The Effects of Women's Bargaining Power on Contraceptive Use: Evidence from Zambia

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Outline

Motivation

- The rate of unplanned pregnancy remains high in low- and middle-income countries despite efforts to increase awareness and provide improved access to family planning and contraceptive methods.
- High fertility rates greatly increase the risks of morbidity and mortality (Mason and Taj, 1987).
- The unmet need for contraceptives and issues of excess fertility are generally ascribed to:
  - Costs of methods and healthcare services
  - Low female autonomy
  - Lack of education and contraceptive knowledge (Bulatao, 1998 & Skirbekk, 2008).

Introduction

- Research Questions:
  - How does bargaining power affect women's adoption of modern contraceptive methods?
  - How does spousal discordance over power assignation affect women's adoption of modern contraceptive methods?
- Setting: Zambia (using 2018 DHS data)
- Methods:
  - First model testing the effects of empowerment on contraception use, and the interaction of financial capability and decision-making power.
  - Second model testing the effects of spousal discordance (degree and directionality) on contraception use.
- Work has previously been done on the connection between empowerment and contraception use, but very little empirical work on spousal discordance exists.

Measuring and Conceptualizing "Women's Bargaining Power"

- Fallback or exit positions greatly affect bargaining power (Agarwal, 1997; Kabeer, 1999).
- Bargaining power can be divided into direct and indirect measures.
- Powerful positive connection between
  - Women's decision-making abilities and they and their families well-being (Hou, 2016; Lepine, 2017)
  - Employment outside the home and bargaining power (Doss, 2013; Qian, 2019; Mahmud and Tasneem, 2014; Laszlo et al., 2020)
  - Education (Doss, 2013; Duflo, 2012; Kabeer, 2005)
  - Role within the household structure (Allendorf, 2013)

Contraceptive Use

- Literature shows a connection between control over decision-making in the household and control over fertility for women (OlaOlorun and Hindin, 2014; Hameed, 2014).
- Other factors with significant positive effects on contraceptive use are:
  - Ability to communicate with the spouse (Meekers and Oladosu, 1996; Woldemicael, 2009)
  - Education (Dincer et al., 2013; Mocan and Cannonier, 2012)
  - Paid employment outside the house (Phan, 2013)

Theories of Power and Spousal Discordance

- Intra-household bargaining has been modeled theoretically in several ways:
  - **Cooperative HH models**, in which spouses jointly maximize utility subject to a HH budget constraint (Chiappori, 1988; Chiappori et al., 1993; Browning and Chiappori, 1998; Basu, 2006)
  - **Non-cooperative HH models**, in which spouses' behaviour is a best response to each others' actions (Rubinstein, 1982; Lundberg and Pollack, 1993; Eswaran and Malhotra, 2011)
- However, most of these papers treat bargaining power as exogenous, or common knowledge.
- Classical theories of power in social and political science, and feminist theory also examine the concept of power (Annan et al., 2021; Rowlands, 1995; Kabeer, 1999; Steinem, 2012).
- Only two studies have empirically examined how spousal *discordance* influences key economic and health outcomes for women (Ambler et al., 2017; Annan et al., 2021).

Data and Descriptive Statistics

- This project uses the 2018 Zambia Demographic and Health Survey.
- The survey was implemented by Zambian entities while funding was provided by USAID.
- Data collection lasted from July 2018 to January 2019.
- Data was collected on men aged 15-59 and women aged 15-49.
- Response rates for all arms of the survey (men, women, and couples) were very high, ranging from 96% to 99%.

Decision-Making Variables

- To examine the relationship between a woman's decision-making power and her ability to control her own fertility, the study considers these variables:
  - Control over her own healthcare decisions
  - Ability to make large household purchase decisions
  - Ability to make small/daily household purchase decisions
  - Ability to make decisions regarding visits to family and friends
  - Control over contraception decisions
  - Financial capability
- Selection of these direct indicators is based on
  - Structure and information in the 2018 Zambia DHS survey
  - Indicators used in previous literature (Blackstone, 2007 & Woldemicael, 2009)

Decision-Making Variables

- Binary variables are created for each of these indicators of interest. Variation is minimized by restricting responses to either "alone" or "jointly with husband". Therefore, decision-making binary variables (for the first specification) are all of the form:
  - Woman solely makes decisions about her own healthcare=1, 0 otherwise
  - Woman jointly with husband makes healthcare decisions=1, 0 otherwise
- The same binary variables are created for the men's responses to the survey. Variation is once again minimized by restricting responses.

