

BARGAINING LEVERAGE IN FAMILY PLANNING: A GENDER-BASED ANALYSIS OF FILIPINO COUPLES' REPRODUCTIVE CHOICES

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ABSTRACT

At the heart of the Philippines' population problem is the high fertility rate among low-income households. The country's total fertility rate remains the highest in Southeast Asia, averaging 2.7 births per woman as of 2017. Numerous studies have established the positive association between poverty and large family size. Most economic studies point to inadequate women's education and lack of access or ineffective use of family planning methods as the main reasons behind high fertility. Less studied is the effect of the distribution of "power" or influence between the spouses. This research examined the problem using the collective household model as theoretical framework. The model recognizes individual preferences of spouses, thereby allowing a gender-based analysis of intrahousehold decision-making. This research utilized the 2003 Philippine national demographic data because, to date, this is the only survey where men were surveyed separately from women on a national scale, with a data subset of matched husbands and wives. The method of analysis employed independent multinomial probit regression, utilizing three dependent variables representing three categories of family planning based on the level of involvement of one or both spouses. These are (1) women-only methods, (2) couple-participation method, and (3) irreversible methods that required consent of both spouses. The econometric results reveal the gender-based differences in the way some power-related factors affected the probability of the man or the woman using certain types of family planning method: (1) support from extended family lowers the probability of using women-only contraception; (2) women's discussion of family planning with other people—which can indicate some social capital—raises the probability of family planning use across categories; (3) exposure to family planning media messages affects men and women differently; and (4) difference in the couple's education matters only in the use of women-based contraception. Interestingly, in contrast to the finding on women, the men's discussion of family planning did not appear as a significant factor in the use of any type of family planning method.

Key words: intrahousehold bargaining; collective household model; family economics; family planning; fertility

INTRODUCTION

The Philippines is one of the few remaining countries in Southeast Asia with a relatively high fertility rate even if an official population program had been in place since 1969 with the setting up of the Population Commission. High fertility is considered a key development issue because it is associated to chronic poverty. The country had seen an acrimonious debate on the reproductive health bill for more than decade before a law was passed in 2012. Even after, public discussion remains a sensitive matter.

It had long been argued that the real problem with respect to the high fertility issue is the inability of low-income couples to achieve their fertility goals (Herrin 2007). This unmet need had largely been blamed on lack of access to information and quality services as well as ineffective contraceptive practices (Herrin 2007; Orbeta 2008). Less studied is the relative influence of spouses on family planning decisions. Hence, this research intends to contribute to efforts to fill in this research gap in the economic analysis of fertility.

The research asks the question: Do Filipino couples bargain over family planning? Its objective is to examine a possible power relation issue, hence the phrase "bargaining leverage". It is analyzed within the so-called collective model, a theoretical framework in economics developed by Bourguignon and Chiappori (1992), among others, and elaborated in Browning, Chiappori and Weiss (2014).

This work differentiates itself from other economic studies in two aspects of the methodology. First, it examines the problem using an economic framework that factors in possible "distribution-of-power" variables between husbands and wives. Second, it categorizes the various family planning methods according to the levels of commitment or involvement of one or both spouses in the actual practice of family planning.

This paper proceeds as follows. It first provides an overview of the issue of large family size in the Philippines. The second part reviews related literature on the economic theories used to examine fertility decisions and outcomes, followed by empirical studies on intrahousehold bargaining that affect fertility outcomes. The third part expounds on the collective model of household behavior as a framework. The fourth presents the data and econometric methodology, followed by the description of the respondents and results of the econometric estimation. The concluding part summarizes the key points and identifies the limitations and opportunities for further research.

HIGH FERTILITY ISSUE

It has been observed that poverty incidence in the Philippines rises with the number of children. Orbeta (2003) had earlier pointed to the causal relationship citing three channels by which large family size contributes to poverty: (1) It can adversely affect economic growth, for instance, when savings fall as youth dependency increases. (2) It can skew the distribution of resources to the detriment of the poor. (3) It can lower the well-being of the members such as reduced school participation and inability to protect themselves from economic shocks. Moreover, there is inter-generational impact as low investments in human capital leads to future poverty.

