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Women's Bargaining Power and Children's Schooling Outcomes: Evidence from Ghana

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Abstract

This study uses data from the Ghana Living Standards Survey to examine the link between women's bargaining power and children's schooling outcomes. We employ a principal component analysis to generate an index measuring women's bargaining power based on the couples' education gap and age gap when the child turned 6 years. We then use women's age at first marriage as an instrument to identify women's bargaining power. Our results show that women's bargaining power yields no significant association with late school enrolment. However, it has a negative and significant association with probability and intensity of grade repetition, especially for firstborn children. Girls tend to benefit more from the mother's bargaining power compared to boys. We further show that women's bargaining power is linked with school enrolment and attainment, which confirms previous findings in the literature. These findings are robust to several sensitivity analyses.

Keywords: *Women's bargaining power, late enrolment, grade repetition, intensity of grade repetition, Ghana.*

JEL classifications: *D13, I2*

1. Introduction

Women's empowerment and children's schooling are two of the United Nations' Sustainable Development Goals (SDGs) due to their economic importance (UN, 2015). This paper examines the link between these two goals via the influence of women's intra-household bargaining power on children's late enrolment and school progression in Ghana.

Schooling outcomes are important to policy-makers and many development organizations largely because of the close relationship between a region's human capital stock and its economic development. The spillover effects are also well documented (Christiaensen & Alderman, 2004; Thomas, Wang & Fan, 2001). The first few years of schooling are vital for children's human capital formation and cognitive progress; what children learn during these years lays a solid foundation for their development and is a strong predictor of the skills they accumulate in later years (Cunha & Heckman 2007; Currie, 2001). Delay in schooling, grade repetition and dropping out, constitute major setbacks to building human capital, as well as being an inefficient use of educational resources.

Yet, slow school progression remains a common problem worldwide, especially in the developing economies. UNESCO (2012) estimates suggest that globally, around 32.2 million primary school children repeat a grade. Grade repetition and late enrolment make pupils over-aged for their grade and such students are more likely to dropout (UNESCO, 2012). The number of grade repeaters in sub-Saharan Africa, for example, was 11.4 million in 2010, representing about 35 percent of primary school repeaters worldwide. Significant gender differences have also been observed. Not only do boys start primary school later, their chances of repeating a grade and dropping out are also higher than girls (UNESCO, 2012).

The premise of our paper and findings can inform policy-makers in developing countries that have suffered disproportionately the adverse consequences of grade repetition. Grade repetition not only retards economic growth, but also increases poverty and undermines public health, especially the wellbeing of the children

who repeat a school grade (UNESCO, 2012). For example, children who repeat a grade usually have low self-esteem, poor peer relationships, increased school alienation and a higher risk of dropping out of school (Anderson, Jimerson & Whipple, 2005; Corman, 2003; Hong & Raudenbush, 2005). Children's life chances, as well as development opportunities, are negatively affected, especially among poor households.¹ Similar to grade repetition, late enrolment has been identified as a major contributing factor to a high incidence of school dropouts (UNESCO, 2012), and higher repetition rates (Wils, 2004). It can also complicate teaching because teachers need to accommodate pupils with different levels of physical, psychological and cognitive maturity. Since students' learning needs at different ages are likely to vary, it is more challenging for teachers to effectively utilize teaching materials and supplies in delivering their responsibilities (Ezpeleta & Weiss, 1994; Schiefelbein & Wolff, 1993). On the other hand, there are studies reporting positive impacts of delayed school enrolment, such as higher test scores (Bedard & Dhuey, 2006; Elder & Lubotsky, 2009). Others found mixed results, with modest long-run effects on education or earnings, which may vary depending on social economic background of the individuals (Black, Devereux & Salvanes, 2011).

In addition to genetic factors and school attributes, family plays an important role in children's schooling outcomes. The extent of family influence depends on resource allocation within the household (Becker, 1965; Doss, 2013). School enrolment and progression are influenced by the amount of money spent on the child's development² as well as the amount of time that parents spend with the child on school-related activities such as helping with homework, offering motivation in educational activities, and attending to other non-financial academic needs. Tansel (1997) also argued that women may have a comparative advantage in assisting their children to learn. Studies to date that link women's bargaining power to children's schooling have focused on school enrolment and attainment (Gitter & Barham, 2008; Pickbourn,

¹ On the supply-side, Brophy (2006) argues that grade repetition creates inefficiency and wastage of social resources because each student's repetition economically affects the addition of new grade entrants. These problems include the need for larger class sizes, more teaching and support staff, and the demand for extra desks and supplies.

² For example, the amount of money spent on food, school supplies, sports activities, etc.

2016; Qian, 2008; Tansel, 1997; Handa, 1996). However, as argued by Doss (2013), measures of enrolment and attainment do not necessarily capture whether the child is successful at school. Better outcome measures such as the timing of enrolment and progression, which are major concerns at the primary school level, have not been examined. Also, in a country like Ghana, where primary education³ is free and compulsory, school enrolment and attainment may not reflect women's desire for their children's education.⁴ In this case, timing of enrolment better reflects parents' desire for education while grade progression unmasks how well they perform in school.

Conceptualizing 'women's bargaining power' as their ability to influence household decision-making, we probe into its impact on children's late enrolment, as well as the likelihood and extent of grade repetition at school. This study generates an index for women's bargaining power using their education and age when their child turns 6 years relative to their partner's. We then use women's age at first marriage or started living with a partner as an instrument to address the endogenous relationship between women's bargaining power and children's education after controlling for a set of confounding variables. Our findings show that women's bargaining power has no significant association with the likelihood of late school enrolment. However, women's bargaining power is significantly associated with a reduction in the likelihood of their children repeating a grade as well as the intensity of grade repetition, and such an association is more evident for firstborn children. Women's bargaining power also has a significantly larger influence on their daughter's school progression than their son's.

The rest of the paper is organized as follows. Section 2 presents a detailed discussion on our measurement of women's bargaining power and its link to schooling outcomes. Section 3 outlines the empirical strategy and discusses potential endogeneity issues. In Section 4, we describe the data source and the descriptive

³ In this study, primary education refers the first nine years of schooling, which is also known as basic education in Ghana.

⁴ Ghana, for example, exceeded the MGD's goal of universal primary education in 2013/14 by recording a 107.3 percent gross enrolment rate (UNESCO, 2015).

statistics, which is followed by a discussion of results and implications in Section 5. The final section concludes with some policy recommendations.

2. Women's bargaining power and children's schooling

Women's bargaining power could improve children's schooling outcomes through their ability to influence household decision-making. Women who possess more human capital have been found to have greater bargaining power (Getahun & Villanger, 2017; Prettnner & Strulik, 2017; Doss, 2013; Luke & Munshi 2011; Qian, 2008; McElroy, 1990), and empowered women can more effectively bargain regarding the allocation of household time and money. This is likely to translate into their children's on-time school enrolment. It can also mitigate the probability and intensity of grade repetition.

