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Contents

The findings presented in this thesis, the interpretations and the conclusions that are drawn from the results are those of the author(s) alone.

Introduction

Gender inequality is pervasive and multifaceted. Regarding economic participation and opportunities, 257 years would be needed to close the global gender gap if progress continued at the same rate as during the period between 2006 and 2019 (World Economic Forum, 2019). The Human Development Report (HDR), developed on an annual basis by the United Nations Development Programme, presents a measure for gender disparity at country-level, the Gender Inequality Index (GII). This index is created by considering three dimensions: health, empowerment and labour market outcomes. More specifically, the GII is calculated including maternal mortality ratio, adolescent birth rate, shares of female and male adults aged at least 25 years with secondary education, shares of parliamentary seats by gender, and labour force participation rates related to women and men aged 15 years and over (UNDP, 2019, 2020). According to the HDR 2019, no country has already achieved full equality between women and men (UNDP, 2019).

Compared to men, women find themselves in a more disadvantageous position, considering a high number of aspects of their lives. Effectively measuring female empowerment is complex, since improvements are context-specific and the process through which empowerment is achieved is generally not directly observable (Mahmud et al., 2012). One of the measures that are largely used to this purpose refers to decision-making ability. Indeed, it is likely that women are less involved in intra-household bargaining and make less decisions on their own, especially decisions regarding the allocation of resources. This may reflect women's low bargaining power, which depends on a set of factors like education, asset ownership, and social norms (Agarwal, 1997; Kabeer, 1999).

Gender dynamics influence many outcomes at micro- and macro-level, and migra-

tion, a phenomenon that in 2019 involved hundreds of millions of people globally (International Organization for Migration, 2019; UNHCR, 2020), is one of them, although it has not been investigated under a gender perspective for a long time. In the 1980s, migration research started to consider gender dimensions, even if an effective shift in thinking within the literature started in the 1990s: gender-conscious studies began to contribute to the body of literature on migration dynamics, by investigating the role of gendered determinants and the differential effects of migration on women and men (Boyd and Grieco, 2003; Fleury, 2016).

This thesis investigates the interdependence between migration and gender dynamics, with a focus on developing countries. More specifically, the *first chapter* concerns intra-household bargaining and migration decision-making. Considering that the decision to migrate is likely to be made within the family, the bargaining powers of household members may shape the result of the decision-making process. The focus of this chapter is on the migration of young individuals, for whom moving may represent a strategy for upward mobility. Since there is large evidence of women's altruistic behaviours towards their children, I investigate how mother's bargaining power affects the decision about the migration of her offspring, who may benefit from the change in location. A collective model of migration decision-making is presented and, to the best of my knowledge, is the first model that theorises how the choice of offspring's migration is made. The predictions of the model are then tested using data from a longitudinal survey on Mexico. An index for mother's power is used to create a dummy variable, which differentiates high-powered mothers from low-powered ones, and propensity score weighting is employed to solve endogeneity and to improve the balance of observables between the groups of high-powered and low-powered mothers. Results are consistent with the findings of the theoretical model: the offspring of empowered mothers are more likely to move. Moreover, there is a higher probability for migrated individuals to

be employed and to have savings at their disposal. This analysis sheds the light on how empowerment may be beneficial not only to women themselves but also to their children, and suggests that policies intending to improve women's position within the household and the whole society should also acknowledge these positive spillover effects.

The *second chapter* regards the uncertainty over health status and the gendered determinants of migration in Malawi. While a number of studies suggest that a relationship between health and migration exists, migration selection in terms of health conditions has been relatively underinvestigated in the context of sub-Saharan Africa (Anglewicz et al., 2018). Using panel data from a survey on young Malawians, I assess the impact of randomised HIV testing on long-term migration and short-term journeys, and I find that becoming certain of being HIV-negative reduces, only for women, the probability of both types of movements. On the one hand, the effect on migration is mainly related to married women and may be due to the avoidance of marital dissolution; on the other hand, the decrease in the likelihood of temporary movements is relative only to unmarried women and may be explained by a rise in risk aversion. The evaluation of this HIV-related intervention indicates that HIV testing has gender-specific unintended consequences, which may need to be counterbalanced: while couple stability could be a positive outcome for tested women, reducing short-term mobility may imply not taking advantage of economic and social opportunities.

Finally, the *third chapter* evaluates the impact of a randomised intervention, aiming to promote child development through improvements in parenting skills, on the empowerment of women in Bangladesh. Households with children aged 3–18 months were randomly selected, and mothers received programme materials and counselling services, which may increase their parenting knowledge. This parenting-related education is likely to make mothers more knowledgeable than

before the treatment, and also more than other household members. Therefore, this may make mothers more influential in intra-household bargaining, in a context in which women have generally low decision-making autonomy – especially for the decisions related to expenditures. Results show that the treatment increases mothers' autonomy and reduces their exclusion from decision-making processes. This effect does not concern only child-related decisions – consistent with the type of education that mother receive – but also decisions about the allocation of resources. The empowerment impact regards only households in which parents cohabit: before the treatment, mothers, whose spouse has previous migration experience and is absent at the time of the baseline, are relatively more empowered than mothers living with their partners, therefore it is possible that this contributes to making them experience no changes in bargaining power. Indeed, as suggested in previous studies, female empowerment and male migration are likely to be positively associated.

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Chapter 1

Mother's Bargaining Power and Offspring's Migration

Jointly written with Gabriella Berloffa

Abstract

The decision to move is likely to be the result of intra-household bargaining, therefore the distribution of power within the family may play a role in determining the outcome of the process. This chapter focuses on the migration of young individuals, who may be highly dependent on their parents. More specifically, this work investigates how mother's decision-making power affects her offspring's migration, which represents an opportunity for upward mobility. A collective household model is included and empirically tested using data on Mexico. Results show that a higher power of the mother increases the probability that her offspring move, and the mechanism that underlies this impact refers to the differences in preferences between parents. This implies that interventions aiming to empower women may have positive spillover effects on their children.

Keywords: intra-household bargaining, mother, power, migration, offspring, Mexico

1.1 Introduction

Migration decision-making and determinants have received long-standing attention from social scientists. A high number of theories and empirical investigations have provided insights into the factors that contribute to shaping migration: while income differentials, returns to skills and networks have been widely discussed, there is scope for large improvements in the understanding of the role of intra-household dynamics. Indeed, following the hints from the New Economics of Labour Migration (Stark and Bloom, 1985), migration may be the result of a joint decision made by migrant and non-migrant individuals, who commit themselves to sharing the costs and benefits of the relocation. Therefore, considering that migration decision-making is likely to take place within the household, the bargaining powers of family members may affect the outcome of the process, although their influence has been addressed in relatively few studies. This chapter examines the bargaining aspect of the choice to move and focuses on the migration of young individuals, who may be highly dependent on their parents. In particular, this work addresses how the decision-making power of the mother affects the migration of her offspring: migration may indeed represent an opportunity for offspring's personal development, and mothers, whose empowerment has been found to be beneficial to their children thus possibly signalling altruism, may be willing to promote it.

A collective household model is presented and illustrates that, because of differences in preferences between parents, an increased decision-making power of the mother leads to a higher probability that her offspring move. These predictions are empirically tested using longitudinal data from the Mexican Family Life Survey, and results are consistent with the findings of the model, showing that young Mexicans' migration, which increases the likelihood of employment and of the availability of savings, is more likely when their mothers' power is higher.

1.2 Migration Theories and Collective Bargaining

The understanding of the factors underlying migration movements is pioneered by Ravenstein (1885, 1889), who suggests the existence of mobility from rural to urban areas and provides possible explanations for it, considering the characteristics of the places of origin and destination and the individuals' desire to be better-off. Several decades later, rural-urban movements are theorised as labour migration resulting from the interaction between income differentials and the employment probability at destination (Todaro, 1969): as presented in the Harris-Todaro model, migration originates from a disequilibrium condition, in which the expected income in the urban sector – consisting of the real income adjusted for the proportion of labour force that is employed – exceeds the rural real earnings (Harris and Todaro, 1970).

Referring to the human capital framework, Sjaastad (1962) considers migration as an investment decision, responding to the comparison between costs and returns. Borjas (1989) presents a model of international migration, following Roy's theory (1951) on the distribution of earnings: given the assumption that the migration decision is driven by an income-maximisation rationale and that wage is a function of individual abilities, migrants are self-selected in terms of their education and unobserved qualities according to the returns to skills in the sending and receiving countries. Borjas proposes that there exists a positive selection when migrants are more skilled than the average individual at both origin and destination, and, relatively to earnings, outperform the host country's natives with the same characteristics. Conversely, a negative selection defines the case in which migrants are selected from the lower tail of the skills – and earnings – distributions, and earn a lower income than the one earned by the average native with equal abilities.

