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## Paying for gender? The gender price gap in Central Kenyan vegetable markets Presentation at the GIZ - Eschborn

Lutz Depenbusch

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#### What is the gender price gap

# We are aware of discrimination in labor markets - but what about product markets?

This is addressed by the **gender price gap** (*GPG*):

The difference between the price a man and a woman get for the exactly same product.

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Why it is	s important			

- It affects livelihood of women especially where self-employment is common
  - In SSA > 80% of women do not work for a wage (The World Bank, 2012)
- It comes on top of other disadvantages in production and marketing
- Large knowledge gaps persist:
  - There are currently only four papers on this topic
  - We do not know if the observations can be generalized

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• We know little about the mechanisms driving it

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Literature	e on the GPG	- US non-co	mmercial seller	S

- Kricheli-Katz and Regev (2016) find a gender price gap in US ebay data.
  - This is besides controlling for all information that buyers have
  - Experimental evidence of a lower willingness to pay for same voucher when sold by person with female name

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  - Experimental evidence of a lower willingness to pay for same voucher when sold by person with female name



Fig. 1. Price gaps by product category.

Figure: GPG by product category; Source: Kricheli-Katz, Regev (2016)



- GPG in finger millet sales in western Kenya found by Handschuch and Wollni (2016)
- GPG in Cocoa sales of Cameroonian smallholders found by Banerjee et al. (2014)
  - Cameroonian women shift Cocoa sales to male relatives to avoid disadvantage, thereby partially loosing control over income

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- GPG in finger millet sales in western Kenya found by Handschuch and Wollni (2016)
- GPG in Cocoa sales of Cameroonian smallholders found by Banerjee et al. (2014)
  - Cameroonian women shift Cocoa sales to male relatives to avoid disadvantage, thereby partially loosing control over income

Identification method:

Compare a significant GPG in individual sales to insignificant differences in collective transactions via village/producer groups.



#### Competence, entitlement, and the GPG

Based on experimental auctions Kricheli-Katz and Regev (2017) find:

GPG depends on the perceived competence and entitlement of the seller.

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- Gender gap disappears when bidders are informed that
  - The selling person is competent
  - or entitled to receiving a good price

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### The Central Kenyan context - Kiambu County



- Rural area directly bordering Nairobi
- Mostly small scale agriculture (median size: one acre)

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References

### The Central Kenyan context - Kiambu County



- Rural area directly bordering Nairobi
- Mostly small scale agriculture (median size: one acre)
- Sales of fresh vegetables to Nairobi and other cities
- Diversity of buyers (supermarkets as a "new" supply chain)

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Introduction

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### The Central Kenyan context - Kikuyu culture

- Some time before the 17th century changed from matrilineal to patrilineal (Wacker, 1994)
  - During colonial times womens position deteriorated
- High importance of horticulture which was traditionally run by women (House-Midamba, 1995)
- Traditionally women control local vegetable trade while men control long distance trade (House-Midamba, 1995)

#### Data structure







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	Difference/se	Male seller	Female seller
Woman controls production	-0.6581***	0.0132	0.6713
	0.0227		
Man controls production	0.6581***	0.9868	0.3287
	0.0227		
Female household head	-0.2357***	0.0044	0.2401
	0.0203		
Male household head	0.2357***	0.9956	0.7599
	0.0203		
Farm Characteristics			
Share irrigated	-30.04	27.47	57.51
	27.35		
Quantity sold per harvest	2036.22***	3385.04	1348.82
	732.11		
Years growing vegetables	0.11	20.55	20.45
	0.78		
Last years vegetable income	286578.1***	471142	184563.9
	71359.52		
Buyers			
Supermarket	0.0595***	0.0945	0.035
	0.0166		
Trader to Supermarket	-0.0245**	0.0197	0.0443
	0.0118		
Company/Institution	0.0589***	0.0659	0.007
	0.0126		
Independent Trader	-0.0181	0.4527	0.4709
	0.0336		
Spot Market	-0.1753***	0.1231	0.2984
	0.0267		
Sold to trader at once	0.0994***	0.244	0.1445
	0.0265		
N	884		