Children have traditionally been highly valued in the Philippines. This has been constantly reaffirmed in studies that date back to over 40 years (e.g., Tan 1994; Ramirez 1984; Go 1993; Jocano 1998; Medina 2001). With the country’s chronic poverty and inequality, family size has become an issue both on the level of households and of the country in the aggregate. The country’s annual population growth rate was estimated at 1.73% for the period 2010-2015, slightly reduced from the 1.9% recorded in the period 2000-2010. The country’s total fertility rate is still the highest in Southeast Asia, averaging 2.7 births per woman as of 2017, a slight improvement from 3.0 births in 2013.

Table 1 shows the declining trend in the Philippines’ total fertility rate and total wanted fertility. There is still about a one-child difference.

Table 1. Comparison of Total Fertility Rate and Total Wanted Fertility, Philippines, 1993 to 2017

NDHS source	Total Fertility Rate (number of children)	Total Wanted Fertility (number of children)	Difference (number of children)
1993	4.1	2.9	1.2
1998	3.7	2.7	1.0
2003	3.5	2.5	1.0
2008	3.3	2.4	0.9
2013	3.0	2.2	0.8
2017	2.7	2.0	0.7

Source of data: 2017 National Demographic and Health Survey (NDHS), Philippines. p.74. Note: Wanted fertility rate “reflects the level of fertility that would result if all unwanted births were prevented”, where unwanted birth refers to “any birth in excess of the number of children a woman reported as her ideal number” (2017 NDHS, p.74).

Among women of the lowest wealth quintile, the mean ideal number of children recorded in the 2017 NDHS was 3.2, which is lower than their total fertility rate of 4.3 children or the 5.1 mean number of children ever born to women age 40-49.

Orbeta (2008, p.84) provided empirical evidence that the large family size among the poor is more a “result of at least three factors: (a) the crowding out of women from poor households that are getting their supplies of modern contraception also from public sources, (b) the lower education of women from poorer households, and (c) the lower capacity of women from poorer households to pay for private supplies.”

Sporadic local surveys usually by sociologists show that Filipino husbands exert a strong influence on couples’ reproductive choice, possibly contributing to the wives’ inability to meet her desired number of children. Earlier studies have found relatively high levels of spousal disagreement among Filipinos in certain aspects of contraception (Biddlecom et al. 1997; Mason and Smith 2000), the influence of men in family planning decisions (David 1994; Alcantara 1994; Biddlecom et al. 1997; Medina 2001; Clark et al. 2007), and the role of men as gatekeepers in family planning (Clark et al. 2007). In the 2017 NDHS, 69% of the women nationwide said that their husbands want the same number of children as they do, and 20% said that their husbands want more children.

RELATED THEORETICAL AND EMPIRICAL LITERATURE

For decades, research on the economic theory of fertility has been framed within neoclassical economics (e.g., Becker 1960, 1993; Schultz 1981, 1990). It is sometimes referred to as the unitary household model. The welfare of the household is represented by the household head, who seeks to improve the joint well-being of the household members given the household’s full income constraint. The income and other resources of members are pooled, with no distinction who contributed what. The quantity and quality of children are certainly part of the equation which, along with other commodities, provide satisfaction to the family. Like other goods, the demand for children also depends on prices and pooled household incomes, regardless of the preferences and contribution of individual household members.

While the unitary model has been the mainstream framework, other perspectives have surfaced to challenge or modify at least one or more of its assumptions. There is a set of literature focusing on the influence of gender-based power on matters related to fertility, for instance, in relation to the social and psychological costs of contraceptive use. Sociologists direct us to the

observation that the balance of power is reflected in the domains of control and decision-making (e.g., Hollerbach 1980; Agarwal 1997; Medina 2001; Blanc 2001).

Another set of literature is on bargaining theory which, in turn, branches into several strands such as cooperative and non-cooperative models. The seminal works on intrahousehold bargaining behavior include Manser and Brown (1980), McElroy and Horney (1981), and Lundberg and Pollak (1994). A crucial point in bargaining theory is the definition of a threat point or a fallback utility in case of a disagreement. This determines one's bargaining power. Individual control of resources, for instance, may improve a spouse's threat point.

In general, the features of intra-household bargaining theory are as follows: (1) It assumes separate utility functions for the husband and wife. (2) It gives importance to who provides and/or controls the household income and other resources. (3) It recognizes, implicitly or explicitly, the existence of the individual spouse's bargaining power and its effect on household outcomes. Such power is determined by economic and other factors.

