Women's Endogenous Bargaining Power and Fertility Preferences: A Collective Model Approach in Pakistan

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ABSTRACT

This study introduces a collective model of fertility decisions (where preferences towards children may differ between couples), by using the Pakistan Demographic and Health Survey (2017-18) data with an instrumental variables (IV) approach. The age and occupational difference between spouses, the wife's cash earnings relative to husband, wealth quintiles, the beating of a wife by the husband is justified, media exposure, current use of any contraceptive have shown direct and positive impacts on women's bargaining power. Accounting for the endogeneity of bargaining power, age, education, and occupational difference and their square terms and wife's cash earnings relative to husband's cash earnings may use as instruments. The results of IV estimation showed that women's bargaining power, wealth quintiles, beating of wife by husband are justified, media exposure, current use of any contraceptive, and types of method (modern) came out as highly significant determinants in reducing the husband's fertility preferences. The findings recommend that improving women's bargaining power, educational attainment, exposure to the media, and contraceptive practice for achieving desired fertility preferences, are some of the substantial challenges on which policymakers should pay careful consideration in Pakistan.

Keywords: Bargaining powers, fertility preferences, instrumental variables, PDHS

JEL Classification: C79, D19, D64, D91

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1. INTRODUCTION

Women's intra-household bargaining power provides researchers a set of practical tools for analyzing fertility differentials between spouses. Evans (1991) described a household as a region where goods are formed, and utility is engendered for household members. The households generally transfer the flexible structures together with a set of people, often assumed to have relationships. Chen and Dunn (1996) believed that the entity to be like a household where individuals live under the same roof, and share a joint function of consumption, production, investment, and ownership. However, Bolt and Bird (2003) believed that household is essentially a multifaceted entity of estimation that can be described in several modes. Neo-Classical theory of Microeconomics generally assumes that households have one utility function, and everyone shares a similar utility function, or decisions are being made inside the family to maximize the collective utility of all household members (Ellis, 1993). A household produces utility in different ways other than market goods, such as leisure time or non-resource allocation, including companionship and health (Eastwood, 1985).

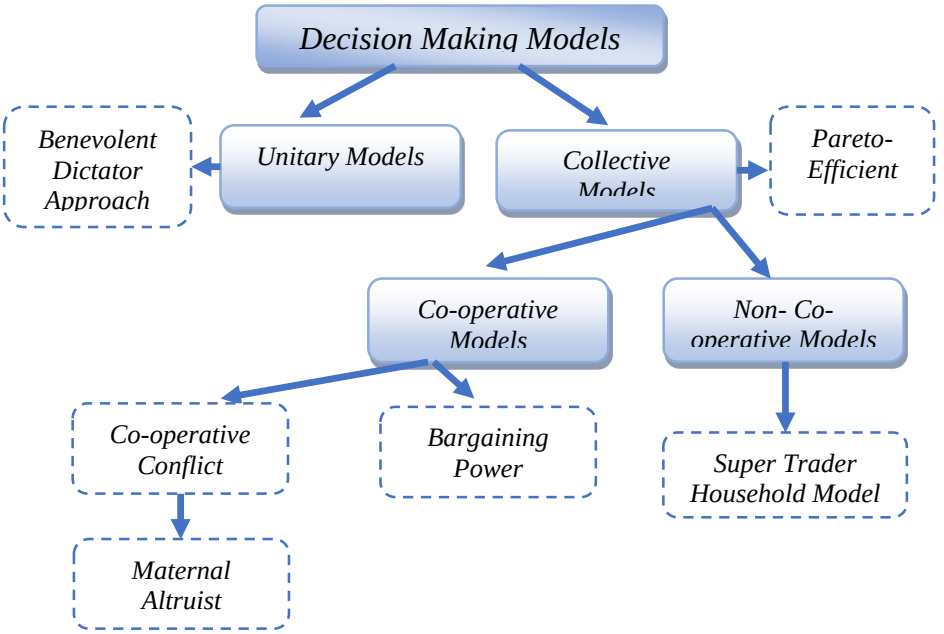
The models of decision making can be divided into two extensive sets; *The Unitary Models* assume a single utility function and combined decision making, which is based upon the settlement, where preferences are similar, and resources are being mutually shared. *The Collective Models* allow various decision-makers who have different preferences and tastes. These two types of theoretical models are used to study intra-household bargaining power and fertility decision issues and talk about how they can influence individual and household utility functions. Two different

distinctiveness planned to be put in the intra-household decision-making model. One major characteristic is that some community standards or peer forces endogenously determine women's bargaining power by investigating the responses of various decisions, such as income, large household purchases, health, and mobility. The other characteristic is that husband and wife bargain over fertility preference explicitly, and contradictory parental preferences mean few children. Several accessible proofs confirmed the presence of heterogeneity in spouses' preferences of fertility outcomes (Voas, 2003). Rasul (2008), Hener (2010), and Noman et al. (2021) studied the effects of bargaining power on fertility under contradictory spouse preferences in developed and developing countries. Once they enter the marriage market, the community imposes definite gender roles on men and women in the proposed model. Balance of power, among them, depends on the harmony in their choices. Given that women's bargaining power stands for various relations of fertility options, it is worth exploring the fertility choice and balance of power among spouses in a model in which both variables are determined inter-dependently. The primary objective of this study is to investigate the different causes of women's endogenous decision-making (bargaining power) and its after-effects on fertility preferences and to verify the non-linear relationship between couple's preferences in Pakistan.