The underpinning theoretical link between women's bargaining power and children's schooling outcomes falls within the framework of the collective household model. Different from the unitary models, which treat the family as a single decision-making agent; collective models use a bargaining game to simulate household decisions (Quisumbing & Maluccio, 2000; Duflo, 2012). Instead of assuming that the family has a single pooled budget constraint and a single utility function that included the consumption and leisure time of every family member, collective models assume intra-household decision-making process involves multiple agents with distinctive preferences (Doss, 2013). The negotiation outcomes depend on each member's preference and endowment in the household (McElroy, 1990). Two types of collective models prevail. Under the cooperative bargaining model, bargained outcomes depend upon the threat point, and the income controlled by husband and wife will affect family behavior if this control influences the threat point (Lundberg & Pollak, 1996). Under the non-cooperative models, the family acts as though decisions were made in two stages, with total family income first divided between public goods and the private expenditures of each individual, and then each individual allocating his or her share among private goods (Chiappori, 1988, 1992).

As far as children's outcomes are concerned, Pickbourn (2016) draws the literature highlight of the role social norms take in shaping human behaviours and argues that these norms permit men to reserve a significant portion of their income for their personal use, while women are obliged to make up for the shortfalls of the household expenditure. As a result, women are more likely to spend their income to meet the household needs, where children's education is a significant component. This study adds to this strand of literature, highlighting the roles of the mother in influencing children's schooling outcomes. Due to the unobserved nature of the bargaining process, it is difficult to directly measure bargaining power. The study, thus, considers the amount of endowment women possess relative to men. Drawing on the argument of McElroy (1990), we proxy women's bargaining power using two factors: education, and age.⁵

Education has long been identified as an important source of women's bargaining power in the household, and their outside marriage options. One of the notable pathways through which education improves women's bargaining power is by exposing them to new ideas that improve their independence and also shelter them from prevailing traditional and cultural norms (Malhotra & Mather, 1997). It is also argued that a mother's education enhances effective use of time in improving her child's education (Leibowitz, 1974; Wolfe & Behrman, 1984). Women's power derived from education has also been shown to improve children's cognitive and health outcomes (Lavy, Lotti & Yan, 2016; Carneiro, Meghir & Parey, 2013; Barber & Gertler, 2009; Gitter & Barham, 2008; Afoakwa et al., 2018; Thomas & Mundial, 1991).⁶ Leibowitz (1974) suggests that a mother's education is a representation of both genetic attributes and home investments. This is explained by the fact that mothers usually devote more time to the child than the fathers do. A mother's education reflects a composition of several factors such as taste for education, efficient household production, opportunity cost of her time in the labour market, parental role modelling, genetic

⁵ We do not include women's relative earnings because our dataset does not include information on the couple's earnings when the child turned 6 years, hence, women's current earnings may not reflect their earnings position when the child turned 6.

⁶ In Ghana, educated women are found to have higher bargaining power within their marriage and more autonomy over contraceptive use (Crissman, Adanu & Harlow, 2012).

endowment of abilities, and motivation (Tansel, 1997). Along with that, educated women are also better at surviving outside the marriage. They are not necessarily limited to the local labour market and can migrate to different labour markets to seek employment in order to improve their children's education. In terms of finances, evidence from the sociology literature suggests that women with better education and employment prospects have more power regarding household financial decisions (Malhotra & Mather, 1997).

Our second measure for women's bargaining is age. While the evidence for this variable is empirically rare, bargaining power through spousal-age ratio may produce either a positive or a negative effect on household outcomes. As McElroy (1990) argues, spousal age measures how well each family member can do in the marriage or remarriage market. Thus, younger wives could have more bargaining power during negotiations. On the other hand, age might also capture the life experience each couple brings to the marriage. Older wives may therefore wield greater influence on decision-making, which could lead to positive outcomes for their children (Chari et al., 2017). However, because the outcome we are interested in this study is children's schooling and we hypothesize that older women would have more say about their children's schooling, we therefore use the woman's relative age when the child was 6 years old.

We first measure women's relative power as education and age gap between the couple when the child turned 6 (mother's years of schooling minus fathers' years of schooling and, mother's age minus father's age). We then employ a composite index for women's bargaining power, which is computed using principal component analysis (PCA) based on the education and age gap. With this approach, we are able to tease out the different sources from which a woman might derive her household power. These measures for women's bargaining power have been used in previous studies (see Gitter & Barham 2008; Gibson, Le & Scobie, 2006; Lundberg and Ward-Batts, 2000). We use the factor loadings of the first extracted components to weigh the index. Appendix A describes the index for women's bargaining power. The main weakness of the principal component analysis is that it is not appropriate to interpret the index as a unit change, therefore, we interpret our findings as a standard deviation increase in the women's bargaining power as have been done in previous studies (see Gibson, Le & Scobie, 2006).

3. Empirical strategy

3.1 The model

In our model, a child's schooling outcome is determined by his/her mother's bargaining power in the marriage, the child's personal attributes, school characteristics, and other household confounding factors. Our main argument is that the degree of bargaining power the mother has in household resource allocation could yield positive outcomes for the child's schooling. Our study focuses on three main outcomes: late enrolment, grade repetition, and intensity of grade repetition. Late enrolment is defined as a child beginning school at the age of 7 or later, as the required school-going age in Ghana is 6.⁷ We later do robustness checks by redefining late enrolment as enrolment after age 7 or after age 8. Grade repetition is considered in two ways: firstly, whether the child has repeated a grade at least once during primary school; and secondly, how many times the child has repeated. The first variable is computed by comparing the child's actual grade with his/her expected grade. Children whose actual completed grade is lower than their expected grade are considered to have repeated at least one grade. Expected grade is calculated as the current age minus the age at which a child started primary school.⁸ The corresponding econometric model is specified as follows:

$$Sch_outcome_i = \Delta_i + wbargain_i\phi + Grandparent_edu'_i\vartheta + chi'_i\rho + hh'_i\alpha + Reg_i\sigma + \mu_i \quad (1)$$

Sch_outcome, schooling outcomes, captures *LE*, *Rep* and *Num_Rep*. *LE*, is a dummy for whether the child enrolled late; that is after age 6. *Rep* is a dummy for whether the child has repeated a grade while *Num_Rep* measures the number of times the child has repeated a grade. *wbargain* represents women's bargaining power. *Grandparent_edu* measures the child's grandparents' level of education. *chi* is a vector of variables for child attributes, *sch* controls for school attributes such as school type and expenditure on books and supplies while *hh* captures household level variables such as

⁷ Ghana's *primary education* begins at age six and is divided into primary school (six years) and junior high school (three years). This level of education is a continuous process where students complete primary school at age 12 and continue directly to junior high unless the student has repeated a grade. In other words, without grade repetition, a 15-year old child should have nine years of schooling.

⁸ We compute late enrolment and grade repetition as such because the Ghana Living Standard Survey does not include an explicit question on whether the child enrolled late or has repeated a grade.

household crowding, distance to fetch water, total household consumption (food and non-food) expenditure, number of children in the household, rural dwelling⁹ and ownership of a computer.¹⁰ *Reg* represents regional dummies for the ten regions in Ghana. We further decompose our analysis into gender-specific analysis because a woman may have differing preferences for her boy or girl child's schooling. This might be due to the prevailing socio-cultural norms and the perceived differences in returns to gender in the labour market (Attanasio, Meghir & Salvati, 2017). In equation (1) our main hypothesis is that women's bargaining power is negatively associated with children's late school enrolment and grade repetition ($\phi < 0$).

