

# If She Builds It, They Won't Come: Experimental Evidence of Demand-side Constraints in The Gender Profit Gap

Morgan Hardy

New York University - Abu Dhabi

Gisella Kagy

Vassar College

**December 15, 2017**

- Understanding the barriers to the **economic empowerment of women** is of primary importance (Boserup, 1970)
- Owning a **micro-enterprise** is a **common** and **growing** form of **employment**, particularly **for women**, and particularly in Sub-Saharan Africa. (Campos and Gassier, 2017)
- **Female-owned** micro-enterprises **earn less than male-owned** micro-enterprises. (Enterprise Surveys, 2016)

**Much of the profit gap is still unexplained:** Majority of gender profit gap left unexplained by observables<sup>1</sup> (Nix, Gamberoni and Heath, 2016)

## Supply-side Interventions:

- Lower returns to financial and human capital interventions in female-owned businesses (De Mel, McKenzie and Woodruff, 2008, 2009; Berge, Bjorvatn and Tungodden, 2014)
- Effects of capital interventions lower if woman's spouse also owns micro-enterprise (Bernhardt, Field, Pande and Rigol, 2017)
- Female-owned firms respond more to in-kind capital grants than cash. (Fafchamps et al., 2014)

---

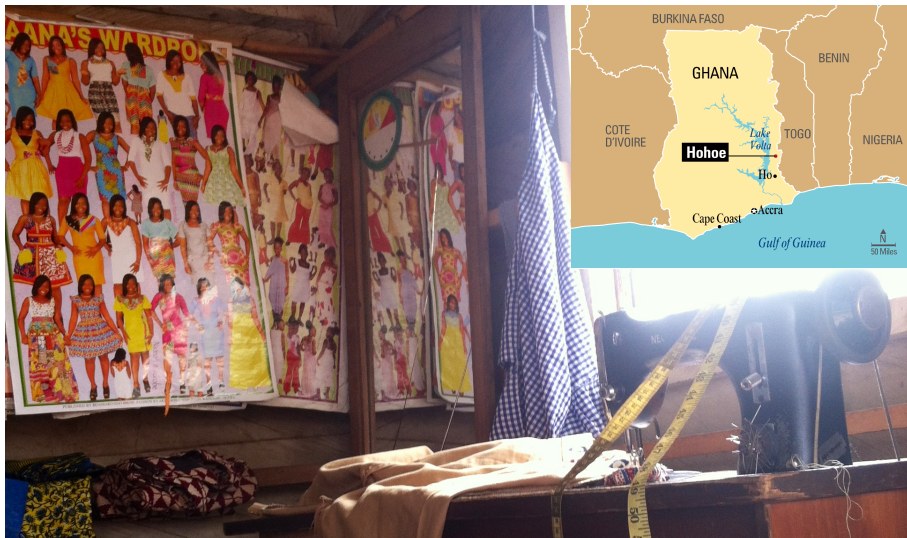
<sup>1</sup>(marital status, experience, education, number of children, hours worked) ▶

# This Paper

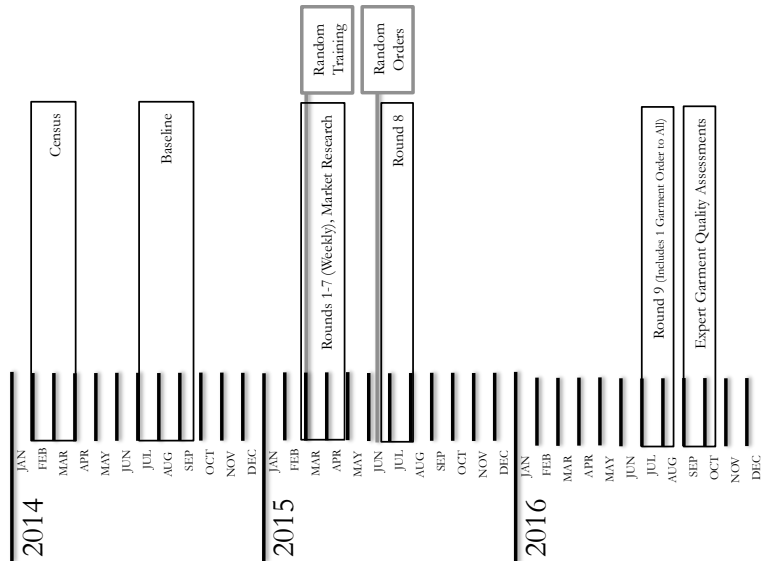
Explores **demand-side constraints** (rather than exclusively supply-side.)