While continuing to highlight the role of income and skills, Stark and Bloom's

New Economics of Labour Migration (1985) provides novel contributions to the migration framework. Concerning earnings, this theory introduces the concept of relative deprivation, which indicates that individuals who are in a disadvantaged position with respect to their reference group choose to move in order to improve their relative income-related situation. Yet the most innovative perspective that is offered by this theory refers to the shift from an individual to a collective approach to migration decision-making. Indeed, Stark and Bloom suggest that the choice to move is taken by migrant and non-migrant individuals, who pool the risks of migration by sharing benefits and costs. More specifically, it is likely that migration occurs as the result of a mutually beneficial intertemporal arrangement between migrants and their family members, the latter contributing to migration costs and receiving remittances. Finally, this theory also suggests that migrants are supported by individuals who have migrated before them, an idea that is previously proposed by Choldin (1973) and is followed by theories of migration networks a few years later (Boyd, 1989; Fawcett, 1989).

Like in the case of migration, the family dimension is relevant to decision-making processes and begins to be considered by economists in the 1950s (Becker, 1981). In Becker's model (1965), household dynamics are theorised using a unitary approach, according to which the household behaves as if all members have a unique rational order of preferences, thus acting like a single decision-maker: each family maximises a unique utility function, subject to one household budget constraint. However, given that the properties of this common preference model are repeatedly rejected by empirical evidence, non-unitary theories of household behaviour are developed, proposing either cooperative or non-cooperative attitudes between family members (Manser and Brown, 1980; McElroy and Horney, 1981; Chiappori, 1988; Browning and Chiappori, 1998). The main hints from collective household models are the rejection of the income pooling hypothesis, and the consideration

of individuals' bargaining powers. Indeed, since household members may have different preferences, power dynamics play a role in determining the outcome of the decision-making.

The intra-household distribution of power is influenced by individual incomes and other factors according to Browning and Chiappori (1998), who mention law changes and the existence of discriminatory work environments as examples of what they define as distribution factors. The gendered aspect of the distribution of power is highlighted by Agarwal (1997) and Kabeer (1999): according to Agarwal (1997), social and gender norms, as well as laws like the ones regulating inheritance, may restrict women's decision-making ability and contribute to defining female position within and outside the household. She also indicates other factors that influence bargaining power, such as education, access to income-generating activities, ownership of assets, and support from government and non-governmental organisations. Kabeer (1999) focuses on women's empowerment, explaining how it can be measured and what are its determinants: she proposes three dimensions related to decision-making power, namely resources, agency and achievements. Resources – referring not only to economic ones, but also to social and human capital – are the pre-conditions for empowerment, agency reflects the ability to pursue own objectives – mainly measured by the decisions made by the individual –, and achievements concern the outcomes that are reached through empowerment – for instance, changes in the health of women and children. Indeed, female empowerment is found to be beneficial not only to women themselves, but also to their children. Several studies show that, when mothers are empowered – for example, they are more educated, have more control over assets or participate in credit programmes –, there is evidence of benefits for children, such as investments in their human capital and increased resources allocated to their needs (Leibowitz, 1974; Pitt and Khandker, 1998; Quisumbing and Maluccio, 2000; Kabeer, 2001; Ander-

son and Baland, 2002; Gitter and Barham, 2008). This also suggests that mothers may be more altruistically driven than fathers, thus promoting the achievement of positive outcomes for children.

The intuitions from the theories of migration and of household behaviour are merged to create a collective model of migration decision-making, which is presented in the following section. In particular, we consider the decision of young offspring's migration, jointly made by the parents, and we assume that migration can improve both household well-being and offspring's personal development. We allow for differences between parents in bargaining powers[1] and preferences, and we intend to focus on how mother's power influences the decision, given that migration can be a tool for the offspring to achieve positive outcomes and that the mother may be more altruistic than the father.

1.3 Collective Model of Migration Decision-Making

Consider a household composed of two parents and one child[2], and assume the existence of two periods, $t = 1,\ 2$. In the first period, all family members cohabit, and parents' earnings are the only source of income. In the second period, the child lives either with the parents as in $t = 1$, contributing to the household income with a share of own earnings; or in a new location, sending to the family left-behind a part of own income and a portion of the migration costs that were entirely borne by the parents in the previous period.

Given child's young age, the child lacks own resources and can only express a preference for migration, while the choice is made by the parents. The mother and father are endowed with different bargaining powers, and the outcome of the decision-making is Pareto efficient (Browning and Chiappori, 1998). Income

[1] In the model, we consider bargaining powers as exogenous parameters for simplicity reasons.
[2] The term *child* here refers to a young working-age daughter or son.

differentials between origin and destination (Harris and Todaro, 1970) affect the decision, and migration costs and gains are assumed to be shared between the parents and the child (Stark and Bloom, 1985).

1.3.1 Maximisation of parents' utility

In the first period, in order to make a decision about child's migration, parents maximise their intertemporal utility W^P, which is composed of the sum of mother's and father's utilities, U^{Moth} and U^{Fath}, weighted by each parent's bargaining power. These two mutually independent utilities are represented by Cobb-Douglas functions, which are assumed to be additive with respect to current and future household consumption and to child's consumption in $t = 2$. This functional form is consistent with previous models of intra-household bargaining, in which decision-makers' utilities may also include altruistic components (Baland and Robinson, 2000; Cigno and Rosati, 2005; Lundberg, Romich, et al., 2009; Del Boca et al., 2014). Therefore, parental utility W^P is expressed as follows:

$$\begin{aligned} W^P(c_{h_1}, c_{p_2}, \bar{c}_{c_2}) &= \varphi\, U^{Moth}(c_{h_1}, c_{p_2}, \bar{c}_{c_2}) + (1-\varphi)\, U^{Fath}(c_{h_1}, c_{p_2}, \bar{c}_{c_2}) \\ &= \varphi(\alpha ln c_{h_1} + \beta ln c_{p_2} + \delta ln \bar{c}_{c_2}) + (1-\varphi)(\alpha' ln c_{h_1} + \beta' ln c_{p_2} + \delta' ln \bar{c}_{c_2}) \end{aligned}$$

The term c_{h_1} stands for household consumption in $t = 1$, c_{p_2} represents parents' future consumption[3], and $\bar{c}_{c_2}$ indicates child's consumption in $t = 2$, which is assumed to be exogenous. Parental preferences are allowed to differ, and φ is mother's bargaining power[4], while $(1 - \varphi)$ is father's one.

The utility maximisation in terms of c_{h_1} and c_{p_2} is subject to two mutually exclusive budget constraints, depending on child's future scenarios. If offspring's migration did not occur, household consumption would be constrained by parents' total

[3] In the first period, the household is made of both parents and child, so household consumption can be decomposed as follows: $c_{h_1} = c_{p_1} + c_{c_1}$.
[4] $0 \leq \varphi \leq 1$

income and a share of child's earnings, as presented in (1). Conversely, if the child moved, the constraint would also include remittances, as shown in (2).

$$\max_{c_{h_1}, c_{p_2}} \; W^P(c_{h_1}, c_{p_2}, \bar{c}_{c_2})$$

subject to

$$c_{h_1}(1+r) + c_{p_2} \leq y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^O \qquad \textit{if } M{=}0 \quad (1)$$

$$c_{h_1}(1+r) + c_{p_2} \leq y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^D - MC_c(1+r)(1-\gamma) \qquad \textit{if } M{=}1 \quad (2)$$

In the conditions (1) and (2), y_{h_1} and y_{p_2} indicate parents' income in $t = 1$ and $t = 2$ respectively[5], and the term r is the interest rate. Child's future income is represented by $y_{c_2}^O$ in condition (1) and by $y_{c_2}^D$ in condition (2)[6], and MC_c stands for migration costs. Moreover, σy_{c_2} is the share of child's future income given to the parents[7] and $\gamma MC_c(1+r)$ is the share of migration costs sent to the parents by the child in the second period.[8]

Maximising parents' utility, the optimal levels of household consumption would be $c_{h_1}^{\mathrm{NM}*}$ and $c_{p_2}^{\mathrm{NM}*}$, if the child stayed, and $c_{h_1}^{\mathrm{M}*}$ and $c_{p_2}^{\mathrm{M}*}$, if the child migrated[9]. For each migration scenario, these optimal levels represent parents' intertemporal income multiplied by the relative weight of each period's consumption in parents' utility.

$$c_{h_1}^{\mathrm{NM}*} = \frac{\Big(y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^O\Big)\Big(\varphi\alpha + (1-\varphi)\alpha'\Big)}{(1+r)\Big(\varphi(\alpha+\beta) + (1-\varphi)(\alpha'+\beta')\Big)}$$

$$c_{p_2}^{\mathrm{NM}*} = \frac{\Big(y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^O\Big)\Big(\varphi\beta + (1-\varphi)\beta'\Big)}{\Big(\varphi(\alpha+\beta) + (1-\varphi)(\alpha'+\beta')\Big)}$$

