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**Marriage payments and bargaining power of women  
in rural Bangladesh**

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# MARRIAGE PAYMENTS AND BARGAINING POWER OF WOMEN IN RURAL BANGLADESH

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## ABSTRACT:

This study examines the relationship between bargaining power and the use of contraceptives in the household. Using data from rural Bangladesh in 1998-1999 it investigates whether women in a relatively strong bargaining position at the time of marriage continue to remain in a strong position post marriage as seen by their decision to use the contraceptive pill. Empirical results from multinomial logit provide evidence for this showing that as brideprice, taken as a fraction of total household marriage payment, increases from 0.1 to 0.3 the predicted probability of the mother using the contraceptive pill increases by 8 percentage points.

**KEYWORDS:** Marriage market; Marriage Payments; Female bargaining power; Contraceptive use; Rural Bangladesh.

**JEL CLASSIFICATION:** J12, J13, J16, D10

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## 1. Introduction

Marriage payments prevailed over all ancient civilizations and continue to remain widespread across many developing countries even today. In South Asia in particular these payments are exorbitantly high and can often be of a considerable financial burden to families.

Economic literature provides a vast number of studies that discuss the role of marriage payments in sorting in the marriage market and its effect on the bargaining power of women. A popular hypothesis on the emergence of marriage payments, the marriage squeeze, follows Becker's work (1981), and attributes marriage payments as a mechanism for aligning the relative supply and demand of brides and grooms in the marriage market. Previous literature provides two motivations of dowry, pre-mortem inheritance and groomprice. Dowry under pre-mortem inheritance is exclusively a payment from the bride's family to the bride at the time of marriage over which she has property rights. Since dowry under pre-mortem inheritance increases the assets under a woman's control it should have the effect of increasing the welfare and bargaining power of women (Brown, 2003). Another component of dowry is 'groomprice' that has the impact of making women more desirable in the marriage market and through which they are able to match with men with whom they would not have matched previously. Dowry payments under 'groomprice' are made to the groom and his family directly and any assets transferred under it are considered their property as opposed to the brides. Amin (2009) argues that dowry serves as an indicator to households that the groom is of much higher quality than the bride and hence this may compromise the position of the bride in the new household. His research shows that women were seen to spend more time doing domestic chores if they had paid dowry.

In this paper, using data from rural Bangladesh (1998-1999), we explore the effect of female bargaining power at the time of marriage as reflected by relative marriage payments, on a woman's intra-household bargaining power post marriage. Female bargaining power post marriage is measured in this study via the use of the contraceptive pill. We assume that women prefer to have fewer children and hence want to increase the consumption of contraceptives in general and the pill in particular. It is important to note that husbands and wives differ in their opinion of desirable family size. Husbands want larger families and the next child sooner, compared to women, especially since women face an increasing cost of having children (Bankole and Singh, 1998; Francis, 2009; Naidu, 2006). Assuming efficiency we conjecture that as the female relative bargaining power increases women will bargain for fewer children and therefore should increase the use of contraceptives in general, and the pill in particular.

Within a framework of binding commitments and transferable utility it is pertinent to study the impact of a woman's value of being single at the time of marriage on her intra-household bargaining power post marriage, as woman initiated divorce represents unreasonable behaviour in rural Bangladesh. This is so because in the context of rural Bangladesh there is asymmetry in the effects of marriage on men and women, where the value of being single for women falls dramatically post marriage for religious and cultural reasons. Also assets women have control over at the time of divorce depends on who makes the decision to end the marriage. This study measures a woman's value of being single at the time of marriage by the fraction of marriage payments composed of brideprice.

Empirical results from multinomial logit provide evidence for this showing that as brideprice, taken as a fraction of total household marriage payment, increases from 0.1 to 0.3 the predicted probability of the mother using the contraceptive pill increases by 8 percentage points.

The paper is organized as follows: section two reviews some related literature and presents the rationale for the study; section three provides background information about the use of contraceptives in Bangladesh; section four discusses the data and some descriptive statistics; section five analyses the results; and finally section six concludes and highlights the policy implications.

## **2. Literature Review, History and the Rationale of the Study**

Marriage payments can be traced to 3000 BC where they were common amongst all civilizations and even today they continue to persist across many developing countries (Anderson, 2007). Brideprice and dowry co-exist in China, Taiwan and Africa (Anderson, 2007). In South Asia during the early part of the twentieth century both of these marriage payments were common; however, by the late twentieth century brideprice was replaced by inflated dowry payments (Maitra, 2007). In India and Pakistan today, paying dowry at the time of marriage is the norm, whereas in Bangladesh initially only brideprice payments were reported, but ever since 1940 other marriage payments such as dowry have also been observed (Esteve-Volart, 2004). Even though in Bangladesh, dowry inflation has not occurred to the same extent as in India, the practice of giving dowry at marriage has widened over time (Esteve-Volart, 2004). The payments though have been large enough to initiate concern as reflected in the Dowry Prohibition Act of 1980 (Anderson, 2007). It has been estimated that in South Asia sometimes dowry payments equal 'six times the family's annual income' (Rao, 1993). Brideprice payments are also often quite large and can be of a significant economic burden for poorer families (Anderson, 2007).

What do we understand by the terms brideprice and dowry? Brideprice and dowry are some of the most traditional and prevalent forms of marriage norms. Brideprice is typically a payment of a significant amount made from the groom or his family to the bride's family at the time of marriage (Maitra, 2007; Tertilt, 2002). Such payments usually comprise cash, livestock or goods. Other forms of payment from the groom to the bride's kinsmen include: 'token bride price' which in comparison to brideprice is smaller in value and is more of a 'symbolic' gesture; 'woman exchange' or 'watta satta' occur when in exchange for the bride, the groom's sister is married to the bride's brother; 'bride service' where the groom renders his labour services to the bride's family; 'bride wealth' where the payment given to the bride's family is used to secure brides for other male members in the family. On the other hand dowry is a payment made at the time of marriage from the bride's family to the bride. Typically it consists of cash; jewellery; clothes; furniture and household items; electronics; livestock such as goats or cows; transport assets like rickshaw, bicycle, boat, van; and in certain cases a house and land as well (Tertilt, 2002; Esteve-Volart, 2004; Maitra, 2007). Esteve-Volart (2004) observes that dowry payments may be made at the time of union or in instalments during the course of the marriage. Marriage payments, such as brideprice and dowry are not necessarily independent of each other (Maitra, 2007). In South India brideprice payments are common but customarily they are used to provide dowry to the bride by her parents (Maitra, 2007).

It is important to note how present day dowry may be different from payments made in the past. In Bangladesh traditionally 'joutuk' (dowry) was given in the form of gifts to the bridegroom and his parents from the bride's family (Esteve-Volart, 2004). In the current marriage market of Bangladesh 'joutuk' has been replaced by 'demand'. Dowry payments under

‘demand’ are made to the groom and his family directly and any assets transferred under it are considered their property as opposed to the brides. Esteve-Volart (2004) elaborates that the size of ‘demand’ may change from situation to situation depending on whether it is the bride’s first marriage or second – ‘demand’ being higher if it is her second. In India, traditional dowry payments differ from current dowry payments as well. Anderson (2000) argues that present day dowry in India is composed of two portions: ‘stridhan’ which represents the traditional custom of gifting assets to the bride at the time of marriage (over which she retains ownership) and groomprice which consists of payments made to the groom and his parents at the time of marriage. Stridhan is also the only component of dowry payments that is legal in India (Siow, 2003). Siow (2003) notes that groomprice payments vary with the quality of the groom. In accordance with the latest literature the sample employed for this study suggests that in 1998-1999 dowry in rural Bangladesh served the groomprice/demand motive.

This study argues that, women who are in a stronger position at the time of marriage as measured by the fraction of marriage payments composed of brideprice continue to have a high bargaining power post marriage as seen by their ability to make decisions in the household. A woman’s decision making power during the marriage is gauged via the use of the contraceptive pill.

Figure 1 provides a diagrammatic illustration of the complex interplay of factors that impact the bargaining power of women at the time of marriage, the size of marriage payments, commitment on long term decisions, and the bargaining power of women during the marriage as measured by their decision to use the contraceptive pill.

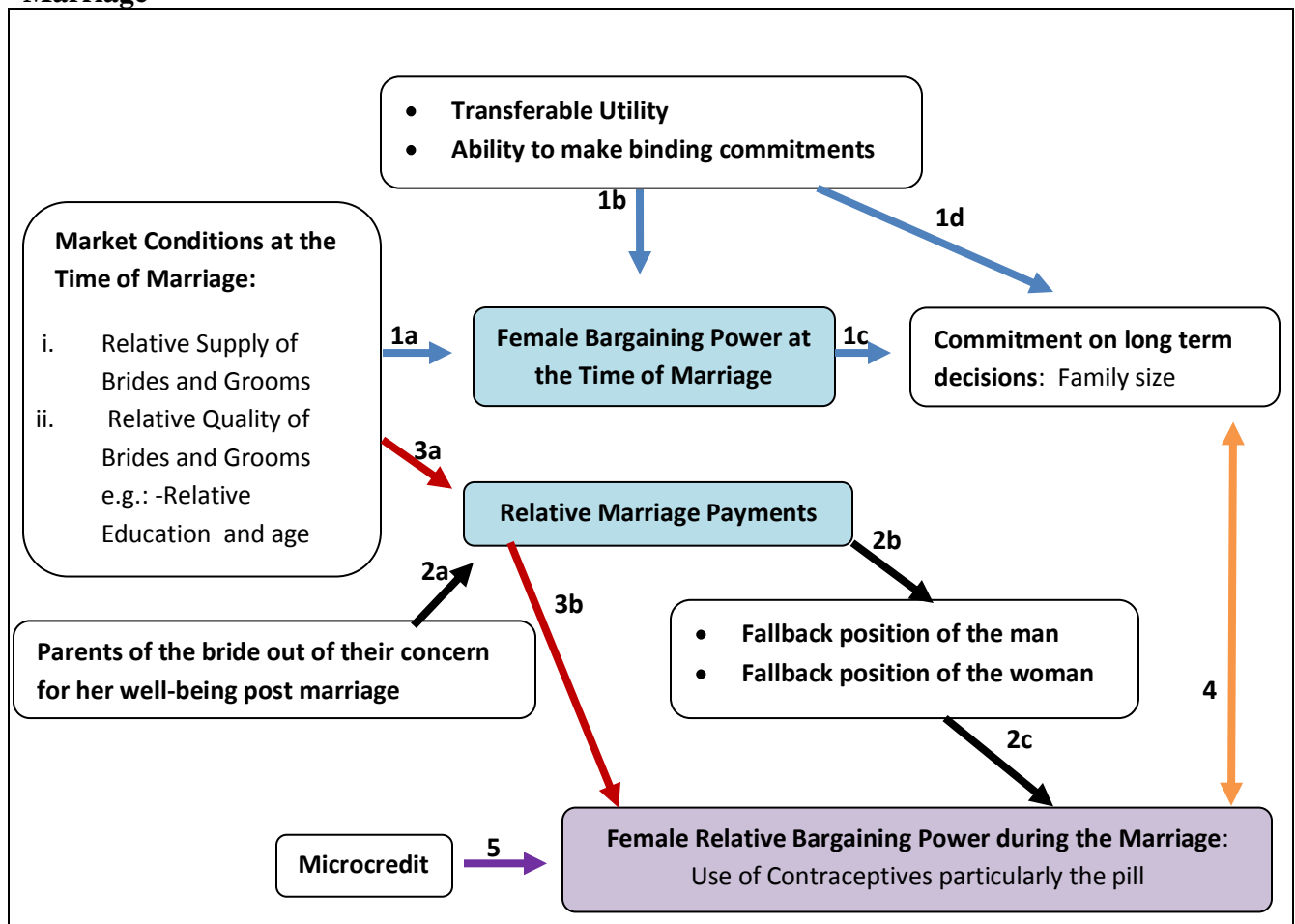
Marriage payments can arise in the marriage market due to market conditions so as to either align the supply and demand of brides and grooms or to match individuals of different qualities and attributes to each other. They can also be from an altruistic parent out of concern for their child’s welfare post marriage.

