



# Parental risk preferences, maternal bargaining power, and the educational progressions of children: Lab-in-the-field evidence from rural Côte d'Ivoire

Arnab Basu<sup>a,b,c,\*</sup>, Ralitza Dimova<sup>b,d</sup>, Monnet Gbakou<sup>e</sup>, Romane Viennet<sup>f</sup>

<sup>a</sup> Charles H. Dyson School of Applied Economics and Management, Cornell University, Ithaca, NY 14853, US

<sup>b</sup> Institute for the Study of Labour (IZA), Bonn, Germany

<sup>c</sup> United Nations University World Institute for Development Economics Research (UNU-WIDER), Helsinki, Finland

<sup>d</sup> University of Manchester, Manchester M13 9PL, UK

<sup>e</sup> Université Félix Houphouët-Boigny, Cocody-Abidjan, Côte d'Ivoire, Paris, France

<sup>f</sup> OECD, Paris, France

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## ABSTRACT

We analyze the effect of parental risk preferences and a novel measure of maternal bargaining power over educational expenses - elicited via lab-in-the-field experiments in rural Côte d'Ivoire - on the educational progression of boys and girls. Data from 135 couples and their children show that father's risk aversion is negatively associated with school attendance for boys and lowers the likelihood of transition from no-schooling to primary schooling for both boys and girls. Mother's risk aversion, on the other hand, has a positive association with the transition into primary schooling and a negative association with the transition into secondary schooling only for girls. Mother's bargaining power is also negatively associated with girls' schooling, while greater bargaining power for mothers who are relatively more risk averse than the father adversely impacts the transition into primary schooling for boys. Our findings are in line with suggestive evidence that points to a preference for current income generated by the employment of boys in high value cash crop production and the concern for girls' safety associated with traveling long distances to attend secondary schools.

## 1. Introduction

The human capital-growth nexus is well-established in the economics literature. For developing countries, especially those in Sub-Saharan Africa (SSA), recognition that early investment in education can break the vicious cycle of poverty has led national governments and international donor agencies to focus on the promotion of a variety of education-related supply and demand-side interventions. Notable supply-side interventions include compulsory primary schooling laws, better incentives for teachers and expansion of school lunch programs, while the most famous demand side intervention has been through conditional cash transfers that incentivize poor families to send their

children to school.<sup>1</sup> These interventions have yielded significant results in the past couple of decades in terms of primary school enrolment rates in SSA (United Nations, 2015).<sup>2</sup> Nevertheless, the transition rates beyond primary school remain low. In SSA only 35% of boys of secondary school going age are reported to attend school and the percentage is even lower for girls.<sup>3</sup> The transition to tertiary education is negligible, despite evidence that university degrees generate both the highest returns in the labor market and the highest boosts to long term growth (Kuepie, Nordman & Roubaud, 2009; Schultz, 2004)

In this paper, we explore whether enrolment rates and the progression from primary to secondary and post-secondary education in a rural developing economy is shaped by parental risk preferences and intra-

\* Corresponding author.

E-mail address: [arnab.basu@cornell.edu](mailto:arnab.basu@cornell.edu) (A. Basu).

<sup>1</sup> See Gelli (2015) for the link between school feeding programs and girls' enrolment in primary schools in SSA; Bennell and Akyeampong (2007) on teacher motivation in SSA, Akyeampong (2009) on the effectiveness of Free and Compulsory Universal Basic Education (FCUBE) program in Ghana and Baird, McIntosh and Özler (2009) on the effect of conditional cash transfers as incentives for girl's schooling in SSA.

<sup>2</sup> Primary school enrolment rates have reached 91% in 2015 - a substantial rise from 83% in 2000. For Sub-Saharan Africa as a specific example, a 20 percentage point increase in the net enrolment rate in primary schools has been observed from 2000 to 2015, compared to 8 percentage point rise between 1990 and 2000. As expected, this increased enrolment in primary schools has translated into a similar rise in the rate of literacy (United Nations, 2015).

<sup>3</sup> UN Data, 2017: [http://data.un.org/Data.aspx?d=UNESCO&f=series%3ANER\\_23](http://data.un.org/Data.aspx?d=UNESCO&f=series%3ANER_23)

household bargaining power over educational expenses. By eliciting - via lab-in-the field experiments - father's and mother's risk preferences, and mother's bargaining power over educational expenses in rural Côte d'Ivoire, we identify any potential bias that favours school attendance, and eventually the schooling progression of boys over girls through secondary schooling. Our analysis reveals a negative association between father's risk aversion and school attendance of children of either gender. Mother's risk aversion, on the other hand, has a positive association with the transition into primary schooling and a negative association with the transition into secondary schooling for girls. Mother's bargaining power is also negatively associated with girls' schooling, while greater bargaining power for mothers who are relatively more risk averse than the father adversely impacts the transition into primary schooling for boys. We attribute these findings to a preference for current income generated via the employment of boys in high value cash crop production and the concern for girls' safety associated with traveling long distances to attend secondary schools.

Our study contributes to two strands of the growing field experiment literature: one that links household or parental risk preferences, and the other that links intra-household bargaining power over educational expenses to child educational outcomes in developing countries. With respect to risk preferences, [Tanaka and Yamano \(2015\)](#) and [Sovero \(2018\)](#) reach a consensus that parental risk aversion has a negative impact on children's years of education. While both these papers use an intertemporal investment modeling framework as a starting point for their analyses, there are interesting conceptual differences in the interpretation of the results. [Tanaka and Yamano \(2015\)](#) establish that the negative effect of parental risk aversion on child education can be explained better by the head of household's security concerns for young children having to undertake a long walk to school in Uganda rather than by an aversion to risky educational investments. Instead of focusing on the behavioral characteristics of the head of household, [Sovero \(2018\)](#) explores the potentially differential effect of mother's and father's risk aversion on child well-being in Mexico. She concludes that the effect of mother's risk aversion dominates that of the father's and leads to prioritization of investments in boys over girls. More recently, [Tabetando \(2019\)](#) for rural Uganda and [Basu and Dimova \(2022\)](#) for rural Ethiopia find household head's risk aversion to be negatively related to children's educational outcomes for poorer households. Tabetando's finding is attributed to household credit constraints while Basu and Dimova argues that uncertain returns to education may lead households to view income from child labor as a safe option and investment in education as a gamble, especially when children's future income act as old-age insurance for the parents. While the precise mechanics of the link between parental risk aversion and child educational outcomes vary due to differences in institutional and cultural norms across countries, our findings with regards to the father's risk preference is broadly consistent with the literature insofar as greater risk aversion impedes educational investment in children (both boys and girls).<sup>4</sup> What are novel findings, however, are the results that (i) mother's risk aversion does not impact the educational progression of boys but has a positive impact on school attendance and on the educational progression of girls from no-schooling to primary schooling but a negative impact on the transition from primary to secondary schooling and (ii) greater bargaining power for relatively risk-averse mothers acts as an impediment to the educational attainment of boys.

The second strand of the experimental literature linking mother's bargaining power elicited via lab-in-the-field experiments to child educational outcomes is sparse with [Ringdal and Hoem Sjursen \(2021\)](#) as the only exception. While numerous lab-in-the-field experiments have

been undertaken in developing countries to test the theoretical predictions of the non-unitary models of household behavior,<sup>5</sup> the link between mother's bargaining power and child-specific investments remains understudied. Ringdal and Home Sjursen's study in Tanzania offers three important insights: (a) an increase in women's bargaining power does not increase investment in child education, (b) for a mother who is less patient than the father, an increase in bargaining power reduces investment in child education and (c) increased bargaining power to mothers who are relatively more risk averse than their husbands has no effect on the investment in child education. In contrast, we find that greater bargaining power of the mother over the allocation of educational expenses significantly lowers the likelihood of school attendance for girls and has no impact on the likelihood of school attendance for boys. Greater bargaining power of mothers who are relatively more risk averse than their husbands, however, lowers the likelihood of school attendance for boys although this association is statistically not strong.<sup>6</sup> These differences in the findings may well be attributed to the differences in experiment design and external validity given the stark difference in locations (rural Côte d'Ivoire versus urban Dar es Salaam, Tanzania).

Nevertheless, identification of women's bargaining power within the household is tricky given that several individual and within marriage characteristics (education, income, age at marriage, bride price, gender of the first-born child) are endogenous to the bargaining power of a spouse. Lab-in-the-field and natural experiments both offer a partial solution to this endogeneity issue by observing the decision-making process of a spouse within a controlled environment. Thus, the insights obtained from Ringdal and Hoem Sjursen and our field experiments should be evaluated against those obtained via natural experiments and randomized control trials (RCTs). Examples of results obtained from this latter group of papers include [Duflo and Udry \(2004\)](#) who finds that an unanticipated increase in women's income share results in greater expenditures on food. An unanticipated increase in male income, on the other hand, results in greater educational expenditures for children. This finding is echoed in macro and community level research. [Chattopadhyay and Duflo \(2004\)](#) witness stronger preferences for children's education amongst men and stronger preference for necessities like drinking water amongst women - a finding also echoed by [Benhassine, Devoto, Duflo, Dupas and Pouliquen \(2015\)](#) for a patriarchal society like Morocco where targeting cash transfers for schooling at fathers leads to an increase in children's primary school enrolment. [Martinez \(2013\)](#), on the other hand, finds that a change in the law allowing unwed mothers to receive child support in Chile led to increased school attendance for children while [Bobonis \(2009\)](#) finds that an unanticipated income increase for the household caused by variations in rainfall leads to a smaller increase in expenditure on children's clothing and education as compared to the conditional cash transfer program PROGRESA which targets only mothers in Mexico. Finally, the literature linking exogenous income shocks to the existence of parental gender bias amongst children reveals an interesting pattern for South Africa: [Duflo \(2003\)](#) finds that an increase in grandmother's income through a pension reform resulted in the prioritization of investment in girls while [Edmonds \(2006\)](#) finds that an increase in grandfather's income induces a prioritization of investment in boys. For Côte d'Ivoire, we find instead that greater bargaining power for the mother, in itself, adversely affects the schooling outcome for girls while greater bargaining power to mothers who are relatively more risk averse than their

<sup>4</sup> While our focus is on studies undertaken in developing countries, one of the earliest studies on the subject is by [Heineck and Wölfel \(2012\)](#) shows that mother's risk aversion negatively affects children's enrolment in upper secondary schools in Germany.

<sup>5</sup> [Munro \(2015\)](#) offers an exhaustive review of field experiments on bargaining undertaken in developing countries while [Donni and Chaippori \(2011\)](#) offers an excellent overview of the theoretical non-unitary models of household behavior.

<sup>6</sup> We were unable to conduct experiments to elicit patience profiles of the spouses due to the limited amount of time we were allowed to spend in the villages, particularly in Western Côte d'Ivoire.

husbands adversely affects the schooling outcome for boys.