Data (Women) Data (Men)

Part 1: Probit Model for Contraception Adoption

$$C_i = 1(\beta_0 + \beta_1 D_i + \beta_2 I_i + \beta_3 FP_i + \beta_4 Z_i + \epsilon_i > 0) \quad (1)$$

$$C_i^* = \beta_0 + \beta_1 D_i + \beta_2 I_i + \beta_3 FP_i + \beta_4 Z_i + \epsilon_i \quad (2)$$

$$C_i = \begin{cases} 1 & \text{if } C_i^* > 0 \\ 0 & \text{otherwise} \end{cases} \quad (3)$$

- Where C_i is the self-reported use of contraception by woman i ($i = 1...N$)
- D_i is a vector of variables measuring her decision-making power. (Note that in model 2, there are interaction terms also included in D_i)
- I_i is a vector of variables measuring her individual characteristics
- FP_i is a vector of variables measuring the set of family planning message she may or may not have received
- Z_i is the set of control variables (for wealth index, region, urban/rural, etc.)

Part 2: Spousal Discordance and Power Assignation Model

$$C_i = 1(\alpha_0 + \alpha_1 Wtakespower_i + \alpha_2 Hgivespower_i + \alpha_3 WHagreement_i + \beta_1 X_i + \epsilon_i > 0) \quad (4)$$

$$C_i^* = \alpha_0 + \alpha_1 Wtakespower_i + \alpha_2 Hgivespower_i + \alpha_3 WHagreement_i + \beta_1 X_i + \epsilon_i \quad (5)$$

$$C_i = \begin{cases} 1 & \text{if } C_i^* > 0 \\ 0 & \text{otherwise} \end{cases} \quad (6)$$

- Where C_i is the self-reported use of contraception by woman i ($i = 1...N$)
- $Wtakespower_i$ is an indicator for the situation where a woman empowers herself, $Hgivespower_i$ is an indicator for the spouse giving power, and $WHagreement_i$ is an indicator for agreement between the spouses
- X_i is a vector of individual characteristics (parallel to I_i, FP_i and Z_i in Part 1).

Part 1: Probit Model for Contraception Adoption

VARIABLES	(1) Estimate	ME	(2) Estimate	ME
Decision-Making Variables				
Healthcare decisions (solely)	-0.499***	-0.196	-0.445***	-0.176
	(0.105)		(0.114)	
Healthcare decision (jointly)	0.066	0.026	0.055	0.022
	(0.115)		(0.121)	
Large HH purchase decisions (solely)	0.846***	0.309	0.861***	0.313
	(0.141)		(0.142)	
Large HH purchase decisions (jointly)	-0.056	-0.022	-0.062	-0.025
	(0.099)		(0.099)	
Daily HH purchase decisions (solely)	0.159	0.063	0.156	0.062
	(0.120)		(0.120)	
Daily HH purchase decisions (jointly)	0.623***	0.241	0.647***	0.249
	(0.148)		(0.149)	
Visits to family or relatives (solely)	-0.395***	-0.156	-0.389***	-0.154
	(0.118)		(0.118)	
Visits to family or relatives (jointly)	-0.601***	-0.236	-0.611***	-0.241
	(0.114)		(0.115)	
Contraception decision (solely)	2.744***	0.557	2.741***	0.557
	(0.130)		(0.130)	
Contraception decisions (jointly)	3.540***	0.914	3.542***	0.914
	(0.103)		(0.103)	
Financial capability (solely)	0.826***	0.311	0.706***	0.271
	(0.137)		(0.162)	
Financial capability (jointly)	-0.492	-0.194	-0.465	-0.184
	(0.432)		(0.434)	
Healthcare decisions (solely) and financial capability			0.369*	0.87
			(0.189)	
Healthcare decisions (jointly) and financial capability			0.395	0.153
			(0.348)	
Constant	-4.005***		-4.063***	
	(0.791)		(0.796)	
Observations	3,873		3,873	
Pseudo-R^2	0.6702		0.6711	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Part 1: Probit Model for Contraception Adoption

- Individual characteristics with significance (in the full regression table):
  - Being the household head or wife (99%).
  - Years of schooling and working in the last 12 months (95%). Surprisingly, "currently working" is not.
  - Owning a house is not, while owning land is.
  - All the family planning messages are significant, except for the "text message on phone" and the message from the fieldworker.
  - Several of the control regions are also significant.
  - Contraceptive use is 56% higher for women who have sole control over their contraception decisions, when compared to those that have none. Joint contraception decisions are even more positively associated with the use of contraception methods.