A popular hypothesis on the emergence of marriage payments follows Becker’s work (1981, 1991), and attributes marriage payments as a mechanism via which the relative supply and demand of brides and grooms can be aligned in the marriage market as shown by *Link 3a* in Figure 1. The marriage squeeze hypothesis argues that in societies where older men marry younger women, if the ratio of marriageable men to women is low, then women have to pay higher dowries to attract scarce men (Amin, 2004; Maitra, 2007; Rao, 1993; Anderson, 2007; Gaspart, 2007; Esteve-Volart, 2004). Since many developing economies have high population growth and younger age cohorts exceed older cohorts this hypothesis provide a reasonable explanation for dowry inflation.

Becker (1991) conjectured that the division of the marital output depends on the supply and demand of grooms and brides in the marriage market. He demonstrated that if the number of men who wanted to marry exceeded the number of women ( $N^m > N^f$ ) then equilibrium income for men would equal their single state utility ( $Z^{*m} = Z_{ms}$ ) whereas, for women it would equal the marital output minus the man’s single state utility ( $Z^{*f} = Z_{mf} - Z_{ms}$ ). However if due to difficulties in dividing marriage output such as children, the income of women cannot exceed  $\bar{Z}^f$  (where  $\bar{Z}^f < Z^{*f}$ ) then the income of men will be  $\bar{Z}^m = Z_{mf} - \bar{Z}^f > Z^{*m}$ . Since all men will want the limited supply of women in the marriage market they will make payments (such as brideprice) larger than  $\bar{Z}^f$  to convince women to marry them. As men who make larger payments will attract more women, competition amongst men will lead to their incomes falling to the equilibrium level, where they were indifferent between being married or remaining single. The

same reasoning would apply in the opposite situation i.e. if income for men was below their equilibrium income then dowry payments from the bride to the groom would emerge instead. He states that whether these payments went to the bride or groom’s parents or they themselves was of little importance as parents were being compensated for giving their children away and in fact he argues that for girls, brideprice can act as an incentive for parents to invest optimally in their daughter’s human capital. His model also suggests that if the marriage is ended due to a valid reason then the payments are returned, however if the marriage is dissolved by either partner without a good cause then the marriage payments are ‘forfeited’.

**Figure 1: Relative Bargaining Power of Women and Determinants of Outcomes Post Marriage**



Pre-mortem inheritance is another popular incentive identified in the literature for parents to provide dowries to their daughters at the time of marriage as seen by *Link 2a* in Figure 1. Pre-mortem inheritance usually exists in patrilocal societies where daughters join their in laws homes after marriage and sons carry on the family business and add to the family wealth (Anderson, 2007). Sons may not exert full effort if their sisters will benefit from the family wealth in the future and hence to mitigate the free rider problem parents’ bequest inheritance to their daughters at the time of marriage (Esteve-Volart, 2004; Anderson, 2003; Siow, 2003). Pre-mortem bequest

theory helps understand why dowry payments increase with social status of the bride and consequently her parent's wealth (Anderson, 2007).

Dowry in this circumstance is exclusively a payment from the bride's family to the bride at the time of marriage over which she has property rights. At the time of divorce dowry assets are returned to the woman and in the case of her death her parents can claim the dowry back (Ambrus, 2010; Maitra, 2007). Dowry payments under pre-mortem inheritance have the effect of improving a woman's fallback position in the marriage as shown by *Link 2b*. Higher dowries should also decrease the probability of husband initiated divorce as more assets will have to be returned by the husband to the wife in the case of divorce (Esteve-Volart, 2004). Since dowry given as pre-mortem inheritance increases resources under a woman's control in the household and strengthens her fallback position, as a consequence this should raise her welfare and bargaining power as seen via *Link 2c* in Figure 1 (Brown, 2003). Research shows that in rural areas of Pakistan and India dowry serves a pre-mortem inheritance purpose.

Bargaining during the marriage as discussed in the intra-household bargaining literature, depends on the threat points of the husband and the wife. Through cooperative bargaining theory, utility possibility frontiers of the couple are determined, along which all points are efficient and correspond to a different distribution of household utility amongst the couple. The non cooperative solution to the household problem lies within the utility possibility frontier where cooperation between partners brings them close to this frontier. The position chosen on the frontier however may lead to conflict as an increase in welfare of one partner implies a decrease in the others. The location adopted on the utility frontier is determined by individual incomes of the spouses and the price of the public good. Alternatively members of the household can be at their threat points, which is equilibrium corresponding to non cooperation i.e. the value of being single. Cooperative solutions on the frontier lay between the threat points of the two individuals. A dominant partner in the marriage may offer his/her partner just enough utility to induce her/him to cooperate i.e. the point corresponding to that individual's threat point. An increase in an individual's threat point in comparison to their partner will hence improve his/her utility.

In this paper we conjecture that all bargains are efficient hence assuming away the non-cooperative solution. This implies that negotiations between husband and wife leading to a different decision on contraceptive use cannot make one partner better off without worsening outcomes for the other. In rural Bangladesh where infertility among women is a socially acceptable reason for husbands to desert their wives and marry again, women are likely to take their husbands into their confidence when using the contraceptive pill as lack of fertility may suggest that a woman is infertile.

This paper argues that the maintained hypothesis in the intra-household literature that dowry assets should make a woman better off may not necessarily hold. In fact the effect of current assets on female bargaining power is ambiguous. In the context of rural Bangladesh it is reasonable to assume that predetermined outcomes are of more importance with regards to the bargaining power of women. This is because there is symmetry at the time of marriage in the value of being single between men and women, where women are desired in the marriage market depending on their good looks, age, education, chastity and their fair complexion and men are desired given their level of education and prospects of earning a good living. However after marriage the value of being single for women (*Link 2(b)* in Figure 1) falls dramatically for religious and cultural reasons. Even though divorce is permitted in Islam and by law there is a social stigma attached to being single and single women are not given the same status in society

as married women whether they have been divorced, are single parents, or have remained unmarried (Esteve-Volart, 2004). This is particularly more acute if the bride’s parents are poor or have passed away (Esteve-Volart, 2004). Hence divorce by women represents unreasonable behaviour. Also assets that a woman has control over at the time of divorce depends on who makes the decision to split. If the woman initiates divorce, she has to return brideprice or ‘maher’ payments to the man, however if the man unilaterally divorces his wife he has to give her the ‘maher’ payment and return to the wife any assets her parents gave to her in the form of dowry (*Link 2(b)* in Figure 1).

	Low stigma attached to divorce	High stigma attached to divorce
Low dowry	Decreases the relative value of being single	Weak effect on the relative value of being single
High Dowry	Increases the relative value of being single	Weak effect on the relative value of being single

***Assumption 1:- Women prefer to have fewer children and increased child spacing***

This paper argues that as the female relative bargaining power increases women bargain for fewer children and increase the use of contraceptives in general and the pill in particular, as seen via *Link 3b* in Figure 1. The contraceptive pill is like an assignable good in intra-household literature on collective models, through which the individual consumption of a private good can be examined, in this case the consumption of the contraceptive pill by women (Browning et.al, 1994). The reason this paper measures female bargaining power via the use of the contraceptive pill and not through any other modern, temporary, non clinical contraceptive such as the condom is because the use of the contraceptive pill falls under the ambit of women. The contraceptive pill has few side effects, is easy to use and particularly readily accessible and of low cost in Bangladesh where fieldworkers deliver pills free of cost to homes.

It is important to acknowledge that husbands and wives have different preferences over family size. Bankole and Singh (1998) using data from 18 developing countries found that ideal family size differed substantially amongst husbands and wives where husbands wanted larger families and the next child sooner. It has also been argued that if women are in excess demand over men and hence brideprice exists, woman have more bargaining power and so can bargain for fewer children where having children has an increasing cost to women (Francis, 2009; Naidu, 2006). Research shows that welfare of women, and their decision making power within the household on important matters such as number of children to have and child spacing, increases with the availability of efficient birth control innovations such as the pill (Chiappori and Orefice, 2008).

***Assumption 2:- Binding Commitments: Decisions Ex-ante affect Decisions in the Future***

Economics of marriage markets and intra-household bargaining provides models on sorting (Burdett and Coles, 1997; 1999; 2001); bargaining at the time of marriage (Becker 1981; 1991); and intra-household bargaining (Manser and Brown, 1980; McElroy and Horney, 1981; Lundberg and Pollak, 1993; Chiappori, 1992). There is a debate in the literature about whether outcomes post marriage are predetermined at the time of marriage or bargained over during the course of the marriage (*Link 4*, Figure 1). The extent, to which outcomes are predetermined,

depends on the ability of the couple to make binding commitments at the time of marriage and transferable utility (*Link 1d* in Figure 1).

Becker's (1991) theory of the marriage market allows for transferable utility where an individual with a large gain from marriage to a particular partner can ensure the match is made by compensating him/her via 'one-for-one' transfers of private goods as seen by *Link 1b* in Figure 1 (Burdett and Coles, 1999). In his formulation of the marriage market he shows that individuals get married when their utility from being married exceeds that from remaining single (Becker, 1973). It may be conjectured, that commitments to behaviour can play a similar role in clearing the market and determining the allocation of resources and outcomes post marriage. Couples when deciding to marry each other can decide on workload of domestic chores post marriage and fertility amongst many other things (*Link 1c* in Figure 1). Hence, an individual can be convinced to form a match and marry given that he/she is promised a large enough share of the post marriage product.

Since we argue in assumption 3 that current assets have a weak impact on a woman's threat point and her value of being single once she is married, this paper stresses that historical agreements have a stronger impact on bargaining power as opposed to current assets.

Matching in the marriage market for instance can affect outcomes post marriage. *Link 3b* in Figure 1 indicates this relationship between relative marriage payments and female relative bargaining power post marriage. Literature suggests that groomprice has a negative impact on a woman's bargaining position in the marriage as a dowry payment is indicative of a lower quality bride. Amin (2009) found that women who paid groomprice spent more time doing domestic chores as opposed to women who did not. In the same line of thought this paper argues that women can be attracted by men in the marriage market via high brideprice payments and that these payments will positively impact the bargaining position of these women post marriage as they signify that the bride is of high quality as compared to the groom, as seen by *Link 3b* in Figure 1.