Advantages notwithstanding, nuances in the experimental design as well as country-specific institutions and social norms raise questions about the external validity of results obtained from lab-in-the-field experiments. Thus, a brief note about our geographical focus and experimental design is in order. Rural Côte d'Ivoire has a low transition rate from primary to secondary schooling even though returns to secondary education is deemed high.<sup>7</sup> This peculiarity is the major motivation behind our geographical choice, not to mention that studies analyzing schooling outcomes in Francophone Africa is sparse. Second, while the effectiveness of free schooling and conditional cash transfers on school enrolment patterns have been analyzed for this part of the world, the potential impact of household behavioral preferences has yet to receive attention. Based on a total of 135 couples across 5 rural villages, we first use lotteries with varying probabilities of success to capture risk preferences of each parent. For our second experiment, we design a novel mechanism for eliciting bargaining power over educational expenditure amongst couples with children. In the first step of this experiment, each partner is asked to allocate a fixed endowment between their private account and a common pot. In the second step, each partner is separately asked to allocate the amount in the common pot amongst various categories of household expenditures including food, transportation, health, transfers to parents and children's education. In the third step, couples are required to confer with each other and jointly allocate the amount in the common pot amongst these various household expenditures categories. This stepwise decision making allows us to extrapolate the bargaining power of a spouse by focusing on the allocation decision between the second and the third step.<sup>8</sup> The two experiments above are further supplemented by a detailed household survey that allows for exploring the differential effect of the two sets of parental preferences on the upward mobility of boys and girls through Côte d'Ivoire's schooling system.

The rest of the paper is organized as follows. Section 2 provides information about the socioeconomic conditions in Côte d'Ivoire, and our field setting. Section 3 describes the experiments while Section 4 highlights the descriptive statistics associated with the household survey. Section 5 outlines the empirical methodology used for the analysis of the role of parental preferences and intra-household decision-making dynamics on child educational outcomes and discusses the empirical results. Section 6 concludes.

## 2. Background and data collection

### 2.1. socioeconomic context

The schooling system in Côte d'Ivoire is based on the French model, whereby primary education lasts from age 6 through 11, middle school (collège) commences after 11 and continues till 15, high school (lycée) starts after 15 and goes on till 18, while university starts thereafter. In 1992, Côte d'Ivoire adopted a 'National Education Plan for All', envisaging amongst others, improved access to basic (primary and secondary) education, retention of students in school till the age of 16 and enhanced quality of education (Oyeniran, 2017). This has resulted in raising the gross primary enrolment rate to 94%. Yet, the primary school completion rate is only 61%, while the enrolment rate in middle school drops to 31% (Education Policy Data Center (2014), based on UNESCO statistics). Aside from classical reasons for the low educational progression rates, such as poverty and credit constraints, a key factor in Côte d'Ivoire

is geography: more than 93.6% of the secondary schools are in urban areas, such that children are required to cover between 17 and 24 kms to attend school (International Cocoa Initiative, 2017; The World Bank, 2015). Beyond these physical barriers to educational attainment is a tight urban labor market with high competition for jobs. However, for those able to find urban jobs, the dividend to high school education is high (World Bank, 2015).

The combination of geographical factors, production structure and social norms creates peculiar distinctions in the value of schooling for boys and girls from the parents' point of view. Geographically, while most villages in our sample have a primary school, children need to cover a non-negligible distance to the nearest urban secondary school. Coupled with a high incidence of violence and rape including by peers and teachers, sending a girl to high school is a risky undertaking (Japan International Cooperation Agency, 2013). From the production structure viewpoint, boys are a disproportionately large agricultural labor resource compared to girls, particularly in cocoa farms (Abou, 2014). Finally, social norm in the form of grooms paying a bride price to the girl's family has perpetuated an incentive for teenage marriages and early withdrawal of girls from school (Japanese International Cooperation Agency, 2013).

### 2.2. Field work

Our sample is drawn from five villages in Côte d'Ivoire: three villages in the South-Eastern area near Abidjan (Andokoi, Ashokoi and Gbrebo) and two villages in the South-Western area near Soubré (Galea 2 and Logboayo). The approximate location of these two sets of villages is highlighted in Fig. 1, while some key characteristics related to their ethnic composition are highlighted in Table 1.

As indicated in Table 1, the dominant ethnic group across the villages is Baoulé, while migrants from Burkina Faso dominate the (international) migrant population. Two villages, one from each of the two surveyed regions, namely Galea 2 near Soubré and Bregbo near Abidjan are representative of the so called CEDEAO (Communauté des Etats de l'Afrique de l'Ouest) villages in the sense that they are populated by migrants from a number of West African countries, notably Burkina Faso, Liberia, Sierra Leone and Mali.

Table 2 highlights the key occupational traits and agricultural production characteristics of each of the villages. While cocoa is the key source of income in the villages in the West, villages in the East are primarily involved in the production of rubber. Across all villages, men are mostly involved in the production of cash crops and high-value agriculture, while the production of food crops is the prerogative of women. There is a slight difference in the portfolio of food crops produced in the West and in the East. The key subsistence crops in the West are rice, tomato, yam and cassava, while the key subsistence crops in the East are tomato, yam and banana. Among the Western villages, cocoa production is organized in a cooperative only in Galea 2, while among the Eastern villages, Bregbo has a high value agricultural cooperative, devoted to animal husbandry (fish, poultry and pigs). A particularly interesting village in the Eastern area is that of Andokoi, where a large proportion of the women are involved in non-agricultural production organized through a women's cooperative.

The governance structure also differs across villages located in the West and in the East. In the Western ones, village Chiefs are mostly appointed via democratic voting procedure while Chiefs in the Eastern villages are elected by the generation-based village management committee. Democratic voting takes place only when there is significant disagreement amongst committee members. In sum, the choice of villages in our sample is not only representative with respect to key production and export crops in the country (namely cocoa and rubber), but also reflects sufficient heterogeneity in livelihoods and institutional settings. We use village fixed effects to account for these differences in our empirical analysis.

<sup>7</sup> See Schultz (2004) and Fink and Peet (2014). While the return to education is high, there is also uncertainty associated with finding good jobs.

<sup>8</sup> Our bargaining experiment circumvents the difficulties that lab-in-the-field experiments involving voluntary contributions face wherein it is difficult to ascertain whether a contribution to the common pot is driven by risk aversion or by alternative considerations (Croson and Gneezy, 2009).



Fig. 1. Key survey areas.

**Table 1**  
Ethnic and migrant composition of the surveyed villages.

Villages	Internal migrants (allochtone)	External migrants (allogène)	Non-migrant populations (autochtone)
<b>Villages in the region of Soubre</b>			
GALEA 2	Baoulé, Sénoufo, Agni, Koulango	Burkina Faso, Togo, Mali, Benin, etc.	Bakoué
LOGBOAYO	Baoulé, Koulango, Ando	Burkina Faso	Bété
<b>Villages in the region of Abidjan</b>			
ANDOKOI	Baoulé, Bété, Agni, Gouro, Yacouba, Senoufo,	Burkina Faso, Mali,	Attié
ASHOKOI	Baoulé, Sénoufo, Agni	Burkina Faso	Attié
GBREBO	Baoulé, malinké,	Burkina Faso, Mali, Niger, Senegal, etc.	Ebrié

**Table 2**  
Main crops and occupational structure.

Villages	Main crop	Secondary crops	Cooperatives
<b>Villages in the region of Soubre</b>			
GALEA 2	Cocoa	Rice, tomato, yam, cassava	Cocoa cooperative
LOGBOAYO	Cocoa	Rice, tomato, yam, cassava	No
<b>Villages in the region of Abidjan</b>			
ANDOKOI		Tomato, yam, banana	Non-agricultural cooperative
ASHOKOI	Rubber	Tomato, yam, banana	No
BREGBO	Rubber	Tomato, yam, banana	Fish, poultry and pigs cooperative

### 3. Experiment design

In each village we undertook lab-in-the-field experiments to capture individual risk preferences, cooperation amongst spouses and women’s bargaining power within the household followed by a survey that was undertaken by every participant. We sought permission for the experiments and the survey from the village Chiefs who provided us with a list of couples residing within the village. From the list, we randomly

selected couples – the only stipulation being that a couple should have at least one child together of school or university-going age (between 6 and 22 years). Each participant was paid 5000 CFA as the participation fee with the opportunity to win an additional amount from the risk experiment through a random draw.<sup>9</sup> As explained later in this section, this participation fee equals the initial endowment for each partner in the bargaining game. The games started with an experiment to elicit individual risk preferences, followed by an intra-household bargaining experiment.<sup>10</sup>

#### 3.1. Risk preferences

Elicitation of individual risk preferences is usually conducted via the presentation of a lottery where individuals face a sequence of options involving a safe return and a risky one. The risky investment yields either a high or a low return depending on the associated probability of success  $p(h)$ . An individual’s choices across various combinations of safe and risky returns reflect the value of the minimum acceptable probability (MAP), i.e., the minimum value of  $p(h)$  for which this individual chooses the risky over the safe investment. Individual risk preferences are computed as the difference between the revealed MAP and  $p^*$ , the probability that makes the game actuarially fair. Thus,  $p^*$  is such that the expected payoff from the risky investment equals the expected payoff from the safe investment, as presented in Fig. 2.

An individual with  $MAP > p^*$  is considered risk averse, while

<sup>9</sup> The participation fee of 5,000 CFA is roughly equal to 2 days average pay for an agricultural worker in rural Côte d’Ivoire. In 2016 when the experiments were undertaken, the average agricultural wage per month was approximately 53,000 CFA (Global Living Wage Coalition, 2020).

<sup>10</sup> In the Instructions for the Risk and Bargaining game in (Appendix 1 and 2) we describe in detail how the participants were informed about the two tasks that they were about to embark upon. We went over the instructions in French and played a hypothetical risk experiment with different payoffs than the actual one, and the allocation game where participants were asked to distribute an arbitrary endowment between their individual needs and the common pot. Researchers and research assistants worked in pairs while on the ground, which enabled them to notice potential misunderstanding among the participants. In the event of any misunderstanding, the instructions and the games were explained in a different yet scripted way to allow for better understanding the problematic part. Participants were also repeatedly encouraged to raise their hand if there was any confusion with the instructions and/or survey questions which allowed us to promptly resolve the issue.

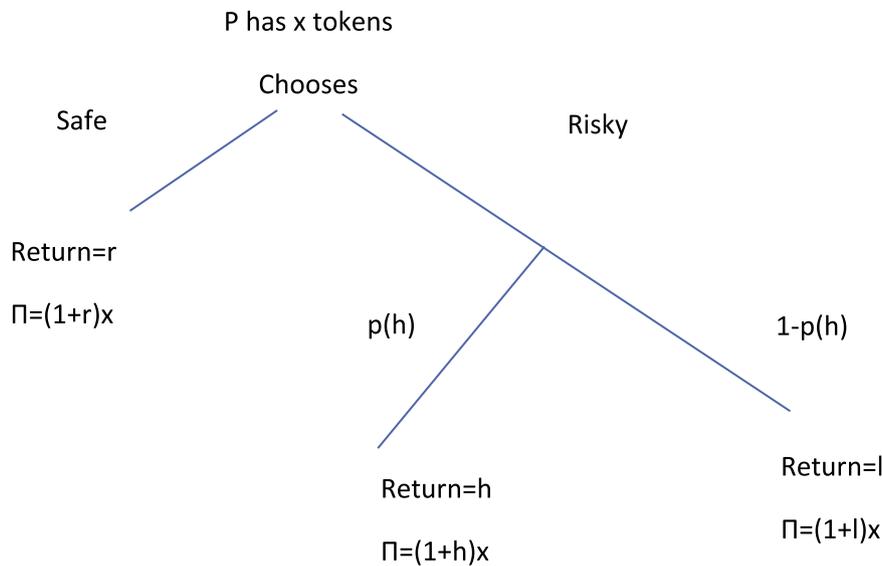


Fig. 2. Risk preference game tree.

someone with  $MAP \leq p^*$  is considered a risk taker. The experiment design mirrors the Multiple Price List (MPL) method popularized by Holt and Laury (2002). One concern raised about MPL methods is that participants may get confused and not understand the instructions, leading to meaningless choices in the activity (Charness, Gneezy & Imas, 2013). To minimize misunderstanding, we modify the original protocol replacing one set of lotteries by a fixed, “safe” return option. Appendix 1 reproduces the experiment protocols used in the field.