[5] In $t = 1$, parents' earnings are the only source of household income; therefore $y_{h_1} = y_{p_1}$.
[6] $y_{c_2}^D > y_{c_2}^O$
[7] For simplicity, σ is assumed to be independent of migration scenarios. However, in case of migration, child's remittances also include a part of migration costs. Therefore, child's total contribution to household income in $t = 2$ is likely to vary when migration occurs.
[8] Note that $0 \leq \sigma \leq 1$ and $0 \leq \gamma \leq 1$.
[9] See *Section 1* in the Appendix for a full description of the maximisation procedure.

$$c_{h_1}^{\mathrm{M}*} = \frac{\Big(y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^{D} - MC_c(1+r)(1-\gamma)\Big)\Big(\varphi\alpha + (1-\varphi)\alpha'\Big)}{(1+r)\Big(\varphi(\alpha+\beta) + (1-\varphi)(\alpha'+\beta')\Big)}$$

$$c_{p_2}^{\mathrm{M}*} = \frac{\Big(y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^{D} - MC_c(1+r)(1-\gamma)\Big)\Big(\varphi\beta + (1-\varphi)\beta'\Big)}{\Big(\varphi(\alpha+\beta) + (1-\varphi)(\alpha'+\beta')\Big)}$$

The comparison between parental indirect utility functions $W^P(c_{h_1}^{\mathrm{M}*}, c_{p_2}^{\mathrm{M}*}, \bar{c}_{c_2}^{\mathrm{D}})$ and $W^P(c_{h_1}^{\mathrm{NM}*}, c_{p_2}^{\mathrm{NM}*}, \bar{c}_{c_2}^{\mathrm{O}})$ indicates which migration scenario is the most advantageous for parents.

1.3.2 Optimal decision

Parents would opt for child's migration if the indirect utility $W^P(c_{h_1}^{\mathrm{M}*}, c_{p_2}^{\mathrm{M}*}, \bar{c}_{c_2}^{\mathrm{D}})$ exceeded the indirect utility $W^P(c_{h_1}^{\mathrm{NM}*}, c_{p_2}^{\mathrm{NM}*}, \bar{c}_{c_2}^{\mathrm{O}})$, namely:

$$W^P(c_{h_1}^{\mathrm{M}*}, c_{p_2}^{\mathrm{M}*}, \bar{c}_{c_2}^{\mathrm{D}}) > W^P(c_{h_1}^{\mathrm{NM}*}, c_{p_2}^{\mathrm{NM}*}, \bar{c}_{c_2}^{\mathrm{O}}) \tag{3}$$

Rearranging condition (3)[10], child's migration is parents' optimal decision when child's relative gains in terms of future consumption, to the power of parental altruistic weight, exceed the possible relative loss in parents' consumption, to the power of parental consumption weight:

$$\left(\frac{\bar{c}_{c_2}^{\mathrm{D}}}{\bar{c}_{c_2}^{\mathrm{O}}}\right)^{A_W} > \left(\frac{FVC^{\mathrm{NM}}}{FVC^{\mathrm{M}}}\right)^{C_W} \tag{4}$$

In condition (4), A_W is the altruistic weight in parents' utility[11] and C_W is the consumption weight in parents' utility[12]. Furthermore, $\bar{c}_{c_2}^{\mathrm{D}}$ and $\bar{c}_{c_2}^{\mathrm{O}}$ stand for child's future consumption when the child migrates and when the child stays, respectively. FVC^{M} and FVC^{NM} represent the future values of parents' total consumption ac-

[10] See *Section 2* in the Appendix for all the steps of this procedure.
[11] $A_W = \varphi\delta + (1-\varphi)\delta'$
[12] $C_W = \varphi(\alpha+\beta) + (1-\varphi)(\alpha'+\beta')$

cording to the different migration scenarios [13].

1.3.3 Implications

As previously stated, child can only express a preference for migration but does not directly participate in the decision-making. To the child, migration would be beneficial if returns exceeded remittances, $y_{c_2}^D - \gamma MC(1+r) - \sigma y_{c_2}^D > y_{c_2}^O - \sigma y_{c_2}^O$, a condition that can be rearranged as follows:

$$(y_{c_2}^D - y_{c_2}^O) > \frac{MC(1+r)(\gamma)}{1-\sigma} \tag{5}$$

If parents were egoistic, their altruistic weight A_W would be null and condition (4) would become:

$$\left(\frac{FVC^{\text{NM}}}{FVC^{\text{M}}}\right)^{C_W} < 1 \tag{6}$$

Therefore, migration would be beneficial to them and so would be opted for if $FVC^{\text{M}} > FVC^{\text{NM}}$, which equals to:

$$(y_{c_2}^D - y_{c_2}^O) > \frac{MC(1+r)(1-\gamma)}{\sigma} \tag{7}$$

This suggests that, for any given child's income differential, offspring's migration is more likely the lower the migration costs, the higher the share of costs paid back to parents, and the higher the share of child's income that is given to parents.

Rearranging conditions (5) and (7), we notice that whether migration is an advantageous outcome for the parents and for the child depends on σ and γ.

$$\textit{Benefit for child}$$

$$\frac{(y_{c_2}^D - y_{c_2}^O)}{MC(1+r)} > \frac{\gamma}{1-\sigma} \tag{8}$$

[13] $FVC^{\text{NM}} = y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^O (no\ migration)$ and $FVC^{\text{M}} = y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^D - MC_c(1+r)(1-\gamma)(migration)$.

Benefit for the parents

$$\frac{(y_{c_2}^D - y_{c_2}^O)}{MC(1+r)} > \frac{(1-\gamma)}{\sigma} \tag{9}$$

Indeed, from conditions (8) and (9), we obtain that whether moving is beneficial is determined by $\frac{\gamma}{1-\sigma} \lessgtr \frac{(1-\gamma)}{\sigma}$, more specifically:

$$\sigma + \gamma \lessgtr 1 \tag{10}$$

Therefore, migration would generate a gain for the child and a loss for the parents if $\frac{\gamma}{1-\sigma} < \frac{(1-\gamma)}{\sigma}$, so when $\sigma + \gamma < 1$. Conversely, migration would be beneficial to the parents but not to the child if $\frac{\gamma}{1-\sigma} > \frac{(1-\gamma)}{\sigma}$, so when $\sigma + \gamma > 1$. If moving would be either a gain or a loss for both parents and child, then $\sigma + \gamma = 1$. Considering these three different situations, the outcome of the decision-making would be Pareto efficient for both parents and child, independently of altruism, only when both of them agree on whether migration is advantageous or not, i.e. when $\sigma + \gamma = 1$. Conversely, if parents were egoistic and $\sigma + \gamma < 1$, offspring's migration, which would be a good opportunity for the child, would not occur because parents would lose from it. Similarly, if $\sigma + \gamma > 1$, egoistic parents would make their child move because they would gain from migration, although the child would incur a loss. These last two cases show that parents' altruism is fundamental for child's welfare when optimal migration decisions of parents and child are discordant.

Indeed, if parents were altruistic, the decision about offspring's migration depends on condition (4), which can be rearranged as:

$$\left(\frac{(1-\sigma)y_{c_2}^D - \gamma MC(1+r)}{(1-\sigma)y_{c_2}^O}\right)^{A_W} > \left(\frac{y_T + \sigma(y_{c_2}^D - y_{c_2}^O) - MC(1+r)(1+\gamma)}{y_T}\right)^{-C_W} \tag{11}$$

where $y_T = y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}$

Transforming condition (11), we obtain:

$$\approx \frac{A_W}{C_W}\left(\frac{(1-\sigma)(y_{c_2}^D - y_{c_2}^O) - MC(1+r)\gamma)}{(1-\sigma)y_{c_2}^O}\right) > \frac{-\sigma(y_{c_2}^D - y_{c_2}^O) - MC(1+r)(1-\gamma)}{y_T}$$

$$\approx \frac{A_W}{C_W} > \frac{-(\%\Delta C^P)}{(\%\Delta C^C)} \tag{12}$$

Condition (12) suggests that, if migration generated a gain for the child but a loss for the parents, the higher the percentage increase in child's consumption, the lower A_W needed to make the child migrate. Moreover, the larger the percentage decrease in parents' consumption, the higher A_W required in order for offspring's migration to occur.

Conversely, if migration is advantageous only for parents, the larger the percentage decrease in child's consumption, the lower A_W needed to make the child stay. Furthermore, the greater the percentage rise in parents' consumption, the higher A_W needed to make the child not migrate.