2. LITERATURE REVIEW

Traditional neo-classical economists' works approached the unitary model of household behaviour (Samuelson, 1956). At a given set of prices and through collective earnings, resources are usually allocated so that the household would get

maximum production of goods. The produced goods link to a similar preference set where the home obtains its utility. Unitary models have been extensively disapproved and discouraged (Kabeer, 1994). Quisumbing and Maluccio (2000) claimed that primary assumptions of unitary models had generated several options that emphasize the individualism of household members and potential dissimilarities in preferences. They also argued that the model failed to identify multifaceted realism directed to partial considerations of intra-household resource allocation and decision making (Figure 1).



Source: Bolt and Bird (2003)

Figure 1: Diagrammatic representation of household decision making models

Another main issue opposing unitary models is that developing and developed communities rejected the income pooling hypothesis. Even though, the approach looks suitable in designing theoretical models and empirical analysis, its application has been robustly disapproved (Chiappori, 1998). The collective model updated by Chiappori et al. (2006) identified personal preferences in a household unit and allowed their bargaining power to affect domestic choices and consequences. The model presumes how decisions and outcomes made under such assumptions are Pareto efficient. Several researchers supported and forged the deduction drawn from this model, including Vermeulen, (2000) and Bourguignon et al. (2009).

Collective bargaining models determined that corollary utility influences the bargaining power of women. Women's earning power, then, controls their corollary utilities. It differs from the classic unitary model, where variation in education and employment status does not influence their decision-making roles. Under the non-cooperative household production model, Lundberg and Pollak (2008) found the likelihood regarding household behaviour of violence against women and children. Collective models can be sub-divided into two groups; one is enthusiastic for setting more formation on the decision-making process, one embedded in cooperative whereas, second in non-co-operative game theory. The collaborative model believes that everyone has an open preference, whether they exist individually or connect collectively, to structure a household to maximize utility with decision making. A decision formed by a family can be supported through economies of scale produced during the production and consumption of specific

goods. Bargaining Power Approach allows the decisions where individuals approaching in support of their preferences, however; negotiating by falling back situation being settled on through various costs, a person may countenance if the contract were remained unaccomplished and break-up or partition of household assets followed. Household bargaining power is regarded as a comparative concept in which the comparative negotiating power among husband and wife does matter instead of a change in each partner's position. Empirical research regarding women's bargaining power in household decisions (belonging to developed and developing countries) discovered that improved incomes of women lead to a high level of bargaining power, which tends to raise women's relative welfare (Quisumbing, 2003). Lundberg et al. (1997) also studied different effects of bargaining power on children spending, mainly on their clothing, when a child payment is transferred to mothers.

Basu (2006) identified endogenity effects of bargaining power and upshots as a two-way connection. A distinction in bargaining power estimation is greatly richer, enveloping the entire collection of determinants, and measures of bargaining power. Women's income, revealing hours of paid work, came out as no considerable effect while the gender wage gap showed remarkable positive effects on decreasing the hours of domestic labor performed by women and partaking of men in household work (MacPhail, 2007). The work of Hiller (2020) proved that women strengthening, both inside the family, and in legislative issues, benefits children and has the potential to advance economic progress. Moeeni (2021) investigated the impacts of education on the labor force participation of

married women in an intra-household collective decision system with imperfectly transferable utility and endogenous bargaining powers. The study concludes that the female's bargaining power increases when a lady is more educated than her companion while women's labour force participation is a reverse U-shaped function of bargaining power. The cooperative conflict approach identifies individuals enjoying distinct preferences. Nevertheless, it states that such preferences represent a household's perceived ideas and compulsion. Maternal Altruist Approach is an example of a cooperative conflict model that perceives a woman as frequently under additional community pressure compared to a man, for sacrificing their fundamental requirements, exhibits maternal altruism.

