Presence of Multiple Partners and Fertility Decision-Making: Evidence from Eight Low-and-Middle Income Countries

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Objective

- To investigate the effect of *presence of multiple wives* on *decision of women to have children* and the *quality of child*

- Study setting: data from Multiple Indicator Cluster Survey (*MICS*) on women in non-African and non-Islamic countries

Introduction

- The fertility decision has been widely examined in the economics literature assuming the household as a *monogamous* relationship - which legally enforced in many countries

- Nevertheless, *polygyny* – the most common form of polygamy – has been prevalent in many societies still

Introduction

- Nowadays, unacceptability of polygyny (and infidelity) is partially derived from socioeconomic transitions in the past century

- Women is gaining more autonomy due to higher level of education and higher rate of labor force participation (Gould et al. 2008)

- Thus, the fertility decisions have been made increasingly jointly (Basu 2002; Liefbroer and Corijn 1999; Becker 1981)

- In the case of polygyny or presence of multiple wives, these decisions would further become more complex

Introduction

- This analysis assumes that the impact of husband's multiple partners will imply that *intra-household allocation of resources is altered*

- Using data on women in eight low-and-middle Income countries, all of which are non-African and non-Islamic

- These countries excluded on the grounds that fertility decisions are likely to be determined by social and religious norms and less so by *socioeconomic factors* and *their own choices*

Literature review

- A household makes the fertility choice by comparing costs and benefits, at economically feasible to their constraints

- Any different fertility preferences between men and women must be negotiated (Doss 1996)

- However, women carry a larger burden through damages to health and career interruptions, they require a secure economic basis to make long-term commitments

- Thus, any *economic uncertainties* have potential to defer women's fertility decisions (Mills and Blossfeld 2005; Rindfuss and VandenHeuvel 1990; Easterlin 1976)

Presence of Multiple Partners as an Economic Uncertainty

- The literature on polygyny mostly studied in the *Africa*

- An *upward fertility* among polygamous union was found driven by competitions between co-wives (Rossi 2018; Tertilt 2005)

- As children were strategic complements to access resources controlled by a husband (Rossi 2018), since wives had little control over men's bequests (Bledsoe 1990)

Presence of Multiple Partners as an Economic Uncertainty

- Only few quantitative studies established a *negative correlation* between polygamy and women's fertility (Lardoux and Van de Walle 2003; Garenne and Van de Walle 1989)

- It was explained by social norms and infertility, for example
  - widowed or divorced women commonly join a polygamous marriage
  - junior wives get married at older age resulted in shorter reproductive periods

- Most of these studies emphasizes the importance of biological constraints and social norms, which *less* likely to depend on *individual choices*

Presence of Multiple Partners as an Economic Uncertainty

Impact of polygyny on intra-household distribution of resources

- The investments in children of polygynous marriages were *unequally* distributed and were affected by mother's rank;

  - being the child of a senior wife positively related with higher quality in term of education (Mammen 2004) and nutritional status (Wagner and Rieger 2015)

- Moreover, the ratio of married women to men were *negatively* correlated with child's quality (Wagner and Rieger 2015)

Presence of Multiple Partners as an Economic Uncertainty

Infidelity

- It was found as well to alter the allocation of time and resources to infidelity activities (external to the marriage) (Fair 1978)

- Resulted in less household income (Fair 1978; Crouch and Dickes 2016; Elmslie and Tebaldi 2008) and higher expenses (Shackelford and Buss 1997).

In *polygamous society*,

- It is well established that polygynous union has impacts on both fertility decisions and allocation of resources

- Yet only few studies examined the impact of adultery on resource allocations in monogamous society.

- Yet, the findings in polygamous society might be interfered by the influences from religious beliefs and social norms rather than women own choices

- Thus, this study takes an advantage from the available of MICS data among monogamous societies to evaluate the association between the presence of husband's multiple partners and the fertility decision.