Given the predictions of this model, we expect that the mother is altruistic and is also relatively more generous than the father (Eckel and Grossman, 1998; Andreoni and Vesterlund, 2001; Simmons and Emanuele, 2007; Falk et al., 2018). Therefore, we also expect that a higher power of the mother increases the probability of offspring's migration, given that moving results in a benefit for the child (Thomas et al., 1991; Lundberg, Pollak, et al., 1997; Phipps and Burton, 1998; Allendorf, 2007; Gitter and Barham, 2008; Behrman et al., 2009; Reggio, 2011; Duflo, 2012; Lépine and Strobl, 2013; van den Bold et al., 2013; Brauw et al., 2014; Imai et al., 2014; Parker and Todd, 2017). We acknowledge that a higher power of the mother is not a sufficient condition to increase migration probability and indeed mother's altruism is required for this to happen: in cases in which migration implies a loss for the parents but is beneficial to the child, the mother needs to be altruistic and

the level of her altruism has to reach a certain threshold in order to make child's migration occur.

Finally, we need to address two possible limitations of this model. First of all, it can be possible that the mother values the presence of her child at home and therefore would bear an additional cost if the child moved. Assuming that this is the case, on the one hand, an increase in mother's power may lead to a reduction in offspring's migration probability; on the other hand, since the mother is expected to be altruistic, this increase may also rise the probability that the child migrates. Therefore, even assuming the existence of these two simultaneous counter-effects, we expect that, if the mother was altruistic enough and the child benefitted from migration, the positive impact would be larger than the negative one, thus making the probability of migration rise.

Lastly, we also consider whether the predictions of the model would change if the share of parents' benefits from migration changed with mother's power. If the altruistic mother had more power and made potential remittances increase[14], migration would still occur either (i) when moving continued to generate a gain for the child or (ii) when migration resulted in a loss for the child but a gain for the parents and the mother was not altruistic enough to let the child stay. Conversely, if an increase in mother's power decreased potential remittances and this created a loss for the parents, the child would migrate only when mother's altruism is large enough to compensate for the reduction in parents' consumption.

[14] A situation that appears to be a contradiction. Indeed, it seems counterintuitive that an altruistic mother asks for more remittances, thus making child's benefits from migration decrease.

1.4 Migration and Women's Decision Making Power in Mexico

The predictions of the theoretical model are tested using data on Mexico, whose context fits the research question and the assumptions of the model. In 2019, Mexico had the second-highest stock of emigrants globally, since nearly 12 million Mexicans lived abroad – representing 9% of the population of the country (United Nations, 2019a,c). Like international migration, internal movements are common: in 2015, approximately 20 million inhabitants were not residing in their birthplace (16% of Mexican population), and more than 3 million individuals changed their place of residence with respect to 5 years before, moving within the country. Mexican migration has been largely investigated and has been found to be a risky investment, influenced by factors like economic opportunities, skills, assets and networks (Massey and Espinosa, 1997; Lindstrom and Lauster, 2001; Munshi, 2003; VanWey, 2005; Chiquiar and Hanson, 2005; Mckenzie and Rapoport, 2007; McKenzie and Rapoport, 2010; Kaestner and Malamud, 2014; Angelucci, 2015). Migration to the US is generally considered as an opportunity for upward mobility and, in communities where emigration has been high, it has become an expected trajectory in the lives of young Mexicans, men in particular (Kandel and Massey, 2002). Zenteno et al. (2013) suggest that the movements of Mexican adolescents and young adults may also reflect the timing of key life events, namely the end of schooling, the entrance in the labour market and marriage.

The interdependence between Mexican migration and women's position within the household has been examined with a focus on female empowerment as determinant or consequence of partner's migration (Antman, 2015; Nobles and McKelvey, 2015). Conversely, to the best of our knowledge, no studies on Mexico address the effect of women's decision-making power on their offspring's migration. How-

ever, there is already evidence of other benefits for children, such as less child labour and higher school enrolment, when mothers are empowered (Reggio, 2011; Chakraborty and De, 2017). Several analyses evaluate the impacts of the government programme Oportunidades (previously Progresa and lately known as Prospera), which provided poor households with cash payments, conditional on the fulfilment of requirements related to education and health. This intervention targeted women as the recipients of the transfers, given the assumption that an increase in the resources controlled by female family members would benefit the household more than a rise in men's income (Rubalcava, Teruel, and Thomas, 2009). Better outcomes for children are among the effects of Oportunidades, such as improved physical health and growth, increased cognitive development and educational attainment, and reduced behavioural problems (Fernald et al., 2008; Leroy et al., 2008; Fernald et al., 2009; Behrman et al., 2009, 2011; Parker and Todd, 2017). The possible channel through which these effects are achieved is women's empowerment (Barber and Gertler, 2009, 2010), which is a desirable outcome per se considering that gender disparities in labour force participation, earnings, access to credit and asset ownership are still present and reflect the inequality between women and men (World Bank, 2019).

1.5 Data

Data from the Mexican Family Life Survey (MxFLS) are used to empirically test the collective model of offspring's migration decision-making (Rubalcava and Teruel, 2006, 2008, 2013). This three-round survey is longitudinal and nationally-representing, covering the 10-year time span from 2002 to 2012. The Ibero-American University and the Center for Economic Research and Teaching (CIDE) developed and implemented the MxFLS with the support of the National Institute of Statistics and Geography (INEGI), the National Institute of Public Health (INSP), Duke

University, and the University of California, Los Angeles. The survey provides detailed information about short- and long-term migrations, within Mexico and to other countries – mainly to the United States. Individuals are followed after migration, and retrospective information about pre-survey movements are also collected. A wide range of socio-economic data is available, including details about decision-making dynamics within the household.

This chapter focuses on the second (2005-6) and third (2009-12) rounds of the MxFLS, while it uses the baseline survey only to increase the availability of data about previous migration events. More specifically, the analysis examines migrations of individuals aged 13-25 years[15], occurred between the second and third rounds, and considers as main determinant of interest the information about intra-household bargaining collected during the second round. The sample is restricted to young respondents who were living with both parents in the second round: the presence of both mother and father is needed to provide a better evaluation of the effect of the distribution of power between parents. In this way, the setting is consistent with the assumptions of the collective household model.

Given the age range, the presence of both parents and the availability of information about decision-making, 5,944 individuals are considered. However, migration information from the third round cannot be found for 4.64% of them – mainly because of attrition. Therefore, the sample includes 5,668 respondents whose migration experiences after 2006 are available, and 15% of them are migrants. It is

[15]This age range – referring to the individuals interviewed in the second round (2005-2006) – was chosen considering the years of compulsory schooling and the average age at first marriage in Mexico. Indeed, at the time of the interview, nine years of compulsory primary and secondary schooling were required (UNESCO, 2020), and this means that Mexican children were expected to attend school until the age of 14. Therefore, the selected age group includes individuals who, during the period between the second and third rounds, were at least 14 years old, thus having completed their compulsory education or being in their last year.
Furthermore, in 2000 the mean age at first marriage was 22.7 years for women and 25 years for men (United Nations, 2019b). For this reason, the maximum age considered is 25 years, representing men's average age at first marriage (which is the highest among female and male ones). In this way, it is more likely that the individuals who are included in the analysis highly relied on their parents.

necessary to clarify that, among 844 migrants, data related to 61% of them are taken from specific sections of the third-round survey dedicated to migration, while the rest is recovered by comparing the locations in which the individuals lived in the two rounds. For this reason, details about migration events are not available for 39% of migrants, and it is possible to define the movements that offspring made without their parents and/or because of own motivations[16] – excluding migrations that are explained by reasons related to parents – only for the respondents of the migration sections of the survey[17]. Both internal and international migrations are considered, although 95% of migrants whose destination is specified moved, at least once, within Mexico and only 11% of them migrated, at least one time, to other countries. We do not exclude temporary migrations – which refer to changes in the living place that lasted more than one month and less than one year –, but we do not include short-term movements whose main reason was going on holidays.

As regards power dynamics within the household, an index for mothers' autonomy is created through principal component analysis (PCA). This variable synthesises several dimensions that can influence or directly express women's decision-making power. Indeed, mothers' age, education and employment status are included in the PCA, as well as twelve different decisions that mothers make on their own. As shown in *Table 1*, the index is higher for educated, employed, and young mothers, and increases as they make autonomous decisions, especially about child's education, health and clothes, as well as about major purchases. Dummy variables representing the states in which mothers reside are also added to the PCA, in order to account for state heterogeneity – in terms of possible differences in gender norms in particular. The indicator is then normalised and therefore ranges from 0

[16] These motives are: education, job, marriage, going back to the place of origin, moving to own house, being independent from family, being close to family and being attracted to the place. Reasons that are not taken into account include education or job of a family member, death or health issues of a family member, insecurity, deportation, visit to relatives, and others.