Part 2: Spousal Discordance and Power Assignation Model

Who usually makes decisions about making major household purchases?		Wife's response		
		Husband	Joint	Wife
Husband's response:	Wife	4.32% [B]	6.65% [B]	1.29% [C]
	Joint	18.56% [B]	37.54% [C]	4.98% [A]
	Husband	10.83% [D]	13.09% [A]	2.07% [A]

- The second part of the study performs a probit estimation to study the effect of spousal discordance and power assignation on womens' use of modern contraception.
- This table reports the different combinations of power assignation over the woman's decision-making roles:
  - A if the woman gives herself more power than her husband gives her.
  - B if the husband gives the wife more power than she gives herself.
  - C if the wife and husband both agree that she is the main decision-maker or decision-making is joint.
  - D if the wife has no power over decision-making whatsoever.

Part 2: Spousal Discordance and Power Assignation Model

VARIABLES	(1) Adoption of modern contraceptive	Marginal effects
Power Assignation		
Wife takes power	0.367*	0.146
	(0.218)	
Husband gives power	-0.0623	-0.025
	(0.196)	
Agreement on power	0.165**	0.167
	(0.080)	
Individual Characteristics	yes	
Family Planning Initiatives	yes	
Attitudes and Knowledge	yes	
Controls	yes	
Constant	-2.033*	
	(1.130)	
Observations	602	
Pseudo-R^2	0.2422	
Log-likelihood	-316.00576	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Part 2: Spousal Discordance and Power Assignation Model

- These results can be found in the full version of the regression table:
  - Very few individual characteristics are significant.
  - Family planning messages received either on the radio, or by text message have an effect. Messages received on the radio lead to a decrease in contraceptive uptake of 11%, while those received by text message lead to an *increase* of 18%.
  - Some difference in probability of adopting modern contraception between the different regions of Zambia, with those living in the Eastern region having the highest marginal effect (55.2%) and those in the Luapula region having the lowest (29.6%).

Part 2: Spousal Discordance and Power Assignation Model

- In terms of attitudes and knowledge about contraception.
  - The area where contradictory messages appear is in the husband's use or contraceptive methods: women with husbands who use *any* contraceptive method are 60% less likely to use modern contraception, while women whose husbands use modern contraception are 75% more likely to use modern contraception as well.
  - Possible explanations:
    - Husbands who use traditional contraceptive methods are unwilling to allow their wives to use modern contraceptive methods, but those who use modern contraceptive methods for themselves also encourage this behaviour in their partners.
    - Partner matching.
    - Other (?)

Conclusion

- Results 1: counter-intuitive result that the probability of using contraception is lower among women who have a say in their own healthcare, but this result is reversed when financial capability is also considered.
- Results 2: the wife taking power is significantly and positively related to the adoption of modern contraception and leads to a 14.6% increase in the probability of use, and that the scenario of joint agreement on power leads to a 16.7% increase in probability of uptake.

Conclusion: Policy Implications

- Prioritize investment in improving women's empowerment and decision-making ability.
- Allow them to negotiate their desired number of children and benefit from health services which would impact the quality of life for themselves, their children, and their entire families.
- Supplement family planning policies with financial support, enable even those women who cannot afford these services to seek them and profit from them.

Conclusion: Directions of Future Research

- Gap in the literature on intra-household bargaining: no accomodation for mismatched expectations between spouses about bargaining power.
- Way to fill this gap:
  - Explicit household bargaining model including spousal discordance and its directionality.
  - One-shot extensive form game played between husband and wife, with asymmetric information (wife holds private information).
- Utility functions:
  - $U_W(x, y, p) = \alpha_1 ln(x) + \beta_1 ln(y) - \delta_1 ln(p)$
  - $U_H(x, y, p) = \alpha_2 ln(x) + \beta_2 ln(y) - \delta_2 ln(p)$
- Bargaining power: Wife=θ, Husband=$1 - \theta$
- Husband commits to a degree of non-cooperative behaviour based on the degree of discordance between the spouses: $p = \eta s$, where $\eta = \theta - E_H[\theta|s]$