The non-cooperative Approach is symbolized as Super Trader Household Model by Becker (1981). The model presumes that every individual does not go into obligatory agreements with everyone and is not confined with community standards; they trade or bargain, exchange, or discuss via implicit prices for deciding about the distribution of resource, through their dealings, conditional on the dealings of other members. Fafchamps (2001) claimed that under this non-co-operative household model, household bargaining power might lead to some crucial ineffectiveness. This non-co-operative model assumes that income earned by individuals is used up according to their own choices and well-being, and it reveals no concept of income or resources pooling. Women with better bargaining power in decisions relating to family planning, household expenses, and mobility are related to improved results in children's health and education (Acharya et al., 2010). Duflo (2003) and Ditto (2011) studied empirical literature underlining a

positive link between women's bargaining power with children's health, education, and fertility decisions. Afoakwah et al. (2018) checked the association between women's bargaining power and children's education by developing an index of Principal Component Analysis (PCA). PCA arrested different facets of bargaining power and analyzed various methods by which women's bargaining power influences children's educational outcomes in Ghana. Doss (2013) emphasized the significance of examining women's bargaining power not only as decisions between spouses but in addition engaging other family members from numerous generations (grandmothers, aunts, uncles, nephews, etc.). He also studied how decisions made by women tend to affect children's outcomes rising inside these surroundings. Several hypothetical works on household bargaining have an endogenous balance of power (Lundberg and Pollak, 2003; Rainer, 2008).

Iyigun and Walsh (2007) proved that the fertility rate has decreased by increasing women's bargaining power, depending on education attainment achieved before marriage. Few studies proved that social communications influence bargaining power among spouses. Doepke (2009) and Fernandez (2010) discovered the inverse relationships between fertility and women's decision-making. They argued husband's choice for a wife's freedom might vary the balance of power, including the number of children. Fertility decisions influence women's preference of employment status because motherhood essentially keeps on a woman out of paid bustles, which consecutively directs to a broader gender gap inside the community. Cigno (2012) highlighted that life of pre-natal phase could lead a woman into an economically critical place at mutual nuptials, tracked by the lesser

result of intra-household resource allocation. As marital fertility engages the participation of spouses, who may have different reproductive objectives, such as the number and gender of children, the timing of producing children, successful planning plus contraceptive practice entails productive discussion between couples (Feyisetan, 2000). These fertility decisions might influence by different approaches and the intentions of either spouse. However, the argument concerning waiting time for upcoming childbirth among husband and wife remains exceptional (Perugini, 2001). In collaborations of person fertility preferences and levels where they execute them rely on individuality and circumstances. Therefore, the association between intentions and behaviour differs according to some socio-demographic characteristics (Hayford, 2012).

Gender preferences are robust indicators of fertility behaviour and intentions of the couples, with male child preferences usually boost fertility, fertility intentions, and unwanted pregnancies (Sathar et al. 2015). Hou (2011), using PSLM Survey and applied unitary versus collective models, found that the unitary model looks well in the Pakistan context as the existing conventional culture ranks the male members as head of household decision-makers. Child inclination is very solid in Pakistan and undesirable ripeness increments with number of surviving children (Hussain et al., 2000). Javed and Mughal (2018) contended that women's say in family decision-making increments after bearing children, but is restricted to regular choices, comparing to less vital social, healthcare, or financial issues, for example going by companions or relatives, seeing a health specialist, buying a household item. Key decisions on the other hand, those that include

substantial quantities of money and envisage the actual source of power at household, persist within the hands of their spouses or the family older people. Mahmood (1998) utilized the coordinated couple information set of PDHS (1990-91) and found that sixty percent of the couples detailed comparative states of mind on distinctive fertility-related questions and forty percent had divergent fertility desires. Kamran et al. (2011) stated that couples occasionally converse fertility intentions or wanted family magnitude in Pakistan, and conflict on fertility intentions is tall among couples, with women being more likely to report unintended fertility than their spouses. Kamran et al. (2014) discovered the fact that spouses quoted cost and need of accessibility of family planning services as primary reasons for not utilizing contraceptives. Usually, the gender dynamics of the society supports male supremacy, it would be beneficial to target males since it may conceivable that it is the unmet need for family planning among men that prevents more fertility due to low contraceptive use among married couples.

Shahid (2017) explores household negotiation power between couples of Pakistani families in Houston. The study inspects that the women's bargaining measures attempted to accomplish their needs additionally access to healthcare services. The findings confirm that more income and education have positive and noteworthy impact on women's decision making and negotiation powers. Nonetheless, the family background of women and perpetual dwelling are also significant factors of their negotiation and decision-making power. Most of the empirical literature of developing countries like Pakistan, Bangladesh, and India accentuate that in what way the diverse factors effect women bargaining power in the household, for

example education, family size, number of male children, wealth quintiles, asset ownership, income. Using such factors as instruments, this study tried to use endogenous women's bargaining power to estimate the fertility preference among couples via collective model approach.

3. METHODOLOGY

3.1 Principal Component Analysis (PCA)

Woman's participation in the decision-making process considers their level of power over various resources, and it has frequently been used as the primary determinant of women's bargaining power. The PDHS exclusively inquired married women who have the final say about the following four categories of decisions: economic, household, health, and freedom of mobility.

1. *The person who decides about money, husband, earns.*
2. *A person who decides on large household purchases.*
3. *The person who decides on wife's health care.*
4. *The person who decides on visits to family or relatives.*

Three options have been offered to each question, and women's responses have been coded into one of the following sets.