3.2. Potential endogeneity

We suspect possible endogeneity between women's bargaining power and children's schooling outcomes. For example, a woman who is highly educated is more likely to marry a highly educated man (as shown in Appendix B¹¹), and the couple may, therefore, have more interest in their children's education. If this holds, women's bargaining index will be correlated with the error term in equation (1). Our identification strategy utilizes an instrumental variable technique (IV) which is used to confirm the reliability of our estimates. We use the woman's age at first marriage or started living with a partner as an instrument. Our argument is that early marriage impedes female human capital accumulation through poor or low school attainment, and future earnings. Chari et al. (2017) find that, in India, early marriage affects the woman's school attainments and her marriage market outcomes. It is also estimated that a woman's years of schooling increase by 0.22 due to a one-year delay in marriage, and such a delay also has a positive effect on her decision-making and mobility during marriage (Field & Ambrus, 2008). This subsequently affects the woman's bargaining power, preferences, and knowledge during marriage (Glewwe, 1999; Christiaensen & Alderman, 2004; Banerji et al., 2013). Evidence from the Ghana Statistical Service (2014) report suggests that females marry about four years earlier than males.

⁹ Appendix C shows that late enrolment and grade repetition are highest among rural dwellers.

¹⁰ Detailed explanations of all the variables are presented in Table 1.

¹¹ Appendix B compares women's years of schooling to that of the man.

For our instrument to satisfy the exclusion restriction criteria, we perform the following: first, women from poor homes are more likely to marry early and to poor men which may affect their earnings, thereby adversely affect children schooling. We therefore control for the total annual expenditure of the household in our model. By this approach, we are able to isolate any plausible mechanism that directly links early marriage to children’s education. Second, women from poor backgrounds with lower perceived marginal benefit for education are likely to marry early to men of similar background, which may affect their children’s education. To mitigate this in our model, we control for the woman’s parents’ level of education as well as the man’s parents’ level of education. Third, to minimize any potential bias that links late marriage to lower fertility, and thereby affecting children’s schooling outcomes, we also control for the total number of children in the household as well as the birth order of the child. For robustness check, we later include additional set of control variables to isolate any indirect channels through which women’s age at first marriage could affect children’s education (discussed in Section 5.4). By doing so, we argue that the channel that links women’s age at first marriage to children’s education is only through her intra-household bargaining power as shown by Chari et al. (2017). We, therefore, utilize this instrument to identify women’s bargaining power in the household. The corresponding first-stage regression is stated as:

$$wbargain_i = \nabla_i + Age_atfirstmarriage_i \varphi + Grandparent_edu_i' \beta + chi_i' \delta + sch_i' \gamma + hh_i' \zeta + Reg_i \epsilon + \mu_i \quad (2)$$

Where *Age_atfirstmarriage* is woman’s age at first marriage or living with a partner. As a key identification condition to obtain consistent results, all control variables in equation 1 are included in the first stage regression (Wooldridge, 2002). In equation (1), we assume the error term to be normally distributed and therefore employ the Linear Probability Model (LPM) for late enrolment and grade repetition, while the Ordinary Least Squared (OLS) is used for intensity of grade repetition. We use a linear probability model for ease of interpretation since the estimated parameters can be conveniently interpreted as marginal effects. LPMs also increase computation speed substantially while producing consistent results

compared with non-linear alternatives (Caudill, 1988). More specifically, the Two-Stage Least Squares (2SLS) method is our main estimation technique.

4. Data and descriptive statistics

Our data is sourced from the sixth round of the Ghana Living Standards Surveys (GLSS-6). The GLSSs are comprehensive datasets in Ghana collected by the Ghana Statistical Service (GSS) and supported by the World Bank. The dataset is a household survey collected in line with the World Bank's Living Standards Measurement Surveys (LSMS). With the objective of providing information on living conditions in the country, the GLSS has been available since 1988 (GSS, 2014). The study is based on the sixth round of the Ghana Living Standards Survey (GLSS 6), which was collected in 2012/2013. We limit the study to only 2012/13 because the previous rounds have not captured information on the age an individual began primary schooling. The GLSS-6 surveyed 16,772 households over the period October 2012 to October 2013. Due to our sample cohort and missing information on some covariates used for the regression analysis, the sample size is 6,316 children aged 7-15 years in a total of 3,842 households¹², but varies slightly by specifications. We focus on children of this age cohort because primary education begins at age 6 and ends at age 15. This analysis is based on children who are currently in school but enrolled late or repeated a grade. However, for robustness check, we later include children aged 6 years and do a cohort analysis for younger children.

Table 1 presents descriptive statistics and definition of the variables used in this study. The descriptive statistics show that our sample consists of 53% boys. 57.4% of children have repeated a grade at least once throughout their primary school level¹³, with 47.2% enrolling late at school. Appendix C shows that more than 70% of children who enrol late or repeat a grade live in rural areas. The breakdown of grade repetitions

¹² We focus on households where the mother and father are both available.

¹³ These are children whose actual completed years of schooling are less than their expected completed years of schooling, hence progressing slowly in school. It is likely to be upward biased because it includes any repetition that may occur throughout the nine years of children's primary education and not in a given year as estimated by other studies. Also, this figure represents slow progression because it includes children who might have dropped out and come back to school due to some reasons or may have been held back due to switching from one school to the other. The study is, however, unable to separate the two because it cannot identify those who stopped schooling but have returned to school or changed schools.

in Appendix D also shows that the highest repetition occurs during the first four years after enrolment between the ages of 7-10 years, which suggests that such slow progression in primary school may not be due to poor class performance. This figure echoes the significant increase in the number of grade repeaters in sub-Saharan Africa over the past decade (UNESCO, 2012). With a very low standard deviation, on average, students in our sample repeat two grades before completing primary education. 97.5% of the children are firstborns¹⁴, and the average number of years for a father's schooling is 7. As shown in Appendices B and E, only 6.01% of women are older, and 10.1% are more educated than their husbands. The average age of a female's first marriage is 20, and a household has an average of 4 children.

In addition to father's education and age, we include a range of household variables such as distance to the nearest water source, household structure, contemporaneous household total expenditure, and availability of a computer at home. About 73% of students are in public school, while 0.7% have at least one form of disability. With regards to fetching water, we notice that household members on average travel as far as 2,341 meters to fetch water for household use. In terms of household crowding, on average, one room is shared by 3 members. A total of 66% of these children live in rural areas.

¹⁴ Birth order is computed based on children who are aged 7-15 years in the household, that is, the oldest child in primary school.

Table 1: Summary statistic of variables used in the regression analysis

Variable	Definition	Mean	SD
Late enrolment (1/0)	Dummy for whether the child started basic school after age 6 (1/0)	0.472	0.499
Repeated a grade (1/0)	Dummy for whether the child has repeated at least once at basic school	0.574	0.494
Number of grade repetitions	Number of times the child has repeated at basic school	1.938	1.282
PCA index	Principal component analysis using women's age and education relative to men	-0.030	1.011
Age at first marriage	Age the mother married or lived with a man for the first time	20.232	3.579
Father's education	Years of schooling of the father	6.780	4.730
Father's age	Age of the father when the child was 6 years	42.79	11.09
Grandmother's education (mother)	Years of schooling of the woman's mother	1.241	3.099
Grandfather's education (mother)	Years of schooling of the woman's father	2.537	4.388
Grandmother's education (father)	Years of schooling of the man's mother	1.542	3.431
Grandfather's education (father)	Years of schooling of the man's father	2.835	4.597
Boy	Boy child (1/0)	0.526	0.499
Children	Total number of children in the household	4.352	2.555
Disability	Dummy for whether the child has any form of disability (1/0)	0.007	0.081
Birth order	Dummy for whether the child is the first born of all children of in the household (1/0)	0.975	0.157
Public school	Dummy for whether the child is attending public school (1/0)	0.749	0.433
Child age	Age of the child (in years)	10.859	2.566
Ln(1+distance)	Log of distance to fetch water for general use in the household (in meters)	4.351	2.239
Ln (household expenditure)	Log of annual household expenditure	8.944	0.717
Household crowding (hhsizerooms)	Household size/number of rooms in the house	3.183	1.731
Rural (1/0)	Dummy for rural dwelling (1/0)	0.659	0.474
Personal computer (1/0)	Whether the household has access to a computer (1/0)	0.867	0.339

Source: Authors' own computation from GLSS 6.