In *monogamous society*,

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- Thus, this study takes an advantage from the available of MICS data among monogamous societies to evaluate the association

Empirical framework

- Following the economic fertility model by Becker (1960, 1981), an equation is expanded

$$FERT = f(DEM, ECON, POLY)$$

- Fertility decision is a function of demographic (*DEM*) and economic (*ECON*) variables

- It is hypothesized here that the presence of multiple wives (*POLY*) predicts the woman's fertility decision, as it can represent the relative bargaining power within the household as a consequence of altered household resources change

However, fertility decision potentially is endogenous

- To address this problem, *a recursive bivariate probit model* is used
- This joint estimation method for a binary variable of the main outcome and it accounts for the presence of common *unobserved factors* across the two decisions (fertility decision and multiple partners)

The recursive bivariate probit model

- *Fertility decision* equation includes an endogenous binary variable of the presence of multiple partners

$$FER = \beta_0 + \beta_1 x + \beta_2 POLY + \varepsilon \qquad (1)$$

  - FER - the fertility decision to have children
  - Xs - exogenous influences including age, education level, partnership type, religion, household wealth, living area and country of residence
  - POLY - awareness of husband's multiple partners

The presence of *multiple partners is modeled* as following

$$POLY = \alpha_0 + \alpha_1 x + \alpha_2 Z + \mu \qquad\qquad (2)$$

- x – exogenous variables

- z - a vector of instrumental variables

- It is assumed that ε and μ are distributed bivariate normal with correlation ρ

The likelihood ratio test

- Used to determine whether ρ is significantly different from *zero*

- If ε and μ in Equations (1) and (2) are not independent due to *endogeneity*,

then a recursive bivariate probit framework will apply

- And *marginal effect* of probability of the regressions will be analyzed

Data

- Multiple Indicator Cluster Surveys (MICS) in eight countries (n=*66,525)*
    - El Salvador (n=6,863), Guyana (n=2,969), Laos (n=7,491), Nepal (n=5,801), Panama (n=18,476), Suriname (n=3,505), Thailand (n=15,562) and Vietnam (n=5,854)
    - Including women aged 15-49 years old
- All countries included in this study do not recognize polygynous union and consider illegal (McDermott 2018)
- The surveys show small proportion of polygamous union:
    - El Salvador (3.24%), Guyana (4.65%), Laos (3.00%), Nepal (3.88%), Panama (3.52%), Suriname (4.99%), Thailand (2.96%) and Vietnam (0.74%).

The dependent variable

- The *decision* to have children : from a question "whether respondents had live births within the last 2 years: 0 if the individual did not, and 1 if the individual gave birth in the past 2 years"
  - Period of interest is restricted to 2 years so as to ensure consistency between the period in which the woman became aware and that when fertility intentions were expressed

- Child's *quality outcome* : measured by using mother's perception of the baby's size at birth: 0 = baby smaller than others and 1 = regular sized baby
  - Many infants in developing countries are not weighed at birth, thus it is common to use this mother perception as a proxy instead (Channon 2011).

Main explanatory variable

- An awareness of husband's other partners : based on the question "Besides yourself, does your husband/partner have any other wives or partners or does he live with other women as if married?"
  - 0 = not be aware and 1 = has been aware of

Descriptive statistics

- Sample contains individuals at average age of 33.47 years, mostly married (57.2%), attained secondary education or less (81.3%), household income at middle and upper level (37.6 and 37.8% respectively), and lived outside a municipal area (57.0%)

- These characteristics differed between 2 groups of samples
  - Those with multiple partner relationship, at the mean, appeared to be little bit older, lower educated, in cohabitation partnership and less wealthy

Limitation:

•   MICS unfortunately lacks information on labor force participation and wage which typically used as a proxy for women's opportunity costs in the fertility decision model

•   This study will instead employ the woman's education as a proxy for her wage (Schultz 2001)

Three potential instrumental variables

- *Sex ratio*: as Becker (1981) argued that polygyny is the result of imbalanced sex ratios
  - This variable is measured as the number of male births per 100 female births in each year that the participant was born
  - Drawn from the Our World in Data (Chao et al. 2019)
- *Spousal age gaps*: have been noted to correlate with polygyny (Pison 1986)
- *HIV literacy*: women who are free to obtain information and knowledge of HIV are better able to negotiate for her better wellbeing (Jejeebhoy 1995; Atteraya et al. 2014)

Results

Table shows marginal effects

- Model (I): univariate ordered probit regression - fertility decision as an *exogenous*

- Model (II): recursive bivariate probit regression - a joint estimation of fertility decision and multiple partners

  – Incorporate with the instrumental variables, thereby explicitly addressing the endogeneity problem

Marginal effect of husband's multiple partners on women's decision to have children: Probit regression and Bivariate Probit regression