[17] 89% of migrants whose details about migration unit are available moved, at least once, without their parents; and 81% of those whose information about migration reason is available moved, at least once, for own motivations.

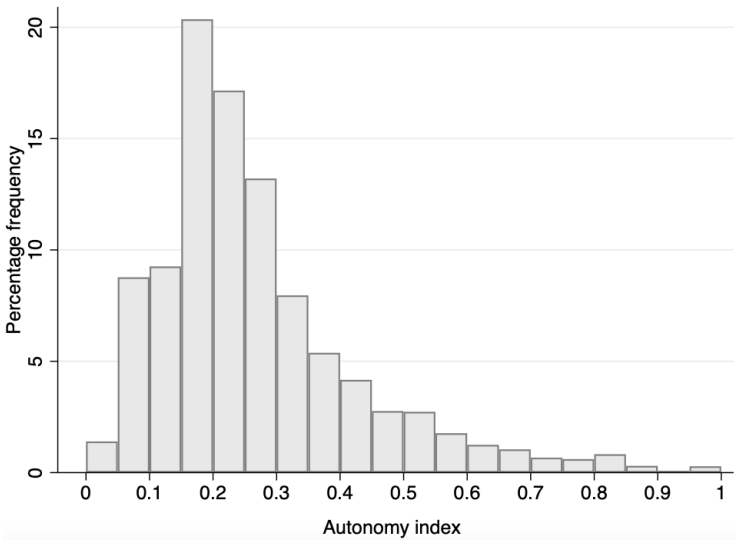
to 1, indicating the lowest and the highest levels of power respectively.

Table 1: First principal component, index for mother's autonomy

Mother characteristics		*State*	
Age	-0.0833	Coahuila	0.0170
Education	0.0647	Distrito Federal	0.0376
Employment	0.0830	Durango	0.0511
Mother's autonomous decisions		Guanajuato	0.0354
Food	0.2224	Jalisco	0.0764
Own clothes	0.2067	Estado de México	0.0156
Spouse's clothes	0.2164	Michoacán	-0.0234
Child's clothes	0.3096	Morelos	-0.0041
Child's education	0.4184	Nuevo León	-0.0318
Child's health	0.4170	Oaxaca	-0.0560
Major purchases	0.3405	Puebla	-0.0061
Transfers to own relatives	0.2932	Sinaloa	-0.0528
Transfers to spouse's relatives	0.2382	Sonora	-0.0495
Own job	0.2181	Veracruz	0.0150
Spouse's job	0.1311	Yucatán	0.0301
Birth control	0.2282		

Figure 1 shows the percentage distribution of this index: the distribution is right-skewed, and the value of the index is lower than 0.3 for approximately 70% of mothers. Using the median of this indicator as benchmark, we create a binary variable, which is coded 1 for mothers whose autonomy index is equal to or higher than the median and 0 for the opposite case, and we use it as main independent variable in the empirical analysis.

Figure 1: Percentage distribution of the normalised index for mother's autonomy



In order to offer insights into the differences in multi-level characteristics according to the level of mother's autonomy, outcomes from t-tests are presented in *Table 2*[18]. Children of high-powered mothers are more likely to migrate, in general terms and more specifically without parents or for own motivations. Besides the migration behaviour, children do not differ by the level of mother's power, except for age and marital status (which are highly correlated, especially given the age range that is considered). Conversely, the characteristics of households are very different according to mother's autonomy: households where mothers are empowered have a smaller size, are wealthier and are more likely to rely on savings. The fact that in these households there is a higher likelihood of previous shocks can be puzzling, yet it is consistent with less competition within the household between members: indeed, in 73% of cases, households reporting shocks experienced the death and/or health issues of a family member. Moreover, members of families with high-powered mothers are more likely to have relatives in the US: similar to the case of shocks, having relatives who live abroad may be a factor that empower women, because of, for instance, their absence itself or because of remittances. Finally, it is more likely that empowered mothers live in urban areas and more developed communities.

[18]See *Table A1* in the Appendix for a full description of the variables.

Table 2: Multi-level characteristics and mothers' autonomy

	Mother's autonomy				
	Low		High		Difference
	Mean	SE	Mean	SE	
Child's migration					
Migration	0.1395	(0.0065)	0.1580	(0.0069)	-0.0185*
Migration without parents	0.0649	(0.0048)	0.0823	(0.0054)	-0.0174**
Migration for own motivations	0.0569	(0.0046)	0.0748	(0.0052)	-0.0179***
Mother characteristics					
Age	45.6883	(0.1454)	43.4000	(0.1304)	2.2883***
Education	2.2534	(0.0168)	2.5029	(0.0185)	-0.2495***
Employment	0.2011	(0.0074)	0.3221	(0.0086)	-0.1210***
Child characteristics					
Age	18.2989	(0.0649)	17.7683	(0.0637)	0.5306***
Female	0.4717	(0.0092)	0.4887	(0.0092)	-0.0170
Education	3.2686	(0.0171)	3.2687	(0.0167)	-0.0001
Employment	0.2797	(0.0082)	0.2726	(0.0082)	0.0071
Married	0.1074	(0.0057)	0.0942	(0.0054)	0.0132*
Siblings	0.9339	(0.0046)	0.9390	(0.0044)	-0.0051
Household characteristics					
Size	6.4022	(0.0448)	6.2708	(0.0414)	0.1313**
Wealth	0.7193	(0.0040)	0.7464	(0.0038)	-0.0271***
Savings	0.2447	(0.0079)	0.3005	(0.0084)	-0.0558***
Non-labour income	0.1306	(0.0062)	0.1207	(0.0060)	0.0098
Shocks	0.2630	(0.0102)	0.3472	(0.0117)	-0.0842***
Previous migrants	0.6623	(0.0087)	0.6563	(0.0087)	0.0060
Relatives in the US	0.1737	(0.0070)	0.2270	(0.0077)	-0.0532***
Location characteristics					
Rural	0.4744	(0.0092)	0.3997	(0.0090)	0.0747***
Developed community	0.6485	(0.0040)	0.6741	(0.0038)	-0.0256***

Note: low autonomy indicates that mother's power is lower than the median, whereas high autonomy refers to mother's power that is higher than or equal to the median. Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

1.6 Methodology

In order to assess the causal effect of mother's power on offspring's migration, we use the method of propensity score weighting (Hirano and Imbens, 2001). The dummy variable that differentiates high-powered mothers from low-powered ones is not as good as random, and regression adjustment with weights is needed to remove the differences in observables between the two groups. As shown in *equation (1)*, we firstly estimate propensity scores regressing the dummy variable related to mother's power on a number of characteristics relating to the offspring (C_{ihl}), the household (H_{hl}) and the location where the mother lives (L_l)[19].

$$high\text{-}powered\ mother_{ihl} = \theta + \kappa\, C_{ihl} + \lambda\, H_{hl} + \mu\, L_l + \eta_{ihl} \tag{1}$$

where i=mother's child, h=household, l=location

Secondly, we use the estimates of the propensity scores to create the weights that allow balancing the observables between high-powered and low-powered mothers. The weight that is assigned to high-powered mothers is w_i^1, which represents the inverse of the probability of being high-powered. Conversely, w_i^0 is the weight assigned to low-powered mothers and is inversely related to the likelihood of being low-powered.

$$w_i^1 = \frac{1}{\widehat{ps}} \qquad\qquad w_i^0 = \frac{1}{(1-\widehat{ps})}$$

The rationale behind this method is assigning higher weights to high-powered mothers who are more similar, in terms of observable characteristics, to low-powered mothers, while assigning lower weights to those who are more different;

[19]The balancing property is satisfied. See *Figure A1* in the Appendix for the graphical representation of the common support

the same procedure is applied to the comparison group. Including these weights in the regression from *equation (1)*, we check that the balance is improved and find that, in this way, the pre-existing differences between the groups of high-powered and low-powered mothers are removed, as presented in *Table A2*.