1. Mainly husband or other family members.

2. Husband and wife (jointly).

3. Mainly wife.

The Decision-making index has calculated by placing women into the three sets described above. Distinctively, one point is allotted to every decision, usually taken by the husband, or other family members (elders or relatives). In contrast, two points have given to all decisions taken jointly. It is because the woman is thought to have a small degree of power, in case when she decides in co-operation with husband concerning necessary decisions, three points are allocated to every decision, mainly taken by women alone. Thus, based on these four (4) decisions, a compound score is built. A scale consists of scores ranging from 1 to 3 in all decision categories. Once a suitable scale has been assigned to every class, Principal Component Analysis (PCA) is used to detect weights of all decision categories. The set of indicators that represent higher index values demonstrate higher decision-making power of woman. PCA is generally applied for data reduction procedures that decrease an extensive set of variables to lesser variables and catch the maximum potential variation from original variables. The followed strategy is relatively easy as we have four decisions and three categories regarding who takes a decision which everyone jointly utilized to find out women's decision-making power; linear combination can be listed as follows.

$$wdm_1 = \alpha_{11}x_1 + \alpha_{12}x_2 + \cdots + \alpha_{14}x_4 \quad (1)$$

$$wdm_2 = \alpha_{21}x_1 + \alpha_{22}x_2 + \cdots + \alpha_{24}x_4 \quad (2)$$

$$wdm_3 = \alpha_{31}x_1 + \alpha_{32}x_2 + \cdots + \alpha_{34}x_4 \quad (3)$$

$$wdm_4 = \alpha_{41}x_1 + \alpha_{42}x_2 + \cdots + \alpha_{44}x_4 \quad (4)$$

Therefore, it indicates that the one who decides the k[th] category. In this study, $k = \{1,2,3,4\}$ and $x \in \{1,2,3\}$. For instance, if the woman decides about own health, in that case, takes the value 3 and 2 if decisions are taken on a joint basis or 1 when all decisions are taken mainly by the husband or other family members. Eigenvalues of the corresponding eigenvector are a variance *(σ)* for every principal component. All components are structured in a manner that the first principal component gives the maximum variation into the data, and it is subjected to some restrictions that are sum of its squared weights ($\alpha_{11}^2 + \alpha_{12}^2 \ldots \alpha_{14}^2$) equals to 1. Variables in data are equal to a sum of the Eigenvalues. The percentage of the total variation in data is then calculated by *(σ_i/n)*. The first component is a linear combination of original variables x and describes maximum potential variance. The second component detains the most significant part of the information, which is not arrested by the first component and uncorrelated by the first component. Each added component clarifies lesser variations, contrasted to the earlier one. So, the higher the correlation between variables, the more secondary components will be taken out. Hence, the first principal component has been utilized to determine women's decision-making, and here it explains about 63.5 percent of variations. As every decision category acquires a value of 1, 2, and 3, depending on the person taking a final decision, if a category shifts from 1 to 2 or 2 to 3, the index raises by the degree of its weight.

3.2 Estimation Procedure

The IV technique is rational to evaluate the causal connections between bargaining power of female and fertility preferences. Thus, Two-Stage Least Square (2SLS) method and IV methodology is used. Considering the following equations.

$$Y_i = \beta_0 + \beta_1 X_i + u_i \qquad (5)$$

$$X_i = \alpha_0 + \alpha_1 Z_i + \varepsilon_i \qquad (6)$$

3.3 Identification

The association between the quantity of instrumental variables(m) and the quantity of endogenous variable (k) in the model is used to identify the estimated coefficients in IV regression. Four instrumental variables along with their squared terms are used to calculate an endogenous variable.

3.4 Post Estimation Test

The IV regression through 2SLS method entails to execute the tests of endogeneity and over identification because both tests are essential for consistent and reliable estimation equally.

3.5 Test for Endogenity

Usually, the Ordinary Least Square (OLS) method is preferable to IV regression/ 2SLS when there is no endogeneity. Hence, the study tried to test the endogeneity of bargaining power of women by reverse causation with fertility preference of

couples. The Hausman Test for endogeneity is useful. The null hypothesis: if residual equals to zero, the bargaining power of women is exogenous. If we reject the null hypothesis, the bargaining power of women is endogenous.

3.6 Model Specification

3.6.1 Stage 1: Estimating the Probabilities of Bargaining Power of Women

Following Reggio (2010), four variables were measured for influencing power distribution within a household, precisely age difference between both spouses [when the wife is older than her husband, she will say more in the decision-making process due to her vast experience, confidence, and consistency]. The education difference (lower the difference directs to higher women's decision-making power). The occupation difference (if employment gap between husband and wife gets smaller in favor of wife, chances of wife's decisions making increase) along with their squared terms; the fourth factor is wife's cash earnings relative to husband (wife's higher income leads to higher decision-making power) incorporated in our proposed model. Factors that directly affect women's bargaining power include household characteristics, attitude toward wife beating, exposure to any media, polygyny, current use of any contraceptive methods, and types of the method being practiced. Women's bargaining power has calculated using the framework of instrumental variable regression, which showed that bargaining power is a strong predictor of fertility preferences with two stages Probit estimators.