The experiment unfolds as follows: we first present individuals with a scenario in which each receives 50,000 CFA Francs, which they are asked to invest in a project of their choosing. We then introduce nine sequential choices for individuals to make, between a safe return and a lottery (see Appendix 1). The safe return option guarantees a return of CFA 65,000, while the lottery option offers a return of either CFA 80,000 or CFA 35,000 with varying probabilities. The payoffs for all choices remain the same but the probability of success in the lottery improves as the subject gets closer to the ninth and last choice. All nine choices have the same conditions and the same returns, except that the probability of success for the uncertain investment increases sequentially.

We record the probability at which an individual switched from choosing the safe return option to playing the lottery. For a risk-neutral individual, the switch technically occurs when the probability of winning the lottery is 0.7, because  $p(h)=0.7$  yields a higher expected payoff than the safe return:  $80,000 \times 0.7 + 35,000 \times 0.3 = 66,500 > 65,000$ . Note that the probability  $p^*$  that makes the game actuarially fair is 0.67, where a risk-neutral individual is indifferent between the safe return and the lottery options. This corresponds to a probability not materialized in the game, which falls somewhere between the sixth ( $p(h)=0.6$ ) and seventh ( $p(h)=0.7$ ) choices. For simplicity, we approximate  $p^*=0.7$ .

An individual switching from the safe return option to the lottery at a probability of success lower than 0.7 is characterized as a risk-taker whereas an individual switching to the lottery at 0.7 or a higher probability of success is characterized as risk-averse. Extremely risk-averse individuals never switch to the lottery while extreme risk takers switch instantly at probability 0.1 of winning the lottery. Using a lottery setting allows for reproducing a situation in which the risk described to individuals does not depend on other individuals, but only on pure

chance.<sup>11</sup>

One “winner” is randomly drawn at the end of the game to make the earnings credible and ensure elicitation of realistic risk preferences. To determine the winner and his/her final prize, we randomly draw one ID number from all participants’ numbers, as well as an integer  $n$  between 1 and 9 to play out one of the decisions she made during the activity. If his/her choice at step  $n$  was to go with the safe return option, he/she receives CFA 65,000. If he/she chose the lottery, then a lottery is performed with the corresponding probability setting, and the winner receives CFA 35,000 or CFA 80,000 depending on the draw. For instance, if the individual chose the safe return option at row 3 ( $p = 0.3$ ), the lottery bag would contain 3 orange balls and 7 white ones. The individual receives CFA 35,000 if a white ball is drawn, and CFA 80,000 if it is an orange ball. This procedure is consistent with Azrieli, Chamber and Healy (2018) who finds that remunerating one randomly chosen decision is the best incentive-compatible mechanism.

Fig. 3 highlights the individual results of the risk preference game. Recall that higher values in the choice set indicate higher levels of risk aversion. Each of the points on the horizontal axis indicate the level at which the individual switched from the safe towards the risky choice, where 10 indicates that no such switch was made, and the individual retained the preference for the safe option throughout. Most of the responses across both men and women cluster around the safest options and women seem more likely than men to stay with the safe option throughout. This is consistent with the implicit assumption in poverty trap models, whereby poor people, the majority in our sample, are more likely to be risk averse. This assumption is supported by the further observation that the relationship between risk aversion and income, irrespective of whether we use household or the individual income of either spouse, is negative.

### 3.2. Intra-household bargaining

Our intra-household bargaining game is conducted as a two-step process that combines elements of both non-cooperative and collective decision making typically observed within a household. Step 1 uses a version of a public good game, adopted from Munro, Kebede,

<sup>11</sup> Bohnet and Zeckhauser (2003) find that in sequential games, first movers appear to be more risk averse (i.e., they declare a higher MAP) when the risk comes from another individual than when risk is determined by nature (e.g., a lottery).

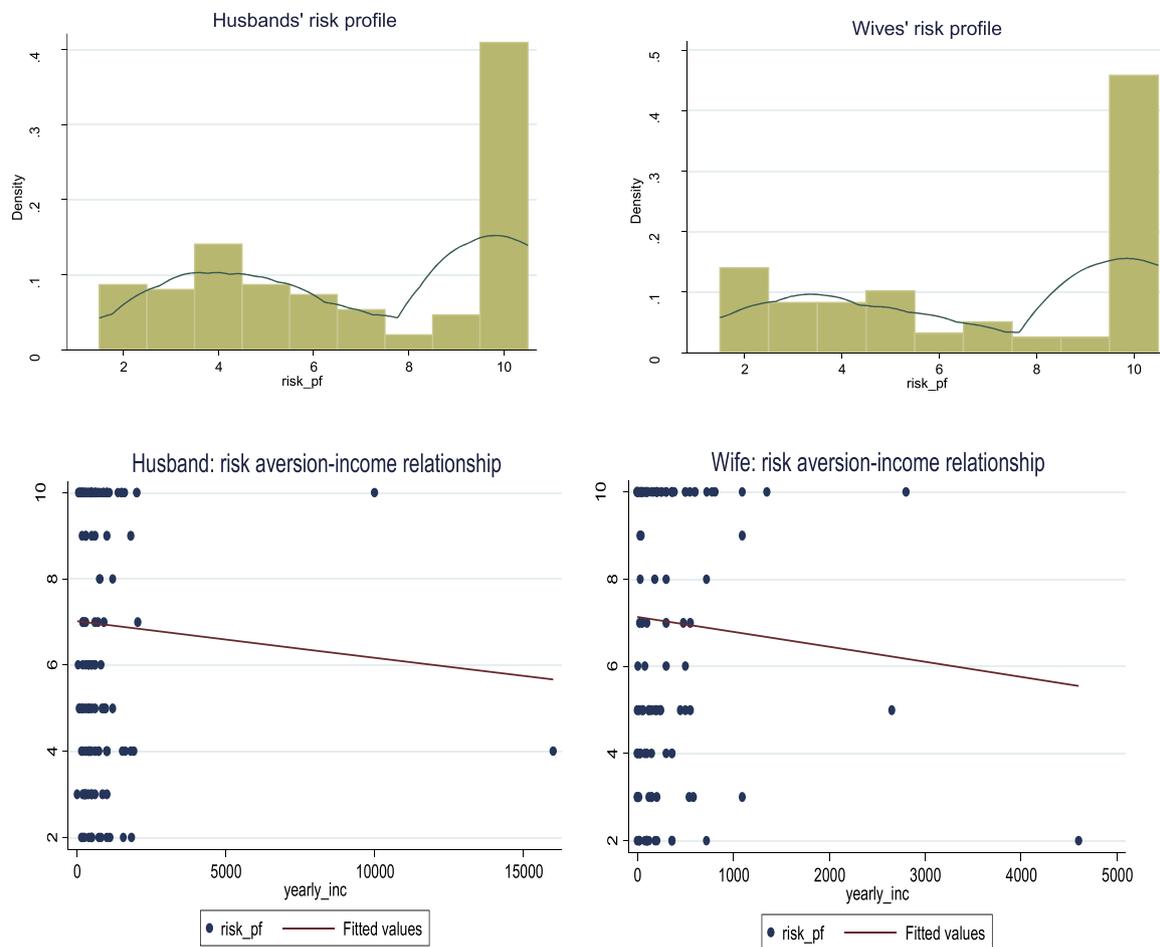


Fig. 3. Risk preferences of husbands and wives.

Tarazona-Gomez and Verschoor (2011), in which spouses separately decide between keeping an allocated budget for their individual benefit, or contributing to a common (household) pot. We innovate in Step 2 by introducing common pot allocation games across three rounds where spouses decide, first individually and then jointly, on how best to allocate the common pot across various expenditure items. The public good game and the individual allocation of the common pot are played in separate rooms for the men and women during the first two rounds, while the reunited spouses jointly decide on the common pot allocation in the last round. This sequential decision-making allows us to subsequently construct a measure of *relative* bargaining power of the wife. A reproduction of the detailed instructions and response sheets used in the country for this experiment can be found in Appendix 2.

3.2.1. Intra-household bargaining: step one

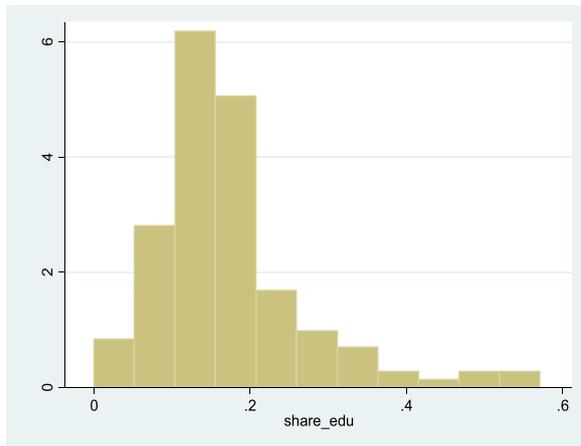
In Step 1, wives and husbands are asked to sit in separate rooms with no opportunity to communicate and play a public good game with their spouse as counterpart. The couples play three times, with a different setting in each round: the initial income allocation varies as well as the identity of the spouse who will decide how to spend the household common pot. The basic sequence of each round is as follows:

- i Individuals are told who, of the wife or the husband, will decide how to spend the household money pot in this round. The order is the same for all couples: the wife decides in the first round, the husband does in the second, and both decide together in the third.
- ii An initial income is simultaneously allocated to each spouse individually. Both wives and husbands are told to assume that their partner has an identical initial income allocation. The initial income,

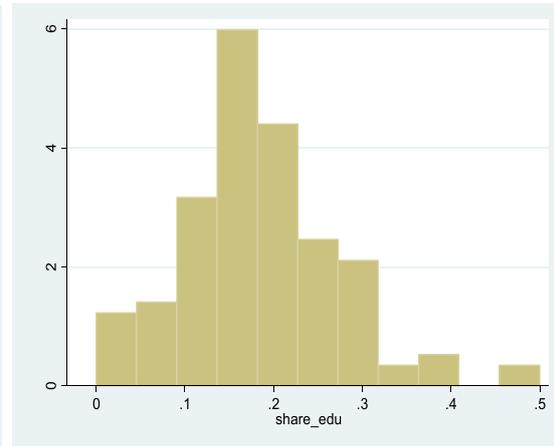
Table 3  
Contributions to the common pot across the three rounds.