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#### Results

	(1)	(2)	(3)	(4)
	In(L. price)	In(H. price)	In(L. price)	In(H. price)
Female household head	-0.107	0.0000670		
	(0.101)	(0.0853)		
Woman controls prod.	0.0573	0.00511		
	(0.0924)	(0.0822)		
Female seller	-0.0340	0.00846		
	(0.0904)	(0.0828)		
Quantity sold p.h.	-0.212***	-0.159***		
	(0.0231)	(0.0190)		

Quantity sold <sup>2</sup>

Fem. seller\*Quantity sold

Fem. seller\*Quantity sold<sup>2</sup>

Constant	4.117***	4.007***	
	(0.310)	(0.293)	
Vegetable dummies	Y	Y	
Region dummies	Y	Y	
Irrigation & experience	Y	Y	
Distances	Y	Y	
Buyer	Y	Y	
Observations	884	884	

Robust standard errors in parentheses \* p < 0.1,\*\* p < 0.05,\*\*\* p < 0.01

Random effects results

#### Results

	(1)	(2)	(3)	(4)
	In(L. price)	In(H. price)	In(L. price)	In(H. price)
Female household head	-0.107	0.0000670	-0.0999	0.00669
	(0.101)	(0.0853)	(0.101)	(0.0855)
Woman controls prod.	0.0573	0.00511	0.0642	0.0108
	(0.0924)	(0.0822)	(0.0931)	(0.0823)
Female seller	-0.0340	0.00846	1.291**	1.120*
	(0.0904)	(0.0828)	(0.625)	(0.607)
Quantity sold p.h.	-0.212***	-0.159***	-0.0321	-0.00745
	(0.0231)	(0.0190)	(0.110)	(0.0991)
Quantity sold <sup>2</sup>			-0.0102	-0.00891
			(0.00648)	(0.00602)
Fem. seller*Quantity sold			-0.316**	-0.278*
			(0.152)	(0.150)
Fem. seller*Quantity sold <sup>2</sup>			0.0180**	0.0166*
· · · · · · · · · · · · · · · · · · ·			(0.00912)	(0.00915)
Constant	4.117***	4.007***	3.380***	3.407***
	(0.310)	(0.293)	(0.524)	(0.467)
Vegetable dummies	Y	Y	Y	Y
Region dummies	Y	Y	Y	Y
Irrigation & experience	Y	Y	Y	Y
Distances	Y	Y	Y	Y
Buyer	Y	Y	Y	Y
Observations	884	884	884	884

Robust standard errors in parentheses \* p < 0.1,\*\* p < 0.05,\*\*\* p < 0.01

Random effects results

## Marginal effects



Robust 90 percent confidence interval; X axis relates to variables distribution with 5th percentile at 5.7 and 95th percentile at 11.3

Results fit Kricheli-Katz and Regev (2017):

GPG depends on the perceived competence and entitlement of the seller.

Women earn well in small scale sales

• Local vegetable trade traditionally run by women Women earn worse when selling larger quantities

• Other trade/long distance trade traditionally done by men Women earn better again at very large quantities

• Unclear (Self-selection?)

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# **Policy implications**



Creating real equality of opportunities demands *changing more then countable factors* (though they are important), it demands to **deal with gender stereotypes**.

There are at least two sets of options:

- Avoid activation of stereotypical models (Deutsch, 2007)
  - Possibly using joint marketing and/or formalized supply chains
- Reduce stereotypes (based on recommendations by The World Bank (2011))
  - Prevent reproduction of gender inequality
  - Erode stereotypes by increasing the share of women in male-dominated sectors

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### Reason for Optimism

Our results also show:

There is no *predetermined* disadvantage of women in agricultural markets.

Change might not be easy but it is possible.

Policy implications

References









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Robustne	ess checks			

- Exclude indirect influence of marketing channel
  - Include interactions between supply chain and sold quantities table
- FE regressions
  - When adding the full set of controls coefficients change little but loose significance **table**
- Control if women only selected to sell under bad circumstances
  - The effect sustains when controlling for interactions with gender at the plot and household level **Table**
- Only vegetables with > 25 observations
  - Coefficients are stable but loose significance in regression on highest price
- Inverse probability weights to control for non-random attrition