$$wbp_i = \beta_0 + \beta_1 Z_i + \beta_2 X_i + u_i \qquad (7)$$

Where;
wbp_i Women's bargaining power

Z_i Distributional factors
X_i Factors influence bargaining power directly
u_i A random error term

3.6.2 Stage 2: Measuring the Women's Bargaining Power as a Determinant of Fertility Preferences

The estimated values of women's bargaining power obtained from the first stage regression regressed on the conflict over fertility preference between spouses in the second stage.

$$frp_{(i)} = \alpha_0 + \alpha_1 wbp_i + \alpha_2 X_i + \varepsilon_i \qquad (8)$$

Where
$frp_{(i)}$ Fertility preference of spouses
wbp_i Woman's bargaining power
X_i The set of different socio-economic and other factors

The summative index of decision-making power is used as the dependent variable in the first stage of regression used PCA. The IV Probit model is applied to fertility preferences as the dependent variable in the second stage, a binary variable equal to 1 if the husband's preferences are heterogeneous (more or less) relative to the wife about some children and zero otherwise. The detail and the computation of all explanatory variables are summarized in Annex-A.

4. RESULTS AND DISCUSSION

4.1 Descriptive Analysis

Table 1 provides the descriptive statistics of women's economic, household, health, and mobility decisions. The statistics showed that women's answers concerning who generally takes decisions about utilizing husbands' earnings, approximately 34.9 percent of women declared that they decide jointly with their husbands, 6 percent stated that they primarily decide alone. In comparison, 54.6 percent answered that mainly husband (alone) or other family members decide about using husband's income. Around 5.7 percent of women stated that they decide alone on major household purchases, 9.3 percent affirmed that they make decisions about their health care, and 9.5 percent of women decide alone about their visits to family or relatives. About 34.2, 37.1, and 35.2 percent of women accounted for making joint decisions with their husbands on purchasing main household items, health care, and visits to family or relatives, respectively. The partaking of the husband (alone) and other family members in all decisions is rather apparent as well. Approximately 56.3, 49.8, and 51.5 percent of decisions took by husbands and other family members on the three decisions mentioned above, respectively.

Table 1: Decision-making indicators of married women

Decision Making Indices	Points	Frequency	Percent
Economic Decision Making			
The person who usually decides about money husband earns			
Mainly husband or other family members	1	8226	54.6
Husband and Wife (jointly)	2	5263	34.9
Mainly wife	3	898	6.0
Household Decision Making			
The person who usually decides on large household purchases			
Mainly husband or other family members	1	8488	56.3

Continued			
Husband and Wife (jointly)	2	5151	34.2
Mainly wife	3	861	5.7
Health Decision Making			
The person who usually decides on wife's health care			
Mainly husband or other family members	1	7507	49.8
Husband and Wife (jointly)	2	5594	37.1
Mainly wife	3	1399	9.3
Freedom of Mobility			
The person who usually decides on visits to family or relatives			
Mainly husband or other family members	1	7767	51.5
Husband and Wife (jointly)	2	5306	35.2
Mainly wife	3	1427	9.5
Total		15068	100

Source: PDHS data 2017-18

Table 2 presents indicators' descriptive statistic and weight to compute the decision-making index (bargaining power). In the final column, the calculated weights point out the relative significance of each factor used in making the decision index. The statistical values explain that high weights assign to decisions on large household purchases, visits to family or relatives, women's own health care.

Table 2: Summary statistics of decision-making indices among married women

Decision Making Indices	Mean	Std. Deviation	Factor Score	Weights (F/SD)
Decision about the money husband earns	1.0165	2.260	0.481	0.2128
Decision about large household purchases	1.080	2.081	0.507	0.2436
Decision about wife's health care	1.180	2.116	0.506	0.2391
Decision about visits to family or relatives	1.164	2.115	0.504	0.2382

Source: PDHS data 2017-18

Table 3 signifies a high agreement between husbands and wives on fertility targets. If differences (heterogeneous) exist, the husband is more Pronatalist (who encourages an increased birth rate) than his wife. About 46.22 percent of spouses

reported the same or homogenous fertility preferences. Of these couples, 33.65 percent wanted more children, whereas only 4.93 percent of husbands accounted for fewer children to their wives for formulating the family size. It has examined that commonality in women's age cohorts has an inverted U-shaped involvement with their fertility desires.