Variable	Women		Test-equality across rounds t-stat(p-value)	Men		Test-equality across rounds t-stat(p-value)
	Mean	Std. Dev.		Mean	Std. Dev.	
Total sum contributed R1	2.878	1.259		2.595	1.142	
Total sum contributed R2	3.565	1.365	-6.997 (0.000)	3.305	1.435	-8.3542 (0.000)
Total sum contributed R3	3.038	1.105	6.476 (0.000)	2.648	1.239	6.4296 (0.000)
Proportion contributed R1	.719	.315		.649	.286	
Proportion contributed R2	.713	.273	0.292 (0.7701)	.661	.287	-0.6741 (0.5014)
Proportion contributed R3	.759	.276	-2.666 (0.0087)	.662	.309	-0.0507 (0.9597)

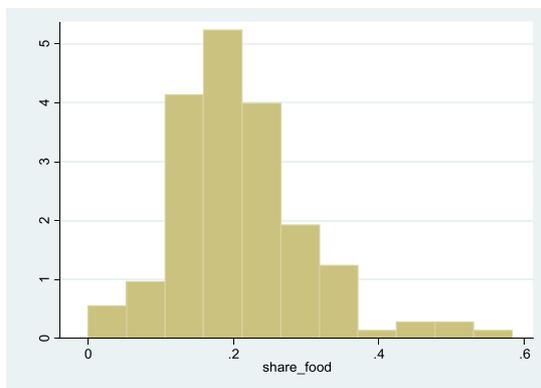
share education, wife



share education, husband



share food, wife



share food, husband

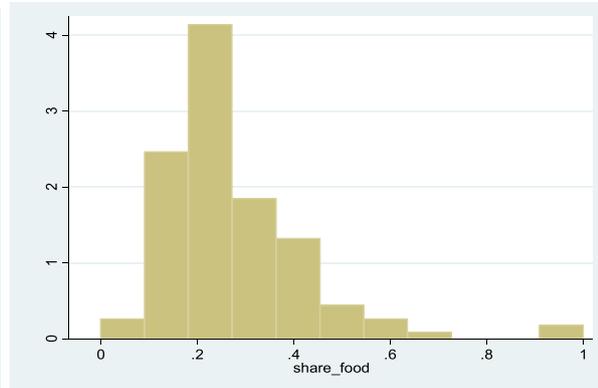


Fig. 4. Histogram of preferred expenditure shares from Round one of the bargaining game.

however is identical for both spouses and equaled 4000 CFA in rounds 1 and 3, and 5000 CFA in round 2.<sup>12</sup>

- iii Individuals are asked to choose how much of their initial income they contribute to the household common pot, knowing that, when contributed, each unit of 1000 CFA is multiplied by 1.5. Individuals can choose to contribute 0, 1, 2, 3, 4 or 5 units of 1000 CFA, depending on their total initial endowment. Wives and husbands play simultaneously; their decisions only take effect in Step 2 (below).
- iv Individuals are then asked to guess how many units of 1000 CFA their spouse contributed to the household common pot.

The variation in settings allows to control for the effect of expected bargaining power on intra-household cooperation. The initial income is presented as individuals' pay for participating in the experiments, thus avoiding any cognitive bias that a "free" income might create in a cooperation game. The multiplying factor of 1.5 applied to each income unit contributed to the household common pot aims to mimic the positive externalities that are expected from cooperation.

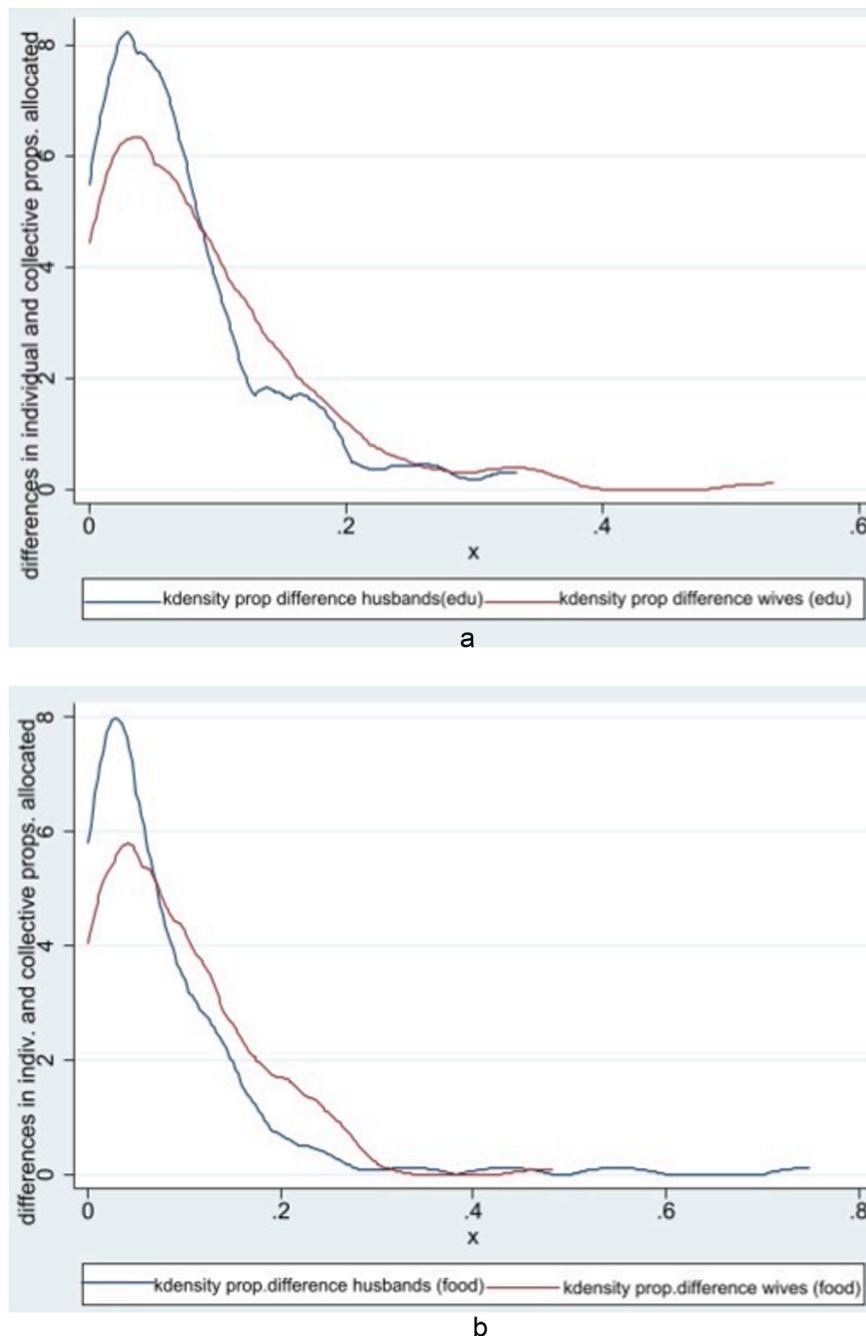
In Table 3 we present the means of the total amounts contributed by the spouses across the three rounds, as well as the proportional contributions of each spouse. Recall that we changed the initial endowment

from 4000 CFA in round 1 to 5000 CFA in round 2 to address potential anchoring effect. However, given that wives decide solely on the allocation of the common pot in round 1 (lower initial endowment for both spouses) while husbands decide solely on the allocation of the common pot in round 2 (with a higher initial endowment for both spouses), it is important to verify whether the contributions across the two rounds are driven by the endowment effect (greater amount of money allocated in the second round) or by the power effect (decision making being switched from the wife to the husband with a higher initial income).<sup>13</sup> The test of equality of contributions across the rounds indicates that the endowment effect matters more than the power effect. Indeed, while the total amounts contributed by both the husband and the wife change almost proportionally with the change in the endowment, there is no significant change in the proportional contributions by either spouse across round 1 and round 2. Thus, we are confident that the greater endowment in round 2 is not viewed by the participants as synonymous with a greater decision-making power of the husband.

Our repeated public good game with varied settings further provides key intermediate metrics to proxy fathers', and especially mothers' relative bargaining power, which are central variables of interest. Finally, the sum of the contributions by each spouse in each round of Step 1, multiplied by 1.5, provides the total value of the household money pots that form the basis for Step 2 of the experiment. The value of households' money pots in each round for each couple is computed by

<sup>12</sup> We vary the endowment across the three rounds to eliminate anchoring, i. e., ensure that participants do not simply replicate the allocation from the previous round for the subsequent round(s).

<sup>13</sup> We are grateful to an anonymous referee for alerting us to this possibility.



**Fig. 5.** A: Kernel Density Plots of the Difference between Individual Proportional and Joint Proportional Contribution to Educational Expenditures by Husbands and Wives  
 B: Kernel Density plots of the Difference between Individual Proportional and Joint Proportional Contribution to Food Expenditures by Husbands and Wives.

the experimenters after collecting the first part of the individual response sheets.

**3.2.2. Intra-household bargaining: step two**

Step 2 aims at measuring the revealed preferences of spouses with respect to different expenditure categories. It also allows us to compute a proxy for each spouse’s relative bargaining power within the household. The individuals play twice, once by making allocation decisions individually and a second time by deciding together with their spouse. A key point to note here is that spouses are only told that they must jointly decide on the allocation of the common pot **after** they have made their individual allocations. The sequence of Step 2 is as follows:

- i Individuals play out the round in which they were given the responsibility to allocate the household money by themselves. Each wife is told the real value of the household money pot from the first round (the sum of their and their husband’s contribution multiplied by 1.5) and each husband is told the real value of the pot from the second round (the sum of their and their wife’s contribution multiplied by 1.5).
- ii Individuals are asked to distribute the total household money between seven possible expenditure categories (food, health, children education, money transfers to children, money transfers to parents, housing, transportation). The proposed seven expenditure categories replicate daily life expenses of the average farm household in Cote d’Ivoire.

- iii Spouses are reunited and seated together in the same room for the last move and are told the real value of the household money pot from the third round.
- iv Spouses are given a few minutes to discuss and decide together how to distribute the total household money between the same expenditure categories.

The allocation decisions in round 1 for women and round 2 for men provide proxies for the revealed preferences of either spouse for various expenses (measured as the proportions of the total sum allocated to each category). Fig. 4 highlights the differences in the proportional allocation to education via histograms for men and women. Consistent with Chattopadhyay and Duflo (2004), we observe that the plots for educational shares are more skewed to the right for men as compared to women, while the opposite is true (though less clearly so) for basic needs such as food expenditures.

Our measure of relative bargaining power is based on comparing the differences between the proportional allocation of the common pot to educational expenses made by a spouse when s/he is the sole decision maker – in round 1 for women and in round 2 for men – and the proportional allocation of the common pot to educational expenses collectively made by the couple. Numerically, we define  $MBP = 1$  for all  $|F(I) - J| > |M(I) - J|$ , where  $F(I)$  and  $M(I)$  are the father's and mother's individual proportional allocations respectively,  $J$  the joint proportional allocation by the couple and  $MBP$  is the mother's relative bargaining power. Whenever the mother is closer to her preferred level of educational expenditures (as compared to the father) in the bargaining process, our binary indicator of mother's relative bargaining power equals 1, which happens to be the case for 44% of the couples. Intuitively, mother's relative bargaining power is higher when her own allocation is closer to the joint allocation as compared to the father's. The smoothed kernel density plots of the difference between the individual proportional allocation and the joint proportional allocation towards educational expenditures for both men and women are presented in Fig. 5A. Men have greater bargaining power than women over the allocation of resources towards education, and this pattern is also observed for food expenditures depicted in Fig. 5B.