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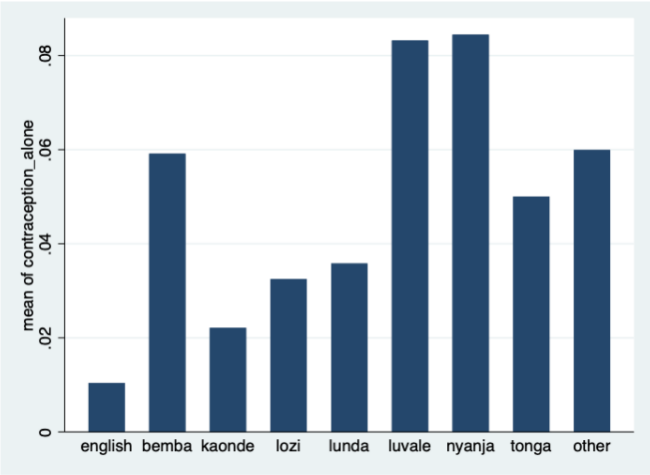
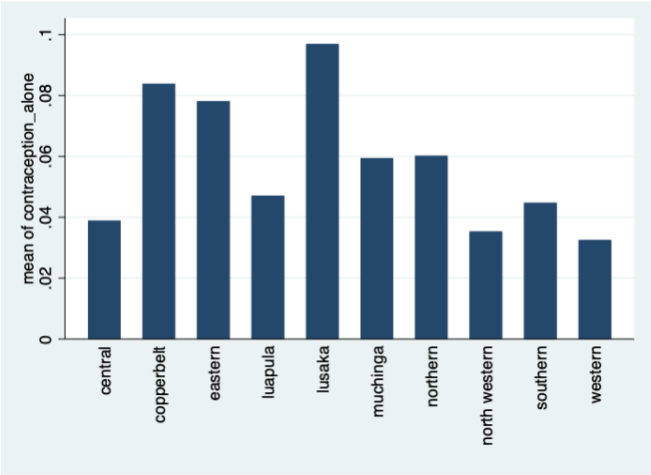
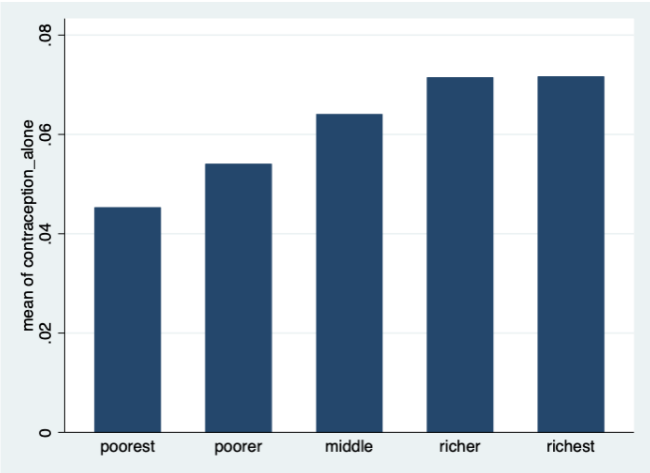
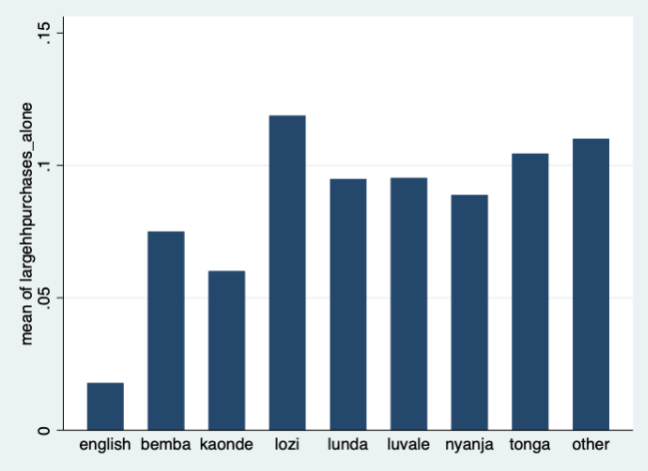
Decision-Making Variables: Control over Contraception Use