5. Results and discussion

5.1 Benchmark findings

We first estimated OLS models, which were followed by 2SLS estimations to address the possible endogeneity issue discussed earlier. Both OLS and 2SLS estimates are reported for comparison and are presented in Tables 2-4. We have also included the first-stage regression coefficient of our instrumental variable at the bottom section of the tables, alongside with the Kleibergen-Paap statistics. As hypothesized earlier, age at first marriage significantly increases women's bargaining power. In all specifications, a one-year delay in the woman's age at first marriage increases her intra-household bargaining power at an average of 0.050 standard deviation. The Kleibergen-Paap statistics are all larger than ten, which indicates that we have a strong instrument in all specifications. Consequently, the endogeneity-corrected coefficients are our preferred estimates for the discussion below.¹⁵

We start with the 2SLS estimates for a base line model as reported in Appendices F-H, and show that women's bargaining power is negatively associated with late enrolment, grade repetition and intensity of grade repetition. The figures plot the predicted late enrolment and grade repetition against women's bargaining power without any control variables. The fitted values, represented by the pink line, show the extent of the women's bargaining power on schooling outcomes.

Next, we focus on the main endogeneity-corrected results from equation (1). Table 2 shows that women's bargaining power has no significant association with children's late enrolment in school. However, it reduces the probability of grade repetition and the intensity of grade repetition. In the full sample, we find that a one standard deviation increase in women's bargaining power is associated with 8.7 percentage points reduction in the probability of grade repetition. Among the children who have repeated a grade, a one standard deviation increase in the woman's bargaining power reduces the number of repetitions by 0.385. These findings indicate that women who have higher bargaining power in intra-household decision-making are more likely to make decisions that will reduce the chances of their children repeating a grade. Moreover,

¹⁵ A summary of the main findings is presented in Table 9.

for those children who repeat a grade, the chances of further repetition are reduced. These findings can be explained by the evidence in Pickbourn (2016) which suggest that in Ghana, spending on children’s education from females who are primary recipient of remittances is more than twice of that from males who are primary recipient of remittances, and the results hold irrespective of the gender of the household head. Also, while fathers play a peripheral role in the lives of their offspring in Ghana, mothers engage in the upbringing of children, and produce and distribute food in the household (Oppong & Bleek 1982; Nsamenang, 1987). Therefore, the bargaining power of the woman in intra-household decision-making has the potential to improve the children’s schooling outcomes.

Table 2: Estimates for women’s bargaining power and children’s schooling outcomes (Full sample)

Explanatory variables	Late enrolment		Grade repetition		Intensity of grade repetition	
	OLS	2SLS	OLS	2SLS	OLS	2SLS
Bargaining index	-0.022*** (0.008)	0.045 (0.034)	-0.014* (0.008)	-0.087** (0.036)	-0.069*** (0.022)	-0.385*** (0.108)
Mean of dependent variable	0.472	0.472	0.574	0.574	1.82	1.82
<i>Instrument for bargaining</i>						
Age at first marriage or started living with partner		0.052*** (0.003)		0.052*** (0.003)		0.049*** (0.004)
Kleibergen-Paap rk statistic		304.61		285.47		140.84
N	6316	6316	6316	6316	3,564	3,564

Note: All specifications include control variables for gender of the child, father’s education and age, grandmother’s education (mother), grandfather’s education (mother), grandmother’s education (father), grandfather’s education (father), birth order of the child, child’s age, whether the child has any form of disability, type of school, number of children in the household, household crowding, travel distance to fetch water, household expenditure, rural dwelling, access to computer in the household and regional dummies. Robust standard errors are in parenthesis *** p<0.01, ** p<0.05, * p<0.1.

5.2 Gender differences in the link between women’s bargaining power and schooling outcomes

Next, we scrutinize the link between women’s bargaining power and boys and girls schooling separately, in order to examine whether the impact varies with the gender of the child. Table 3 presents these results. Consistent with the finding from the full sample, women’s bargaining power has no significant association with late enrolment on either their sons or daughters. However, with regards to grade repetition, we find that women’s bargaining power significantly reduces girls’ grade repetition. A one standard deviation increase in women’s bargaining power reduces the probability of repeating a grade by 13.6 percentage points. Although negative, this association is statistically insignificant for boys. Finally, Table 4 shows the gender impact of women’s bargaining power on the intensity of grade repetition. In both samples, women’s

bargaining power is statistically significant. Among boys who have repeated a grade, their mother's bargaining power reduces the number of times they repeat by 0.284. The corresponding reduction in girls' repetition is about twice as large as boy's (0.477 times). Overall, the link between women's bargaining power and grade repetition is stronger for girls than boys. This finding confirms earlier studies that found stronger impact of women's bargaining power on their female offspring's outcomes (Qian, 2008; Duflo, 2003; Hawison & Gaillard 1999). While it does not suggest that women discriminate in their children's education, it echoes the findings by Duflo (2003), who reported that pensions received by women had a large impact on the nutrition of girls but little effect on that of boys. Another interpretation is that the same resources are spent differently depending on whether they are received by a woman or by a man, and women are more likely to allocate resources to support girl's education.

Table 3: Gender analysis of women's bargaining power and late school enrolment and grade repetition (Restricted sample)

	Late enrolment				Grade repetition			
	Boys		Girls		Boys		Girls	
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
Bargaining index	-0.017 (0.011)	0.044 (0.050)	-0.028** (0.011)	0.041 (0.047)	-0.011 (0.011)	-0.038 (0.052)	-0.018 (0.012)	0.136** (0.050)
Mean of dependent variable	0.490	0.490	0.466	0.466	0.590	0.590	0.521	0.521
<i>Instrument for bargaining</i>								
Age at first marriage or started living with partner		0.049* ** (0.004)		0.057*** (0.006)		0.049** * (0.004)		0.054** * (0.004)
Kleibergen-Paap rk statistic		146.85		154.99		137.86		143.96
N	3368	3368	2948	2948	3368	3368	2948	2948

Note: All specifications include control variables for father's education and age, grandmother's education (mother), grandfather's education (mother), grandmother's education (father), grandfather's education (father), birth order of the child, child's age, whether the child has any form of disability, type of school, number of children in the household, household crowding, travel distance to fetch water, household expenditure, rural dwelling, access to computer in the household and regional dummies. Robust standard errors are in parenthesis *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Gender analysis of women's bargaining power and intensity of grade repetition (Restricted sample)

	Intensity of grade repetition			
	Boys		Girls	
	OLS	2SLS	OLS	2SLS
Bargaining index	-0.066** (0.030)	-0.284* (0.158)	-0.072** (0.032)	-0.477*** (0.148)
Mean of dependent variable	1.84	1.84	1.80	1.80
<i>Instrument for bargaining</i>				
Age at first marriage or started living with partner		0.047*** (0.006)		0.051*** (0.006)
Kleibergen-Paap rk Wald F statistic		71.61		65.80
N	1,943	1,943	1,621	1,621

Note: All specifications include control variables for father's education and age, grandmother's education (mother), grandfather's education (mother), grandmother's education (father), grandfather's education (father), birth order of the child, child's age, whether the child has any form of disability, type of school, number of children in the household, household crowding, travel distance to fetch water, household expenditure, rural dwelling, access to computer in the household and regional dummies. Robust standard errors are in parenthesis *** p<0.01, ** p<0.05, * p<0.1.