It is worthwhile to point out the difference between our experiment to capture bargaining power as compared to Ringdal and Hoem Sjursten's (2021) experimental design given that theirs is the only paper (to the best of our knowledge) that relates women's bargaining power to education expenses. Ringdal and Home Sjursten use four treatments to capture bargaining power over education expenses. Two of the treatments are from a Dictator game where the husband and the wife alternate as the proposer and the other two treatments are from a Rubenstein shrinking-pie game where again the husband and the wife alternate as the first mover. In comparison, we have three quasi (non-random) treatments – two non-cooperative and one collective – where respectively the husband exclusively, the wife exclusively and the couple jointly decide on the allocation of the common pot to various household expenditures including education expenses. In the next section we present the empirics of these non-cooperative and collective allocation to educational expenditure on the likelihood of school attendance for boys and girls. Subsequently, we relate our measure of mother's bargaining power described above to the likelihood of school attendance and the progression through the schooling system for boys and girls. A second key difference is that the bargaining games in Ringdal and Hoem Sjursten are conducted with reference to a randomly selected a child for every couple. In our experiment, the allocation to education expenses is not child specific which allows us to circumvent the issue of child-specific characteristics known only to either the father or the mother that might influence the allocation decision by a spouse. Instead, any gender bias with regards to children by either the father or the mother is accounted for in the regressions since our dependent variable is a particular child's schooling outcome, and multiple children in our data share the same parent. To account for potential household level

correlation, and thus underestimation of the effects, we cluster the standard errors at the household level.

#### 4. Survey data and descriptive statistics

As a second step in our field work, we requested each spouse to complete a short questionnaire, containing information on the demographic structure of the family, educational attainment of the children, educational and their own occupational status and incomes. We requested each spouse to separately complete the questionnaire to eliminate any inconsistencies in the reporting of any data, particularly for children. Any inconsistencies (number, gender, birth order and educational status of children) were reconciled on the spot.<sup>14</sup> Given that our main interest is child educational outcomes, we construct a dataset at the child level, where information on parents is the same for each child within a household. After accounting for missing observations and restricting the sample to children and young adults in the 6–22 age group, we are left with 334 observations for our empirical analysis to test for the implications of parental behavioural preferences on children's educational outcomes.

Table 4 highlights child and household characteristics of interest to us for the sample as a whole and for each of the five villages. With respect to the behavioural variables of interest, we observe that approximately half of the men and women are risk averse, with the proportion of risk averse men being slightly higher than the corresponding proportion of women (0.5060 of the men versus 0.4341 of the women). These proportions vary across the villages. In Ashokoi and Bergbo the proportion of risk tolerant men is significantly higher than average, while in Andokoi (the village characterised by a non-agricultural women's cooperative) the proportion of risk tolerant women is significantly higher than average. On average, women allocate less money to education than men. This pattern holds across four of the five villages and is only reversed in Logboayo. Given greater revealed preference for educational expenditures by men as compared to women, we hypothesize that greater relative bargaining power for mothers might adversely impact children's educational outcome.

The average age of children is 12.59. The average number of children per household is 5.0749 with girls representing slightly more than half of the sample. The average education of fathers is 6.75 years, indicating a completion of at least middle school, while mothers' education is substantially lower at an average of 3.05 years of schooling. Indeed, more than half of mothers in our sample have no education at all. The average annual household income is 621.1138 CFA, approximately equivalent to USD 1000. While slightly more than half of the men reported being a farmer as their primary occupation, fewer (approximately a third) of the women reported farming as their primary occupation. The most obvious explanation for this is the land ownership pattern in Côte d'Ivoire which excludes women by tradition. Land is typically only allocated to women by their spouses, mainly for subsistence farming purposes.

Further, noticeable variations in the socioeconomic and demographic characteristics across the villages exist. There are two significantly poorer villages, Ashokoi (in the Abidjan area) and Galea 2 (in the Soubré area) with annual household incomes approximately half of that of the sample average. In the case of Galea 2 this coincides with substantially lower levels of education of both men (4.75 years of education on average) and women (only 1.51 years of education on average) and reflects its status as a village with a high proportion of migrants from Burkina Faso and Mali. In the case of Ashokoi the only important difference with the other villages in the area is the absence of a cooperative and the significantly lower incidence of non-farm employment for both men and women. In terms of the occupational structure, an interesting

<sup>14</sup> Couples with foster and step-children residing within the household and belonging to the school going age (6–22 years) were excluded from the analysis.

**Table 4**  
Descriptive Statistics.

VARIABLES	Andokoi	Ashokoi	Bregbo	Galea two	Logboayo	Total
Child age	12.8909 (0.2911)	11.5672 (4.6424)	13.2424 (4.1326)	12.0706 (4.4207)	13.4426 (4.8529)	12.5868 (4.5976)
Number of girls	1.9818 (1.1302)	2.403 (1.8754)	2.6969 (1.4355)	3.3176 (1.1973)	3.5902 (1.3463)	2.8413 (1.5232)
Number of siblings	3.8000 (1.8298)	3.3284 (1.9648)	3.6970 (1.3470)	4.6706 (1.6285)	4.7213 (1.2128)	4.0749 (1.7077)
Mother's years of education	3.4364 (3.4575)	5.2836 (4.2097)	4.7879 (4.4011)	1.5176 (2.7282)	0.5246 (1.5980)	3.0539 (3.8683)
Father's years of education	7.2364 (4.9327)	8.4925 (4.3358)	7.8182 (4.9580)	4.7529 (3.9997)	6.0000 (2.8461)	6.7455 (4.4679)
Mother's risk aversion	0.3091 (0.4664)	0.6567 (0.4784)	0.4545 (0.5017)	0.5529 (0.5001)	0.5082 (0.5041)	0.5060 (0.5007)
Father's risk aversion	0.6545 (0.4799)	0.2687 (0.4466)	0.2576 (0.4407)	0.4706 (0.5021)	0.5574 (0.5008)	0.4341 (0.4963)
Mother's allocation to education	1163.64 (787.95)	1492.02 (919.62)	1528.79 (572.91)	1230.59 (1224.94)	1959.02 (1005.38)	1463.967 (983.70)
Father's allocation to education	1436.36 (707.46)	1634.33 (1085.66)	2045.46 (1568.26)	1864.71 (970.97)	1435.25 (1263.87)	1705.24 (1173.12)
Mother's bargaining power	0.2909 (0.4583)	0.7313 (0.4466)	0.5455 (0.5017)	0.2471 (0.4339)	0.3607 (0.4842)	0.4311 (0.4960)
Household yearly income	786.4545 (458.1405)	329.4701 (308.8742)	526.053 (402.6678)	396.9412 (267.5026)	1207.59 (2121.061)	621.1138 (10,062.36)
The mother is a farmer	0.0000 (0.0000)	0.5672 (0.4992)	0.1212 (0.3289)	0.4706 (0.5021)	0.7049 (0.4599)	0.3862 (0.4876)
The father is a farmer	0.2182 (0.4168)	0.4179 (0.4969)	0.1515 (0.3613)	0.9765 (0.1525)	1.0000 (0.0000)	0.5808 (0.4942)
Observations	55	67	66	85	61	334

The figures in brackets are standard deviations. Household yearly income is deflated by 1000.

characteristic is the complete absence of farm occupations amongst women in the case of Andokoi (where all working age women are involved in a non-agricultural cooperative), and the absence of non-farm employment amongst men in Logboayo.<sup>15</sup>

## 5. Empirical analysis

### 5.1. Empirical strategy

Our empirical analysis of the link between parental risk preferences, mother's relative bargaining power and child educational outcomes proceeds in two steps. First, we estimate a child's probability of attending school using a logistic function:

$$p(y_i = 1 | x_i) = \frac{\exp(\beta x_i)}{1 + \exp(\beta x_i)} \tag{1}$$

where  $y_i = 1$  when the child attends school at the time of the survey and  $x_i$  is a vector of observed child and household characteristics. The most important explanatory variables of interest to us are the levels of risk aversion of the mother and the father, and the relative bargaining power of the mother over educational expenditures. The binary risk aversion variable of each parent takes the value of 1 for  $p^* \geq 0.7$  as described in sub-section A of Section 3, and 0 otherwise. As described in sub-section B2 of Section 3, the binary mother's relative bargaining power variable takes the value of 1 if the absolute difference between the husband's own proportional allocation to education and the joint proportional allocation exceeds the absolute difference between the wife's own proportional allocation to education and the joint proportional allocation, and 0 otherwise.

<sup>15</sup> In a companion paper (Dimova, Abou, Basu and Viennet (2022)), we explore the allocation behaviour of the spouses across various household expenditure items and find that husbands prioritise food expenditures while wives prioritise transfers to parents, and both have similar average priorities with respect to educational expenditures. This behaviour is correlated with the education of the wife, the income of the husband and the bride price.

The child level control variables include the age of the child, the number of girls and number of siblings in the household.<sup>16</sup> We also control for mother's and father's education, household's yearly income and mother's and father's primary occupation. Given the high incidence of farming as a primary occupation, we assign a value of 1 in the case where a parent is a farmer, and zero otherwise. Following stylised empirical literature, we estimate a logit model that explores the propensity of children and adolescents to be enrolled in school, separately for girls and boys aged 6–22 years (Ashraf, Bau, Nunn & Voena, 2020). Our results are robust to the inclusion of village fixed effects.

### 5.2. Empirical results

We first start by analysing the impact of non-cooperative and collective decision making with regards to household educational expenses on the likelihood of children's school attendance. In Table 5, the marginal effects from the logit model of girls' and boys' school attendance reveal that non-cooperative decision-making regarding the proportional allocation of household expenditures towards education by either spouse has a significant pro-son bias, which disappears when the proportional allocation is collectively determined by the couple. For girls, non-cooperative or collective decision making has no significant impact on the likelihood of school attendance.

Table 6 highlights the marginal effects from the logit model of girls' and boys' school attendance with a binary measure of mother's relative bargaining power over educational expenses replacing the non-cooperative and collective proportional allocations. In columns 1 and 3 we report the results based on the binary risk aversion variable described in Section 3. The likelihood of school attendance falls for children of either gender if the father is risk-averse with a fall of 8 percentage points for boys and 5 percentage points for girls, even though at only 10% significance. By contrast, maternal risk aversion is

<sup>16</sup> The inclusion of these variables follows the work of Akresh et al. (2012) who analyze how sibling rivalry exerts an impact on the parents' decision of whether and how much to invest in their child's education.

**Table 5**

Marginal effects from the logit model on child schooling as a function of parents' non-cooperative and collective decision making and binary risk aversion variable.