	Probit model	Bivariate Probit model	
	Decision to have children	Decision to have children	Awareness of husband's other partners
Awareness of husband's other partners	0.036*** (0.009)	-0.252*** (0.069)	
Sex Ratio			0.007*** (0.002)
HIV Literacy			-0.009*** (0.002)
Spouse Age Difference			0.002*** (0.000)
Country FE	Yes	Yes	
Number of Observations	66,525	66,525	
Wald chi2	13,838.41***	15818.60***	
Pseudo R2	0.198		
Rho		0.499*** (0.121)	

- After controlling the possibility of endogeneity, the results markedly differ from previous studies that polygamy *associated with high fertility*
- However, it aligns with the *most recent empirical study by Rossi (2018)* that polygamy is associated with lower birth rates at the micro level
  - when controlling for reproductive externalities such as norms of society – the decision depends more on women's choices (Ickowitz and Mohanty 2015)

Estimations for the quality of newborn baby

- A Wald test of the significance of rho is statistically significant at 10% level

- Thus, the recursive bivariate probit model can be applied

- An awareness of husband's partner *increases the probability of having small child* by 21.3% statistically significant

- The unsurprising results confirmed by previous studies that found polygyny lower the quality of children (Wagner and Rieger 2015; Mammen 2004)

Marginal effect of husband's multiple partners on quality of children: Probit regression and Bivariate Probit regression

	Probit model	Bivariate Probit model	
	Regular sized child	Regular sized child	Husband's multiple partner
Awareness of husband's other partners	-0.054***	-0.213**	
	(0.011)	(0.089)	
Living Area	-0.001	0.000	0.005
	(0.006)	(0.006)	(0.003)
Sex Ratio			0.004
			(0.004)
HIV Literacy			-0.017***
			(0.004)
Spouse Age Difference			0.002***
			(0.000)
Country FE	Yes	Yes	
Number of observations	17,890	17,890	
Wald chi2	287.23***	699.31***	
Pseudo R2	0.024		
rho		0.373*	
		(0.199)	

Sub-sample analyses

- Regarding to the legality (and stability) of the union are also investigated
- Type of relationship is a strong predictor of fertility decision (Testa 2007; Philipov et al. 2006) and importantly the allocation of income (Oropesa et al. 2003); cohabitation relationship relatively unstable over time (Bumpass and Lu 2000)
- However, this study finds indifferences of the results between these two types of union

Marginal effect of husband's multiple partners on fertility decision and quality of children among cohabitation and married groups

	Decision to have children				Regular sized child			
	Probit		Bivariate Probit		Probit		Bivariate Probit	
	Cohabitation	Married	Cohabitation	Married	Cohabitation	Married	Cohabitation	Married
Awareness of husband's other partners	0.046*** (0.012)	0.019 (0.013)	-0.311*** (0.077)	-0.300*** (0.045)	-0.045*** (0.014)	-0.077*** (0.020)	-0.371*** (0.048)	0.191* (0.113)
Number of observations	28,468	38,057	28,468	38,057	9,558	8,328	9,558	8,328
Wald chi2	5,164.88***	7,505.78***	6,476.13***	8,355.09***	145.57***	152.94***	2,136.20***	327.53***
Pseudo r2	0.150	0.227			0.022	0.028		
rho			0.547*** (0.117)	0.619*** (0.083)			0.734*** (0.099)	-0.690 (0.294)

Conclusion

- Exploring fertility decision women make given that her husband engaged in multiple partners relationship in the condition that less likely to be interfered by social norms (excluding polygamous countries)

- Using a recursive bivariate probit approach, taking into account the possibility of endogeneity

- The results show that multiple partners has a negative impact on fertility decision

- This negative association represents a form of risk that is decreasingly tolerated as women's economic independence grows as her household resources have been shifted and shared to other women

Conclusion

- The inefficient allocation of household resources among polygynous relationship is confirmed by the lower quality of children

- It has been documented that polygyny reduces human capital accumulation (Edlund and Lagerlof 2004)

Conclusion

- Polygynous relationship can happen in monogamous society

- However, most of literature in this field rarely examined the relationship outside Africa

- This study takes an advantage from rich data from MICS to analyze this relationship that most likely to be decided based on women's choices

Conclusion

- Although, family relationship might be considered a private affair, it can bring some public consequences

    - Examples include potential lower quality of children

- Polygyny may hurt economic growth by lower fertility rate and lower quality of child

- Policy recommendations would be to promote strong family bonds and prevent polygyny

- It also contributes to policy in Africa that besides banning on polygamous, promoting women's empowerment and her economic independence are necessary