- Our story: **crowding in the market contributes to gender pay gap**
  - Oversupply of female micro-entrepreneurs:
    - Limited formal employment opportunities for women
    - Women are more likely to be necessity entrepreneurs
    - Gender segregation in industry choice
  - This crowding causes:
    - Lower market size to firm ratio
    - Higher demand scarcity for female-owned firms
- We show: **descriptive and experimental evidence using:**
  - A detailed firm-level panel of garment making firms in Hohoe, Ghana
  - A market research survey of Hohoe residents
  - A field experiment involving random demand shocks to firms

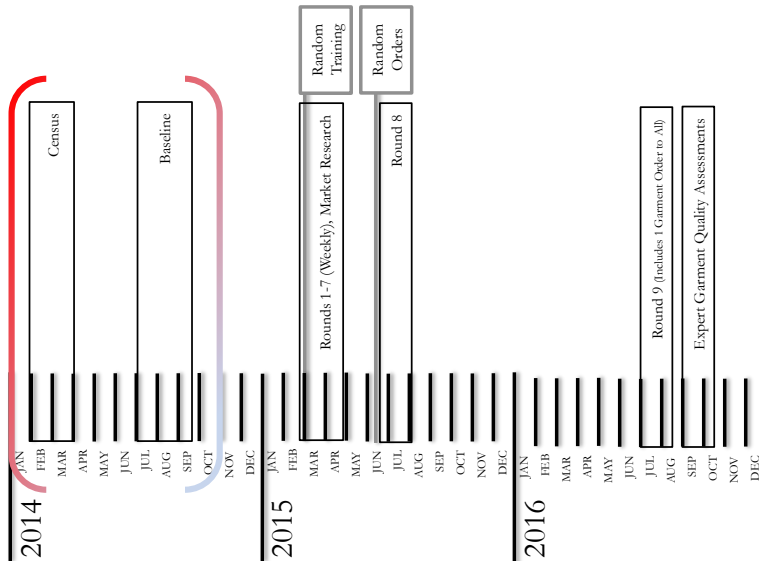
# This Paper - One Industry (Garment Maker Census, Hohoe, Ghana)



# This Paper - Detailed Panel w/Random Demand Shock

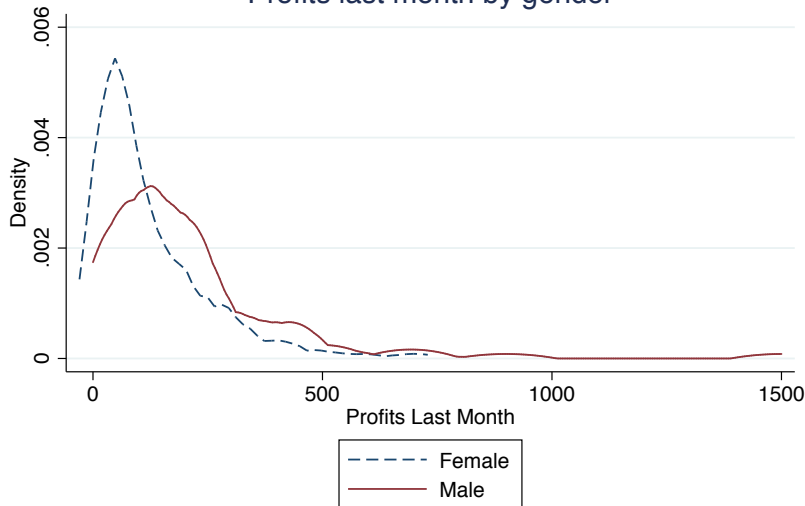


# This Paper - Detailed Panel w/Random Demand Shock



# Baseline Stylized Fact

Profits last month by gender



kernel = epanechnikov, bandwidth = 29.3962



# Observable Characteristics by Gender - Firm

	Men		Women		Difference in Means	T-Stat
	Mean	N	Mean	N		
Panel A: Firm Characteristics						
Profits Last Month (GHC)	216.84	95	114.68	321	102.17	5.84
Sales Last Month (GHC)	308.81	95	163.54	321	145.27	5.92
Profits/Sales	0.7	90	0.69	286	0.01	0.67
Hours Worked Last Week	55.4	95	41.96	321	13.44	6.65
Profits per Hour (GHC)	0.98	89	0.66	299	0.32	3.32
Assets (GHC)	1605.31	95	1098.89	322	506.41	2.62
Firm age	11.45	91	8.91	305	2.54	2.61
Number Paid Workers (excl owner)	0.15	91	0.05	305	0.11	2.79
Number Apprentices	0.43	91	0.76	305	-0.34	-1.95
Unpaid Workers	0.26	91	0.22	304	0.04	0.57
Total Workers	0.85	91	1.03	304	-0.19	-0.96
Number of Garments for customers last month	25.46	95	19.35	322	6.12	2.78
Number of Alterations last month	8.41	86	3.25	290	5.16	5.84
Number of Customers last Month	14.75	91	9.69	286	5.06	4.95
Typical time to make garment	2.19	94	2.38	300	-0.19	-0.94