5.3 Birth order analysis

We now examine whether women have differences in caring for their children's education depending on the child's birth order. The analysis focuses on the rank of children in the household. Table 5 shows that women's bargaining power has no significant association with late enrolment irrespective of the birth order of the child. However, we find that the women's bargaining significantly reduces the probability and number of grade repetition for all first-born children. No significant association is found for the subsequent children.¹⁶ This suggests that women pay special attention to their first-born child's education.

Table 5: Birth order analysis of women's bargaining power and children's schooling outcomes (Restricted sample)

	Late enrolled		Grade repetition		Intensity of grade repetition	
	1 st born	2 nd ≤	1 st born	2 nd ≤	1 st born	2 nd ≤
	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
Bargaining index	0.045 (0.033)	0.078 (0.339)	-0.085** (0.036)	0.106 (0.271)	-0.374*** (0.108)	-1.207 (1.994)
Mean of dependent variable	0.494	0.459	0.562	0.598	1.82	1.71
<i>Instrument for bargaining</i>						
Age at first marriage or started living with partner	0.053*** (0.003)	0.031 (0.022)	0.053*** (0.003)	0.027 (0.024)	0.054*** (0.005)	0.027 (0.059)
Kleibergen-Paap rk Wald F statistic	309.91	1.83	292.37	1.33	146.23	0.481
N	6054	262	5926	390	3472	92

¹⁶ This partly could be due to the small sample of subsequent children as 93.8% of children in the sample are firstborns. We also used an interaction between birth order and women's bargaining power, and the results were qualitatively similar to those presented in Table 5.

Note: All specifications include control variables for gender of the child, father's education and age, grandmother's education (mother), grandfather's education (mother), grandmother's education (father), grandfather's education (father), child's age, whether the child has any form of disability, type of school, number of children in the household, household crowding, travel distance to fetch water, household expenditure, rural dwelling, access to computer in the household and regional dummies. Robust standard errors are in parenthesis *** p<0.01, ** p<0.05, * p<0.1.

5.4 Robustness checks

In this sub-section, we test the robustness of our results in several aspects. First, it is possible that a child may turn 6 after schools have officially started. For example, in Ghana, the first term primary school starts early September, hence, children who turn 6 after September will miss the enrolment date. We therefore redefine late enrolment as enrolment after age of 7. We further redefine late enrolment as enrolling after age 8 but still do not find any significant association. The results in Table 6 shows no significant association between women's bargaining power and late enrolment irrespective of how we define late enrolment.

Second, we consider a more contemporaneous measure of late enrolment. The survey questionnaire includes questions on whether household members 3 years or older has ever attended school. We therefore use this variable as a measure for late enrolment for children aged 6 to 9 years. Children who have never attended school are considered as late enrolled. As shown in Table 6, no significant association between women's bargaining power and the probability of late enrolment, although the association is negative.

Table 6: Redefining late enrolment

	Enrolled after age 7 (7-15 years)	Enrolled after age 8 (7-15 years)	Child 6-9 years ever attended school
	2SLS	2SLS	2SLS
Bargaining index	0.054 (0.034)	0.010 (0.025)	0.015 (0.013)
Mean of dependent variable	0.324	0.163	0.096
<i>Instrument for bargaining</i>			
Age at first marriage or started living with partner	0.052*** (0.003)	0.052*** (0.003)	0.053*** (0.004)
Kleibergen-Paap rk Wald F statistic	304.61	304.61	141.42
N	6,316	6,316	2,702

Note: All specifications include control variables for gender of the child, father's education and age, grandmother's education (mother), grandfather's education (mother), grandmother's education (father), grandfather's education (father), birth order of the child, child's age, whether the child has any form of disability, type of school, number of children in the household, household crowding, travel distance to fetch water, household expenditure, rural dwelling, access to computer in the household and regional dummies. Robust standard errors are in parenthesis *** p<0.01, ** p<0.05, * p<0.1.

Third, our measure for grade repetition could be biased because the number of grade repetition is likely to increase with age. For example, a child aged 15 years may have repeated about 9 times while a child aged 7 years can only repeat once.¹⁷ To explore this possible bias, we re-estimate grade repetition and intensity of grade repetition using a sample of children aged 16 to 18 years who may be out of primary school. This approach would give a complete history of their repetition. The results are reported in Table 7. They show that women’s bargaining reduces the probability of grade repetition by 14.2 percentage points as well as the number of times they repeat by 0.433. These findings are consistent with our main results when we use children of primary school age, and suggest that our main finding is a lower bound of the link between women’s bargaining power and grade repetition.

Table 7: Using different sample for grade repetition (16-18)

	Grade repetition	Intensity of grade repetition
	2SLS	2SLS
Bargaining index	-0.142** (0.064)	-0.433* (0.233)
Mean of dependent variable	0.741	2.448
<i>Instrument for bargaining</i>		
Age at first marriage or started living with partner	0.042*** (0.005)	0.043*** (0.006)
Kleibergen-Paap rk Wald F statistic	72.54	44.61
N	2218	1643

Note: All specifications include control variables for gender of the child, father’s education and age, grandmother’s education (mother), grandfather’s education (mother), grandmother’s education (father), grandfather’s education (father), birth order of the child, child’s age, whether the child has any form of disability, type of school, number of children in the household, household crowding, travel distance to fetch water, household expenditure, rural dwelling, access to computer in the household and regional dummies. Robust standard errors are in parenthesis *** p<0.01, ** p<0.05, * p<0.1.

Fourth, we replicate previous findings in the literature which show that women’s bargaining power increases children’s school enrolment and years of schooling (see Gitter and Barham 2008; Qian 2008). Here, we focus on all children aged 6-15 years old. The results in Table 8 show that women’s bargaining power increases the probability of children enrolling in school as well as the years of school attainment. A one standard deviation increase in women’s bargaining power increases the probability of enrolment by 2.1

¹⁷ A seven years old child is expected to have one year of completed schooling given that he/she started schooling at age 6, which is the official age of primary school enrolment.

percentage points. Similarly, women’s bargaining power increases the child’s grade attainment by 0.182 years. No significant association is found for the probability of school dropout. While these findings corroborate previous findings of school enrolment and attainment, it also means the woman’s intra-household bargaining power has no significant association with the time the child starts school (as shown in Table 6).