Couples however during the course of their marriage may or may not commit to the settlement made at the time of marriage. If predetermined outcomes persist during the course of the marriage then only those variables should affect outcomes post-marriage which were not predictable ex ante, such as availability of microcredit as shown by *Link 5* in Figure 1.

***Assumption 3: There are bigger differences in the quality of women than in tastes of families to protect their daughters***

One of the motivations of providing dowry, groomprice, is to make brides more desirable in the marriage market so that they can match with men who would in the absence of the dowry payment not have matched with them as seen via *Link 3a* in Figure 1. Groomprice payments have been observed to vary with the quality of the groom which is determined by his level of education, whether he lives in an urban area and can provide a good living for the bride amongst many other things (Amin, 2004; Ambrus, 2010; Anderson, 2007; Tertilt, 2002). In urban areas of Pakistan and India research shows that dowry serves the groomprice motive (Anderson, 2000). In India, Pakistan and Bangladesh the demand for brides depends on their appearance, particularly if they are light skinned or not, chastity, age and level of education (Amin, 2004; Anderson, 2000). It has been argued that since dowry payments make brides more desirable, higher dowries should have the effect of increasing their price in the marriage market (Becker,

1991; Edlund, 2001). Consequently, in South Asia dark skinned, older women, getting married for the second time have to offer higher groomprice payments so as to attract partners and make a better match (Esteve-Volart, 2004; Becker, 1991; Edlund, 2001). Research shows that women in marriage markets may 'self improve' such as invest in education so as to match with a better groom who is of high quality and educated as opposed to improving their own work prospects (Lahiri, 2004). Groomprice component of dowry is paid directly to the groom and his family and they have property rights over them as opposed to the bride.

Women are also able to marry men from a higher caste or social standing via groomprice. Therefore dowry under the groomprice mechanism can be used as a means of maintaining or improving status via marriage (Anderson, 2007). This practice known as hypergamy is a possible explanation of why dowry payments have persisted in India despite strides in development and modernization (Esteve-Volart, 2004). It has been argued that in societies which are characterized by a rigid caste system income dispersion across grooms of a higher caste may be of little consequence to brides from a lower caste (Anderson, 2003). In such a scenario changes in income distribution due to modernization have little effect on marriage payments as status is inherited and not linked with wealth (Anderson, 2003). Many studies argue that dowry payments will soon vanish from marriage markets in India as urbanization and modernization take over and the supply of grooms who are educated and live in the urban areas increase. It is reasonable to assume that this transition will be slow due to the caste system prevalent in India – where sons from a particular caste may find it exceptionally difficult to not continue in their parent's footsteps, and higher castes get opportunities related to education and urbanization earlier. On the contrary it can also be argued that if individuals could buy their way into a particular caste then after an initial explosion the value of being in a particular caste itself would fall due to comparatively easy accessibility.

Hence, we argue that marriage payments may be reflecting other differences in characteristics of the bride and bridegroom which are not observed in Becker's model such as playing a role in sorting individuals of different characteristics and qualities as can be seen by *Link 3a* in Figure 1.

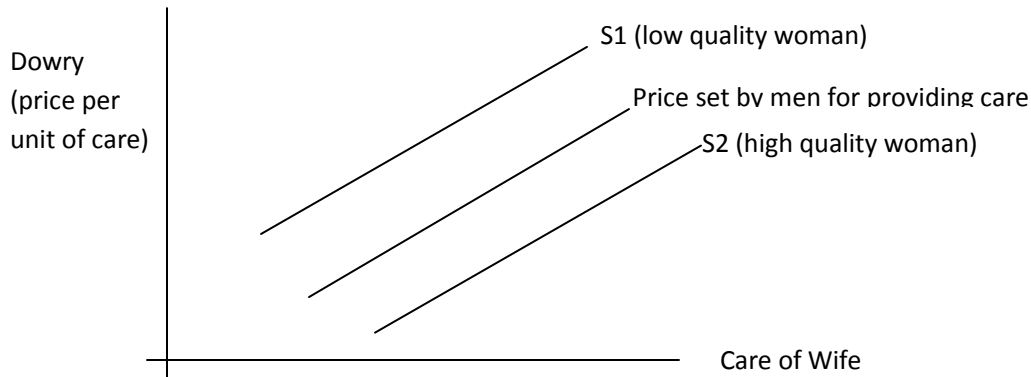
Matches made in the marriage market vary by the relative quality of the woman, dowry, and the level of care provided by husbands towards their wives. In Becker's model, in the absence of marriage payments and differences in the level of care, individuals of the same type marry each other. The data used in this study suggests that in rural Bangladesh marriage payments help clear the marriage market and allow individuals of different types to match with each other. It is important to highlight that the distribution of the level of care provided by husbands to their wives not only plays a role in clearing the marriage market but also in setting the marriage payment.

Let us assume that the dowry demanded by the husband for a given level of care and quality difference is represented by equation 1 below.

$$D = b_H(\text{care}) + \alpha(q_H - q_W) \tag{1}$$

Where the elasticity of the supply curve [ $b_H(\text{care})$ ] shows that there is a positive relationship between the amount of care supplied by men to their wives and dowry (the price per unit of care) received by them. Equation (1) also shows that the higher the quality of the husband

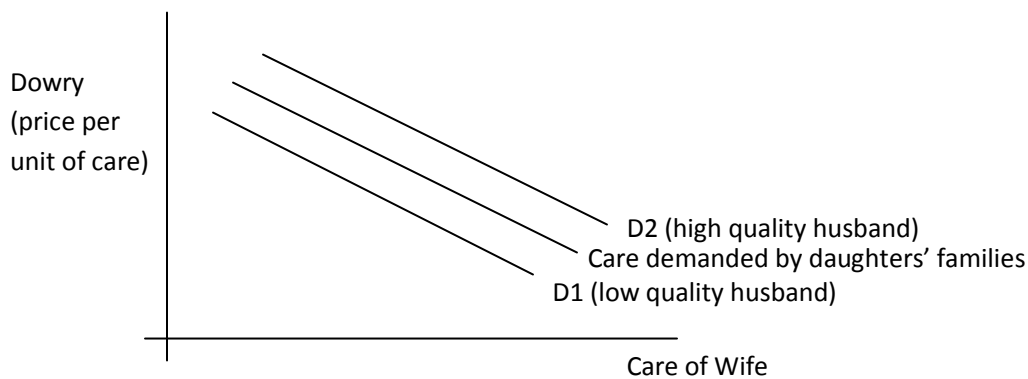
relative to the wife [ $\alpha(q_H - q_W)$ ] the higher the amount of dowry is needed to secure the match; and the change in the relative position of the supply curve depends on the relative quality of the woman.



On the other hand let us conjecture that the dowry offered by a daughter’s family for a given level of care and quality difference is given by equation 2 below.

$$D = -b_w(\text{care}) - \beta(q_W - q_H) \tag{2}$$

The elasticity of the demand curve [ $-b_w(\text{care})$ ] shows that as dowry (the price per unit of care) increases fewer units of care are demanded by a daughter’s family. The equation denoting the demand curve also shows that the higher the quality of the wife relative to the husband [ $-\beta(q_W - q_H)$ ] the lower the amount of dowry is needed to secure the match. A change in the level of concern by the families, towards their daughters securing a match with a high quality groom, causes shifts in the demand curve.



Equation 2 can be rewritten as

$$D = -b_w(\text{care}) + \beta(q_H - q_W) \tag{3}$$

To determine the equilibrium level of care and dowry equation 1 and 3 are equated to each other.

$$\text{Equilibrium care} = \left\{ \frac{(\beta - \alpha)}{(b_H + b_W)} (q_H - q_W) \right\} \quad (4)$$

To determine equilibrium level of dowry, equilibrium care can be substituted into equation 1:

$$\text{Equilibrium Dowry} = b_H \frac{(\beta - \alpha)}{(b_H + b_W)} (q_H - q_W) + \alpha (q_H - q_W) \quad (5)$$

Equation 4 shows that if  $\beta < \alpha$  i.e. if the quality of the wife matters more to husbands supplying care ( $\alpha$ ) than the tastes of daughter's parents to protect their daughters by matching them with high quality men ( $\beta$ ), then equilibrium care is negatively related to the difference in the quality of the husband relative to his wife ( $q_H - q_W$ ).

The lower the quality of the wife in relation to her husband the higher the amount of dowry needed to secure the match, and as seen by equation 4 the lower the level of care provided by the husband to his wife (given that  $\beta < \alpha$ ). Hence, showing a negative relationship between dowry and the level of care provided.

This can be thought of as shifts of the supply curve along a relatively static demand curve. Women differ discretely from each other by their complexion, attractiveness, chastity, age and level of education. Men on the other hand differ by caste, class and earning potential. If a woman marries a man with high earnings but he provides her with little care then her utility is no better off, especially if a man who earns less will treat her better. A woman's desire to go up in status will depend on her share of utility being constant and hence the moves in demand are smaller.

## 2.1 Source of Female Bargaining Power

Figure A1 illustrates some important factors like access to microcredit, relative education and age which can impact the bargaining power of women in the household.

The literature suggests that easily accessible credit via microcredit programs should increase a woman's decision making power in the household. Increased savings of a woman under a microcredit program relative to her husband imply increased levels of cash income under the control of a woman, which should have the impact of strengthening her bargaining power and hence influence her reproductive behaviour (Pitt et.al, 1999). Other studies have observed a rapid increase in contraceptive prevalence in villages associated with the initiation of credit programs (Amin and Lloyd, 1998). Kamal and Islam (2010) also find that NGO membership is an important factor in determining contraceptive use.

Relative education of women as compared to men plays an important role in determining their bargaining power. Handa, (1996) argues that increased educational attainment of women increases opportunities for women to find income bearing jobs and via that channel improves their bargaining power in the household. Difference in husband and wife's age is another noteworthy measure of bargaining power where a woman, who is older, given her husband's age, is hypothesized to have more bargaining power in household decision making (Lundberg and Ward-Batts, 2000).

## 2.2 Determinants of Contraceptive Pill Use

Figure A2 shows important factors affecting the use of the contraceptive pill amongst married women in Bangladesh, as identified by various studies in the past.<sup>1</sup> Considered to be important factors are the number of living children, individual characteristics of the woman such as her age and education, and home delivery of contraceptives.

The total number of living children is a key determinant of contraceptive use by women (Kamal and Islam, 2010; Khan, 1996). Mannan (2002) using the BDHS 1996-1997 found that women make less use of inefficient and permanent methods as the number of living children increases. Also, factors in contraceptive choice included, increased marital duration and age leading to a preference for sterilization, and education of both married women and their husbands, resulting in more use of condoms.

Khan (1996) in his study using data from the 1990 KAP survey with a sample of about 8500 married women examined the relationship between fertility control, availability of contraceptives, and socio-demographic factors in rural Bangladesh. Factors that effected contraceptive use were number of living children, followed by number of living sons, as well as the attitude of married women and their husbands towards fertility control. He found that education had no effect on the use of contraceptives in the Matlab treatment area, but in the comparison area a modest use by level of education was found. Khan and Rahman, (1996) on the contrary find that the pill is used more by educated women, whereas injectibles and permanent methods are used by uneducated women.