The development of the collective model of household behavior—the framework used in this research—draws from cooperative bargaining but without a discussion of a threat point. In a collective model, cooperation is also important and assumes that spouses seek decisions that are Pareto efficient.

Applied to reproductive choice, one can only find very limited empirical literature on intra-household bargaining. Most applications of bargaining theory have been on labor supply and household consumption. In the Philippines, there are two major published empirical papers on this topic, namely, Mendoza and Berlage (2006) on the effect of inherited land on labor supply decision, and Bayudan (2006) on the effect of differences in age, education and wage on time allocation and consumption decisions.

The paper of Bayudan is one of the very few empirical tests on the collective household model in the Philippines (Browning, Chiappori and Weiss 2014). Among Bayudan's findings, and the one clearly relevant to this research, is that close to 70 percent of the wives consulted their spouses on family planning matters and that a bigger wage difference in favor of the husband led to a greater probability that the husband will be the final decision maker on this matter.

Using a bargaining model, the earliest empirical studies on fertility in other countries probably dates back to the early 1990s (e.g., Schultz 1990; Isvan 1991; Ott 1992). Klawon and Tiefenthaler (2001) studied over 40,000 married couples in Brazil and similarly confirmed nonwage income as a source of bargaining power. They saw that transfers received by women have a significantly stronger effect on fertility reduction than those received by men. Quisumbing and Maluccio (2003) tested the collective model against the unitary model using data from Bangladesh, Ethiopia, Indonesia and South Africa. They noted the relevance of socio-cultural factors, such as support from extended family, that can serve as indicators of bargaining power. The culture factor was also recognized in the paper of Rasul (2008). It focused on the fertility preferences of ethnic Chinese and Malay couples in Malaysia and their commitment to future actions in their marriage. Part of the results showed inherited land as a source of bargaining power for husbands among Malay couples.

THEORETICAL FRAMEWORK

The collective model introduced the concept of "distribution factors" to denote the distribution of power or influence among the household members. A household utility function, u^H , is defined recognizing the individual preferences and well-being of two household members. Following Browning and Chiappori (1998) and Bourguignon, Browning and Chiappori (2009), the household utility function is shown as the weighted sum of the utility functions of individual members, say spouses A and B . The general form may be shown as:

$$u^H(\mathbf{q}, \mu) = \mu \cdot u^A(\mathbf{q}^A, \mathbf{q}^B, \mathbf{Q}; \mathbf{a}) + (1 - \mu) \cdot u^B(\mathbf{q}^A, \mathbf{q}^B, \mathbf{Q}; \mathbf{a}) \quad \text{Eqn. 1}$$

where

- $\mathbf{q}^A, \mathbf{q}^B$ = vectors of private goods
- \mathbf{Q} = vector of household public goods
- μ = Pareto weight to represent the distribution of power
- \mathbf{a} = preference factors

"Preference factors", \mathbf{a} , include personal and demographic characteristics of the spouses that affect preferences directly, such as age, race or residence. The explicit inclusion of Pareto weights, μ and $(1-\mu)$, is the key feature of the collective model as it represents the distribution of influence or power between spouses. The Pareto weight μ is a function formally stated as

$$\mu = \mu(\mathbf{p}, x, \mathbf{z}), \quad \text{Eqn. 2}$$

where \mathbf{p} is the price vector of the goods, x is total household expenditures and \mathbf{z} is a vector of distribution factors. Examples of these distribution factors that have been used in previous studies include: relative income, relative wages, relative unearned income, relative age, relative education, local sex ratio, household income, background family factors, control of land, previous children, reported influence in the household, married or cohabiting, divorce laws, alimonies, single parent benefits and gender

of a benefit's recipient (Browning, Chiappori and Weiss 2014). Thus, distribution factors may be considered as extra-household or extra-marital environmental parameters like social-cultural norms that may affect the direction of an intrahousehold decision.

It is helpful to understand the connection between the Pareto weight μ and bargaining power, and this is clearly described by Browning and Chiappori (1998) as follows:

"The "distribution" function μ has an obvious interpretation as a "distribution of power" function. If $\mu= 1$ then the household behaves as though A always gets their way, whereas if $\mu= 0$ it is as though B is the effective dictator. For intermediate values, the household behaves as though each person has some decision power. Note that μ will generally depend on prices and total expenditures, since these environmental variables influence the distribution of "power" within the household. Two additional points may be noted at this stage. One is that, in general, μ may also depend on other factors, such as individual incomes of the two partners, or any other factor of the household environment that may affect the decision process." (p.1247)

The last phrase "individual incomes of the two partners, or any other factor of the household environment" in the quoted paragraph is captured by the distribution factors, \mathbf{z} , which can shift power in favor of one spouse.