Table 8: Additional results for women’s bargaining power and enrolment, attainment and dropout

	Enrolled (6-15 year)	Highest grade completed (6-15)	Drop out (6-15)
	2SLS	2SLS	2SLS
Bargaining index	0.017* (0.010)	0.201** (0.089)	0.001 (0.004)
Father and child attribute	Yes	Yes	Yes
Grandparents education	Yes	Yes	Yes
Household characteristics	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes
Mean of dependent variable	0.977	3.01	0.005
<i>Instrument for bargaining</i>			
	0.056***	0.054***	0.054***
Age at first marriage or started living with partner	(0.003)	(0.003)	(0.005)
Kleibergen-Paap rk Wald F statistic	375.76	375.76	321.80
N	7441	7441	7270

Note: All specifications include control variables for gender of the child, father’s education and age, grandmother’s education (mother), grandfather’s education (mother), grandmother’s education (father), grandfather’s education (father), birth order of the child, child’s age, whether the child has any form of disability, type of school, number of children in the household, household crowding, travel distance to fetch water, household expenditure, rural dwelling, access to computer in the household and regional dummies. Robust standard errors are in parenthesis *** p<0.01, ** p<0.05, * p<0.1.

Finally, we test for the robustness of our results by including additional set of control variables to see whether our model suffers from misspecification. We include variables such as the woman’s ethnicity, the man’s ethnicity, the woman’s religion, the man’s religion as well as district dummies. The results in Table 9 show that our findings are robust to inclusion of additional control variables. Women’s bargaining power consistently do not have any significant association with late enrolment but significantly reduces the probability and intensity of grade repetition. This shows that our findings are not sensitive to inclusion of additional control variables.

Table 9: Including addition control variables

	Late enrolment	Grade repetition	Intensity of grade repetition
	2SLS	2SLS	2SLS
Bargaining index	0.059 (0.038)	-0.091** (0.037)	-0.442*** (0.112)
Mean of dependent variable	0.472	0.574	1.82
<i>Instrument for bargaining</i>			
Age at first marriage or started living with partner	0.050*** (0.003)	0.050*** (0.003)	0.049*** (0.004)
Kleibergen-Paap rk Wald F statistic	280.27	265.54	138.87
N	6,316	6,316	3,564

Note: All specifications include control variables for gender of the child, father's education and age, mother's ethnicity, mother's religion, father's ethnicity, father's religion, grandmother's education (mother), grandfather's education (mother), grandmother's education (father), grandfather's education (father), birth order of the child, child's age, whether the child has any form of disability, type of school, number of children in the household, household crowding, travel distance to fetch water, household expenditure, rural dwelling, access to computer in the household and regional dummies. Robust standard errors are in parenthesis *** p<0.01, ** p<0.05, * p<0.1.

Table 10: Summary of results from 2SLS regressions

	Late enrolment	Grade repetition	Intensity of grade repetition
<i>Unrestricted sample</i>			
Women's bargaining power	0.045~	-0.087**	-0.385***
<i>Boys sample</i>			
Women's bargaining power	0.044~	-0.038~	-0.284*
<i>Girls sample</i>			
Women's bargaining power	0.041~	-0.136***	-0.477***
<i>Firstborn children</i>			
Women's bargaining power	0.045~	-0.085***	-0.374***
<i>Second and subsequent children</i>			
Women's bargaining power	0.078~	0.106~	-1.207~

Note: *** (significant at 1%), ** (significant at 5%), * (significant at 10%), ~ (insignificant),

6. Conclusion

Slow progression at school is detrimental to development of the human capital needed by a country. Contributing to the literature on intra-household allocation, we have explored the impact of women's bargaining power on children's schooling outcomes, with special focus on late enrolment and grade repetition. While previous studies have found a positive impact of women's bargaining power on outcomes such as school enrolment, expenditure and attainment (Pickbourn, 2016; Gitter & Barham 2008; Qian, 2008), to the best of our knowledge, ours is the first to examine specific outcomes such as late enrolment

and grade repetition. Compared to school enrolment, we believe that the timing of enrolment better reflects the women's desire for children's education, especially when education is free, while grade repetition demonstrates how well children perform in school. The results confirm previous findings that children's outcomes are improved when women have more power in the household. More importantly, our findings show that women's bargaining power has not significant association with the chances of a child enrolling late in school, but it lowers the probability that the child repeats a grade. For children who repeat a grade, women's bargaining power also mitigates the incidence of another repetition. We also find that women's bargaining power benefits their daughter's school progression more than the son's, which confirms previous findings on the gender effect of women's bargaining power (Duflo, 2003; Qian, 2008). We do not find any significant association between women's bargaining power and late enrolment. One plausible reason is that parents may have the perception that the child is not ready for school, although he/she has turned 6 years. This is because parents often associate children's age with certain tasks, which defines the child's capabilities (Fentiman, Hall & Bundy, 1999). Finally, our robustness analyses confirm previous finding that women's bargaining power increases children's school enrolment and attainment. From a policy perspective, our findings suggest that it is not enough to increase women's absolute levels of education, but it is also important to achieve gender equality. Such empowerment does not only benefit women and the nation by improving their human capital, but also advantage the next generation by improving their offspring's learning outcomes.

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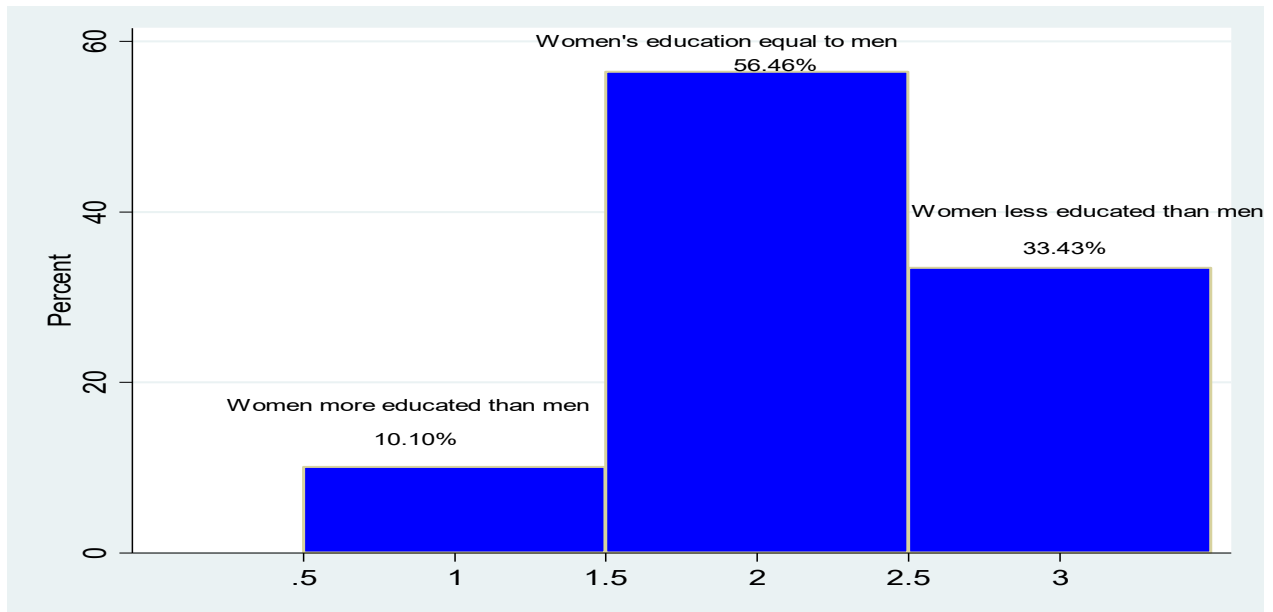
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Appendices

Appendix A: Description of the principal component analysis as the measure for women's bargaining power