The average treatment effect of the power of the mother on offspring's migration is estimated using *equation (2)*. Independent variables refer to the second round (t), whereas the dependent variable is taken from the third round survey and concerns the period between the second and third rounds (t+1). The outcome variable $y_{ihl}^{(t+1)}$ represents the migration of the offspring, and three different specifications are used: the first one describes migration as any change in location that lasted at least one month, the second one refers to movements without parents, and the third one regards movements for own motivations. The main independent variable, *high-powered mother*$_{ihl}^{(t)}$, makes a distinction between mothers based on the median level of power. A set of 15 controls at individual- ($C_{ihl}^{(t)}$), household- ($H_{hl}^{(t)}$) and location-level ($L_{l}^{(t)}$) are considered, and logit models – adjusted for propensity score weights – are estimated.

$$y_{ihl}^{(t+1)} = \alpha + \beta \; high\text{-}powered \; mother_{ihl}^{(t)} + \gamma \; C_{ihl}^{(t)} + \delta \; H_{hl}^{(t)} + \zeta \; L_{l}^{(t)} + \epsilon_{ihl} \qquad (2)$$

where i=mother's child, h=household, l=location

Finally, we also check for heterogeneous effects by including the main independent variable interacted with several multi-level characteristics, as shown in *equation (3)*.

$$y_{ihl}^{(t+1)} = \alpha' + \beta' \; high\text{-}powered \; mother_{ihl}^{(t)} + \nu \; high\text{-}powered \; mother_{ihl}^{(t)} * x^{(t)} + \gamma' \; C_{ihl}^{(t)} + \delta' \; H_{hl}^{(t)} + \zeta' \; L_{l}^{(t)} + \epsilon'_{ihl} \qquad (3)$$

where i=mother's child, h=household, l=location

Propensity score weighting is a non-experimental setting method that allows balancing two groups – here, high-powered and low-powered mothers – in terms of their observable characteristics. Considering that there has been no randomisation, we acknowledge that the differences between the two groups in terms of unobservables may not be captured by using this impact evaluation method. Therefore, we would like to point out the possible existence of a bias related to unobservable characteristics, especially to those who may influence both mother's power and child's migration. Nevertheless, since the magnitude of this type of bias is linked to the inadequacy of the conditional independence assumption (CIA), we believe that the CIA is adequately respected because we use a large number of observables to calculate the propensity score, so we expect that this possible bias may be negligible.

1.7 Results

Table 3 presents how mother's power shapes the decision of offspring's migration. The first column concerns the effect on migration in general terms and shows that, when mother's power is equal or larger than the median, the likelihood of offspring's migration increases by 2.51 percentage points, corresponding to 18.63 percentage change. Since the specification of this outcome variable allows including movements that are related to other individuals' motives, migrations without parents and for own motivations are specifically considered and represent proxies for changes in location that can be explained by migrant's own reasons: the second and third columns indicate that, for the offspring, having a high-powered mother rises the probability of migration without parents and for own motivations by 1.92 and 1.90 percentage points, respectively. The corresponding percentage changes – 29.03% and 32.54% – are higher than the one relative to migration in general, and this may be due to the fact that these dependent variables are not only more

specific, but also coded missing for other types of movements (i.e. with parents and for other individuals' motivations), thus making the average probability of

Table 3: Impact of mother's power on offspring's migration

	Offspring's Migration		
	All	Without parents	Own motivations
High-powered mother	0.0251***	0.0192***	0.0190***
	(0.0095)	(0.0074)	(0.0071)
Average migration if T=0	0.1345	0.0661	0.0583
Percentage change	18.63%	29.03%	32.54%
Controls	yes	yes	yes
Observations	5,481	5,069	5,027

Note: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

migration lower.[20] Furthermore, it is necessary to acknowledge that there are three hundred individuals whose information about migration is not available. In order to account for these issues, we use different specifications of the three outcome variables to check the sensitivity of results. First of all, we substitute either 1 or 0 for missing data about whether the individual moved, as presented in *Table A4*: results related to the new specifications continue to show an increase in the likelihood of migration, although the percentage changes vary according to the mean level of the probability of migration. Similarly, we make the same substitutions for the other two outcome variables and we also assign the value 0 to migrations with parents and migrations for other individuals' reasons[21]. The positive impact on

[20] In *Table A3*, we present the estimates without propensity score weights, in order to show the extent and direction of the bias that is corrected by using this method. As regards the variable on migrations in general terms, the absence of propensity score weights leads to an underestimation of the effect by about 29%, while, as regards the other types of migrations, the differences are smaller. Indeed, considering migrations without parents, the effect is underestimated by 5%; and, for migration for own motivations, there is a slight overestimation (2%).

[21] We did not substitute 1 for other types of migrations because, otherwise, there would be correspondence between these two variables and the one representing migration in general

migration continues to be present even when the outcomes are specified in these different ways.

We also make a robustness check considering attritors as migrants and we still find a positive effect on migration, although it is relatively smaller[22](see *Table A5*). As other check, we consider mother's migration networks, which may be correlated with both mother's power and preferences for child's migration. Therefore, we create two new dummies – one that indicates whether the mother has previously migrated and the other one whether another household member has migration experience – and we substitute them for the variable related to household's networks: results in *Table A6* show a slight increase in the magnitude of the impact previously estimated.

Since the positive effect on offspring's migration may be heterogeneous, we check whether mother's power has differential impacts depending on a set of characteristics of the offspring, household, and location. *Table A7* presents the results of the regressions that include the interactions between the main dummy variable and the controls, and we do not find evidence of heterogeneity. We do not present heterogeneity analyses that are conducted by using subsamples because, considering that we employ propensity score weighting to assess causal effects, reducing the number of observations prevents from keeping the balancing property satisfied.

Results are consistent with the predictions of the theoretical model, which suggests that mothers are altruistic and an increase in their power rises the probability of offspring's migration. The higher likelihood of migration is related to differences in preferences between parents and, more specifically, to the fact that mothers are more generous than fathers. We cannot directly test this mechanism, but we show in *Table A8* that mothers seem to be more caring towards their children than fa-

terms.

[22]This check regards only migrations in general terms.

thers[23]: indeed, they are more likely to consider showing love and care to children as their main parenting priority, and they are also more involved in activities that promote child development, such as reading, singing and playing with children.

The channel related to altruism is also supported by the evidence of positive outcomes after migration, as presented in *Table 4*[24]. Indeed, for the offspring, migration rises the probability to be employed and to have savings at their disposal. Considering that the average probability of employment for non-migrants is approximately 51 percentage points, migrant offspring are 15.18% more likely to be employed, and the percentage increase is even higher when migrations without parents and migrations for own motivations are investigated – 25.50% and 27.79%, respectively. Furthermore, there is a 13.14% higher probability for the households where migrated individuals live to have savings – a likelihood that is 19.14% and 20.37% higher when the offspring migrate without parents and for own motivations. Migration also reduces the probability that the household relies on non-labour income, when migration in general terms and migration for own motivations are examined: this result may be related to how we define non-labour income, which includes a large number of support programmes implemented by the government or other institutions. Therefore, if individuals became better-off after migration, it would be plausible that they would receive less social benefits. Finally, there is no evidence of changes in wealth, which is represented by an index that reflects the characteristics of the house where the individual lives: the effect that we estimate refers to a maximum of 5 years after migration, and it is possible that a variation is not captured because it may be a longer-term consequence.

[23]However, we recognize that this could also reflect gender norms, according to which childcare may be mainly a female responsibility.

[24]We regress four outcomes – employment, availability of savings and non-labour income, and wealth – over migration and the same controls as in equation (2). We use propensity score weighting also in this case, in order to estimate causal impacts.

Table 4: Outcomes after offspring's migration

		Household		
	Employment	Savings	Non-labour income	Wealth
Migration	0.0775***	0.0461**	-0.0448***	0.0004
	(0.0177)	(0.0185)	(0.0129)	(0.0063)
Migration without parents	0.1301***	0.0672***	-0.0295	0.0011
	(0.0233)	(0.0258)	(0.0196)	(0.0087)
Migration for own motivations	0.1418***	0.0715***	-0.0398**	0.0032
	(0.0241)	(0.0273)	(0.0203)	(0.0090)
Controls	yes	yes	yes	yes

Note: Employment is considered at individual-level, whereas savings, non-labour income and wealth are at household-level. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

This analysis provides insights into the benefits of the empowerment of women for their children. Policy-makers should indeed consider that interventions promoting female autonomy may be beneficial to children, not only for their education and health – as it has been previously found – but also for other outcomes reached through migration. Since the majority of migrations that we examine are internal, empowerment may also influence demographic changes within the country, thus possibly leading to other positive effects at aggregate-level.

1.8 Conclusions

Most theories and empirical studies on migration have disregarded the impact of bargaining powers on migration-decision making, although literature suggests that the process is likely to be collective. We address this gap by focusing on the distribution of power within the household and, in particular, on the effect of mother's power on the migration of her young offspring. Indeed, mothers, who are generally assumed to be more altruistic than fathers, may encourage migration, supposing

that moving represents an opportunity for her offspring to obtain positive outcomes.