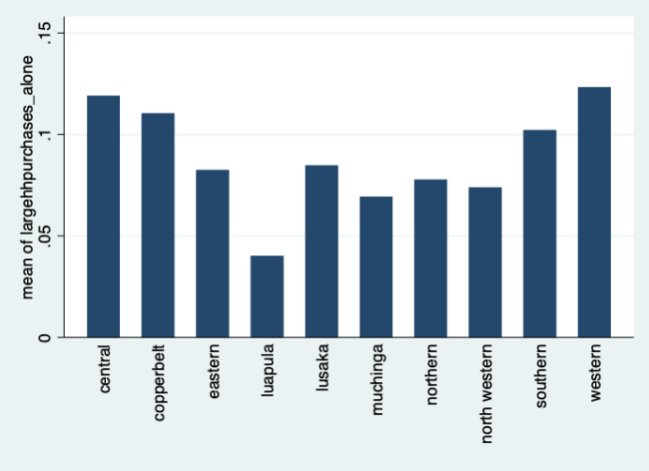


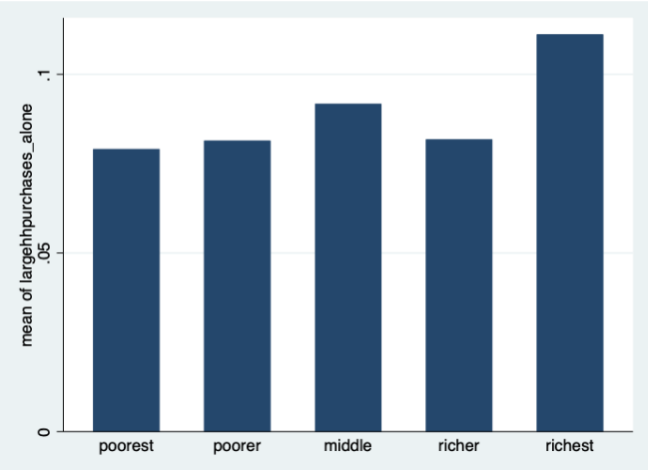




Decision-Making Variables: Control over Large HH Purchases







Decision-Making Variables (Women)

Table 1: Summary Statistics for Decision-Making Variables

Variable	Mean	Std. Error	Variable type
Decision-Making Variables			
Woman solely makes healthcare decisions	.312	.002	Binary
Woman jointly with husband makes healthcare decisions	.305	.002	Binary
Woman solely makes large HH purchase decisions	.087	.001	Binary
Woman jointly with husband makes large HH purchase decisions	.427	.003	Binary
Woman solely makes daily HH purchase decisions	.422	.003	Binary
Woman jointly with husband makes daily HH purchase decisions	.240	.002	Binary
Woman solely makes decision on visits to her family or relatives	.177	.002	Binary
Woman jointly with husband decides on visits to her family or relatives	.424	.003	Binary
Woman solely makes contraception decisions	.059	.001	Binary
Woman jointly with husband makes contraception decisions	.299	.002	Binary
Woman solely has financial capability	.106	.002	Binary
Woman jointly with husband has financial capability	.278	.002	Binary

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Decision-Making Variables (Men)

Table 2: Summary Statistics for Decision-Making Variables (for the men)

Variable	Mean	Std. Error	Variable type
Decision-Making Variables			
Man solely makes large HH purchase decisions	.144	.351	Binary
Woman solely makes large HH purchase decisions	.067	.248	Binary
Woman jointly with husband makes large HH purchase decisions	.322	.467	Binary
Man solely makes daily HH purchase decisions	.071	.256	Binary
Woman solely makes daily HH purchase decisions	.285	.451	Binary
Woman jointly with husband makes daily HH purchase decisions	.176	.381	Binary

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Individual Characteristics (Women)

Summary Statistics for Individual Characteristics

Variable	Mean	Std. Error	Variable type
Individual Characteristics			
Head of household	.196	.002	Binary
Wife	.684	.002	Binary
Daughter-in-law	.006	.003	Binary
Woman's years of schooling	5.692	.019	Continuous
Woman currently working	.570	.003	Binary
Woman worked in last 12 months	.653	.002	Binary
Woman engaged in paid work	.516	.003	Binary
Woman owns land (alone and/or jointly)	.466	.003	Binary
Woman owns house (alone and/or jointly)	.571	.003	Binary
Woman's age	35.465	.041	Continuous
Woman's age squared	1323.61	2.876	Continuous
Marriage duration (grouped)	3.874	.009	Grouped
Last sexual intercourse was 4 weeks ago	.685	.002	Binary
Sons at home	1.813	.007	Continuous
Daughters at home	1.743	.007	Continuous
Husband/partner works	.692	.002	Binary
Husband's/partner's total years of education	12.087	.118	Continuous

Individual Characteristics (Men)

Table 4: Summary Statistics for Individual Characteristics (for the men)