Table 3: Percentage distributions of fertility preferences of spouses according to some background characteristics

	Fertility Preferences of Spouses		
Background Characteristic	Both want same	Husband wants more	Husband wants fewer
Women's Age Cohorts			
15-19	33.1	64.1	2.8
20-24	44.6	51.6	3.7
25-29	44.9	50.3	4.8
30-34	48.5	46.4	5.1
35-39	48.3	45.7	5.9
40-44	50.0	44.4	5.6
45-49	46.9	47.5	5.6
Women's Education			
No education	36.7	59.7	3.6
Primary	51.8	43.4	4.8
Secondary	56.4	37.3	6.2
Higher	59.1	33.3	7.6
Place of Residence			
Urban	49.7	44.3	6.0
Rural	43.1	53.0	4.0
Regions			
Sindh	59.5	35.1	5.4
Punjab	46.3	47.9	5.8
Khyber-Pakhtunkhwa	35.1	59.4	5.5
Balochistan	30.3	67.6	2.1
Gilgit Baltistan	58.6	34.9	6.4
Islamabad	58.9	36.0	5.1
Azad Jammu and Kashmir (AJK)	57.0	39.1	3.9

Continued			
Federal and tribal area (FATA)	17.6	77.6	4.8
Wealth Quintiles			
Poorest	34.8	62.7	2.5
Poorer	39.8	56.3	3.9
Middle	48.3	46.5	5.1
Richer	51.4	42.7	5.8
Richest	57.3	35.4	7.3
Husband's Education			
No education	36.8	59.6	3.6
Primary	46.5	49.1	4.4
Secondary	49.1	46.2	4.7
Higher	52.6	40.3	7.1
Polygyny			
No other wife	46.9	48.2	4.9
Another wife	29.4	64.3	6.3
Beating justified if;			
Wife goes out without telling husband			
Yes	36.3	60.0	3.8
No	52.7	41.6	5.7
Wife neglects the children			
Yes	38.5	57.4	4.1
No	50.0	44.7	5.3
Wife argues with husband			
Yes	36.9	59.1	4.0
No	52.3	42.2	5.5
Wife refuses to have sex with husband			
Yes	37.2	58.7	4.1
No	51.0	43.6	5.4
Wife burns the food			
Yes	38.8	56.8	4.4
No	48.3	46.6	5.1
Heard or listen family planning program during the last few months	53.1	41.0	5.9
	33.8	63.0	3.2

Continued			
Do not heard or listen family planning program during the last few months			
Current contraceptive use			
Not using	42.4	53.6	4.0
Using folk or traditional or modern method	56.3	36.3	7.4
Method of contraceptive by type			
Not using	43.8	51.7	4.5
Modern method of contraceptive	57.3	35.9	6.9

Source: PDHS data 2017-18

The outcomes confirmed that the spouse's fertility preferences increase from age cohorts (15-19 years) to (25-29 years) and gradually decrease. The pattern remained varying for all age cohorts where husbands desire more children than wives. Among couples, harmony increases with women's level of education because 36.7 percent of women with no proper education showed the same preferences compared to 59.1 percent of women with a higher level of education. Approximately, 59.7 percent of husbands whose wives have no education want to have more children, whereas 33.3 percent of couples had a higher education level. Husband's desire for fewer children increases with women's educational attainment, from 3.6 percent with no education to 7.6 percent higher. The study indicates that urban couples are probably have more homogenous fertility preferences than rural (49.7 percent), while 53 percent of rural husbands desire more children than 44.3 percent of urban residents. An excellent agreement has been found amongst couples living in the Islamabad region (58.9 percent) comparative to 30.3 percent in Balochistan and 17.6 percent in Federal and tribal areas. Again, women belonging to the richest quintile are more consistent with spouses (57.3 percent) in formulating fertility, in contrast to women

in the poorest standards, about 34.8 percent. Similarly, low-income couples demand more children (62.7 percent) than 35.4 percent richer spouses.

The figures entailed that couple desires for the same number of children varied consistently with the level of education, i.e., 36.8 percent of husbands with no proper education want the same number of children relative to 52.6 percent of husbands with a higher level of education. Around 59.6 percent of husbands with no formal education want more children than 40.3 percent with higher education. The outcome pointed out that spouses' fertility preferences disagreed according to marriage types. Such as, 29.4 percent of monogamous husbands want the same number of children compared to 46.9 percent in polygynous marriages. Amongst the monogamous couples, 64.3 percent of husbands desire more children, whereas, among polygynous couples, 48.2 percent of husbands desire to have additional children. Only 4.9 percent of monogamous husbands want fewer children simultaneously, 6.3 percent of polygynous men. Beating is justified in five different cases that showed that a couple's fertility preference (36.3, 38.5, 36.9, 37.2, and 38.8) decreases in contrast to women's negation against any violence (52.7, 50, 52.3, 51, and 48.3 percent). Outcomes revealed that couples' fertility intention diverges according to media exposure. 53.1 percent of couples prefer the same number of children who regularly listened, watched, or read radio, television, or newspaper for family planning programs during the last few months compared to 33.8 percent who do not want expose to any media. Likewise, lacking exposure to media raises 63 percent of husbands' desire for more fertility relative to 41 percent. The statistics also show that 56.3 percent of couples (using folk or traditional or

modern contraceptives) reported having identical fertility preferences except for 42.2 percent, not practicing any method. Around 36.3 percent of husbands want more fertility than 53.6 percent who do not use any method of birth control. Preferences from same to more children decrease from 57.3 to 35.9 percent for exercising modern method of contraceptive in contrast to 43.8 and 51.7 percent, not practicing. To discover the associations, simple two-sample t-tests were applied. We tested, mean women's bargaining power was the same between spouses' fertility preferences on the number of children or not.