VARIABLES	Boys			Girls		
	Wife	Husband	Couple	Wife	Husband	Couple
Child's age	0.0141*** (0.00449)	0.0149*** (0.00472)	0.0146*** (0.00494)	-0.000525 (0.00446)	-0.000524 (0.00427)	-0.000800 (0.00449)
Number of girls	-0.00633 (0.0224)	0.0115 (0.0209)	0.00233 (0.0230)	-0.0132 (0.0215)	-0.0130 (0.0205)	-0.0124 (0.0210)
Number of siblings	-0.0213 (0.0193)	-0.0329* (0.0194)	-0.0306 (0.0212)	0.00294 (0.0132)	0.00351 (0.0132)	0.00358 (0.0130)
Mother's education	0.0267** (0.0111)	0.0218** (0.0102)	0.0261** (0.0117)	0.000100 (0.00803)	9.50e-05 (0.00796)	0.000830 (0.00782)
Father's education	-0.00404 (0.00440)	-0.00583 (0.00430)	-0.00645 (0.00459)	0.0155** (0.00638)	0.0152*** (0.00490)	0.0148*** (0.00514)
Father is risk averse	-0.105** (0.0473)	-0.0969** (0.0484)	-0.0938** (0.0478)	-0.0540* (0.0321)	-0.0540* (0.0311)	-0.0516* (0.0300)
Mother is risk averse	-0.0718* (0.0420)	-0.0631 (0.0407)	-0.0569 (0.0412)	0.0965** (0.0465)	0.0953** (0.0396)	0.0924** (0.0396)
<b>Education allocation</b>	<b>0.0414** (0.0200)</b>	<b>0.0530** (0.0227)</b>	<b>0.0221 (0.0265)</b>	<b>0.00211 (0.0162)</b>	<b>-0.00283 (0.0166)</b>	<b>-0.0127 (0.0259)</b>
Household yearly Income	0.0693 (0.0642)	0.0383 (0.0389)	0.0554 (0.0614)	-0.0244*** (0.00708)	-0.0249*** (0.00700)	-0.0244*** (0.00650)
The Mother is a farmer	0.0372 (0.0536)	0.0169 (0.0502)	0.0347 (0.0573)	-0.0741* (0.0404)	-0.0760** (0.0387)	-0.0803** (0.0375)
The Father is a farmer	-0.185** (0.0892)	-0.180** (0.0843)	-0.209** (0.100)	0.0217 (0.116)	0.0212 (0.115)	0.0287 (0.123)
Observations	154	154	154	180	180	180

Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 6**

Marginal effects from the logit model on child schooling as a function of the binary measure of mother's bargaining power.

VARIABLES	Boys		Girls	
	Binary risk preference	Categorical risk preference	Binary risk preference	Categorical risk preference
Child age	0.0134** (0.00673)	0.0143** (0.00673)	0.000493 (0.00426)	-0.000296 (0.00440)
Number of girls	0.0107 (0.0285)	0.0119 (0.0295)	-0.0171 (0.0292)	-0.0310 (0.0273)
Number of siblings	-0.0327 (0.0228)	-0.0389 (0.0243)	0.00496 (0.0144)	0.0123 (0.0148)
Mother's years of education	0.0312 (0.0246)	0.0369 (0.0270)	0.00406 (0.00842)	0.00120 (0.00852)
Father's years of education	-0.00576 (0.00461)	-0.00773* (0.00458)	0.0191*** (0.00597)	0.0208*** (0.00715)
Mother's risk aversion	-0.0918 (0.0597)	-0.0155 (0.00995)	0.115*** (0.0440)	0.0193*** (0.00459)
Father's risk aversion	-0.0856* (0.0477)	-0.0130* (0.00724)	-0.0578* (0.0305)	-0.00932** (0.00468)
Mother's bargaining power	-0.0808 (0.0777)	-0.0769 (0.0712)	-0.119*** (0.0326)	-0.120*** (0.0335)
Household yearly income	0.0412 (0.0485)	0.0384 (0.0347)	-0.0178*** (0.00602)	-0.0158*** (0.00567)
The mother is a farmer	0.0107 (0.0607)	0.0557 (0.0699)	-0.125*** (0.0426)	-0.148*** (0.0431)
The father is a farmer	-0.246** (0.120)	-0.291** (0.134)	-0.00494 (0.114)	0.0139 (0.139)
R squared	0.232	0.235	0.167	0.166
Observations	154	154	180	180

Robust standard errors in brackets, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ; Village fixed effects accounted for.

positively associated with the school attendance of girls (an increase of 11 percentage points) but has no impact on the same for boys. Mother's relative bargaining power, however, is highly significant at the 1% level on lowering school attendance for girls but has no impact on the same for boys. The marginal effect of the mother's relative bargaining power variable is of roughly the same size as that of the mother's risk aversion variable with regards to girls' school attendance. This suggests that greater relative bargaining power of the mother over educational expenditure tends to neutralize the positive effect of mother's risk aversion on girls' school attendance.

While the likelihood of older boys attending school is positive, Table 6 reveals interesting patterns with regards to the effect of parental education and occupational choice on the schooling outcome for boys and girls. While mother's education has an insignificant impact on school attendance for either boys or girls (possibly due to universally low mother's education level), father's education has a significant positive impact on the schooling outcome for girls only. In terms of occupation, farming as an occupation for the father has a significant negative impact on the likelihood of school attendance for boys while mother being a farmer has a significant negative impact on the same for girls. Finally, richer households are less likely to encourage school attendance for girls.

### 5.3. Robustness checks

In this sub-section we first analyze whether our results are robust to alternative specifications of the father's and mother's risk aversion and the mother's relative bargaining power variables. Second, we employ a sequential logit regression to analyze the progression of children through the various stages of schooling and finally, analyze whether the interaction of mother's relative bargaining power with her relative risk aversion impede the educational outcomes for boys and girls differentially.

**Categorical Measure of Risk Aversion:** We use a categorical risk preference variable taking values between 2 and 10 for all the risk preference options faced by the subjects during the risk assessment experiment where 2 represents the highest level of risk tolerance and 10 represents the highest level of risk aversion. Columns 2 and 4 in Table 6 reports the results when the categorical risk aversion variable is used. A

comparison of column 1 with 2, and 3 with 4 in Table 6 shows remarkable consistency in the results irrespective of whether we use the binary or the categorical measure of risk aversion. As a result, we only use the binary risk aversion measure due to greater ease of interpretation in the rest of the analysis.

**Continuous Measure of Relative Bargaining Power:** We construct a continuous measure of mother’s relative bargaining power as  $|F(I) - J| - |M(I) - J| = MBP$  where  $F(I)$  and  $M(I)$  are, as before, the father’s and mother’s individual proportional allocations,  $J$  the joint proportional allocation and  $MBP$  the mother’s relative bargaining power. A large positive value of  $MBP$  in this case would imply a high mother’s relative bargaining power while a low negative value would imply a high father’s relative bargaining power. As reported in Table 7, our findings are robust to this construct with the statistical significance of the variables remaining the same when compared with the binary measure of mother’s relative bargaining power. Once again, father’s risk aversion is negatively associated with school attendance for both boys and girls while mother’s risk aversion positively affects school attendance for girls and has no effect on the school attendance for boys. Mother’s relative bargaining power counters the effect of risk aversion (albeit to a larger extent as compared to the binary relative bargaining power measure) and negatively impacts school attendance for only girls. The results related to parental occupation, household income and father’s education remain robust, and only minor difference is the positive effect of mother’s education on the likelihood of school attendance for boys but at only 10% significance.

**Educational Progression of Boys and Girls:** It has long been the

**Table 7**  
Marginal effects from the logit model on child schooling as a function of the continuous measure of mother’s bargaining power.

VARIABLES	Boys		Girls	
	Binary risk aversion	Categorical risk aversion	Binary risk aversion	Categorical risk aversion
Child age	0.0141** (0.00570)	0.0148** (0.00581)	0.000224 (0.00422)	-1.24e-05 (0.00466)
Number of girls	0.0132 (0.0255)	0.0134 (0.0263)	-0.0180 (0.0232)	-0.0484* (0.0267)
Number of siblings	-0.0345 (0.0218)	-0.0386* (0.0211)	-0.00108 (0.0137)	0.0106 (0.0147)
Mother’s years of education	0.0273* (0.0161)	0.0322* (0.0192)	0.00130 (0.00775)	0.000134 (0.00773)
Father’s years of education	-0.00533 (0.00460)	-0.00718 (0.00471)	0.0206*** (0.00595)	0.0295*** (0.00774)
Mother’s risk aversion	-0.0669 (0.0466)	-0.0122 (0.00779)	0.130*** (0.0502)	0.0315*** (0.00645)
Father’s risk aversion	-0.0949* (0.0520)	-0.0142** (0.00678)	-0.0611** (0.0294)	-0.0101** (0.00444)
Mother’s bargaining power	-0.326 (0.270)	-0.315 (0.284)	-0.533*** (0.196)	-0.845*** (0.196)
Household yearly income	0.0386 (0.0412)	0.0343 (0.0318)	-0.0139** (0.00667)	-0.00633 (0.00580)
The mother is a farmer	0.0254 (0.0687)	0.0680 (0.0741)	-0.0730** (0.0366)	-0.116*** (0.0443)
The father is a farmer	-0.219** (0.105)	-0.264** (0.112)	0.0105 (0.110)	0.0552 (0.106)
R-squared	0.3683	0.3747	0.3491	0.4083
Observations	154	154	180	180

Robust standard errors in brackets, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ; Village fixed effects accounted for.

norm in the literature on education to proxy educational outcomes by either completed years of education (Birdsall, 1985), or current enrolment (Singh, 1992) or the incidence of ever attending school (Cochrane, Mehra & Osheba, 1986). Yet, one could argue that such measures of schooling achievement are problematic in an environment such as that of Côte d’Ivoire where the dropout rates are very high, and few children progress through the schooling system. To account for these context-specific and methodological issues, we also estimate a sequential logit model following (Buis, 2017), and in the tradition of Lillard and Willis (1994) as a robustness check of the results obtained from the logit model. Our sequencing is based on three levels of educational attainment: no schooling, primary education, and middle/high school (or higher) and follows the structure highlighted in Fig. 6. After completing a level of education  $k$ , an individual  $i$  has the option to continue to the next level with probability  $p_{ki}$  or exit with probability  $(1-p_{ki})$ . The estimates of these transition probabilities are given by:

$$\hat{p}_{ki} = \frac{\exp(a_k + \sum_m \beta_{km})}{1 + \exp(a_k + \sum_m \beta_{km})}, \text{ if } p_{k-1,i=1} \tag{2}$$

It is important to note that while each of the villages in our dataset has a primary school within a 10 to 20-minute walk, in all cases children need to commute large distances should they choose to attend middle school and (particularly) higher than middle school facilities. Note also that 8.46% of the child sample above age 6 have never attended school, 59.70% of these children transited to primary school and 31.84% completed primary school and transited to middle school or higher stage. The stages in our transition tree are based on numbers of cases in each category, as well as on the conceptual importance of distinguishing between: (i) primary school attendance and completion and (ii) moving on to middle school and higher levels of schooling.