The National Contraceptive Prevalence Survey (CPS) of 1983 and 1991 revealed a positive association between contraceptive use and home visitations of the female family planning field workers who distribute pills and condoms. It has been argued that doorstep delivery of contraceptives can be seen as a means of empowering women, especially those practicing purdah by enhancing their use of contraceptives (Khan and Rehman, 1996).

A recent study (Kamal and Islam, 2010), investigating socioeconomic factors regarding use of contraceptives and choice of methods used in rural Bangladesh, indicates that the contraceptive prevalence rate among currently married women is 61% and use of modern methods is 49%; and preferred methods both modern and traditional were the oral pill and periodic abstinence. Important factors seen affecting use of contraceptives was: women's age, number of living children, number of sons, women's education, her religion, and her membership of an NGO, as well as place of residence. Findings suggest that discussion on family planning by husband and wife has the most significant effect on contraceptive use.

Whilst previous studies examined the relationship of various factors on the use of contraceptives by married women such as education, door delivery of contraceptives and availability of micro-credit programs; no study to the author's knowledge has been undertaken to date to investigate the effect of marriage payments on the resultant bargaining power of the woman in the household as seen through her use of contraceptive pills in rural Bangladesh.

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<sup>1</sup> Due to data availability constraints this study was only able to include the following determinants of contraceptive use: the individual characteristics of the mothers and fathers like their age, education and religion, household characteristics like the number of total living children in the household, number of children under the age of 5, presence of a male child and variables indicating bargaining power such as relative marriage payments, age the mother married and savings under a microcredit program.

The current literature gives rise to some important research questions:

- a) Does groomprice (component of dowry over which brides have no property rights) have the effect of lowering the bargaining power of women?
- b) Does brideprice increase a woman's bargaining power in the household?
- c) Do sex ratios of men and women of marriageable age in the marriage market affect the existence and size of groomprice and brideprice, and influence women's bargaining power post marriage?
- d) Do variables not predictable ex ante such as availability of microcredit effect outcomes post marriage?

In the present study these research questions were investigated in the context of Bangladesh during the 1990s using data from rural Bangladesh (1998/1999). The data was chosen keeping in mind that 76% of Bangladesh's population is rural and that Bangladesh was going through some significant changes in the area of population planning during the 1990s (U.N., 2003).

### **3. Context of the Study**

The choice of using Bangladesh for the study was made keeping in mind that it gained its independence in 1971 and as a developing country with low socio-economic indicators faced many problems related to rapid population growth and low literacy. These problems were further compounded by the gender disparity in education and work force. Women in Bangladesh especially in rural areas faced many hardships including giving birth to and raising a large number of off-spring.

Various drives sponsored by the government of Bangladesh and international donors were undertaken between the mid 1970s and late 1990s to improve the living standards of its citizens. Prominent amongst these was the population control drive that included the Social Marketing Project, initiated in 1974 by USAID/Washington (Epstein and Altman, 1991) to distribute non-clinical contraceptives throughout Bangladesh; the Health and Population Sector Program in July 1998 that helped set up rural health and family planning clinics and outreach programs; as well as the Bangladesh Family Planning program, and the Maternal and Child Health and Family Planning programs which delivered services through a community-based distribution approach; were launched by the government of Bangladesh (Khan and Rahman, 1996).

Bangladesh made great strides in population control as its fertility rates fell by 60 percent and from 6.9 children per woman in 1970-1975 reduced to 2.4 in 2005-2010. A number of surveys and evaluation studies have been conducted by the government of Bangladesh and international agencies such as the World Bank to examine the effect of various factors such as outreach programs on population control. Results of these studies inform us that fertility in Bangladesh declined substantially falling from close to 7 in the early 1970s to 3.3 in 1994 and the number of women using contraception almost tripled (US Dept. of Commerce, 1993; Amin and Kamal, 1994). This census reveals that in 1991, nearly 8 out of every 10 married women using contraception were users of modern methods. The pill was the most popular method, where 1 out of every 3 married women using contraception had selected the pill. Mannan (2002) attributed the popularity of the pill to its relatively few side effects and easy usage compared to other methods, and its accessibility and cost (fieldworkers delivered pills free of costs to homes). A larger percentage of urban women (48%) as compared to rural women (39%) used

contraception (US Dept. of Commerce, 1993). The increased usage of contraceptives by married couples was identified as the main reason for the decline in fertility in Bangladesh. According to the Bangladesh Fertility Survey, however 'there was a significant gap between fertility preferences and use of contraception among married women' (U.S. Dept. of Commerce, 1993). During this period, it was seen that one third of all married women who were fertile were not using contraceptives and wished either to terminate childbearing or to space their next birth.

#### **4. Data**

The study uses survey data from 1998-1999 (Household Survey to Conduct Micro-Credit Impact Studies: Bangladesh) collected by the World Bank and the Bangladesh Institute of Development Economics (BIDS). The survey was conducted to collect information on the credit programs of Grameen Bank, Bangladesh Rural Advancement Committee and the Rural Development-12 program of the Bangladesh Rural Development Board in 1991-1992 and was followed by a later round of data collection in 1998-1999.

The 1991-1992 dataset included 1798 households from rural Bangladesh, randomly drawn from 87 villages of 29 thanas (sub-districts). These 29 thanas were randomly selected from 391 thanas in Bangladesh out of which 24 thanas had at least one of the above mentioned credit programs in operation; whereas, 5 thanas had none. From each of the thanas which had a credit program operational in it, 3 villages were randomly chosen from a list of villages provided by that program's local office, where the credit program had been running for at least three years. From the village census data provided by the Government of Bangladesh an additional three villages were randomly chosen in which no program was running. Same households from the villages chosen in the first round of the survey, along with new villages from the initial thanas, and three new thanas, were included in the follow up round in 1998-1999. The 1998-1999 survey collected data on 2599 households.

Survey data was collected in three rounds reflecting the major rice based seasons (Aus, Aman and Boro) in Bangladesh. Each round was conducted post-harvest namely in December/January, April/May, and July/August. The reason the data were collected in this manner was so as to capture the income flows, impact on agricultural employment and change in prices associated with each of these seasons.

This study uses the data collected in the second round by BIDS and the World Bank in 1998-1999. The sample selected for this study of 2077 couples, was of married men and women who were fathers and mothers identified by the mother and father identity numbers provided in the data. The reason for selecting a sample of mothers and fathers as opposed to just married couples is that we believe that all women want at least one child, hence the real conflict in the household is about child spacing and the total number of children to have, and not whether to have any children at all.

Questions regarding contraceptive use are addressed to all women between the ages of 12-50 in the survey; women who respond in the affirmative to 'are you currently using any birth control methods,' are women who are married and of which 94% of them are mothers i.e. have one child or more at the time of the survey.

Table A1 provides some insightful summary statistics regarding the sample. Fathers on average are older (by 8.5 years) and more educated than the mothers. On average 60% of

household marriage payments comprise of brideprice and 50% of household savings under a microcredit program are by women.

The subsample averages in Table A2 show that women who use the contraceptive pill are more educated than the average woman in the sample, and compared to women who use no form of contraception. Women who use contraception also receive a higher payment of brideprice at the time of marriage. Average amount of brideprice received by women who use the contraceptive pill is 1236 takas (62%) higher than women who use no contraception and 1186 takas (58%) more than women who use other forms of contraception. Children were restricted in the sample to those under the age of 18 and who were living currently in the household with their parents in 1998/99. On average, women who took the contraceptive pill had 5 children, 2 less than women who used other forms of contraception and 4 children fewer than women who used no form of contraception.

Amongst the sample of 2077 mothers and fathers, fifty eight percent had one or more children under the age of 5.<sup>2</sup> Of the 2077 women, 1182 were currently using contraception at the time of the survey in 1998-1999<sup>3</sup>. The most popular method of contraception was the pill (65.48%), followed by injections (16.92%), ligation (10.24%), rhythm (3.3%) condom (1.52%), other forms of contraception (1.18%), IUD (0.59%), vasectomy (0.51%) and withdrawal (0.25%)<sup>4</sup>.

To construct sex ratios of men and women of marriageable age, census data on the population of Bangladesh by age and sex from 1974, 1981, 1991 and 2001 was obtained from the United Nations Statistics Divisions Demographic Yearbook. Further, information on the 1991 census data was acquired by the Asia-Pacific Population Research Report (Kantner, Lerman and Yusuf, 1995). Three ratios were created - Proportion 1: number of boys' 15-19/number of girls 10-19; Proportion 2: number of boys 20-29/number of girls 10-19; and Proportion 3: number of boys 30+/number of girls 10-19 (see Table A4).

As can be seen in Table A4, P1 does not vary much across the years. P2 however shows considerable changes, first decreasing from 0.73 in 1974 to 0.65 in 1981 before increasing again to 0.81 in 1991. In 2001 P2 was down to 0.74. P3 after falling slightly from 1.29 to 1.24 increased sharply to 1.59 in 1991 and 1.69 in 2001. Stata was used to interpolate and extrapolate sex ratios for the remaining years on which no census data was found. Figure A8 provides a graphical picture of how sex ratios are changing over time.

To search for a potential partner, girls were taken to enter the marriage market when they were 15 and boys at 20. Although girls in our paper are considered to enter the marriage market when they are 15, when calculating the sex ratios girls from age 10-19 are considered. This is because even though the legal age of marriage is 18 for women in Bangladesh, the literature shows that the largest proportion of women who get married are from the 10-19 age group and boys from the 20-29 age group (Rao, 1993; Esteve-Volart, 2004). Upon entering the marriage market at 15 girls faced competition by other 10-19 year olds and boys at 20 from other younger and older boys. Figure A5 shows the relationship between the year mothers entered the marriage market and the year they got married. The figure indicates that the later women entered the marriage market, the later they got married.

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<sup>2</sup> See Table A3 in Appendix

<sup>3</sup> See Figure A3 in Appendix

<sup>4</sup> See Figure A4 in Appendix

## 5. Results and Discussion

Using data from rural Bangladesh (1998-1999), this study explores whether women in a relatively strong bargaining position at the time of marriage continue to remain in a strong position post marriage, as seen by their decision making power within the household.

Marriage payments exchanged are indicative of the bargaining power of the bride and groom at the time of marriage. In this study the relative bargaining of women is measured by taking brideprice as a fraction of the total marriage payments<sup>5</sup> and decision making power post marriage is proxied via the use of the contraceptive pill by women.