Table 4 points out that the t-test observes a difference in the mean women's bargaining power between fertility preferences, significant with a t-value of 14.5311 and p-value of 0.000. After proving significant differences in the mean value of fertility preferences, the study proceeds to regression analysis.

Table 4: Two-sample t-test with equal variances

Group	Obs.	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
Same pref. (0)	6253	3.133	0.0141	1.118	3.105	3.160
Different (1)	7270	2.850	0.0132	1.133	2.824	2.876
Combined	13523	2.981	0.0097	1.135	2.962	3.000
Difference		0.282	0.019		0.244	0.320
diff = mean (0) – mean (1)				t = 14.5311		
Ho: diff = 0			degrees of freedom = 13521			
Ha: diff < 0			Ha: diff! = 0		Ha: diff > 0	
Pr (T < t) = 1.000			Pr (|T| > |t|) = 0.0000		Pr (T > t) = 0.0000	

Source: PDHS data 2017-18

4.2 Quantitative Analysis

As elucidated previously, four instrumental variables (IV) are used; the difference between husband and wife's age, education, and occupation along with their square

terms (Effect of these factors could be non-linear. Thus, squared terms of three IVs are incorporated) and wife's cash earnings relative to husband's cash earnings. F-test and over-identification tests confirm that IV used is suitable instruments. F-test verifies that selected instruments are not weak [F (6, 12534) = 27.37 and Prob.> F = 0.000]. Every instrument that stands for women's decision-making power passed from an over-identification test too. Wald test (chi2 = 5.79 and p-value = 0.00) rejects the homogeneity in sample. Table 5 illustrates the first and second-stage regression results regarding women's bargaining power and fertility preference and marginal effects at means. The outcomes revealed that age and occupation differences between spouses and their square terms proved insignificant (not non-linear) and did not contribute to sharing intra-household bargaining power. Education difference and its square term (non-linear) negatively influenced women's bargaining power at 1 and 10 percent, respectively. By looking at the estimated determinant, the outcomes found out that the gap between the education of husband and wife significantly reduce women's bargaining power by 0.0097 percentage points. Women's relative income contribution to household expenses positively influenced decision-making and increased by 3.5 percentage points with a p-value (0.000). Results supported the core hypothesis of bargaining theory; women who contribute more economic resources to household spending are usually empowered to take different decisions.

Table 5: Determinant of women's bargaining power, fertility preference and marginal effects at means

Dependent Variables	Bargaining power of women	Fertility Preferences of Spouses	
Explanatory Variables	OLS Coefficients (First stage regression)	IV Probit Coefficients (Second stage regression)	Delta-method dy/dx
Age difference between spouses	0.0136 (0.000) ***	---	---
Square of Age difference between spouses	-0.0004 (0.003) **	---	---
Education difference between spouses	-0.0097 (0.193)	---	---
Square of Education difference between spouses	0.002 (0.781)	---	---
Occupation difference between spouses	0.0027 (0.000) ***	---	---
Square of occupation difference between spouses	-0.0002 (0.000) ***	---	---
Wife's cash earnings relative to husband's cash earning	0.0358 (0.000) ***	---	---
Bargaining power of women	---	-0.159 (0.090) *	-0.159 (0.090) *
Age of the head of household	-0.0091 (0.000) ***	-0.0005 (0.44)	0.0005 (0.44)
Sex of the household	-0.6883 (0.000) ***	-0.0478 (0.64)	-0.0478 (0.64)
Wealth Quintiles	0.0592 (0.000) ***	-0.0428 (0.000) ***	-0.0428 (0.000) ***
Beating of wives by husband is justified	0.0936 (0.000) ***	-0.041 (0.000) ***	-0.041 (0.000) ***
Media Exposure	0.2483 (0.000) ***	-0.2837 (0.000) ***	-0.2837 (0.000) ***
Polygyny	-0.1241 (0.013) **	0.3834 (0.000) ***	0.3834 (0.000) ***
Current use of any contraceptive	0.1045 (0.001) **	-0.1668 (0.000) ***	-0.1668 (0.00) ***
Types of method (modern)	-0.0874 (0.017) **	-0.122 (0.006) ***	-0.122 (0.006) ***
Constant	3.475 (0.000) ***	1.14398 (0.000) ***	---

Continued

R-square	0.1298	---	---
F – statistic	133.60	---	---
Prob. F-test	0.000	---	---
Wald test of exogeneity Chi^2	---	5.79	---
Prob. > Chi^2	---	0.000	---
Amemiya-Lee-Newey Chi^2 (6) (OID-Test)	---	25.17	---
Number of obs.		13456	

Source: Author's own compilation. *Note: Figures in parenthesis are p-values, * significant at 10 percent, ** at 5 percent and *** at 1 percent level.*