Variable	Mean	Std. Error	Variable type
Individual Characteristics			
Head of household	.553	.497	Binary
Husband	.007	.081	Binary
Son	.266	.442	Binary
Son-in-law	.004	.063	Binary
Gender of HH head	.867	.339	Binary
Man's years of schooling	7.503	3.441	Continuous
Man is literate	.809	.393	Binary
Man currently working	.756	.429	Binary
Man worked in last 12 months	.792	.406	Binary
Man engaged in paid work	.635	.482	Binary
Man owns land (alone and/or jointly)	.815	.388	Binary
Man owns house (alone and/or jointly)	.788	.409	Binary
Man's age	30.437	11.907	Continuous
Man's age squared	1068.153	814.22	Continuous
Man married	.712	.886	Binary
Marriage duration (grouped)	1.915	2.179	Grouped
Last sexual intercourse was 4 weeks ago	.685	.002	Binary
Sons at home	.825	1.302	Continuous
Daughters at home	.784	1.247	Continuous

Attitudes and Knowledge (Men)

Table 5: Summary Statistics for Attitudes and Knowledge about Contraception and Sex (for the men)

Variable	Mean	Std. Error	Variable type
Attitudes and Knowledge			
Has knowledge of modern contraceptive method	.991	.095	Binary
Has some knowledge of ovulatory cycle	.835	.371	Binary
Believes a breastfeeding woman can get pregnant	.712	.453	Binary
Believes woman can get pregnant after birth of a child before period returns	.321	.467	Binary
Currently uses any contraception method	.404	.491	Binary
Currently uses any modern contraception method	.395	.489	Binary
Currently does not use any family planning but knows a source	.889	.314	Binary
Has any knowledge of STIs	.995	.068	Binary
Has any knowledge of HIV/AIDS	.990	.098	Binary
Believes contraception is a woman's business	.236	.424	Binary
Believes access to contraception makes women promiscuous	.366	.482	Binary

Family Planning Initiatives (Women)

Table 6: Summary Statistics for Family Planning Initiatives (for the women)

Variable	Mean	Std. Error	Variable type
Family Planning Initiatives			
Heard about family planning on radio in last few months	.179	.002	Binary
Heard about family planning on TV in last few months	.089	.001	Binary
Heard about family planning in newspaper/magazine in last few months	.032	.001	Binary
Heard about family planning in text message on phone in last few months	.019	.001	Binary
Fieldworker talked about family planning	.454	.007	Binary
At health facility, was told about family planning	.493	.003	Binary

Family Planning Initiatives (Men)

Table 7: Summary Statistics for Family Planning Initiatives (for the men)

Variable	Mean	Std. Error	Variable type
Family Planning Initiatives			
Heard about family planning on radio in last few months	.277	.447	Binary
Heard about family planning on TV in last few months	.147	.354	Binary
Heard about family planning in newspaper/magazine in last few months	.107	.309	Binary
Heard about family planning in text message on phone in last few months	.076	.265	Binary
At health facility, was told about family planning	.155	.362	Binary

Controls (Women)

Table 8: Summary Statistics for Controls (for the women)

Variable	Mean	Std. Error	Variable type
Controls			
Region			
Central	.100	.002	Binary
Copperbelt	.099	.002	Binary
Eastern	.119	.002	Binary
Luapula	.117	.002	Binary
Lusaka	.105	.002	Binary
Muchinga	.099	.002	Binary
Northern	.101	.002	Binary
North Western	.078	.001	Binary
Southern	.101	.002	Binary
Western	.081	.001	Binary
Wealth Index			
Poorest	.256	.002	Binary
Poorer	.239	.002	Binary
Middle	.216	.002	Binary
Richer	.157	.002	Binary
Richest	.132	.002	Binary
Urban vs. Rural (Ref: Urban)	.307	.002	Binary

Controls (Men)

Table 9: Summary Statistics for Controls (for the men)

Variable	Mean	Std. Error	Variable type
Controls			
Region			
Central	.109	.313	Binary
Copperbelt	.117	.322	Binary
Eastern	.119	.324	Binary
Luapula	.103	.304	Binary
Lusaka	.125	.331	Binary
Muchinga	.089	.284	Binary
Northern	.089	.286	Binary
North Western	.076	.264	Binary
Southern	.101	.301	Binary
Western	.071	.256	Binary
Wealth Index			
Poorest	.193	.394	Binary
Poorer	.203	.402	Binary
Middle	.216	.412	Binary
Richer	.185	.388	Binary
Richest	.204	.403	Binary
Urban vs. Rural (Urban=1)	.371	.483	Binary