# Observable Characteristics by Gender - Firm Owner

	Men		Women		Difference in Means	T-Stat
	Mean	N	Mean	N		
Panel B: Firm Owner Characteristics & Garment Quality						
Married or Living with a Partner	0.73	95	0.7	322	0.02	0.46
Age	38.87	91	34.53	305	4.34	3.98
Years of Schooling	8.89	91	8.84	305	0.05	0.18
Children in Household	2.23	95	1.71	322	0.52	3.35
Ravens Score (out of 12)	5.68	95	5.61	322	0.07	0.23
Has another business	0.07	95	0.31	322	-0.24	-4.76
Firm is the primary economic activity	0.94	95	0.89	322	0.05	1.31
Caring for Children - Very Important Reason for Self-Employment	0.23	95	0.42	322	-0.19	-3.41
Potential Future growth - Very Important Reason for Self-Employment	0.62	95	0.53	322	0.09	1.5
Average Garment Quality	6.16	83	4.66	270	1.51	11.35

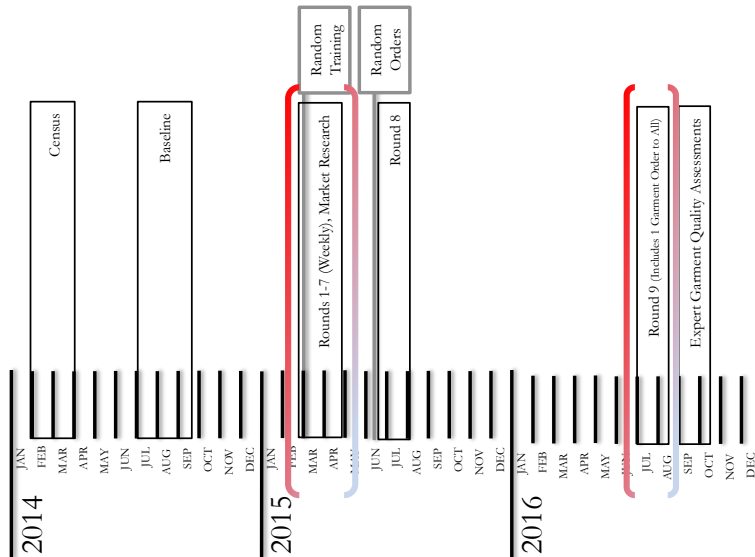
# Controlling for Observables

	(1) Profits (GHC)	(2) Profits (GHC)	(3) Profits (GHC)	(4) Profits (GHC)	(5) Profits (GHC)	(6) Profits (GHC)	(7) Profits (GHC)
<b>Male</b>	<b>102.2***</b> <b>(17.51)</b>	<b>76.77***</b> <b>(17.54)</b>	<b>77.05***</b> <b>(17.38)</b>	<b>85.18***</b> <b>(16.60)</b>	<b>82.15***</b> <b>(17.12)</b>	<b>81.29***</b> <b>(17.41)</b>	<b>82.19***</b> <b>(22.55)</b>
<b>Controls Included in Regression</b>							
Married	NO	YES +	YES +	YES +	YES +	YES +	YES +
Age	NO	YES -	YES -	YES -	YES -	YES -	YES -
Years of School	NO	YES +***	YES +***	YES +***	YES +***	YES +***	YES +***
Number of Children	NO	YES -	YES -	YES -	YES -	YES -	YES -
Owner Hours Last Week	NO	YES +***	YES +***	YES +***	YES +***	YES +***	YES +***
Ravens	NO	NO	YES +***	YES +***	YES +***	YES +***	YES +***
Age of Firm	NO	NO	NO	YES +	YES +	YES +	YES +
Assets	NO	NO	NO	YES +***	YES +***	YES +***	YES +***
Number of Workers	NO	NO	NO	YES +***	YES +***	YES +***	YES +***
Time to Produce Garment	NO	NO	NO	NO	YES +	YES +	YES +
Reason - Child Care	NO	NO	NO	NO	NO	YES -	YES -
Reason - Grwoth Potential	NO	NO	NO	NO	NO	YES +	YES +
Garment Quality	NO	NO	NO	NO	NO	NO	YES -
<b>N</b>	<b>416</b>	<b>396</b>	<b>396</b>	<b>395</b>	<b>373</b>	<b>373</b>	<b>318</b>