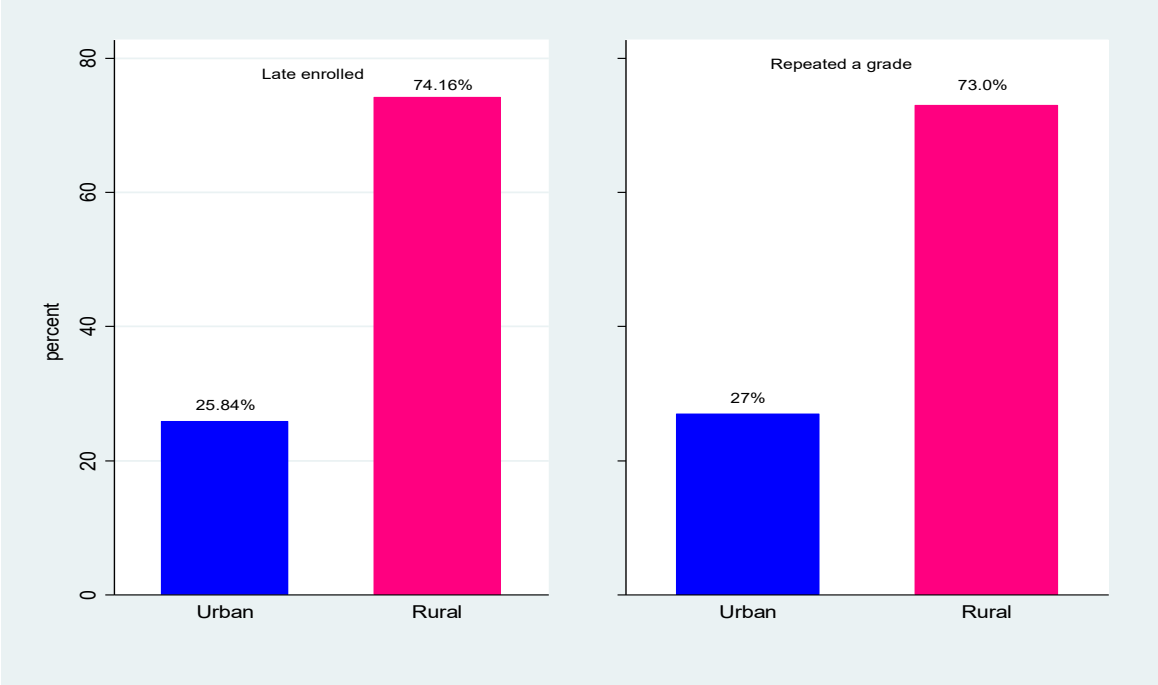
Variables for PCA	Eigenvalue	Difference	Proportion	Cumulative
Component 1	1.018	0.036	0.598	0.598
Component 2	0.982		0.402	1.00
Kaiser-Meyer-Olkin measure of sampling adequacy =0.658				
Woman's age minus man's age when the child was 6 years old	Mean (-4.808)	SD (3.919)		
Woman's years of schooling minus man's years of schooling	Mean (-1.719)	SD (4.108)		

Appendix B: Histogram of women's education relative to men



Source: Authors' own computation from GLSS, 6 dataset

Appendix C: Distribution of late enrolment and grade repetition among rural and urban children



Source: Authors' own computation from GLSS, 6 datasets

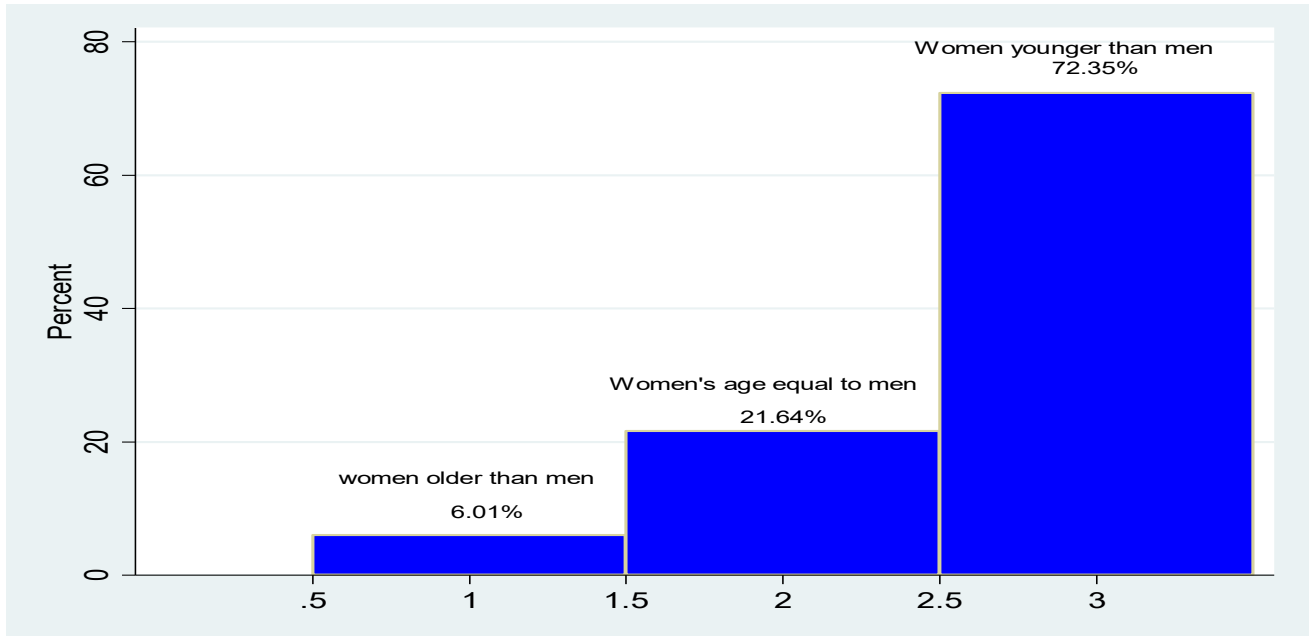
Appendix D: Distribution of grade repetition across age

Age in years	Grade repetition (Actual completed years of schooling less than expected completed years of schooling)		
	Yes (%)	No (%)	Total (%)
7	28.66	71.34	100
	3.12	11.58	6.52
8	41.47	58.53	100
	7.02	14.76	10.13
9	53.63	46.37	100
	10.05	12.94	11.21
10	55.25	44.75	100
	12.12	14.62	13.12
11	59.23	40.77	100
	10.78	11.05	10.89
12	66.99	33.01	100
	16.44	12.07	14.68
13	70.36	29.64	100
	14.77	9.27	12.56
14	72.19	27.81	100
	12.99	7.45	10.76
15	75.14	24.86	100
	12.71	6.26	10.12
Total	57.4	42.6	100
	100	100	100