<b>Table 1: Brideprice as a Fraction of Marriage Payments</b>						
	fplanpill					
	1	2	x1	P1(P2)	x2	P1(P2)
fath_age	-0.0148* (0.00717)	-0.0015 (0.00848)	35	0.385(0.193)	40	0.369(0.196)
age_m	0.236*** (0.0586)	0.277*** (0.0708)	25	0.25(0.09)	30	0.35(0.168)
agemsq	-0.00459*** (0.000886)	-0.00457*** (0.00103)	25	0.625(0.3405)	30	0.6245(0.3404)
educ_moth	0.0189* (0.00918)	-0.0344* (0.0158)	3	0.37(0.19)	6	0.39(0.17)
fath_ed	0.00382 (0.0103)	-0.0104 (0.0149)	3	0.372(0.196)	6	0.372(0.196)
m_dowrykfrac	0.791*** (0.204)	0.695** (0.256)	0.1	0.358(0.192)	0.3	0.387(0.204)
motage_marr	-0.0446 (0.0237)	-0.0331 (0.0276)	12	0.382(0.204)	15	0.374(0.197)
ntc_u5	-0.630*** (0.0941)	-0.831*** (0.117)	1	0.359(0.166)	2	0.252(0.094)
child	0.152** (0.0547)	0.0841 (0.0607)	2	0.233(0.087)	4	0.318(0.109)
_cons	-1.585 (0.921)	-3.734** (1.191)				
<i>N</i>	2077					
pseudo <i>R</i> <sup>2</sup>	0.06					
Standard errors in parentheses						
* <i>p</i> < 0.05, ** <i>p</i> < 0.01, *** <i>p</i> < 0.001						

<sup>5</sup>Total marriage payments received by the household are calculated by summing the amount of brideprice received by the woman and groomprice received by the man.

Table 1 shows the impact of brideprice as a fraction of total household marriage payments on a woman's decision to use the contraceptive pill. The results of the multinomial logit show that as the fraction of total marriage payments composed of brideprice increases from 10% to 30% the predicted probability of using the contraceptive pill increases by 8 percentage points; and the predicted probability of choosing any other form of contraceptive increases by 6 percentage points.

In line with findings of previous studies, individual characteristics of the mothers and fathers also play an important role in determining the use of the contraceptive pill, such as their level of education and ages (Kamal and Islam, 2010). As the years of education received by the mother increase by 3 years, from receiving 3 years of education to 6, the predicted probability of using the contraceptive pill increases by 5 percentage points. The predicted probability of women using other forms of contraception however shows a decline of 10 percentage points as mother's education increases by 3 years.

The results of the variable age and age squared suggest that as the age of the mother increases she is more likely to use the contraceptive pill as opposed to no contraception but at a decreasing rate.<sup>6</sup> However as the fathers age increases from 35 years to 40 years the predicted probability of using the contraceptive pill decreases by 4 percentage points. This may be explained by the fact that men may be able to exercise more control over household decisions as they become older.

Results show that as the number of children born in the household increase from 2 to 4, the predicted probability of choosing contraceptive pills rises by 36 percentage points.<sup>7</sup> Previous studies investigating the effect of an increase in the total number of living children on the use of contraceptives confirm these findings (Khan, 1996; Kamal and Islam, 2010; Mannan, 2002). However as the number of children under the age of 5 increases from 1 to 2 the predicted probability using the contraceptive pill falls by 30 percentage points. This result may suggest that in households where there are young children women are less likely to use contraception as they may still be completing their families or breast feeding one of their children, where lactation acts a natural form of contraception.

Table A5 displays the result of the multinomial logit that estimates the effect of differences in educational attainment and age between the mother and father on the mother's decision to use the contraceptive pill. The difference in age variable is constructed by subtracting the mothers age from the fathers. Results show that as the difference in age variable increases from 7 years to 10 years the predicted probability of using the contraceptive pill falls by 2 percentage points. This confirms the hypothesis suggested before that as the age of the father increases relative to the mother he is likely to hold more decision making power in the household (Lundberg and Ward-Batts, 2000). The predicted probability of using the pill increases by 12 percentage points as the proportion of marriage payments composed of brideprice increase from 10% to 30%.

Probit estimation on the choice of using contraception are presented in Table A7, where the dependant variable equals 1 if the mother was currently using contraception, and equalled zero if she was not. Results show that an increase of brideprice as a fraction of total marriage payments by one unit has a positive and significant effect on the likelihood of using

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<sup>6</sup> The turning point of this concave relationship is calculated at 26 years.

<sup>7</sup> We include the presence of a male child to the basic specification in Table 1 however we find that its effect on the use of the contraceptive pill is not statistically significant.

contraception by 18 percentage points. The age at which women first marry has a negative effect on the use of the contraception. This might indicate that women who marry later are keen to complete their families and hence less likely to use contraception. Similar to our findings in Table 1, as the number of living children increase mothers are more likely to practise contraception, as the number of children in the household under 5 increase, she is less likely to be currently using contraception, and as the age of the mother increases mothers are more likely to use contraception but at a decreasing rate.<sup>8</sup>

Compared to the probit model, the multinomial logit model (Table 1) is less restrictive on the effects that explanatory variables can have on the different choices of contraceptive use, allowing coefficients of exogenous variables such as education of the mother to vary across using the contraceptive pill or other forms of contraception. The probit on the other hand restricts the coefficients to be the same for all currently using contraception (currently not using contraception) decisions.

Results for the multinomial logit constrained such that coefficients of all variables equal each other in the two equations (of dependent variables use of contraceptive pill and other forms of contraception) except for education are shown in Table A6. They show that as the education of mothers increase by three years (from 3 years of education to 6) the predicted probability of her using the contraceptive pill goes up by 6 percentage points whereas for other forms of contraception the predicted probability of using them falls by 12 percentage points. Khan and Rehman, (1996) similarly found that women who were educated were more likely to use the contraceptive pill; whereas, uneducated women often used injectibles and other forms of contraception. A Likelihood-ratio test was performed, to test the unrestricted model presented in Table 1 and the restricted model discussed above. Results show that the null hypothesis is strongly rejected and we conclude that the unrestricted model fits the data significantly better and is hence preferred.

Likelihood-ratio test	LR chi2(8) = 57.50
(Assumption: restrict nested in unrestricted)	Prob > chi2 = 0.0000

The use of contraception increases amongst women as their relative savings through participation in a microcredit program increases in the household. Relative savings in this paper are defined as - the savings of the mother as a fraction of total household savings, under the microcredit program. Probit results on the use of contraception (where the dependant variable equals 1 if the mother was currently using contraception and equalled zero if she was not) are provided in Table A8, showing the positive significant effect on contraceptive use of a woman's relative savings as they increase under the microcredit program. The coefficient on brideprice taken as a fraction of household marriage payment remains significant and positive. It can be argued that marriage payments such as brideprice may continue to matter despite participation of women in the microcredit program, as membership in the program was not anticipated by the

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<sup>8</sup> A probit on the use of the contraceptive pill as opposed to no contraception yields similar results as the one reported in Table 1 with the likelihood of using the contraceptive pill increasing by the fraction of brideprice taken, the education level of the mother, the total number of living children in the household and as the age of the mother increases but at a decreasing rate. The likelihood of using the pill falls as the father's age and the number of children under the age of 5 increases by one unit.

couples at the time of marriage when marriage payments were made.

A specification with the dummy variable Islam was tried to see whether brideprice may in fact represent the Muslim marriage payment of maher. However, brideprice in our sample is received by individuals of all religions and not just Muslims. In addition, the results for the multinomial logit which included Islam and an interaction term with brideprice, are not included in this paper as they did not have a significant effect on the use of any form of contraception.

Dummy variables representing different districts in Bangladesh are included to see whether any regional differences may determine the use of the contraceptive pill as opposed to no contraception. Dhaka, Rangpur district, Sylhet, Khulna, Rajshahi and Barisal are the districts included.<sup>9</sup> Multinomial estimates in Table A9 show that belonging to district Dhaka, Khulna and Rajshahi have a positive significant impact on using the contraceptive pill, whereas belonging to Sylhet has a negative effect. It is interesting to note that even though the effect of brideprice as a fraction of total marriage payments weakens, it still remains significant and strong showing that the statistic is robust to changes in specification. We add four variables that might help explain why the district the individual belongs to matters: distance to nearest commercial bank from the household, distance of nearest paved road from the household, distance to nearest market place from the household, and distance to nearest business centre from the household. As the distance from the nearest paved road increases by 1 kilometre, the predicted probability of using other forms of contraception falls by 2 percentage points and as the distance from the nearest commercial bank increases by 2 kilometres, the predicted probability of a mother choosing other forms of contraception increases by 7 percentage points. After the inclusion of these variables, belonging to the district Sylhet has a significant and negative impact on the use of other forms of contraception; whereas, living in Rangpur district has a positive significant impact on the use of the contraceptive pill but no longer has significant impact on using other forms of contraception. Significance and signs of the rest of the districts remain roughly the same<sup>10</sup>. Further work needs to be done to explore why belonging to a particular district in Bangladesh may affect the use of contraception.

Results from Table A12 show that as the difference in education between the mother and father increases by 1 year, brideprice as a fraction of total marriage payments increases by 0.002. These results suggest that relative education of the mother compared to the fathers plays a significant role in explaining the size of marriage payments (Handa, 1996).

### **5.1. Sex ratio's and Relative Marriage Payments**

The possibility of sex ratios<sup>11</sup> affecting the bargaining power of women in the household post marriage was also investigated. The relationship between the two did not emerge to be as simple as imagined. Figure A7 shows that individuals entering the marriage market later end up with a higher brideprice as a fraction of total marriage payments. However, Figure A6 shows that as p1 (i.e. number of boys 15-19 relative to girls 10-19) increases, the fraction of brideprice as a fraction of total marriage payments falls. These trends are puzzling as even though the bargaining power of women is increasing over time as proxied by the amount of brideprice received relative to groomprice given, sex ratios are working against women. The regression

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<sup>9</sup> Chittagong is excluded so to avoid the dummy variable trap.

<sup>10</sup> Results are reported in the Appendix, Table A10

<sup>11</sup> faced by individuals when they enter the marriage market

results<sup>12</sup> provide a similar picture where  $p_1$  has a negative significant effect on brideprice as a fraction of total marriage payments. This suggests that a factor other than sex ratios might be affecting the size of relative marriage payments in rural Bangladesh. It can be argued that the increasing trend of relative marriage payments over time is driven by the outside option of women which may have been growing in rural Bangladesh over time.

## 6. Conclusion and Policy Implications

Findings of this paper suggest that circumstances around when a woman gets married has a greater effect on her bargaining power post marriage as opposed to her current conditions. Policy makers looking to improve the welfare of women in rural Bangladesh would have a larger impact on their well-being by intervening in the marriage market as opposed to during a woman's marriage for instance through micro-credit programs. This is so because a woman's value of being single falls dramatically post marriage due to the stigma attached to being divorced. This large negative stigma weakens the relationship between a woman's fallback position and relative bargaining power during the marriage. On the other hand because of the symmetry between the value of being single for men and women at the time of marriage, binding commitments have a lasting effect on long-term decisions affecting the woman such as family size.

There is a close link between the bargaining of women in the household and desirable economic outcomes such as low levels of population growth and the health of women and children. Rapid population growth is a crucial problem for developing countries where 75% of the world's population resides. It lowers per capita income; hinders economic growth by lowering saving rates and reducing 'the stock of human capital'; puts additional pressure on government revenue to provide basic services; and high levels of fertility and closely spaced births also have an adverse affect on the health of the mother and increase child mortality (Todaro and Smith, 2009). The empowerment of women plays a crucial role in achieving lower levels of population growth as emphasized in the United Nations International Conference on Population and Development in 1994. Recommendations of the conference highlighted that high levels of fertility were a consequence of the low status of women at home and in their community. Findings of our paper support this hypothesis where an increase in the bargaining power of women at the time of marriage increases their predicted probability of using the contraceptive pill.