# Deconstructing the Profit Gap

$$\Delta\pi_i = (\Delta P_i - \Delta C_i) * \Delta Q_i$$

# Deconstructing the Profit Gap (Data)



# Deconstructing the Profit Gap

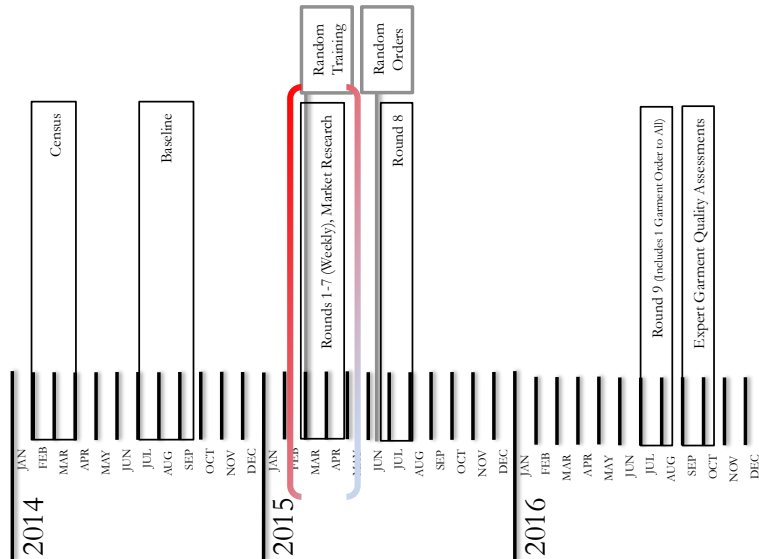
	(1) Number of Orders	(2) Number of Orders	(3) Expenses per Order	(4) Expenses per Order	(5) Price per Order	(6) Price per Order
Male (=1)	32.87*** (5.465)	22.89*** (6.180)	-0.868 (0.564)	-2.044* (1.128)	1.687*** (0.421)	0.988 (0.627)
Covariates Included	NO	YES	NO	YES	NO	YES
Average for Men	72.07		3.77		19.35	
Average for Women	39.2		4.64		17.67	
Gender Profit Ratio when equated	0.84		0.49		0.51	
N	416	317	404	311	363	315

True gender profit ratio: 0.45

# What do we know so far?

- The gender profit gap prevails, even within the same industry
- Supply-side focused observables do not explain the gap in profits
- Quantity of orders drives the profit gap (over price and cost)
- Supply-side focused observables do not explain the gap in quantity

# What About Demand Side Constraints?





# Demand is Gender Segregated

## Market Research Survey

	Female Owned		Male Owned		Diff in	
	Mean	N	Mean	N	Means	T-Stat
=1 if customer female	0.83	761	0.12	489	0.71	34.04
Age of customer	30.75	760	31.85	487	-1.1	-2.01
Customer makes no income	0.19	761	0.2	489	-0.01	-0.26
Customer is salary employee	0.19	761	0.25	489	-0.06	-2.44
Customer is wage employee	0.13	761	0.15	489	-0.02	-1.09
Customer is self employed	0.45	761	0.35	489	0.1	3.47
Customer is farmer or fisherman	0.04	761	0.05	489	-0.01	-0.77

# Lower Market to Firm Size Ratio for Women

## Market Research Survey

	Female Owned		Male Owned		Diff in Means	T-Stat
	Mean	N	Mean	N		
=1 if customer female	0.83	761	0.12	489	0.71	34.04
Age of customer	30.75	760	31.85	487	-1.1	-2.01
Customer makes no income	0.19	761	0.2	489	-0.01	-0.26
Customer is salary employee	0.19	761	0.25	489	-0.06	-2.44
Customer is wage employee	0.13	761	0.15	489	-0.02	-1.09
Customer is self employed	0.45	761	0.35	489	0.1	3.47
Customer is farmer or fisherman	0.04	761	0.05	489	-0.01	-0.77