The reduced-form demand function for a collective household good \mathbf{g} is written as

$$\mathbf{g} = \mathbf{g}(\mathbf{p}, x, \mathbf{z}; \mathbf{a}), \tag{Eqn.3}$$

meaning demand for \mathbf{g} depends on prices, expenditures, some distribution factors and preference factors. In this research, we consider family planning as the \mathbf{g} .

Decision-making process in collective household model is assumed to be cooperative and outcome Pareto efficient (Chiappori 1992, p.442). Pareto efficiency is used here in the usual economic sense: that all opportunities for gains have been exhausted and no other consumption vector in the budget set can make the household members better off (Browning and Chiappori 1998, p.1246). It is noted that there would be cases where decision allocations are not Pareto efficient, like when some families may be rigid in the way things are run at home. Disagreements may arise but cooperation does not preclude conflict which can be resolved in different ways.

Bourguignon, Browning and Chiappori (2009) provide the detailed conditions in testing the collective model against the traditional unitary model. The basics of these tests reveal how crucial the role of the distribution factors is. The first step to be able to consider if a collective model is suitable is to test Proposition 1 (p. 509): "Proposition 1. A given system of demand functions is compatible with unitary rationality if and only if it satisfies

$$\frac{\partial \xi_i(x, \mathbf{a}, \mathbf{z})}{\partial z_k} = 0 \quad \forall i, k "$$

This essentially means that any distribution factor, z_k , will not significantly affect the demand for good ζ in a unitary model that is, its marginal effect is not significantly different from zero.

A test on the collective household model against a unitary model is further validated by a post-estimation test to check if decisions are Pareto efficient. This test on the proportionality condition, for instance, may be empirically done using cross-equation Wald test. This paper, however, does not cover this.

DATA AND METHODOLOGY

The research utilized nationally representative data from the 2003 Philippine NDHS, the only year when a national demographic survey asked men to respond separately from the women. The 2003 NDHS interviewed 13,633 women, 15-49 years old, and 4,766 men, 15-54 years old, with a subset containing 2,380 matched couples. For this research, couples in which the woman was pregnant and those in which the man and/or the woman were infecund were eliminated since there is no reason for them to practice family planning. The remaining number of observations used was 2,112.

The econometric method involved testing the main hypothesis—following Proposition 1—that the selected distribution factors \mathbf{z} significantly matter in the couple's use of specific family planning methods. The practice of family planning, FP , is considered as the collective household good \mathbf{g} for which demand functions are estimated. The demand for family planning is a derived demand for children. Behind the choice of number and spacing of children is an assumption of desire for quality. The prime motivation is to raise "quality" children—happy, healthy, educated, responsible, and endowed with desirable characteristics—and prepare for a good life given the household resources.

The methodology involves estimating two sets of independent multinomial probit regressions representing two empirical models for the demand equations. The difference between the two lies in the choice of distribution factors.

The dependent variables for each model are FP_1 , FP_2 and FP_3 , which are categories of family planning use as described below. These variables are all probabilities, limited to a binary response, either 1 or 0.

(1) FP_1 = “Women-only” methods are those that can be used by the wife, without the participation or even knowledge of the husband, such as pills, injectables, IUD;

(2) FP_2 = “Couples-based methods” are those that need the knowledge, participation and cooperation of both the husband and the wife such as condoms, withdrawal, and periodic abstinence (rhythm). It also includes the natural family planning methods allowed by the Catholic Church in the Philippines, namely lactational amenorrhea, ovulation method, basal body temperature, symphothermal method and standard days count.

(3) FP_3 = “Permanent and irreversible methods” that includes male sterilization (vasectomy) or female sterilization (ligation) requiring the written consent of the person who will be sterilized, and in some cases also the spouse.

In Model 1, the independent variables tested representing the distribution factors, z , were:

- The couple receives support from woman’s family ($Hhwomfam$).
- The couple receives support from man’s family ($Hhmanfam$).
- The woman discussed family planning with people other than spouse ($Dwomdisfp$).
- The man discussed family planning with people other than spouse ($Dmandisfp$).
- The woman is exposed to family planning messages in media ($Dwomexpfp$).
- The man is exposed to family planning messages in media ($Dmanexpfp$).