Pearson chi-square = 492.093***

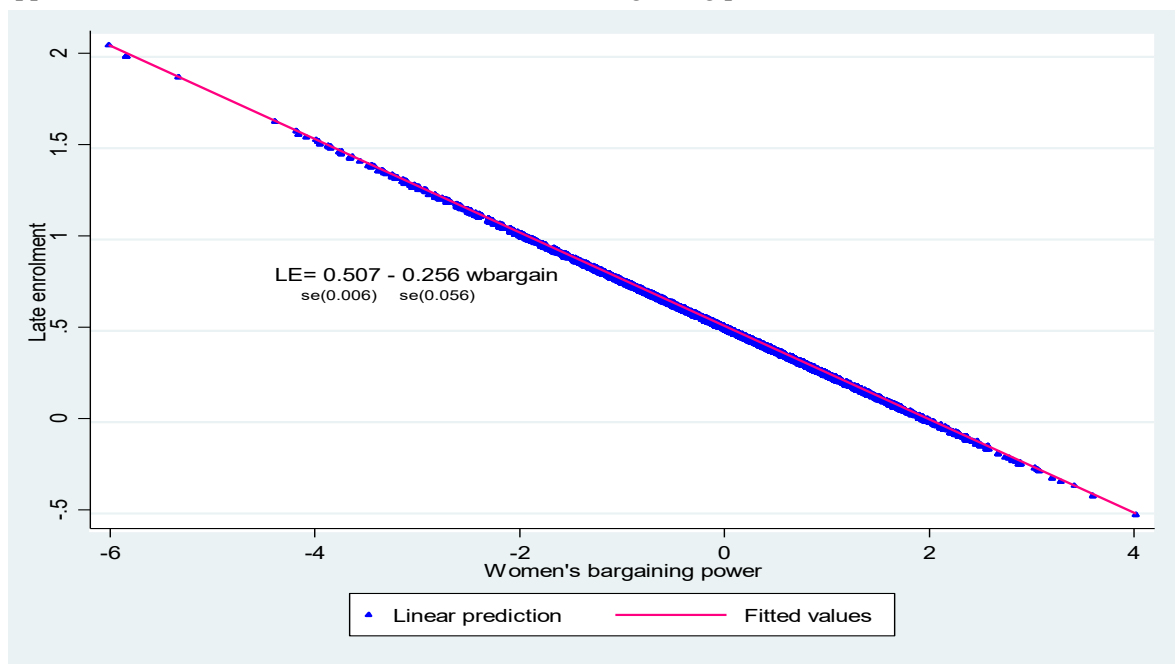
Source: Authors' own computation from GLSS, 6 datasets

Appendix E: Histogram of women's age relative to men when the child was 6 years old



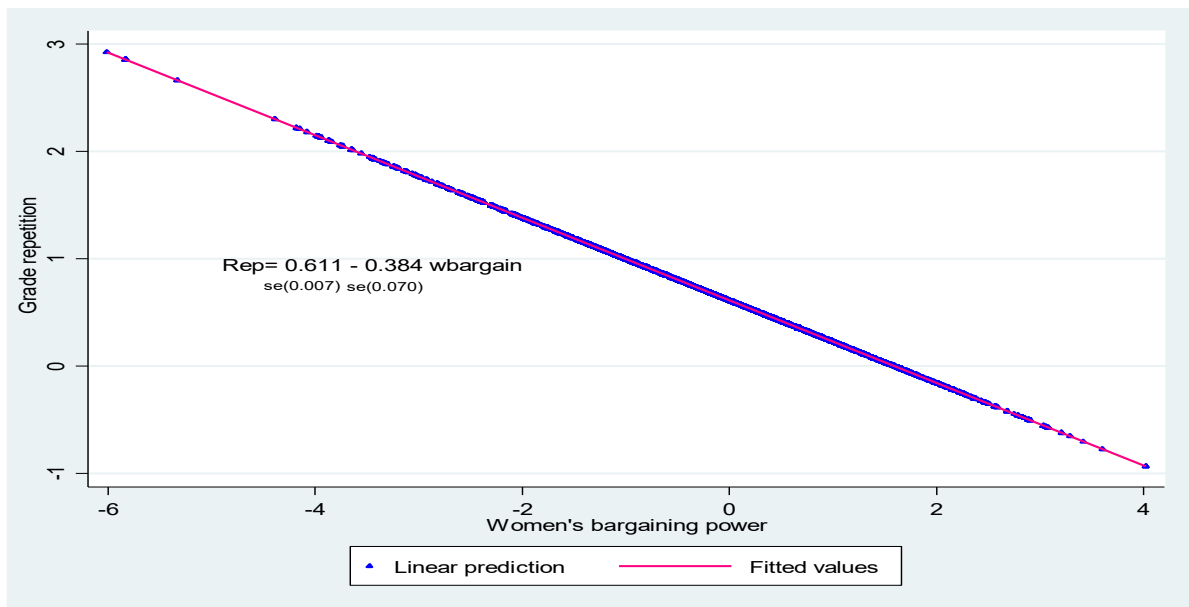
Source: Authors' own computation from GLSS, 6 datasets

Appendix F: Baseline 2SLS estimate for women's bargaining power and children's late enrollment



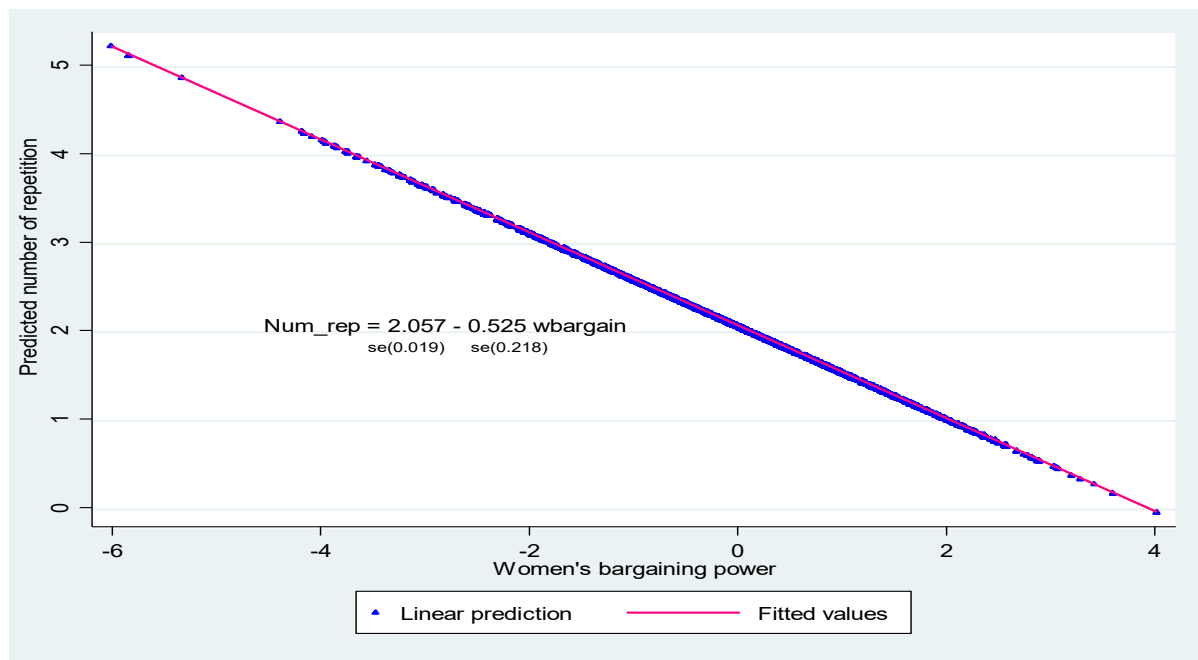
Source: Authors' own computation from GLSS, 6 datasets

Appendix G: Baseline 2SLS estimate for women's bargaining power and children's grade repetition



Source: Authors' own computation from GLSS, 6 datasets

Appendix H: Baseline 2SLS estimate for women's empowerment and intensity of children's grade repetition



Source: Authors' own computation from GLSS, 6 datasets