**Women respondents ordered only .2 more garments in the last year than men.**

# Descriptive Evidence of Demand Scarcity for Women

**Women report “Not enough customers” as most common barrier.**

## Reported Business Barriers

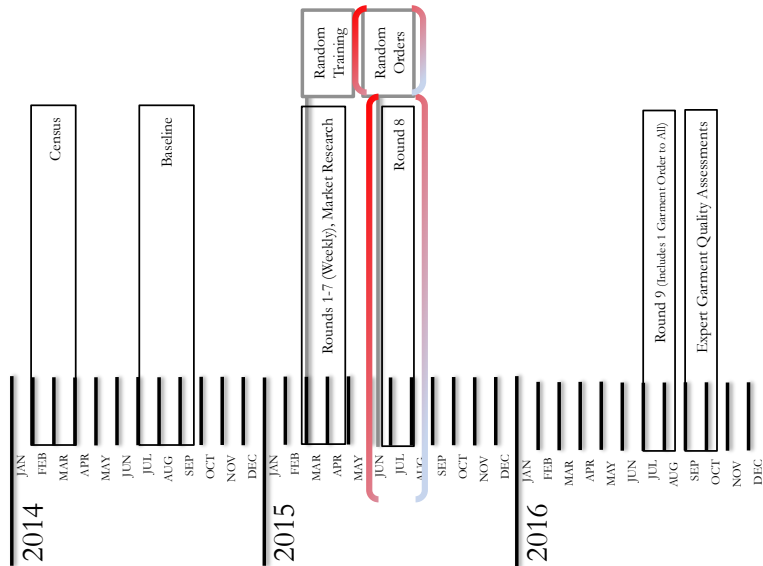
	Female Owned		Male Owned		Diff in	
	Mean	N	Mean	N	Means	T-Stat
Not enough customers	0.57	289	0.42	88	0.15	2.49
Not enough access to cash/savings	0.49	289	0.48	88	0.01	0.23
Supply problems - water/electricity	0.44	289	0.55	88	-0.11	-1.75
Customer Default	0.33	289	0.48	88	-0.15	-2.49
Not enough apprentices	0.25	289	0.26	88	-0.01	-0.16
Customers Do Not Pay On Time	0.09	289	0.06	88	0.03	0.99
Not enough access to credit	0.07	289	0.08	88	-0.01	-0.33
Not enough time	0.06	289	0.06	88	0	-0.05
Supply problems - materials	0.04	289	0.14	88	-0.09	-3.05
Inflation/Price uncertainty	0.04	289	0.06	88	-0.02	-0.6

# Testing for Demand Scarcity

What should happen if there is a random demand shock?

- If a woman's lower  $Q$  is due to the firm hitting a capacity constraint in the production function (i.e. labor, capital)
  - Experimental demand should displace non-experimental demand
- If a woman's lower  $Q$  is due to the firm not operating at production capacity (i.e. demand scarcity)
  - Experimental demand should not displace non-experimental demand (firm will absorb extra demand)

# Random Demand Shock - Data



# Random Demand Shock - Design

Experiment for (Hardy and McCasland, 2016) randomized two aspects:

- ① Invitation to learn a new design technique to be used on garments:
  - Unisex
  - Any size firm could implement design, minimal capital investments
  - Easy to learn
- ② **Demand for garments with the new design:**
  - **Randomly assigned firms orders of 0, 1, 4 or 10 garments**

# Random Demand Displacement by Gender

	(1) ITT	(2) TOT	(3)
	Non Exp. Sales	Non Exp. Sales	Non Exp. Sales
Male	185.0*** (28.83)	192.2*** (28.79)	195.6*** (32.37)
Demand Size	-1.413 (3.999)		
Male * Demand Size	-13.52* (8.109)		
Demand Size Accepted		-1.419 (5.626)	
Male * Demand Size Accepted		-17.27* (10.17)	
Experimental Sales			-0.126 (0.365)
Male * Experimental Sales			-1.848* (1.024)
Constant	126.3*** (14.17)	127.2*** (14.18)	126.1*** (14.07)
N	383	363	383

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## What did we learn?

- The gender profit gap prevails, even within the same industry
- Supply-side focused observables do not explain the gap
- Quantity of orders drives the profit gap (over price and cost)
- There is a gender gap in the market size to firm ratio
- Women are more likely to report “not enough customers”
- There is a large displacement effect of random demand shocks in male-owned firms, but not in female-owned firms

## What does this mean? Research/policy/programs focused on:

- (i) increasing alternative labor market opportunities for women and
  - (ii) creating alternative customer sources for female-owned firms
- may see strong results in the fight against gender income inequality.