In Model 2, the independent variables tested representing the distribution factors z were

- Difference in the spouses’ age ($Agediff$)
- Difference in spouses’ years of education ($Educdiffw$)

Model 2 was constructed because its two distribution factors are among those considered unequivocal, coming out as significant in previous studies. Difference in the spouses’ age and education reflects the difference in the human assets brought into the marriage, a proxy for the distribution of resources.

In both Model 1 and Model 2, the independent variables include preference factors, a , that may affect family planning. Both models are already reduced-form equations. Hence, there may be other variables usually deemed as family planning determinants but were excluded because they are not exogenous in this research. For example, current number of children, a key consideration to limit childbirth, is an endogenous variable. Marriage, a candidate explanatory variable indicating commitment, is likewise endogenous in this case.

The NDHS data set unfortunately does not contain prices, household income nor expenditures. In order to factor in their effects, regional data variables were included. The model specification then assumes that variation in prices and incomes are determined by the location characteristics as well.

DATA DESCRIPTION

Table 2 shows an overview of the 2,112 respondent couples. Majority of them (56.92%) practice some form of family planning. Of these, the most popular forms are woman-only methods (24.15%), closely followed by the couple-participation methods (20.98%). Voluntary sterilization, a permanent or irreversible method, was used by only 11.79%.

The men were generally older than the women but women had more years of school. Three fourths of the couples were Catholic while 5.4% were Muslim. Almost half of the couples lived in urban areas. Households were fairly well distributed among the five socioeconomic classes. All geographic regions in the country were proportionately represented. Majority (86.74%) of the couples have the husband as the household head. Some 11% of the couples lived in households headed by a relative of either the wife or the husband. Such couples are presumed to be receiving some support from their extended families. Most respondents discussed family planning with their spouses, but only a third of the respondents discussed family planning with other people. Majority of them admitted having been exposed to family planning information from mass media sources.

Table 2: Descriptive Statistics of the Respondent Couples

Variables	N	%	Mean	Std dev	Min	Max
Current use of family planning (FP):	2,112					
If practicing FP Category 1		24.15				
If practicing FP Category 2		20.98			0	1
If practicing FP Category 3		11.79			0	1
Not currently practicing FP		43.09			0	1
Total		100.00				

If the couple has children of both sexes	2,112	61.65			0	1
If both spouses are Catholic	2,112	75.00			0	1
If both spouses are Muslim	2,112	5.40			0	1
If an urban household	2,112	48.63			0	1
Distribution by household wealth:	2,112		2.85	1.401	1	5
Lowest quintile/Poorest (index=1)		22.54				
2nd lowest		22.16				
Middle		19.84				
2 nd highest		18.56				
Highest quintile/Richest (index=5)		<u>16.90</u>				
Total		99.99				
Distribution of households by region*	2,112				0	1
If the spouses discussed FP	2,112	53.46			0	1
Woman's current age	2,112		33.84	8.056	15	49
Man's current age	2,112		36.48	8.389	17	54
Woman's years of education	2,112		8.92	4.011	0	17
Man's years of education	2,112		8.41	4.080	0	17
Distribution of couples by household head:	2,112					
Man /Husband						
Woman/ Wife		86.70				
Man's family (parent, grandparent, etc.)		1.23				
Wife's family (parent, grandparent, etc.)		5.92				
Others		4.97				
Unstated		0.90				
Total		<u>0.24</u>				
		100.00				
If woman discussed FP with people other than spouse	2,112	50.33			0	1
If man discussed FP with people other than spouse	2,112	33.71			0	1
If woman is exposed to FP information in media	2,112	74.43			0	1
If man is exposed to FP information in media	2,112	67.23			0	1

*Not shown; sample size depends on percentage of regional population to national total. Percentages range from a high of 13.0% for the National Capital Region to a low of 3.5% for the Cordillera Autonomous Region.

DISCUSSION OF RESULTS

1. Effect of Distribution Factors

Support from extended family. This variable was proxied by information on whether a couple is living in a household headed by parents, grandparents or other close relatives. Couples who do undeniably enjoy some support in the form of direct and indirect subsidy for rent, food, and utilities as well as non-monetary support like childcare services. Table 3 shows that household support from extended family, either man's or woman's side (*Hhwomfam*, *Hhmanfam*) significantly lowers the probability that the wife will use women-only methods (*FP₁*). With the usual dotting role played by grandparents, it is not surprising to see how childbearing can be encouraged in traditional Filipino families. Support from the woman's extended family (*Hhwomfam*) also significantly lowers the probability of the wife undergoing sterilization.