To conclude, this paper attempts to investigate whether the bargaining position of brides and bridegrooms at the time of marriage affected their decision making power within the household post marriage. The relative bargaining position of women was represented by the fraction of marriage payments composed of brideprice; whereas, their decision making power post marriage was proxied by their use of the contraceptive pill. Results of this study show that as the fraction of total marriage payments composed of brideprice increases from 10% to 30% the predicted probability of using the contraceptive pill increases by 8 percentage points. Other factors such as the difference in age between the husband and wife, the number of living children in the household and the level of education of the mother are all seen to play a significant role in the use of contraceptive pills by women. Results show that an increase in the difference of ages between the father and the mother from 7 years to 10 years decreases the predicted probability of

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<sup>12</sup> Results are reported in the Appendix, Table A11

using the contraceptive pill by 2 percentage points and as the education of the mother increases by three years (where level of education attained increased from 3 to 6 years) the predicted probability of using the contraceptive pill increases by 5 percentage points. Education however, has a negative effect on using other forms of contraception.

Marriage payments, as conjectured by Becker, arise to align the demand and supply of brides and grooms in the marriage market. However, there may be other characteristics of the bride and bridegroom that may be giving rise to these payments such as level of education, good looks or that they belong to dignified, high socio-economic status families. Hence marriage payments may be used to help match individuals of different characteristics and qualities to each other. This may particularly be so as marriage payments have the effect of making an individual more desirable in the marriage market. Our results show that as the difference in education between the mother and father increases by 1 year, brideprice as a fraction of total marriage payments increases by 0.002.

The idea that marriage payments impact on a woman's position in the household post marriage is one that is reasonable. Even though intra-household bargaining literature argues that the share of utility received by a woman post marriage depends on her threat point, it is important to note that divorce or separation represent unreasonable behaviour in rural Bangladesh where being a single woman is looked down upon. Women in rural Bangladesh are also unlikely to have opportunities to work outside their homes. Hence commitments made at the time of marriage play a vital role in determining the position of these women in their families post marriage.

Further studies are required to investigate how distance from the natal home of women may affect binding commitments made at the time of marriage.

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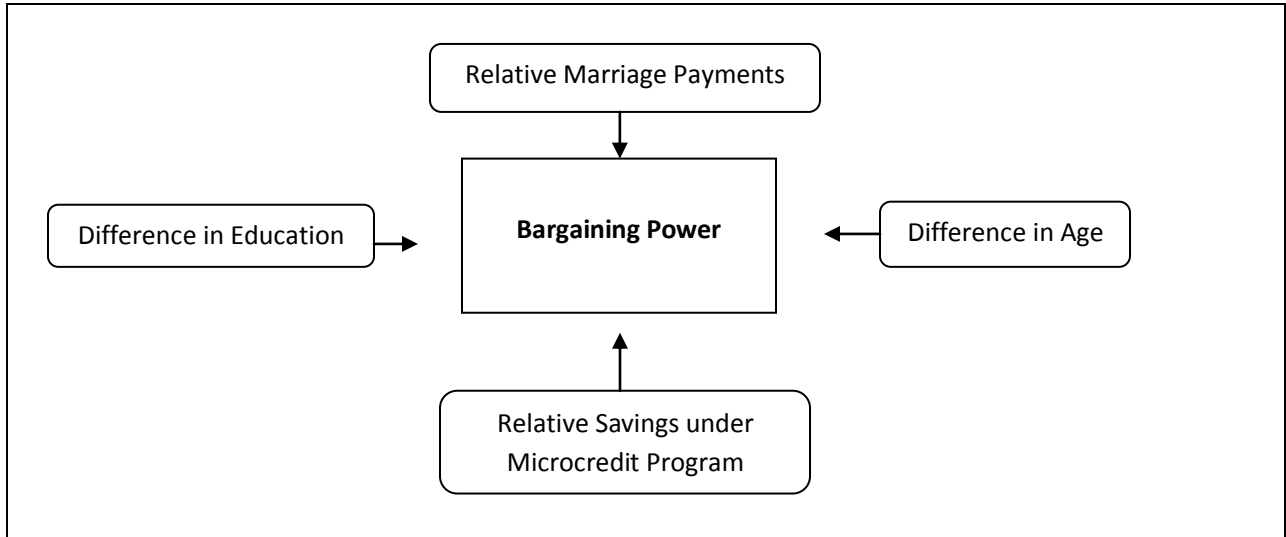
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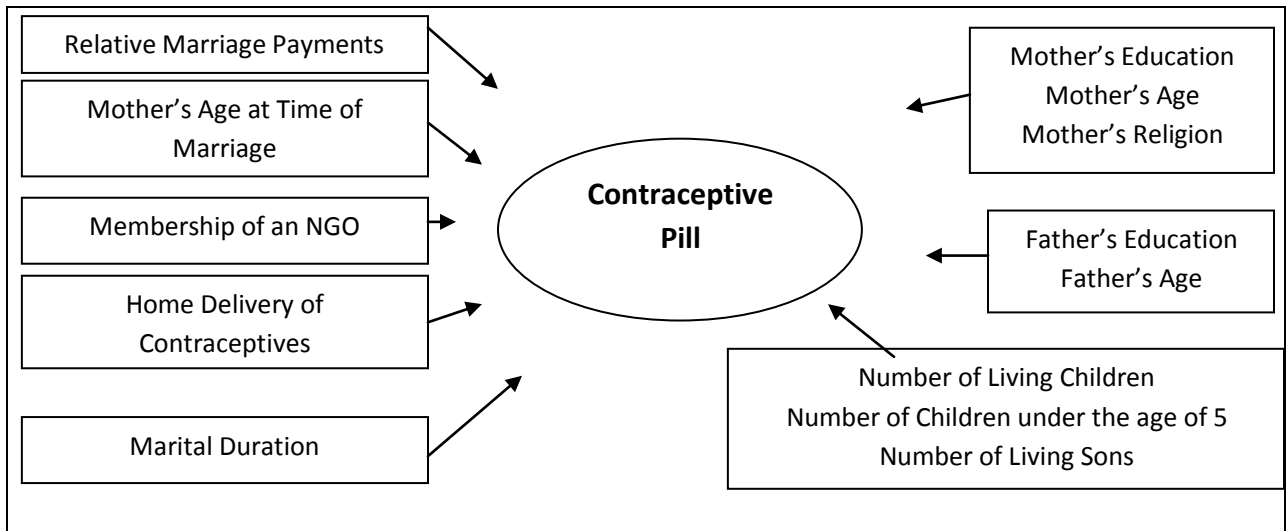
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## APPENDIX

**Figure A1: Source of Women Bargaining Power**



**Figure A2: Determinants of Contraceptive Pill Use**



**Figure A3:**

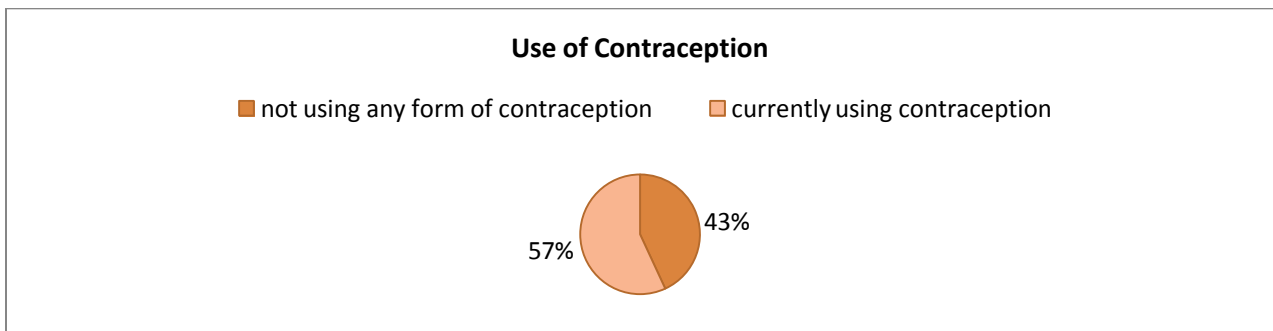


Figure A4:

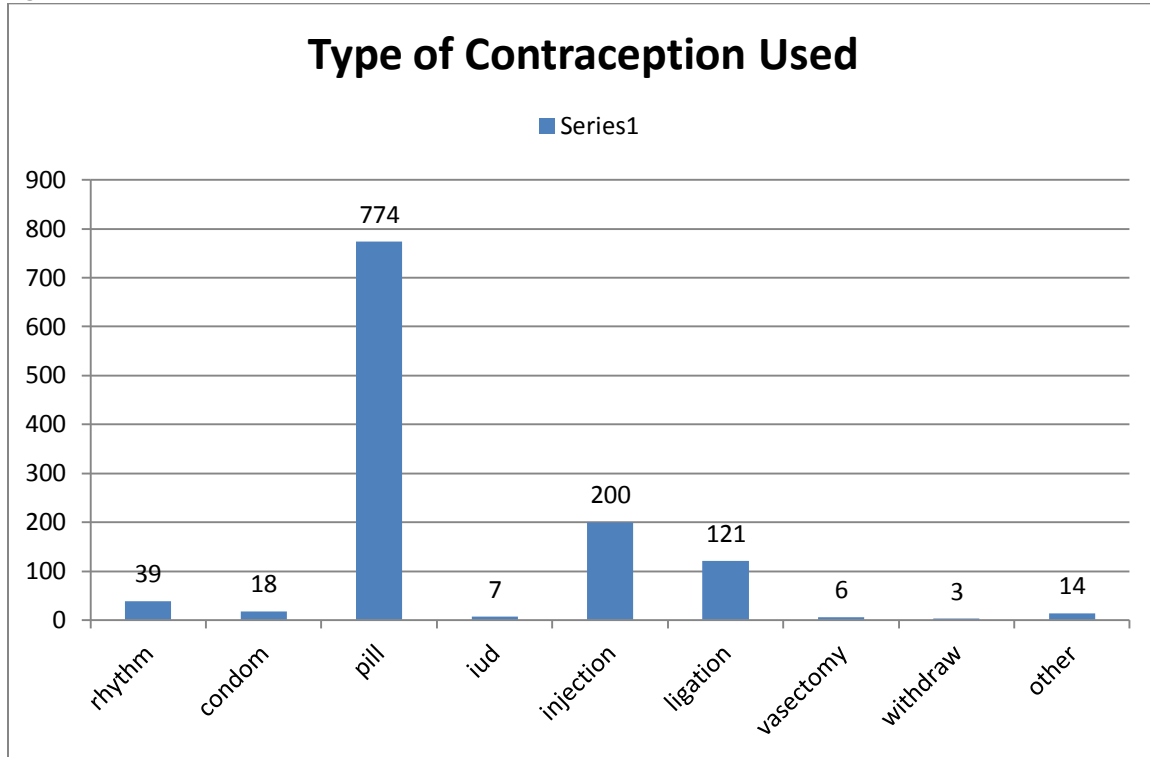


Figure A5: Relationship between Year of Entry into the Marriage Market and Year Married