Aside from IVs, a few other factors significantly influence women's bargaining power. For instance, age of the head of household, wealth quintiles, beating of wives by husband, media exposure, and current use of any contraceptive found to boost decision making power of women, whereas, polygyny and types of method (modern) all significantly reduce the bargaining power of women. The effects of bargaining power, age of the head of household, wealth quintiles, beating of wives by husband, media exposure, current use of any contraceptive and types of method (modern) came out as highly significant predictors and inverse on fertility preferences, whereas, polygyny increased the fertility preferences. The IV estimates suggested that women's bargaining power has a statistically significant impact on a varying number of children, desired by husbands. A one (1) percentage point increase in bargaining power reduces preference by 0.159 percentage points. This negative effect of bargaining power on fertility preferences is a net impact on the wife's age, education, relative income, and the total effect of participation in the decision-making process on her preferred number of children.

The variable of bargaining power is a composite, comprehensive and multifaceted determinant and carries effects of many other socioeconomic and demographic characteristics along with decision making representing women's role in intra-household affairs. Even though, it is exclusive discretion to utilize bargaining power, she can use her sole will to prefer her preferences over her husband's preferences, according to the prevailing situation, to accomplish the desired goal about family size.

The estimated marginal effects of the second stage IV Probit regression showed that additional bargaining power reduces the likelihood of the fertility preference of a husband by 15.9 percentage points. The age of the household's head reduces the probability of husbands' desires by 0.05 percentage points. Raising polygynous marriages also increases the probability of dominating a husband's preferences by 38.4 percent. If a woman belongs to the highest wealth quintile, she has the most excellent chances to disagree with spouse's desires by 4.28 percentage points compared to women who belong to the poorest wealth quintile. Disagreement with wives' beating by husband is justified also reduces the probability of husband's preferred family size by 4.1 percent. Media exposure, current use of any contraceptive, and modern family planning also significantly reduces the likelihood of spouse preferred number of children by 28.3, 16.6, and 12.2 percentage points, respectively.

5. CONCLUSION AND POLICY IMPLICATIONS

Based on maximum likelihood estimation, a two-step regression is employed. In the first stage regression, it is found that cash earnings of wife relative to husband, age of the head of household, wealth quintiles, the beating of wives by husband is justified, current use of any contraceptive boost women's bargaining power while on the other hand, education differences between spouses and modern methods of contraceptive, tend to decline women's decision-making power. The results of IV estimates suggest that effects of bargaining power, wealth quintiles, the beating of wives by husband is justified, media exposure, presently practicing any contraceptive and types of method if modern came out as highly significant and decrease the fertility preference of husbands whereas, polygyny favored husband's fertility preference. From the policy perspectives, findings recommend that improving women's bargaining power, education, exposure to media, and contraceptive practice for achieving desired fertility preferences is a substantial challenge, to which policymakers must give careful consideration. In addition, the husband's desire for more children determines women's contraceptive use to a great extent. Therefore, it is crucial to engage the husband in family planning programs for partners' contraceptive exercise because their decision-making is noteworthy.

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Annex-A: Description list of explanatory variables used in estimation

Variable	Description	Type
Distribution Factors		
Age difference between spouses (husband-wife)	Negative values indicate that wife is older than husband	Continuous
(Age difference between spouses)^2	Square term is used to determine the degree to which age difference affects women's bargaining power	
Education difference between spouses (husband-wife)	Negative values indicate that wife's education is more than husband	Continuous
(Education difference between spouses)^2	Square term is added to detect the level to which education difference influences women's bargaining power	
Occupation difference between spouses (husband-wife)	Negative values indicate that wife's occupation is higher than husband	Continuous
(Occupation difference between spouses)^2	Square term is used to verify the strength to which occupation difference affects women's bargaining power	

Continued		
Wife's cash earnings relative to husband's cash earnings	0 = Husband does not work, 1 = Less than husband, 2 = Same as husband, 3 = More than husband	Weighted Index
Instrumental Factors		
Demographics and other Characteristics of Household		
Age of the head of household	Years	Continuous
Sex of household	1=Male, 0=Female	Dichotomous
Wealth Quintiles	1= Poorest quintile, 2= Poorer quintile, 3= Middle quintile, 4= Richer quintile, 5= Richest quintile	Weighted Index
Beating of wives by husband is Justified in different cases if:	0= Yes, 1=No 1= Wife goes out without telling husband 2= Wife neglects the children 3= Wife argues with husband 4= Wife refuses to have sex with husband 5= Wife burns the food	Weighted Index (if 1 in any case)
Exposure to Mass Media (Heard or watched family planning program on any media during the last few months)	1= Yes, 0 = Otherwise	Dichotomous
Polygyny	1= If husband has another wife, 0 = Otherwise	Dichotomous
Current use of any contraceptive	1= Yes, 0 = Otherwise	Dichotomous
Types of method (modern)	1= Modern contraceptive method, 0 = Otherwise	Dichotomous