Such results appear to reflect the socio-cultural observation that the spouses' parents and in-laws aspire to have more grandchildren as a continuation of their lineage. It is likewise possible to infer that family subsidies reduce the pressure to keep family size small.

It may be useful to consider that couples who live in households headed by relatives are also younger, and younger couples are less likely to practice family planning especially if they are receiving support from somewhere.

Discussion of family planning. This is some form of social support or possibly an indicator of social capital. The results highlight the importance of communication. Discussion with other relatives, friends or community members provides an opportunity for the individual to process his or her thoughts and feelings about fertility regulation and family size. Table 3 shows that women who discussed family planning with people (*Dwomdisfp*) other than their spouses are more likely to use some family planning method, as seen in the significantly positive coefficients in all family planning categories. It is interesting to note that discussion of family planning does not seem to matter for husband's decision, or perhaps men are less likely to express their feelings or engage in such discussion.

Exposure to media messages on family planning (*Dwomexpfp*, *Dmanexpfp*). Tri-media (print, radio and television) provide useful information that can influence the practice of family planning. Exposure to family planning media messages appears to be effective in influencing both men and women, albeit in different ways. During the years prior to the survey, USAID through its

cooperating agencies undertook extensive advertising campaigns on print, radio and television pushing for the practice of modern methods of family planning. It is possible to infer that the campaign may have convinced women to use methods that demonstrate their autonomy. As for the men, they may have been convinced to prefer methods in which they can participate. One can almost see here the empowering influence of media towards an individual spouse's assertion of his or her interest.

Table 3: Model 1 - Multinomial probit equations for different categories of family planning

Base outcome = 0	Dependent variables: Family planning categories		
	(1) Woman methods: P($FP_1=1$)	(2) Both need to participate: P($FP_2=1$)	(3) Permanent methods needing formal consent: P($FP_3=1$)
	β coefficients	β coefficients	β coefficients
Independent Variables: "Preference factors" and other control factors:			
Urban	-0.0497384	0.1307106	0.2367269 *
Cath	0.0998992	-0.0354325	-0.3204162 **
Muslim	-0.7073493 **	-1.727403 ***	-1.089755 **
Hhwealth	0.2407251 ***	0.0449524	0.1815799 ***
Sexchild	0.5896456 ***	0.3239906 ***	1.002699 ***
Spsdisfp	0.428926 ***	0.4157862 ***	0.0591413
Womage	0.1687623 ***	0.0542279	0.2438749 ***
Womagesq	-0.0035892 ***	-0.0011137	-0.0028957 **
Manage	0.0870789	0.1078803*	0.0001856
Managesq	-0.0012005	-0.0012431	0.0001033
Womedu	-0.0062013	0.0483993 ***	0.0231641
Manedu	-0.0322859 *	0.0062913	0.0051609
Regional dummies /a			
Independent Variables: "Distribution factors" (Proxies for bargaining power):			
Support from extended family: Based on whose side of the family heads the household			
Hhwomfam	-0.5684895 ***	-0.219664	-0.6994974 *
Hhmanfam	-0.6139309 ***	-0.1081188	-0.4620874
Social support: Discussed FP with others			
Dwomdisfp	0.4312712 ***	0.3807946***	0.259442 **
Dmandisfp	0.1198436	-0.0098507	-0.0508832
Exposure to media info			
Dwomexpfp	0.2534083 **	-0.2327035**	0.055187
Dmanexpfp	0.0022666	0.232625 **	0.1217476
N = 2112			
Log pseudo-likelihood = -2311.0231 Wald chi2 (102) = 638.17 Prob > chi2 = 0.0000			

*Significant at 10%, ** Significant at 5%, *** Significant at 1%

Note: (a) Dummy variables for 16 of the 17 regions were included as location variables (NCR as base variable). Prices and incomes are assumed to be endogenously determined by these variables. Results not shown in the table.