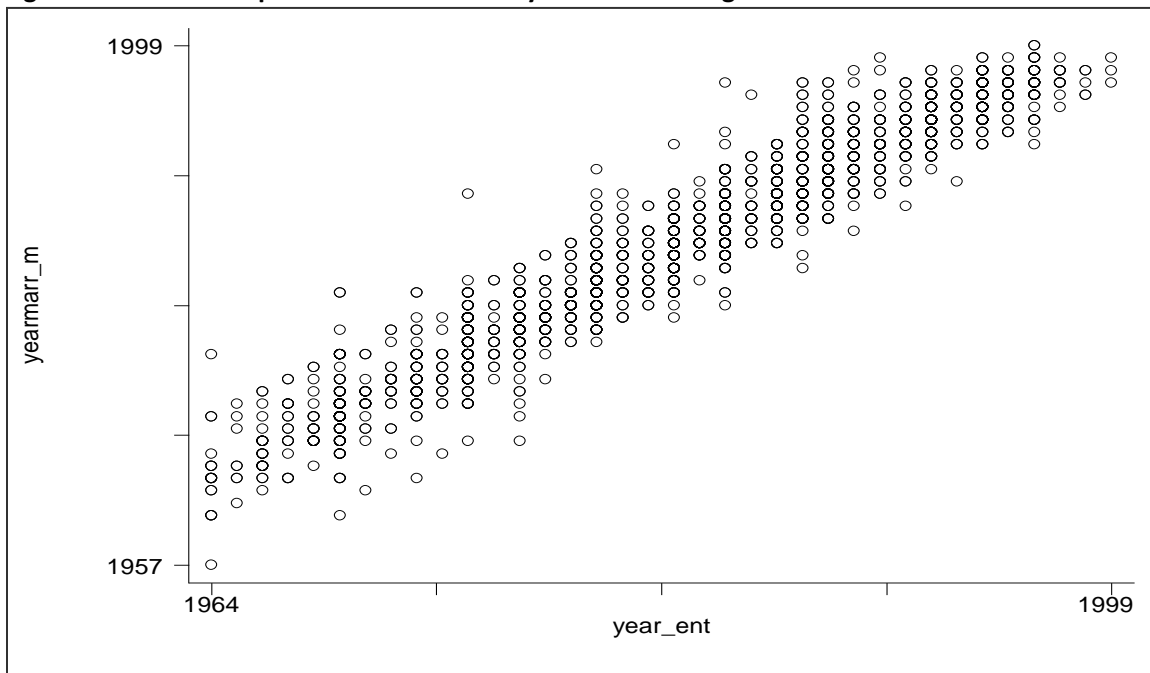


Figure A6: Relationship between Relative Marriage Payments and p1.

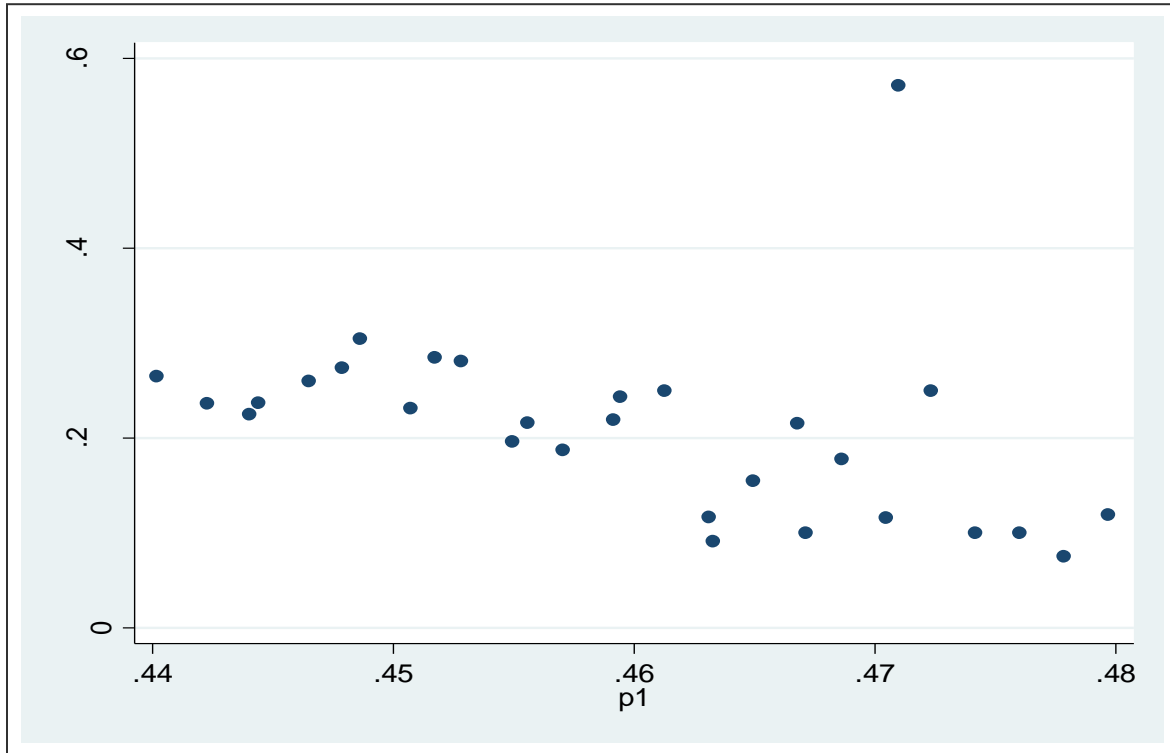


Figure A7: Relationship between Brideprice taken as a fraction of total Marriage Payments and Year of Entry into the Marriage Market.

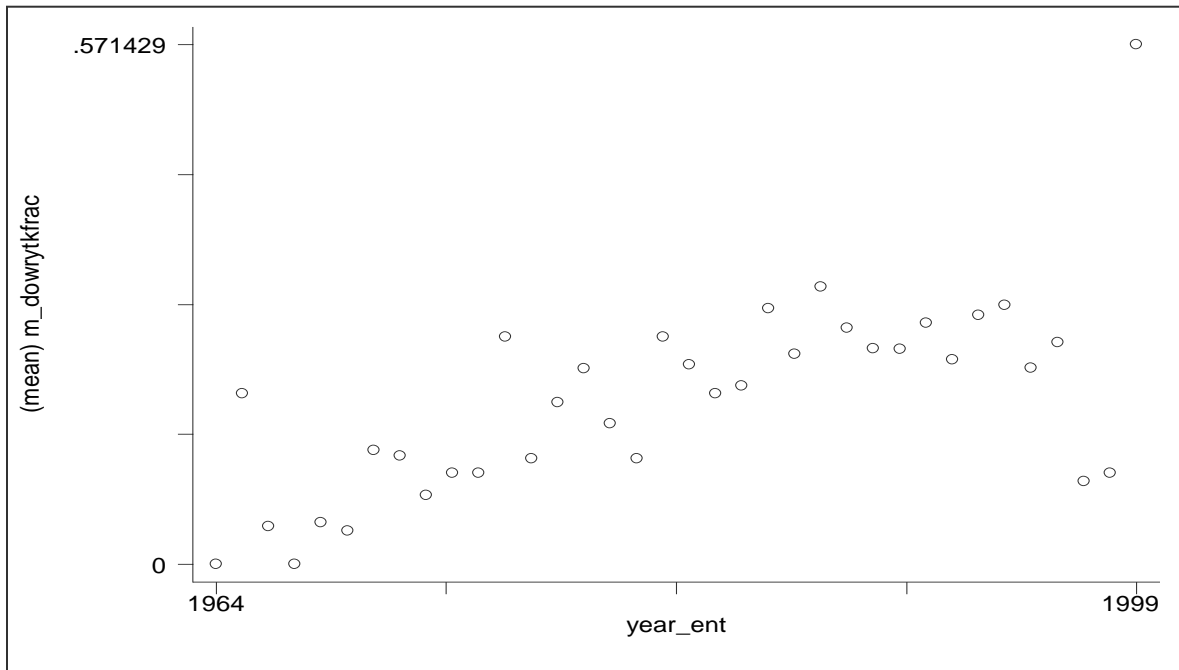


Figure A8: Sex Ratio's over time.

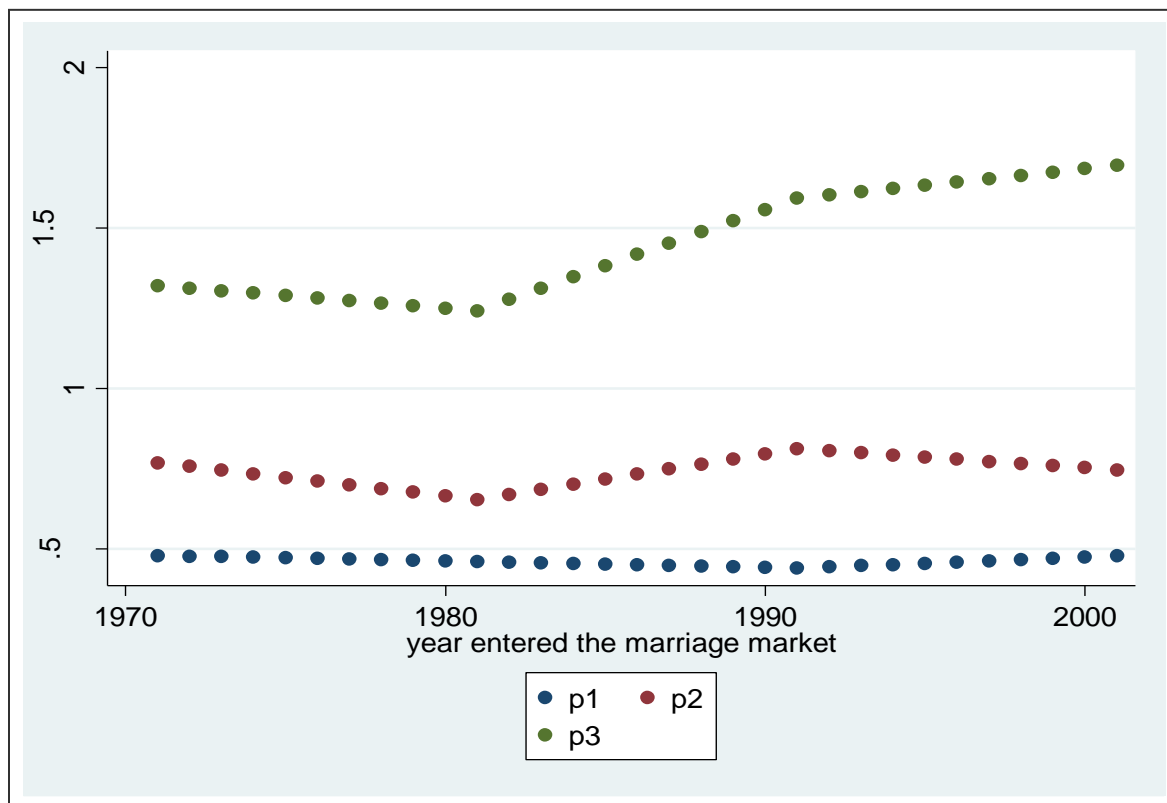


Table A1: Descriptive Statistics

Variable	mean
Fathers age (fath_age)	40.13
Mothers age (age_m)	31.58
Mothers education (educ_moth)	2.84
Fathers education (fath_ed)	3.20
Household savings under microcredit program (hhsavprg)	1401.36
Mothers savings under microcredit program (motsav_prg)	695.59
Age mother married (motage_marr)	15.76
Brideprice taken by mother (mot_dowrytkn)	2479.56
Household Marriage Payments (hhdowrtkn)	4153.40
Distance to Nearest Agricultural/Commercial Bank from the Household in km (d_bank)	3.40
Distance of nearest Paved Road from the Household in km (distance)	1.23
Distance to Nearest Haat from the Household in km (d_hat)	1.29
Distance to Nearest Business Centre from the household in km (d_bcentr)	3.65
Number of Observations	2077

