advert. expenses (PPP USD)	Customer care: std index	HR training: # new methods	Formality: std index
Treat (T)	0.52*** (0.03)	0.21*** (0.03) [0.001]	1.07*** (0.05) [0.001]	0.00 (0.04) [0.978]	0.19*** (0.05) [0.001]	1.34*** (0.35) [0.001]	0.21*** (0.05) [0.001]	0.01 (0.04) [0.855]	0.09 (0.07) [0.338]
High Intensity (HI)	-0.00 (0.05)	0.02 (0.03) [0.551]	-0.03 (0.07) [0.777]	0.13** (0.06) [0.079]	-0.05 (0.04) [0.457]	-1.57** (0.75) [0.088]	-0.03 (0.05) [0.719]	-0.00 (0.04) [0.978]	0.03 (0.04) [0.630]
Observations	9,731	9,731	7,558	5,401	6,456	6,431	9,730	3,117	1,059
Unique businesses	1,180	1,180	1,180	1,169	1,163	1,171	1,180	1,090	1,059
Follow-up mean (C-LI)	-0.01	-0.23	-0.03	0.34	0.12	4.41	0.39	0.47	-0.36
Follow-up SD (C-LI)	1.26	0.96	1.11	1.12	1.52	12.58	1.47	0.64	0.97

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## WMB effects: Financial outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	<b>Financial outcomes: std index</b>	Business in operation (=1)	Monthly revenue (PPP USD)	Monthly profit (PPP USD)	Monthly take home (PPP USD)	Business grew since 2013 (=1)	Business more profitable since 2013 (=1)
Treat (T)	0.10** (0.04)	0.01 (0.01) [0.306]	731.05* (416.47) [0.202]	113.32* (61.18) [0.202]	48.30** (19.39) [0.169]	0.05 (0.04) [0.306]	0.06* (0.04) [0.202]
High Intensity (HI)	0.01 (0.03)	-0.00 (0.01) [0.903]	346.13 (270.80) [0.306]	23.60 (36.56) [0.568]	-27.12* (15.10) [0.202]	0.02 (0.02) [0.330]	0.01 (0.02) [0.568]
Observations	17,289	5,390	16,857	16,530	14,333	1,061	1,061
Unique businesses	1,178	1,143	1,174	1,174	1,172	1,061	1,061
Follow-up mean (C-LI)	-0.16	0.93	4,636.37	903.46	391.59	0.57	0.54
Follow-up SD (C-LI)	0.89	0.25	7,353.36	1,334.33	392.60	0.50	0.50

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## WMB effects: Production inputs

	(1) Total expenses last month (PPP USD)	(2) Stock expenses last month (PPP USD)	(3) Employee expenses last month (PPP USD)	(4) Equipment expenses last month (PPP USD)	(5) Other expenses last month (PPP USD)	(6) # non-casual employees	(7) Property replace- ment value (PPP USD)
Treat (T)	463.80* (250.12)	245.44 (206.72) [0.356]	36.30 (22.88) [0.277]	2.58 (2.46) [0.388]	145.92*** (43.90) [0.014]	0.39* (0.21) [0.223]	4,096.89 (2,984.55) [0.296]
High Intensity (HI)	208.02 (146.78)	267.05* (148.35) [0.223]	-15.19 (15.32) [0.388]	-0.29 (2.87) [0.920]	-35.83 (25.79) [0.296]	-0.03 (0.18) [0.920]	3,431.29* (1,896.14) [0.223]
Observations	9,814	9,814	9,814	9,814	9,814	8,667	1,008
Unique businesses	1,293	1,293	1,293	1,293	1,293	1,178	1,008
Follow-up mean (C-LI)	2,569.45	1,594.35	350.95	18.34	605.81	2.81	22,796.22
Follow-up SD (C-LI)	4,307.16	3,586.10	649.89	114.78	895.07	4.58	43,071.41

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## WMB effects: Business operations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	# daily customers	Weighted price index (log)	Weighted avg markup (log)	Weighted unit cost index (log)	Total units sold (log)	Introduced product in last 3m (=1)	Stopped offering product in last 3m (=1)
Treat (T)	1.86 (1.75) [0.964]	0.05 (0.06) [0.964]	0.02 (0.02) [0.964]	0.03 (0.06) [0.964]	0.12 (0.09) [0.964]	0.00 (0.01) [0.964]	0.00 (0.01) [0.964]
High Intensity (HI)	2.40* (1.26) [0.836]	0.01 (0.07) [0.964]	-0.02 (0.03) [0.964]	0.03 (0.07) [0.964]	-0.03 (0.05) [0.964]	-0.00 (0.02) [0.964]	-0.00 (0.01) [0.964]
Observations	9,674	8,132	8,120	8,119	8,132	9,730	9,730
Unique businesses	1,178	1,166	1,166	1,166	1,166	1,180	1,180
Follow-up mean (C-LI)	16.37	9.58	0.63	8.98	5.82	0.28	0.08
Follow-up SD (C-LI)	32.94	1.85	0.55	1.84	1.90	0.45	0.28

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## Indexes of business practices

Outcome	Components
Record keeping	Keeps records Showed records to surveyor How often records sales and purchases (1-3; higher = more often) Separates personal and business expenses
Financial services	<i>Binary indicators for use of financial services:</i> bill payment, insurance, loans, mobile money, money transfer, saving services
Supply mgmt	Uses/sells imported materials/inputs Negotiated with supplier in last three months How often out of product when requested (1-5; higher = less often) Compared alternative supplier in last three months
Business planning	Has written business plan Has written budget for business
Marketing	Amount spent on advertisement (trimmed)



## Indexes of business practices (cont.)

Outcome	Components
Customer care	Ask customers for feedback Has made changes based on customer feedback <i>Binary indicators for customer care strategies:</i> after sale services, customer relations, discounts/gifts, low prices, new products, good quality, special terms, updates
Human resources	<i>Binary indicators for methods for employee training:</i> formal training, external professional, other employee, respondent, similar business <i>Binary indicators for methods for finding applicants:</i> advertise at business, hire family/friends, advertise at radio/newspapers, advertise at other businesses, recruit from other businesses, referrals, walk-in applicants
Formality	Has trading license Has other sector-specific licenses Has Tax ID Registered in Registry of Companies