Table 3 shows that the woman's exposure to media messages (*Dwomexpfp*) significantly raises the probability of using woman-only method (FP_1) but reduces the probability of using couple-based methods (FP_2). Of interest is the effect of the husband's exposure to media messages (*Dmanexpfp*) which significantly raises the probability of using couple-based methods (FP_2). This might be a result of the proliferation of advertisements on male condom compared to other family planning methods. It may also be an indication that men are open or willing to participate in couple-based methods given more information. It is worth noting also that even though natural family planning methods are also couples-based, these methods have limited media mileage.

Table 4: Model 2 - Multinomial probit equations for different categories of family planning

Base outcome = 0	Dependent variables: Family planning categories		
	(1) Woman-only methods P ($FP_1=1$)	(2) Couple participation methods P ($FP_2=1$)	(3) Permanent methods needing formal consent P ($FP_3=1$)
	β coefficients	β coefficients	β coefficients
Independent Variables: "Preference factors" and other control factors:			
Urban	-0.0252936	0.1394837	0.2468409*
Cath	0.0647262	-0.0693688	-0.3446292**

Muslim	-0.8208148**	-1.814874 ***	-1.152883**
Hhwealth	0.2012262***	0.0415365	0.16533***
Sexchild	0.587845 ***	0.3321292***	0.9989775***
Spsdisfp	0.5152982***	0.4538728***	0.911709
Womage	0.2603054***	0.1275862***	0.2686519***
Womagesq	-0.0048012***	-0.0019291***	-0.0030366***
Womedu	-0.0219996	0.0595321***	0.0319363
Regional dummies /a			
Independent Variables: "Distribution factors" (Proxies for bargaining power):			
Relative age and relative education:			
Agediff	0.0043681	0.0167579	0.0140516
Educdiffw	0.0308847*	-0.0070584	-0.0043836
N = 2,112			
Log pseudo-likelihood = -2346.263 Wald chi2 (57) = 593.76 Prob > chi2 = 0.0000			

Significant at 10%, ** Significant at 5%, *** Significant to 1%

Note: (a) Dummy variables for 16 of the 17 regions were included as location variables (NCR as base variable). Prices and incomes are assumed to be endogenously determined by these variables. Results are not shown here.

Difference in Education. Table 4 shows that the more educated the woman is relative to the man (*Educdiffw*), the more likely she will be using woman-only methods where she can practice more autonomy. Note that the variable *Educdiffw* is defined as excess of woman's years of education over the man's. In the Philippines, the average education of women generally exceeds that of men.

2. Effect of Preference Factors and Other Control Variables

Urbanization (*urban*). Family planning services are more widely available in urban areas. Also, non-urban areas will likely be agricultural, and there are indications that agricultural households value children as farm labor.

Living in an urban area is a significant factor only for those who choose sterilization as a family planning method (*FP₃*), the effect being positive as expected. While an urban environment will make other family planning services more accessible, this condition did not show any significant influence on the demand for methods in *FP₁* and *FP₂*. This implies that for these other family planning methods, it did not matter whether the couple lives in an urban or rural area.

Being Catholic (*Cath*). Followers of the Catholic faith are prohibited from using artificial family planning methods as well as male and female sterilization. Having both spouses as Catholics significantly reduces the probability that the woman or the man will be sterilized (*FP₃*). This conforms to expectation. However, the result also implies that being Catholic did not appear to matter in the use of other family planning methods (*FP₁* and *FP₂*).

Being Muslims (*Muslim*). Having both spouses as Muslims significantly reduces the probability of family planning use in all three FP categories. Muslims in the Philippines are known to be pronatalist and many believe that family planning is prohibited in Islam.

Socioeconomic status (*Hhwealth*). This control variable identifies the household wealth quintile. Couples of higher socioeconomic status are more likely to practice *FP₁* and *FP₃*. These are methods that involve some cost like pills and sterilization. On the other hand, couple participation-based method—except for the condom—hardly require out-of-pocket expenses so wealth does not appear to be a determinant for *FP₂* use.

Having a Daughter and a Son (*Sexchild*). There is a strong cultural bias to desiring children of both sexes in the Philippines. The dummy variable, *sexchild*, denotes that the couple has children of both sexes. Regression results show that, as expected, having at least one child of both sexes significantly increases the probability of family planning use in all categories.

Spouses Discussed Family Planning (*spsdisfp*). Regression results show that discussion between spouses has a significant positive effect for both *FP₁* and *FP₂*. However, there is no significant result for *FP₃*. Being an irreversible procedure, it is expected that this would involve more discussion that should lead to a committed decision.