This chapter provides a collective household model, which, to the best of our knowledge, is the first one to theorise the decision of offspring's migration, and test its predictions using data on Mexico. According to the model, households with empowered mothers are more likely to opt for offspring's migration, even in case of household consumption loss. The empirical analysis uses propensity score weighting to assess the effect of a dummy variable, coded 1 for high-powered mothers and 0 for low-powered ones, on the migration of young Mexicans aged 13-25 years living with their parents. Results are consistent with the predictions of the theoretical model, thus showing that a higher power of the mother increases the likelihood of migration for her offspring and suggesting that the mother is relatively more altruistic than the father. In order to exclude the possibility that the migration of the offspring is explained by factors related to the parents, different specifications of the dependent variable account for the motivations of the movement and the people who participate in it. Results are not sensitive to the use of several different outcome variables and are robust to several checks. The impact of mother's power is not heterogeneous considering a number of characteristics at individual-, household-, and location-level. There is evidence that migrated offspring are more likely to be employed and to have savings at their disposal. For this reason, this work highlights another positive outcome that women's empowerment may favour. Therefore, policies that aim to empower women may have positive spillover effects like offspring's upward mobility through migration.

Appendix

SECTION 1

Maximisation of Parents' Intertemporal Utility

1. ***If M=0***

$$\max_{c_{h_1}, c_{p_2}} W^P(c_{h_1}, c_{p_2}, \bar{c}_{c_2}) \ \textbf{\textit{s.t.}} \ c_{h_1}(1+r) + c_{p_2} \leq y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^O$$

$$L = W^P(c_{h_1}, c_{p_2}, \bar{c}_{c_2}) + \lambda\Big(y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^O - c_{h_1}(1+r) - c_{p_2}\Big)$$

$$\frac{\delta L}{\delta c_{h_1}} = \frac{\varphi\alpha}{c_{h_1}} + \frac{(1-\varphi)\alpha'}{c_{h_1}} - \lambda(1+r) = 0$$
$$\frac{\delta L}{\delta c_{p_2}} = \frac{\varphi\beta}{c_{p_2}} + \frac{(1-\varphi)\beta'}{c_{p_2}} - \lambda = 0$$
$$\frac{\delta L}{\delta \lambda} = y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^O - c_{h_1}(1+r) - c_{p_2} = 0$$

Substituting $\lambda = \dfrac{\varphi\beta}{c_{p_2}} + \dfrac{(1-\varphi)\beta'}{c_{p_2}}$ into $\dfrac{\delta L}{\delta c_{h_1}}$:

$$\frac{\varphi\alpha}{c_{h_1}} + \frac{(1-\varphi)\alpha'}{c_{h_1}} - \Big(\frac{\varphi\beta}{c_{p_2}} + \frac{(1-\varphi)\beta'}{c_{p_2}}\Big)(1+r) = 0$$
$$\frac{c_{h_1}}{\varphi\alpha + (1-\varphi)\alpha'} - \frac{c_{p_2}}{\big(\varphi\beta + (1-\varphi)\beta'\big)(1+r)} = 0$$
$$c_{h_1} = \frac{c_{p_2}\big(\varphi\alpha + (1-\varphi)\alpha'\big)}{\big(\varphi\beta + (1-\varphi)\beta'\big)(1+r)}$$

Substituting $c_{h_1} = \dfrac{c_{p_2}\big(\varphi\alpha + (1-\varphi)\alpha'\big)}{\big(\varphi\beta + (1-\varphi)\beta'\big)(1+r)}$ into $\dfrac{\delta L}{\delta \lambda}$:

$$y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^O - \left(\frac{c_{p_2}\big(\varphi\alpha + (1-\varphi)\alpha'\big)}{\big(\varphi\beta + (1-\varphi)\beta'\big)(1+r)}\right)(1+r) - c_{p_2} = 0$$
$$c_{p_2} = y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^O - \left(\frac{c_{p_2}\big(\varphi\alpha + (1-\varphi)\alpha'\big)}{\big(\varphi\beta + (1-\varphi)\beta'\big)(1+r)}\right)(1+r)$$
$$c_{p_2} + \left(\frac{c_{p_2}\big(\varphi\alpha + (1-\varphi)\alpha'\big)}{\big(\varphi\beta + (1-\varphi)\beta'\big)}\right) = y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^O$$
$$c_{p_2}^{\mathrm{NM}*} = \frac{\big(y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^O\big)\big(\varphi\beta + (1-\varphi)\beta'\big)}{\varphi(\alpha+\beta) + (1-\varphi)(\alpha'+\beta')}$$

Substituting $c_{p_2}^{\mathrm{NM}*}$ into c_{h_1}:

$$c_{h_1}^{\mathrm{NM}*} = \frac{\big(y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^O\big)\big(\varphi\alpha + (1-\varphi)\alpha'\big)}{(1+r)\Big(\varphi(\alpha+\beta) + (1-\varphi)(\alpha'+\beta')\Big)}$$

2. ***If M=1***

$$\max_{c_{h_1},c_{p_2}} W^P(c_{h_1},c_{p_2},\bar{c}_{c_2}) \textbf{ s.t. } c_{h_1}(1+r)+c_{p_2} \le y_{h_1}(1+r)+y_{p_2}-MC_c(1+r)(1-\gamma)+\sigma y_{c_2}^D$$

$$L = W^P(c_{h_1},c_{p_2},\bar{c}_{c_2}) + \lambda\Big(y_{h_1}(1+r)+y_{p_2}-MC_c(1+r)(1-\gamma)+\sigma y_{c_2}^D - c_{h_1}(1+r)-c_{p_2}\Big)$$

$$\frac{\delta L}{\delta c_{h_1}} = \frac{\varphi\alpha}{c_{h_1}} + \frac{(1-\varphi)\alpha'}{c_{h_1}} - \lambda(1+r) = 0$$
$$\frac{\delta L}{\delta c_{p_2}} = \frac{\varphi\beta}{c_{p_2}} + \frac{(1-\varphi)\beta'}{c_{p_2}} - \lambda = 0$$
$$\frac{\delta L}{\delta \lambda} = y_{h_1}(1+r)+y_{p_2}-MC_c(1+r)(1-\gamma)+\sigma y_{c_2}^D - c_{h_1}(1+r)-c_{p_2} = 0$$

Substituting $\lambda = \dfrac{\varphi\beta}{c_{p_2}} + \dfrac{(1-\varphi)\beta'}{c_{p_2}}$ into $\dfrac{\delta L}{\delta c_{h_1}}$:

$$\frac{\varphi\alpha}{c_{h_1}} + \frac{(1-\varphi)\alpha'}{c_{h_1}} - \Big(\frac{\varphi\beta}{c_{p_2}} + \frac{(1-\varphi)\beta'}{c_{p_2}}\Big)(1+r) = 0$$
$$\frac{c_{h_1}}{\varphi\alpha+(1-\varphi)\alpha'} - \frac{c_{p_2}}{\big(\varphi\beta+(1-\varphi)\beta'\big)(1+r)} = 0$$
$$c_{h_1} = \frac{c_{p_2}\big(\varphi\alpha+(1-\varphi)\alpha'\big)}{\big(\varphi\beta+(1-\varphi)\beta'\big)(1+r)}$$

Substituting $c_{h_1} = \dfrac{c_{p_2}\big(\varphi\alpha+(1-\varphi)\alpha'\big)}{\big(\varphi\beta+(1-\varphi)\beta'\big)(1+r)}$ into $\dfrac{\delta L}{\delta \lambda}$:

$$y_{h_1}(1+r)+y_{p_2}-MC_c(1+r)(1-\gamma)+\sigma y_{c_2}^D - \left(\frac{c_{p_2}\big(\varphi\alpha+(1-\varphi)\alpha'\big)}{\big(\varphi\beta+(1-\varphi)\beta'\big)(1+r)}\right)(1+r) - c_{p_2} = 0$$
$$c_{p_2} = y_{h_1}(1+r)+y_{p_2}-MC_c(1+r)(1-\gamma)+\sigma y_{c_2}^D - \left(\frac{c_{p_2}\big(\varphi\alpha+(1-\varphi)\alpha'\big)}{\big(\varphi\beta+(1-\varphi)\beta'\big)(1+r)}\right)(1+r)$$
$$c_{p_2} + \left(\frac{c_{p_2}\big(\varphi\alpha+(1-\varphi)\alpha'\big)}{\big(\varphi\beta+(1-\varphi)\beta'\big)}\right) = y_{h_1}(1+r)+y_{p_2}-MC_c(1+r)(1-\gamma)+\sigma y_{c_2}^D$$
$$c_{p_2}^{\mathrm{M}*} = \frac{\big(y_{h_1}(1+r)+y_{p_2}-MC_c(1+r)(1-\gamma)+\sigma y_{c_2}^D\big)\big(\varphi\beta+(1-\varphi)\beta'\big)}{\varphi(\alpha+\beta)+(1-\varphi)(\alpha'+\beta')}$$

Substituting $c_{p_2}^{\mathrm{M}*}$ into c_{h_1}:

$$c_{h_1}^{\mathrm{M}*} = \frac{\big(y_{h_1}(1+r)+y_{p_2}-MC_c(1+r)(1-\gamma)+\sigma y_{c_2}^D\big)\big(\varphi\alpha+(1-\varphi)\alpha'\big)}{(1+r)\Big(\varphi(\alpha+\beta)+(1-\varphi)(\alpha'+\beta')\Big)}$$