**Table A2: Sub Sample Averages**

Explanatory Variable	Sub sample Averages			All y
	y=0	y=1	y=2	
	No Contraception	Contraceptive Pill	Other Forms of Contraception	Overall
education of the mother (years)	2.655866	3.624031	1.77451	2.84352
brideprice (taka)	2008.849	3245.556	2059.007	2479.56
total children	9	4.9	6.8	7
Observations	895	774	408	2077

**Table A3: Number of Children under the Age of 5**

(sum) children under 5	Frequency	Percent
0	872	41.98
1	876	42.18
2	304	14.64
3	25	1.2

**Table A4: Sex Ratio (number of boys/number of girls)**

	1974	1981	1991	2001
P1	0.47	0.46	0.44	0.47
P2	0.73	0.65	0.81	0.74
P3	1.29	1.24	1.59	1.69

**Table A5: Difference in Father's and Mother's Ages and Education**

	fplanpill 1	2	x1	P1(P2)	x2	P1(P2)
m_dowrytkfrac	1.127 <sup>***</sup> (0.195)	0.672 <sup>**</sup> (0.238)	0.1	0.352(0.195)	0.3	0.395(0.2)
Diffage	-0.0147 <sup>*</sup> (0.00685)	-0.00829 (0.00833)	7	0.376(0.19)	10	0.368(0.19)
Diffeduc	0.0115 (0.00803)	-0.0125 (0.0103)				
_cons	-0.231 <sup>**</sup> (0.0846)	-0.839 <sup>***</sup> (0.103)				
N	2077					
pseudo R <sup>2</sup>	0.01					

<b>Table A6: Fplanpill constrained</b>						
	fplanpill pill	any other	x1	P1(P2)	x2	P1(P2)
educ_moth	0.0199* (0.00905)	-0.0455** (0.0158)	3	0.375(0.19)	6	0.398(0.166)
fath_age	-0.01 (0.00641)	-0.01 (0.00641)				
age_m	0.227*** (0.0509)	0.227*** (0.0509)				
agemsq	-0.00418*** (0.000756)	-0.00418*** (0.000756)				
fath_ed	0.000515 (0.00971)	0.000515 (0.00971)				
m_dowrykfrac	0.744*** (0.189)	0.744*** (0.189)				
motage_marr	-0.041 (0.021)	-0.041 (0.021)				
ntc_u5	-0.688*** (0.0856)	-0.688*** (0.0856)				
child	0.122* (0.0479)	0.122* (0.0479)				
_cons	-1.785* (0.821)	-2.263** (0.822)				
N	2077					
pseudo R <sup>2</sup>	0.046					
Standard errors in parentheses						
* $p < 0.05$ , ** $p < 0.01$ , *** $p < 0.001$						

**Table A7: Brideprice as a Fraction of Household Marriage Payments**

	mothusefplan
fath_age	-0.0024 (0.00152)
age_m	0.0552*** (0.0123)
agemqr	-0.00101*** (0.000182)
educ_moth	0.00153 (0.00209)
fath_ed	-0.000118 (0.00232)
m_dowrytkfrac	0.183*** (0.0452)
motage_marr	-0.0102* (0.00507)
ntc_u5	-0.166*** (0.0204)
child	0.0294* (0.0115)
<i>N</i>	2077
pseudo <i>R</i> <sup>2</sup>	0.061

Marginal effects; Standard errors in parentheses

(d) for discrete change of dummy variable from 0 to 1

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

**Table A8:**  
**Mothers Savings under Microcredit Program as a Fraction of Total Household Savings**

	mothusefplan
fath_age	-0.00226 (0.00152)
age_m	0.0510*** (0.0124)
agemqr	-0.000962*** (0.000183)
educ_moth	0.00181 (0.00209)
fath_ed	0.000331 (0.00233)
m_dowrytkfrac	0.171*** (0.0455)
motage_marr	-0.00857 (0.00511)
ntc_u5	-0.162*** (0.0205)
Child	0.0288* (0.0115)
m_savprgfrac	0.130** (0.0484)

<b>Table A9: Districts</b>						
	fplanpill					
	1	2	x1	P1(P2)	x2	P1(P2)
fath_age	-0.0115 (0.00735)	0.000958 (0.00852)	35	0.383(0.191)	40	0.37(0.196)
age_m	0.228*** (0.0591)	0.266*** (0.0718)	25	0.25(0.09)	30	0.36(0.16)
agemsq	-0.00454*** (0.000893)	-0.00449*** (0.00104)	25	0.625(0.3375)	30	0.624(0.3374)
educ_moth	0.0196* (0.00937)	-0.0309 (0.0166)	3	0.374(0.19)	6	0.39(0.17)
fath_ed	0.00559 (0.0104)	-0.00697 (0.0153)	3	0.372(0.196)	6	0.377(0.191)
m_dowrytkfrac	0.489* (0.214)	0.581* (0.267)	0.1	0.36(0.192)	0.3	0.379(0.203)
motage_marr	-0.0172 (0.0248)	-0.0296 (0.0288)	12	0.378(0.208)	15	0.373(0.198)
ntc_u5	-0.589*** (0.0955)	-0.832*** (0.119)	1	0.364(0.168)	2	0.28(0.1)
child	0.212*** (0.0565)	0.118 (0.0623)	2	0.355(0.193)	4	0.428(0.197)
dhaka	0.560** (0.181)	0.376 (0.214)	0	0.346(0.19)	1	0.438(0.205)
rangpurdist	0.397 (0.204)	0.475* (0.235)	0	0.365(0.188)	1	0.413(0.231)
sylhet	-0.918** (0.288)	-0.552 (0.319)	0	0.381(0.198)	1	0.233(0.171)
khulna	0.553** (0.191)	-0.121 (0.243)	0	0.347(0.205)	1	0.477(0.149)
rajshahi	0.942*** (0.219)	0.395 (0.268)	0	0.352(0.197)	1	0.529(0.179)
barisal	-0.0687 (0.262)	0.446 (0.283)	0	0.375(0.191)	1	0.325(0.27)
_cons	-2.464** (0.945)	-3.912** (1.217)				
<i>N</i>	2077					
pseudo <i>R</i> <sup>2</sup>	0.078					
Standard errors in parentheses						
* <i>p</i> < 0.05, ** <i>p</i> < 0.01, *** <i>p</i> < 0.001						

<b>Table A10: Districts and Distance to Banks/Paved Road</b>						
	fplanpill					
	1	2	x1	P1(P2)	x2	P1(P2)
fath_age	-0.0128 (0.00739)	0.000352 (0.00856)	35	0.384(0.191)	40	0.37(0.196)
age_m	0.229*** (0.0593)	0.261*** (0.0718)	25	0.256(0.093)	30	0.362(0.159)
agemqr	-0.00454*** (0.000896)	-0.00439*** (0.00104)	25	0.648(0.31)	30	0.647(0.341)
educ_moth	0.0196* (0.0094)	-0.0321* (0.0163)	3	0.374(0.192)	6	0.393(0.174)
fath_ed	0.00647 (0.0105)	-0.00629 (0.0152)	3	0.372(0.196)	6	0.377(0.192)
m_dowrytkfrac	0.526* (0.216)	0.573* (0.27)	0.1	0.365(0.193)	0.3	0.379(0.202)
motage_marr	-0.017 (0.0248)	-0.0273 (0.0291)	12	0.378(0.207)	15	0.374(0.198)
ntc_u5	-0.594*** (0.0957)	-0.844*** (0.12)	1	0.364(0.168)	2	0.283(0.1)
child	0.218*** (0.0569)	0.111 (0.0627)	2	0.355(0.19)	4	0.43(0.195)
dhaka	0.643*** (0.191)	0.275 (0.226)	0	0.339(0.196)	1	0.457(0.189)
rangpurdist	0.414* (0.21)	0.324 (0.242)	0	0.363(0.192)	1	0.427(0.21)
sylhet	-0.933** (0.296)	-0.775* (0.336)	0	0.38(0.2)	1	0.239(0.145)
khulna	0.579** (0.195)	-0.139 (0.246)	0	0.346(0.2)	1	0.483(0.146)
rajshahi	0.964*** (0.221)	0.373 (0.269)	0	0.351(0.198)	1	0.534(0.175)
barisal	0.00137 (0.267)	0.397 (0.289)	0	0.374(0.192)	1	0.343(0.25)
distance	-0.0713 (0.0441)	-0.106* (0.0516)	1	0.374(0.199)	2	0.366(0.188)
d_hat	0.017 (0.0688)	0.059 (0.0792)	1	0.372(0.194)	2	0.372(0.2)
d_bcentr	0.024 (0.0277)	0.0016 (0.0324)	2	0.365(0.198)	4	0.37(0.197)
d_bank	-0.019 (0.0267)	0.0772** (0.0299)	2	0.385(0.178)	4	0.376(0.19)
_cons	-2.444* (0.953)	-3.988** (1.225)				
<i>N</i>	2077					
pseudo <i>R</i> <sup>2</sup>	0.081					
Standard errors in parentheses						
* <i>p</i> < 0.05, ** <i>p</i> < 0.01, *** <i>p</i> < 0.001						

<b>Table A11: Regression: Sex Ratios</b>	
m_dowrytkfrac	
p1	-3.691 <sup>***</sup> (0.877)
p2	-0.534 (0.279)
p3	0.184 (0.152)
_cons	2.023 <sup>***</sup> (0.463)
<i>N</i>	1873
pseudo <i>R</i> <sup>2</sup>	
Standard errors in parentheses	
* $p < 0.05$ , ** $p < 0.01$ , *** $p < 0.001$	

<b>Table A12: Difference in Age and Education between Mother and Father</b>	
m_dowrytkfrac	
Diffage	0.00424 (0.0077)
Diffeduc	0.00231 <sup>*</sup> (0.000909)
_cons	0.187 <sup>***</sup> (0.00866)
<i>N</i>	2077
<i>R</i> <sup>2</sup>	0.003
Standard errors in parentheses	
* $p < 0.05$ , ** $p < 0.01$ , *** $p < 0.001$	