Woman's Age (*womage* and *womagesq*). As expected, the woman's current age is significantly positive for both *FP₁* and *FP₃*, and the corresponding age-square is significantly negative for both categories. The negative age-square variable reflects the lower need for family planning as the woman ages.

Man's Age (*manage* and *managesq*). Man's age is positively significant for the couple participation-based methods (*FP₂*). Although not expected, these findings may show that men also feel the need to participate in family planning as they grow older.

Woman's Education (*womedu*). Woman's education significantly raises the probability of using couple participation-based (FP_2) methods only, and not the other methods. The traditional economic model of fertility argues that more educated women have higher opportunity cost. Therefore, an increase in education tends to raise the demand for family planning to lower fertility. In this study, the positive sign only applies to couple participation methods (FP_2). This result suggests that education also affects the choice of method, reflecting relative power. Education gives a woman knowledge and self-assurance to make informed choices. Education can enable a woman to involve her husband in family planning. It can improve her confidence in using FP_2 methods more effectively with the husband's participation.

Man's Education (*manedu*). It was hypothesized that educated men will likely be able to afford more children, and thus find lesser need for family planning. This is based on the neoclassical prediction of a positive income effect on the demand for children owing to a wage increase (or an increase in education), and this effect is expected to be larger for men than for the women. The hypothesis is empirically supported only in FP_1 methods. It may be interpreted that a man can use his higher education as leverage to discourage the wife from using women-only methods as part of his gate-keeping functions.

Additional insights can be gained from the age and education variables. Wives and husbands who practice couple-based methods (FP_2) are generally older and more educated compared to wives and husbands who practice women-only methods (FP_1). There are studies indicating that artificial and hormonal methods like pills, IUD and injection (FP_1) are considered more reliable in terms of effectiveness although there are perceived trade-offs in health. On the other hand, FP_2 methods like rhythm and fertility-awareness based methods require more cooperation and periodic sexual abstinence (for rhythm and fertility awareness methods). One conjecture is that after couples try and discontinue the pills, injectables, and IUD they used in their younger years because of perceived difficulty and side effects, they try non-hormonal methods and couple participation-based methods in FP_2 .

CONCLUSION

This study argues, with some empirical basis, the possibility of using the collective model in analyzing intra-household reproductive decisions. In contrast to traditional unitary household model in economics, the collective model allows for separate utility functions of husbands and wives. Hence, it is flexible enough to accommodate gender-related variables when one deals with the distribution of intra-household influence or power.

The primary motivation of the research was to explore additional ways of analyzing the long-standing problems of high fertility and unmet need for family planning among low income households in the Philippines. This paper hypothesized that couples bargain over the choice of family planning method. They leverage various proxies for bargaining power to get to a decision. These proxies for bargaining power were represented in this study by five candidate distribution factors: support from extended family; spouse's discussion of family planning with other people; spouse's exposure to media information; spouses' age difference, and; education difference. Except for the age difference, there was sufficient empirical evidence that these factors do significantly influence the use of family planning, in varying ways for the spouses.

One interesting observation is that a distribution factor can come out to be significant for one spouse, but not for the other. This implies more weight on the man's interest in some cases, and more weight on the woman's interest in other cases. For instance, the wife's discussion of family planning with other people (an indicator of social support) can exert a positive significant influence on the decision to use family planning, but not so in the case of the husband.

Moreover, the empirical finding supports the existing literature that difference in education matters in swaying intra-household decisions, and in this case, reproductive choices. Difference in the spouses' education reflects the difference in the human assets brought into the marriage, a proxy for the distribution of resources which in turn is a source of power.

This paper has some limitations constraining it from fully testing the first proposition in a collective household model related to the distribution of power factors. The data set does not contain prices, household expenditures and incomes. As indicated in the methodology and in Tables 3 and 4, the inclusion of dummy variables for the regions in the Philippines was an attempt to address the price and income variation.

Future research can also pursue the following: (1) using household income data that can actually show the distribution of the sources of wage and non-wage financial resources among spouses, and (2) close investigation of the bargaining behavior of the couples in the two lowest household wealth quintiles to have a better picture of the situation among poor families. As a policy implication, there is a need for government to study the information delivery and counseling services with regards to the use of modern scientific methods, both artificial and natural.

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