table

	In(I maine)	In(H nuise)	la (la raises)	In (II miss)	
Female howeehold head	n(L. price)		n(L. price)	0.0174	
Female nousenoid nead	-0.0999	(0.0855)	-0.0909	(0.0260)	
Manage controls are duction	(0.101)	(0.0655)	(0.105)	(0.0609)	
woman controls production	0.0042	(0.0202)	0.0055	(0.0139	
Female celler	1 201**	(0.0023)	(0.0930)	(0.0032)	
Female seller	(0.625)	(0.607)	(0.541)	(0.500)	
Quantity cold n h	0.023)	0.00745	0.0419	0.0124	
Quantity sold p.n.	-0.0321	-0.00745	-0.0410	(0.114)	
0	(0.110)	(0.0991)	(0.112)	(0.114)	
Quantity sold p.h.	-0.0102	-0.00891	-0.0106	-0.0111	
	(0.00648)	(0.00602)	(0.00727)	(0.00727)	
Female seller*Quantity sold p.n.	-0.310***	-0.278*	-0.345***	-0.291*	
	(0.152)	(0.150)	(0.138)	(0.151)	
Female seller*Quantity sold p.h. <sup>2</sup>	0.0180**	0.0166*	0.0193**	0.01/1*	
	(0.00912)	(0.00915)	(0.00865)	(0.00940)	
Supply channel, base group are sup	pliers to indeper	ndent traders:		0.000	
Supermarkets	0.578***	0.328***	1.565	2.674**	back
<b>T I</b> ( <b>D I I O I</b>	(0.115)	(0.112)	(1.728)	(1.166)	DACK
Irader/Broker to SM	0.0934	-0.134	-1.842	-2.713*	
	(0.172)	(0.156)	(1.337)	(1.647)	
Companies/Institutions	0.0947	-0.0825	-0.291	-1.175	
	(0.169)	(0.139)	(3.287)	(2.629)	
Spot market	0.0723	0.0645	-1.499*	-0.258	
<b>.</b>	(0.0683)	(0.0635)	(0.906)	(0.977)	
Sold to trader at once	0.152*	-0.418***	0.0880	-0.109	
-	(0.0848)	(0.0780)	(2.208)	(2.215)	
Constant	3.380***	3.407***	3.455***	3.384***	
	(0.524)	(0.467)	(0.508)	(0.512)	
Buyer*Quanti/Quanti. <sup>2</sup>	N	N	Y	Y	
Vegetable dummies	Y	Y	Y	Y	
Region dummies	Y	Y	Y	Y	
Distances	Y	Y	Y	Y	
Exp. & Irrigation	Y	Y	Y	Y	
Observations	884	884	884	884	

Literature review		000000000	Policy Implications		Referen	
		In(L. price	) In(H. price)	In(L. price)	In(H. I	
Woman c	ontrols production	-0.757	-0.462	-0.691	-0.4	
		(0.491)	(0.534)	(0.527)	(0.5	
Female se	ller	0.176	0.139	1.117	0.7	
		(0.440)	(0.468)	(0.759)	(0.7	
Quantity :	sold p.h.	-0.266***	-0.211***	-0.125	-0.2	
		(0.0316)	(0.0291)	(0.152)	(0.1	
Quantity s	sold p.h. * Quantity sold p.h.	( )	( )	-0.00782	0.000	
				(0.00911)	(0.00	
Female se	ller * Quantity sold p.h.			-0.218	-0.1	
				(0.209)	(0.2	
Female se	ller * Quantity sold p.h. * Qu	antity sold p.h.		0.0113	0.00	
				(0.0127)	(0.01	
Supply ch	annel, base group are supplier	s to independent traders:				
Supermar	kets	0.116	0.0973	0.105	0.08	
		(0.288)	(0.398)	(0.278)	(0.3	
Trader/Br	roker to SM	0.252	0.117	0.245	0.1	
		(0.322)	(0.327)	(0.321)	(0.3	
Companie	s/Institutions	-0.0946	-0.107	-0.111	-0.1	
		(0.292)	(0.283)	(0.290)	(0.2	
Spot mark	ket	0.227	0.0520	0.224	0.04	
		(0.174)	(0.221)	(0.177)	(0.2	
Sold to tr	ader at once	0.378**	-0.214	0.366**	-0.2	
-		(0.165)	(0.170)	(0.170)	(0.1	
Constant		4.164***	4.145***	3.561***	4.075	
		(0.289)	(0.270)	(0.655)	(0.6	
Observatio	ons	884	884	884	88	