The sequential logit results confirm and enrich the results from the logit model. Table 8 reports log odds ratios from this model in which we focus on the binary risk aversion variable and the binary measure of mother’s relative bargaining power. Note that a ratio greater than 1 indicates a positive association between the variable of interest and the outcome variable, while a ratio of less than one indicates a negative association.<sup>17</sup> The log ratios of the risk aversion variable for either spouse are below one, thus indicating a negative effect of either parents’ risk aversion on the boys’ transition from none to primary schooling. The log odds ratio of the mother’s risk aversion variable, however, is above one for the transition of girls into primary schooling but below one for the transition into middle school. Thus, the positive association between maternal risk aversion and schooling from the logit model is confirmed but only for the lower transition stages. Interestingly, mother’s relative bargaining power over educational expenses has a negative association with the transition into primary schooling for girls. It reduces, but does not neutralize, the positive association of maternal risk aversion on girls’ schooling at this level. However, maternal relative bargaining power has effect on the higher schooling transitions for girls. Further, farming as the primary occupation of the father reduces the chances of young boys to transition into primary schooling. However, if these boys manage to complete primary school, then the sons of farmers have a greater chance to transit to middle school than the sons of non-farmers.

A word of caution while interpreting our sequential logit results due to the unresolved debate in the literature on the stability of risk preferences. The second stage of the sequential logit model looks at the transition of children to middle school and higher levels of education, which may have happened several years prior to the time at which parental risk preferences were elicited by our lab-in-the-field

<sup>17</sup> While the overall number of observations are reported in Table 8, the sequencing part of the model only accounts for the children that have reached a certain node.

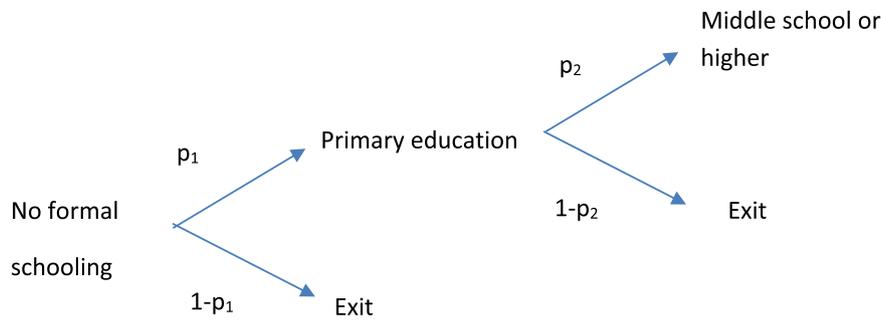


Fig. 6. Sequential educational attainment tree.

Table 8

Log odds results of the role of the binary parental risk aversion variable and binary measure of mother’s bargaining power on the educational transitions.

	Boys		Girls	
	No school-primary	Primary-higher	No school-primary	Primary-higher
Child age	1.2192*** (0.0907)	1.3364*** (0.0693)	1.0074 (0.0594)	1.2142*** (0.0468)
Number of girls	1.3364 (0.5606)	3.0276*** (0.8671)	0.5855 (0.2927)	1.2509 (0.2861)
Number of siblings	0.5297 (0.2209)	0.5201*** (0.1180)	1.3581 (0.4277)	0.8564 (0.1729)
Mother’s years of education	1.8438** (0.4908)	0.9994 (0.0758)	1.1514 (0.1623)	0.9659 (0.0683)
Father’s years of education	0.9111 (0.0873)	1.0511 (0.0618)	1.4373*** (0.1768)	0.9517 (0.0543)
Mother’s risk aversion	0.2089* (0.2003)	1.0277 (0.5044)	9.2439** (8.6419)	0.3239** (0.1519)
Father’s risk aversion	0.2107* (0.1953)	0.7129 (0.3882)	0.5685 (0.4267)	1.9390 (0.8398)
Mother’s bargaining power	0.2773 (0.2439)	0.5889 (0.3127)	0.2085* (0.1927)	0.9406 (0.4206)
Household yearly income	2.0003 (1.8973)	1.2630 (0.2838)	0.7150 (0.1684)	0.6290 (0.2079)
The mother is a farmer	1.4430 (1.4560)	1.0719 (0.7147)	0.1260* (0.1394)	0.8078 (0.4480)
The father is a farmer	0.0106*** (0.0182)	7.8411*** (5.8990)	2.4925 (3.7389)	0.5057 (0.3949)
Constant	10,735*** (35,808)	0.0036*** (0.0044)	0.0000 (0.0000)	0.1534* (0.1736)
Log-likelihood	-98.544942		120.3073	
N observations	177	177	206	206

Note: The table highlights the odd ratios of transitioning from one level to another. An odds ratio of one indicates that an individual our household characteristic does not have any impact on the likelihood of transitioning. An odds ratio greater than one indicates that the variable increases the likelihood of transitioning to the next educational level, while an odds ratio smaller than one indicates that the variable reduces the likelihood of transitioning to the next level. The figures in brackets are standard errors, clustered at the household level. \*\*\*, \*\* and \* indicate significance at the 1%, 5% and 10% level, respectively.

experiment. While the classical economics literature assumes stability of risk preferences, more recent conceptual frameworks point to the possibility that lifetime events and shocks may lead to at least temporary alterations of risk preferences (Schildberg-Hörisch, 2018). In other words, the result from our sequential logit estimates with respect to the

second transition from primary to secondary schooling needs to be treated with caution.

What underlying mechanisms might be at play behind the observed effects of parental risk aversion and mother’s relative bargaining power on the educational outcomes for boys and girls? Our empirical results in Tables 5, 6 and 8 needs to be evaluated against the following established facts for Côte d’Ivoire: (i) crop production is undertaken along gender lines - males in the production of cash crops and females in the production of staples (Duflo and Udry (2004)) with the production of cash crops entailing greater income volatility (Dimova and Gbakou (2013)), (ii) boys’ labor is considered a productive input in agriculture (Abou (2014)), (iii) while the returns to secondary education is high, there is an accompanying risk of unemployment (Kuepie et al. (2009); Oyeniran (2017); Schultz (2004)), (iv) safety of girls is a concern specially when secondary school attendance involves travel over longer distances (Japanese International Cooperation Agency (2013)) and (v) prevalence of early marriage and the norm of receiving a bride price by the parents of girls which could be a significant amount for poorer families (Fenn, Edmeades, Lantos and Onovo (2015) and Jacoby (1995)).

Thus, the result that the likelihood of school attendance for boys is adversely affected if fathers are either risk-averse or are engaged in farming can be attributed to a combination of an aversion to risky educational returns and a preference for current income generated via the employment of boys in cash crop production. Mother’s occupation has a similar effect on the likelihood of school attendance for girls i.e., need for labor in the production of staples, while maternal risk aversion favouring primary school attendance for girls may well be driven by the possibility of obtaining a higher bride price for better educated daughters<sup>18</sup> even though concern for safety acts as a barrier for the transition of girls from primary to secondary schooling. Increased mother’s relative bargaining power acting as an impediment for girls’ school attendance is not surprising. As Table 5 shows, the non-cooperative allocation in relation to the collective one by either spouse exhibit a strong son preference. However, since boys are typically employed in high value cash crop production, greater relative bargaining power of the mother over educational expenses seems to leave the preference for current income unaltered. It further seems from our results that the influence of greater mother’s relative bargaining power is only observable on the decisions that the mother can control, i.e., allocation of girls’ labor to staple crop production and concern for the safety of older girls. However, absent loss aversion experiments and explicit questions in the survey related to perceptions of safety, our interpretation of the pathways through which parental risk aversion and maternal relative bargaining power affects the educational outcomes for boys and girls should be treated only as a plausibility.

**Relative Risk Aversion and Bargaining Power:** Table 9 reports the set of results where relative maternal risk aversion is interacted with the

<sup>18</sup> Ashraf et al., (2014) points out that in a context of bride prices and absence of female land ownership, investing in girls’ education may well be a rational choice amongst risk averse mothers.

**Table 9**

Marginal effects of relative maternal risk aversion and binary measure of mother's bargaining power on school attendance.

VARIABLES	(1) boys	(2) girls
Child age	0.0151*** (0.00562)	0.000298 (0.00462)
Number of girls	0.0114 (0.0217)	-0.0228 (0.0222)
Number of siblings	-0.0398** (0.0202)	0.00309 (0.0133)
Mother's years of education	0.0257** (0.0113)	-0.00285 (0.00685)
Father's years of education	-0.00701 (0.00548)	0.0221*** (0.00763)
Mother's bargaining power	-0.568** (0.273)	-0.653*** (0.231)
Mother's relative risk aversion	-0.00656 (0.00591)	0.0180*** (0.00383)
Mother's relative risk aversion*bargaining power	-0.111* (0.0628)	-0.0208 (0.0459)
Yearly income	0.0356 (0.0344)	-0.0149* (0.00777)
The mother is a farmer	0.0385 (0.0536)	-0.0830** (0.0374)
The father is a farmer	-0.201** (0.0940)	0.0174 (0.114)
R squared	0.344	0.3691
Observations	154	180

Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

binary measure of mother's relative bargaining power. We define relative maternal risk aversion as the difference between the categorical risk aversion of the mother and the father. Thus, a positive value implies a higher maternal risk aversion (mother prefers the lottery rather than the safe return at a higher probability  $p(h)$  of winning as compared to the father). We find that greater relative bargaining power for mothers who are also relatively risk averse has a negative impact on the likelihood of school attendance for boys (albeit at only 10% significance). But mother's relative risk aversion alone has no effect on the school attendance for boys. However, the opposite is the case for girls. Greater relative bargaining power for mothers who are also relatively risk averse has no impact on the likelihood of school attendance for girls, but relative risk aversion (exclusively) has a significant adverse impact on the likelihood of school attendance for girls. Occupational choice of the parents is also strongly associated with the likelihood of children's school attendance. Farming as an occupation for the father is negatively associated with the boys while farming as an occupation for the mother is negatively associated with the girls' school attendance.

## 6. Conclusion

Our analysis of the implications of parental risk preferences and mother's relative bargaining power over the educational expenses of

## Appendix 1. Eliciting risk preferences

### A INSTRUCTIONS

### B RESPONSE SHEET: TABLE 1

#### A. INSTRUCTIONS

Imagine you earned CFA 50,000 and you have to invest that sum in a project of your choosing, in order to enhance productivity on your land.

- If you invest in **Project "A"**, productivity enhancement would yield CFA **65,000**.

TAKE the bag with the lottery: 2 orange balls and 8 white ones.

- If you invest in **project B**, the gain depends on chance:

children highlight three novel findings. First, the association between parental risk preference and educational progressions highlights a greater tendency to treat boys as a productive asset and greater tendency to protect girls. Greater risk aversion on the part of either parent means that boys are less likely to be enrolled in school than girls when they are still at primary school going age. For girls, while maternal risk aversion has a positive impact on the transition from no-schooling to primary school, it impedes the transition to higher levels of education.

Mother's relative bargaining power over the allocation of educational expenses – a key focus of our study – has an adverse impact on the educational progression of girls and no impact on the educational progression of boys. This result contrasts with the finding by Ringdal and Hoem Sjurseten (2021) that an increase in the wife's bargaining power (relative to a Dictator husband) does not increase investment in education for either boys or girls. This negative association between mother's relative bargaining power and the educational progression of girls is orthogonal to the findings from natural experiments evaluated by Martinez (2013) for single mothers in Chile, Bobonis (2009) with respect to both income shocks and conditional cash transfers in Mexico and Duflo (2003) with respect to pension reforms in South Africa. Moreover, greater bargaining power to mother's who are relatively more risk averse than their husbands lowers the likelihood of school attendance for boys. We hypothesize that these results may be driven by a high valuation of current income from the employment of boys in cash-crop (cocoa and rubber) production in rural Côte d'Ivoire.

## Data availability

Data will be made available on request.

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For example, if you take this lottery bag with 10 balls, 2 orange and 8 white:

You earn CFA **80,000** if one of the 2 orange balls comes out

You earn CFA **35,000** if one of the 8 white balls comes out



Look at [Table 1](#):

- The only thing that changes between every row is the number of orange and white balls in Project B bag. Orange balls are those that yield the highest price if they come out of the bag.
- I am going to read each row out loud (1–9).
- In every row, circle letter A if you'd rather invest in project A, or circle letter B if you'd rather invest in Project B.

Remember:

- These prices are for real. If this activity is randomly drawn at the end of today, there will be a winner among you. You will put your ID number in a box, and we will draw one winner at random.
- We will then draw one of the two tables, and one row in the table.
- If, in this row, the winner chose to invest in Project A, he or she will receive the corresponding price.
- If the winner chose to invest in Project B, he or she will play the lottery as indicated in that row, and he or she will receive the highest price if an orange ball comes out, or the smaller price if a white ball comes out.

We will now play. Read the table row after row to make sure participants are keeping up.

B. RESPONSE SHEET: [TABLE 1](#)

1	65 000 Fr	A	B	80 000 Fr <input checked="" type="radio"/> 1 35 000 Fr <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9
2	65 000 Fr	A	B	80 000 Fr <input checked="" type="radio"/> 1 <input checked="" type="radio"/> 2 35 000 Fr <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8
3	65 000 Fr	A	B	80 000 Fr <input checked="" type="radio"/> 1 <input checked="" type="radio"/> 2 <input checked="" type="radio"/> 3 35 000 Fr <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7
4	65 000 Fr	A	B	80 000 Fr <input checked="" type="radio"/> 1 <input checked="" type="radio"/> 2 <input checked="" type="radio"/> 3 <input checked="" type="radio"/> 4 35 000 Fr <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6
5	65 000 Fr	A	B	80 000 Fr <input checked="" type="radio"/> 1 <input checked="" type="radio"/> 2 <input checked="" type="radio"/> 3 <input checked="" type="radio"/> 4 <input checked="" type="radio"/> 5 35 000 Fr <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5
6	65 000 Fr	A	B	80 000 Fr <input checked="" type="radio"/> 1 <input checked="" type="radio"/> 2 <input checked="" type="radio"/> 3 <input checked="" type="radio"/> 4 <input checked="" type="radio"/> 5 <input checked="" type="radio"/> 6 35 000 Fr <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4
7	65 000 Fr	A	B	80 000 Fr <input checked="" type="radio"/> 1 <input checked="" type="radio"/> 2 <input checked="" type="radio"/> 3 <input checked="" type="radio"/> 4 <input checked="" type="radio"/> 5 <input checked="" type="radio"/> 6 <input checked="" type="radio"/> 7 35 000 Fr <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3
8	65 000 Fr	A	B	80 000 Fr <input checked="" type="radio"/> 1 <input checked="" type="radio"/> 2 <input checked="" type="radio"/> 3 <input checked="" type="radio"/> 4 <input checked="" type="radio"/> 5 <input checked="" type="radio"/> 6 <input checked="" type="radio"/> 7 <input checked="" type="radio"/> 8 35 000 Fr <input type="radio"/> 1 <input type="radio"/> 2
9	65 000 Fr	A	B	80 000 Fr <input checked="" type="radio"/> 1 <input checked="" type="radio"/> 2 <input checked="" type="radio"/> 3 <input checked="" type="radio"/> 4 <input checked="" type="radio"/> 5 <input checked="" type="radio"/> 6 <input checked="" type="radio"/> 7 <input checked="" type="radio"/> 8 <input checked="" type="radio"/> 9 35 000 Fr <input type="radio"/> 1

**Appendix 2. Intra-household bargaining power**

**A INSTRUCTIONS (NON-GENDERED)**

- 1 Step 1: public good games (3 rounds)
- 2 Step 2: individual allocation of household money

**B RESPONSE SHEETS FOR THE INDIVIDUALS**

**Note:** the response sheets display the instructions for [WIVES]. The response sheets for husbands were the same, except the rules for household money allocation decisions were inverted between rounds 1 and 2. The response sheets' text is slightly altered [between brackets] where relevant.

- 1 Step 1: public good games (3 rounds)
- 2 Step 2: individual allocation of household money

**A RESPONSE SHEET FOR COUPLE ALLOCATION**

**A. INSTRUCTIONS (NON-GENDERED)**

Step 1: public good games (3 rounds)

*During this activity, spouses will take their decisions apart from each other, wives on one side and husbands on the other. Then they will convene for the final part of the activity.*

Each of you earned between CFA 4000 and CFA 5000 for taking part in today's activities. You can see how much in the wallet drawn on the sheet of paper in front of you (point 1).

In the other room, your spouses have also earned between CFA 4000 and CFA 5000

This activity consists of

- Deciding whether you want to contribute part of this money to a common pool with your spouse, for family expenses (food, school supplies for the children, health, etc.), and how much;
- If you don't contribute the whole thing to the common pool, you will keep the rest for your own personal expenses.

Your spouse makes the same choice on his/her side.

The sum contributed to the common pool on your and your spouse's part multiplies: if you put CFA 1000 into the common pool, it becomes CFA 1500; if you keep CFA 1000, it remains CFA 1000.

A rule that we will share with you before we begin determines who decides how to use the money in the common pool (between you and your spouse). Everyone will play three rounds in this activity but each time with a different rule.

At the end of this activity, we will randomly draw one of the rounds and we will give you an envelope with the money you decided to keep for your own personal expenses, we will give your spouse his/her own envelope and we will give one of you the envelope with the money from the common pool of that round.

*For instance:* I have 4 CFA 1000 banknotes in my wallet (1), so? CFA 4000

(2) I want to put 2 banknotes to the common pool. I check the box for 2 banknotes. Look how much goes to the common pool? CFA 3 500

(3) If my spouse received CFA 5000, I think he put 3 banknotes to the common pool. I check the box for 3 banknotes.

*Other example:* (1) 2 notes (2) 0 note (3) 1 note

Questions? If you have any during the activity, wave at us and we will come to you.

**For the 1st round**, the wives decide how to spend the money from the family's common pool.

In the wallet (1) there are between 4 banknotes of CFA 1000. Your total is written next to your wallet.

**Out of this total**, you will have to decide how much to contribute to the family's common pool (2). **Tick the box corresponding to the number of CFA 1000 banknotes you want to contribute to the common pool** (0 1 2 3 4 or 5).

**Now**, imagine your spouse received CFA 4000. Tick the box corresponding to the number of CFA 1000 banknotes you think your spouse contributed to the family's common pool (0 1 2 3 or 4)

Is everybody done with that sheet?

**For round 2**, it is the husbands who decide how to spend the money from the family's common pool.

- 1 CFA 5000 in the wallet.
- 2 How much do you put in the pot?
- 3 Imagine if your spouse also received CFA 5000.....

Same questions

Is everybody done with that sheet?

**For round 3**, you decide together with your spouse how to spend the money from the family's common pool.

- 1 CFA 4000 in the wallet.
- 2 How much do you put in the pot?
- 3 Imagine if your spouse also received CFA 4000.....

Same questions

Is everybody done with that sheet?

Alright now we will gather the answer sheets, take a 10 min break and meet the others. After that you will make one last decision on how to spend the money from the common pool.

2. Step 2: individual allocation of household money

*After 10 min*

In front of you, a new answer sheet.

Written on it, the total sum in the common pool after you and your spouse contributed. It is your turn to decide what you would like to spend that money on among several option (read)

Choose 1, 2 or 3 of these options and write how much money you would like to spend on each.

Careful, you can't spend more than the total sum written for the common pool.

For instance: if in the common pool there is CFA 8000, you can't spend 5000 on one thing and 4000 on another. Why? *Because 9000 > 8000. Check with people that they understood.*

**1st or 2nd round:** it is you (husband or wife) who decide how to spend the money from the common pool for family expenses.

There is CFA..... in the common pool

What would you like to spend this money on?

	How much?
Food	
Health	
Children's Education	
Money Transfers to Children	
Money Transfers to Parents	
Housing	
Transportation	

Is everybody done? We'll pick up the answer sheets now.

Now, couples please get together.

In front of you, a new sheet of paper with on it, the total sum in the common pool for that round.

You have 5 min to decide together what are the 1, 2 or 3 items you want to spend this money on, and how much (read the list above). Write that down on the paper.

**B. RESPONSE SHEETS FOR INDIVIDUALS**

**Note:** the response sheets display the instructions for [WIVES]. The response sheets for husbands were the same, except the rules for household money allocation decisions were inverted between rounds 1 and 2. The response sheets' text is slightly altered [between brackets] where relevant. The alterations are as follows for the husband's version of the response sheet:

- [YOU] (Step 1, 1st round) becomes [YOUR WIFE]
- [YOUR HUSBAND] (Step1, 2nd round) becomes [YOU]
- [1st round] (Step 2) becomes [2nd round]

Step 1: public good games (3 rounds)

[1st Round]: YOU are the one who will decide on how to spend the money in the common pot for family expenses.

- 1) You have CFA 4000.
- 2) In the common pot for family expenses (check ONE box below)



You Put	This will result in
0	0
1000	1500
2000	3000
3000	4500
4000	6000

- 3) Imagine if your SPOUSE also had CFA 4000  
Your think your Spouse put (check ONE box below)

Your SPOUSE Put	This will result in
0	0
1000	1500
2000	3000
3000	4500
4000	6000

[2nd Round]: It is Your Husband who will decide on how to spend the money in the common pot for family expenses.

- 1) You have CFA 5000.
- 2) In the common pot for family expenses (check ONE box below)



You Put	This will result in
0	0
1000	1500
2000	3000
3000	4500
4000	6000
5000	7500

3) Imagine if your SPOUSE also had CFA 5000  
 Your think your Spouse put (check ONE box below)

Your SPOUSE Put	This will result in
0	0
1000	1500
2000	3000
3000	4500
4000	6000
5000	7500

[3rd round]: You and Your Spouse **TOGETHER** will decide on how to spend the money in the common pot for family expenses.

- 1) You have CFA 4000.
- 2) In the common pot for family expenses (check ONE box below)



You Put	This will result in
0	0
1000	1500
2000	3000
3000	4500
4000	6000

3) Imagine if your SPOUSE also had CFA 4000  
 Your think your Spouse put (check ONE box below)

Your SPOUSE Put	This will result in
0	0
1000	1500
2000	3000
3000	4500
4000	6000

Step 2: individual allocation of household money

[1st round], **YOU** are the one to decide how to spend the money from the common pot for family expenses.

There is CFA.....in the common pot for family expenses.

What do you want to spend the money on?

	How much?
Food	
Health	
Children's Education	
Money Transfers to Children	
Money Transfers to Parents	
Housing	
Transportation	

## C. Response Sheet for Couple Allocation

**[3rd round]**, YOU and YOUR SPOUSE together decide how to spend the money from the common pot for family expenses.

There is CFA.....in the common pot for family expenses.

What do you want to spend the money on?

	How much?
Food	
Health	
Children's Education	
Money Transfers to Children	
Money Transfers to Parents	
Housing	
Transportation	

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