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	0000	000000			
		In(L. price)	In(H. price)	In(L. price)	In(H. p
Female ho	ousehold head	-0.491**	-0.662***	-0.218	-0.602
		(0.235)	(0.0890)	(0.306)	(0.1
Women c	ontrols production	0.131	-0.0593	0.114	Ò.09
		(0.176)	(0.0835)	(0.180)	(0.23
Female se	ller	1.282**	0.470	1.289**	1.09
		(0.630)	(0.611)	(0.626)	(0.60
Female se	ller $ imes$ Female household head	0.332	0.624***	0.122	0.626
		(0.252)	(0.111)	(0.323)	(0.19
Female se	ller $ imes$ Female production	-0.0686	0.0658	-0.0525	-0.08
		(0.201)	(0.114)	(0.198)	(0.23
Quantity	sold p.h.	0.0144	-0.0364	-0.0328	-0.01
		(0.111)	(0.103)	(0.110)	(0.09
Quantity	sold p.h. $ imes$ Quantity sold p.h.	-0.0117*	-0.00783	-0.0102	-0.00
		(0.00679)	(0.00640)	(0.00649)	(0.00
Female se	ller $\times$ Quantity sold p.h.	-0.344**	-0.118	-0.315**	-0.27
		(0.155)	(0.152)	(0.152)	(0.1
Female se	ller $\times$ Quantity sold p.h. $\times$ Quantity sold	p.h. 0.0200**	0.00631	0.0180**	0.01
		(0.00948)	(0.00924)	(0.00913)	(0.00
Constant		2.726***	3.160***	3.390***	3.467
		(0.475)	(0.418)	(0.527)	(0.4
Vegetable	dummies	Y	Y	Y	Y
Region du	Immies	N	N	Y	Y
Distances		N	N	Y	Y
Exp. & In	rigation	N	N	Y	Y
Buyer		N	N	Y	Y
Observati	ons	884	884	884	88

back

tion	Literature review	Farmer survey	Policy implications		References	
		(1)	(2)	(3)	(4)	
		In(L. price)	In(H. price)	In(L. price)	In(H. price)	
Female ho	ousehold head	-0.110	-0.00833	-0.103	-0.00193	
		(0.0892)	(0.0777)	(0.0891)	(0.0773)	
Woman controls production		0.0637	0.0157	0.0711	0.0216	
		(0.0806)	(0.0703)	(0.0805)	(0.0701)	
Female seller		-0.0348	0.00306	1.350**	1.189**	
		(0.0744)	(0.0656)	(0.608)	(0.588)	
Quantity sold p.h.		-0.209***	-0.157***	-0.0218	0.00590	
		(0.0195)	(0.0181)	(0.110)	(0.106)	
Quantity sold p.h. *Quantity sold p.h.				-0.0106	-0.00953	
				(0.00643)	(0.00617)	
Female seller *Quantity sold p.h.				-0.328**	-0.296**	
				(0.147)	(0.142)	
Female seller *Quantity sold p.h. *Quantity sold p.h		ntity sold p.h.		0.0186**	0.0177**	
Supply ch	annel, base group are supplier	s to independent traders:				
Supermarkets		0.589***	0.334***	0.582***	0.330***	
		(0.115)	(0.100)	(0.114)	(0.1000)	
Trader/Broker to SM		0.114	-0.123	0.0968	-0.136	
		(0.141)	(0.130)	(0.141)	(0.130)	
Companies/Institutions		0.116	-0.0677	0.106	-0.0760	
		(0.141)	(0.128)	(0.141)	(0.128)	
Spot market		0.0792	0.0712	0.0759	0.0704	
		(0.0670)	(0.0596)	(0.0668)	(0.0593)	
Sold to tr	ader at once	0.165**	-0.408***	0.150**	-0.422***	
-		(0.0711)	(0.0648)	(0.0716)	(0.0650)	
Constant		4.102***	4.003***	3.330***	3.356***	
		(0.297)	(0.266)	(0.534)	(0.507)	
Vegetable	dummies	Ŷ	Y	Y	Y	
Region du	immies	N	N	Y	Y	
Distances		N	N	Ŷ	Y	
Exp. & Ir	rigation	Ň	N	Y	Y	
Observati	ons	884	884	884	884	
Robust st	andard errors in parentheses; '	* p < 0.1,** p < 0.05,*** p <	< 0.01			