SECTION 2

Comparison between Parents' Indirect Utility Functions

$$W^P(c_{h_1}^{\mathrm{M}*}, c_{p_2}^{\mathrm{M}*}, \bar{c}_{c_2}^{\mathrm{D}}) > W^P(c_{h_1}^{\mathrm{NM}*}, c_{p_2}^{\mathrm{NM}*}, \bar{c}_{c_2})$$

$$\varphi\big(\alpha \ln c_{h_1}^{\mathrm{M}*} + \beta \ln c_{p_2}^{\mathrm{M}*} + \delta \ln \bar{c}_{c_2}^{D}\big) + (1-\varphi)\big(\alpha' \ln c_{h_1}^{\mathrm{M}*} + \beta' \ln c_{p_2}^{\mathrm{M}*} + \delta' \ln \bar{c}_{c_2}^{D}\big) > \\ \varphi\big(\alpha \ln c_{h_1}^{\mathrm{NM}*} + \beta \ln c_{p_2}^{\mathrm{NM}*} + \delta \ln \bar{c}_{c_2}^{O}\big) + (1-\varphi)\big(\alpha' \ln c_{h_1}^{\mathrm{NM}*} + \beta' \ln c_{p_2}^{\mathrm{NM}*} + \delta' \ln \bar{c}_{c_2}^{O}\big)$$

$$\big(\varphi\alpha + (1-\varphi)\alpha'\big)\big(\Delta_{\text{M-NM}} \ln c_{h_1}\big) + \big(\varphi\beta + (1-\varphi)\beta'\big)\big(\Delta_{\text{M-NM}} \ln c_{p_2}\big) + \big(\varphi\delta + (1-\varphi)\delta'\big)\big(\Delta_{\text{D-O}} \ln \bar{c}_{c_2}\big) > 0$$

$$\big(\varphi\alpha + (1-\varphi)\alpha'\big)\Big(\ln \frac{y_{h_1}(1+r) + y_{p_2} - MC_c(1+r)(1-\gamma) + \sigma y_{c_2}^{D}}{y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^{O}}\Big) + \big(\varphi\beta + (1- \\ \varphi)\beta'\big)\Big(\ln \frac{y_{h_1}(1+r) + y_{p_2} - MC_c(1+r)(1-\gamma) + \sigma y_{c_2}^{D}}{y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^{O}}\Big) + \big(\varphi\delta + (1-\varphi)\delta'\big)\big(\Delta_{\text{D-O}} \ln \bar{c}_{c_2}\big) > 0$$

$$\big(\varphi(\alpha+\beta) + (1-\varphi)(\alpha'+\beta')\big)\Big(\ln \frac{y_{h_1}(1+r) + y_{p_2} - MC_c(1+r)(1-\gamma) + \sigma y_{c_2}^{D}}{y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^{O}}\Big) > \\ -\big(\varphi\delta + (1-\varphi)\delta'\big)\big(\Delta_{\text{D-O}} \ln \bar{c}_{c_2}\big)$$

$$\frac{\varphi(\alpha+\beta) + (1-\varphi)(\alpha'+\beta')}{\varphi\delta + (1-\varphi)\delta'}\Big(\ln \frac{y_{h_1}(1+r) + y_{p_2} - MC_c(1+r)(1-\gamma) + \sigma y_{c_2}^{D}}{y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^{O}}\Big) > \big(\Delta_{\text{O-D}} \ln \bar{c}_{c_2}\big)$$

$$\big(e^{(\ln H)}\big)^{\frac{a}{b}} > e^{\left(\ln \frac{\bar{c}_{c_2}^{O}}{\bar{c}_{c_2}^{D}}\right)}$$

where $\mathrm{H} = \frac{y_{h_1}(1+r) + y_{p_2} - MC_c(1+r)(1-\gamma) + \sigma y_{c_2}^{D}}{y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^{O}}$, $\mathrm{a} = \varphi(\alpha+\beta) + (1-\varphi)(\alpha'+\beta')$ and $\mathrm{b} = \varphi\delta + (1-\varphi)\delta'$

$$(H)^a > \left(\frac{\bar{c}_{c_2}^{D}}{\bar{c}_{c_2}^{O}}\right)^{-b}$$

Adding and subtracting: (i) $\sigma y_{c_2}^{O}$ in H, and (ii) $\bar{c}_{c_2}^{O}$ in $\frac{\bar{c}_{c_2}^{D}}{\bar{c}_{c_2}^{O}}$:

$$\Big(1 + \frac{\sigma(y_{c_2}^{D} - y_{c_2}^{O}) - MC(1+r)(1-\gamma)}{y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^{O}}\Big)^{a} > \Big(1 + \frac{\bar{c}_{c_2}^{D} - \bar{c}_{c_2}^{O}}{\bar{c}_{c_2}^{O}}\Big)^{-b}$$

$$\Big(1 + \frac{\sigma(y_{c_2}^{D} - y_{c_2}^{O}) - MC(1+r)(1-\gamma)}{y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^{O}}\Big)^{a}\Big(1 + \frac{\bar{c}_{c_2}^{D} - \bar{c}_{c_2}^{O}}{\bar{c}_{c_2}^{O}}\Big)^{b} > 1$$

$$\Big(1 + \frac{\sigma(y_{c_2}^{D} - y_{c_2}^{O}) - MC(1+r)(1-\gamma)}{y_{h_1}(1+r) + y_{p_2} + \sigma y_{c_2}^{O}}\Big)^{\varphi(\alpha+\beta)+(1-\varphi)(\alpha'+\beta')}\Big(1 + \frac{\bar{c}_{c_2}^{D} - \bar{c}_{c_2}^{O}}{\bar{c}_{c_2}^{O}}\Big)^{\varphi\delta+(1-\varphi)\delta'} > 1$$

Table A1: Characteristics at individual-, household-, and location-level

Variable	Mean	SD	Type	Note
Child's migration				
Migration	0.1489	0.3560	Binary	Any change in location that lasted at least one month. Holidays are excluded.
Migration without parents	0.0734	0.2608	Binary	Movement that did not involve parents. The individual may be accompanied by other family members or friends.
Migration for own motivations	0.0658	0.2480	Binary	Movement due to own motivations: education, job, marriage, going back to the place of origin, moving to own house, being independent from the family, being close to the family and being attracted to the place.
Mother characteristics				
Age	44.5488	7.6016	Continuous	
Education	2.3794	0.9708	Categorical	1: no education or kindergarten, 2: primary, 3: lower secondary, 4: upper secondary, 5: tertiary
Employment	0.2611	0.4393	Binary	Not specified whether formal or informal work.
Child characteristics				
Age	18.0016	3.5048	Continuous	
Female	0.4825	0.4997	Binary	
Education	3.2488	0.9110	Categorical	See mother's education.
Employment	0.2756	0.4468	Binary	Not specified whether formal or informal work.
Married	0.1007	0.3009	Binary	Married or in union.
Siblings	0.9381	0.2410	Binary	

Variable	Mean	SD	Type	Note
Household characteristics				
Size	6.3844	2.3710	Continuous	
Wealth	0.7268	0.2118	Continuous	Normalised index, in which 0 expresses the lowest wealth and 1 the highest. The index originates from PCA, in which these characteristics of the house are used: owned house; house surrounded by human and animal waste/garbage/ stagnant water; adequate ventilation; low-quality material for floor/wall/roof; kitchen used as bedroom; poor fuel for stove; number of bedrooms; toilet; and telephone.
Savings	0.2717	0.4449	Binary	
Non-labour income	0.1272	0.3332	Binary	Non-labour income from: Procampo programme; Vivah programme; Word credit programme; Social coinvestment programme; Temporary job programme; Alianza por el campo programme; funds for enterprises; Fonaes programme; other governmental support programmes; scholarship or donations from other institutions; indemnities; donated cash; retirement; life insurance; inheritance/dowries/bequests/lottery wins; sale of properties/machinery/assets; or other income.
Shocks	0.2410	0.4277	Binary	The household experienced, in the last 5 years, at least one of the following shocks related to any household member: death/hospitalisation; unemployment or business failure; home or business loss due to earthquake/flood/other natural disaster; crop loss; loss, robbery, or death of livestock.
Previous migrants	0.6621	0.4730	Binary	The household includes individuals who have previously migrated.
Relatives in the US	0.2043	0.4032	Binary	
Location characteristics				
Rural	0.4525	0.4978	Binary	
Developed community	0.6558	0.2150	Continuous	Normalised index, in which 0 indicates the lowest level of development and 1 the highest. The index originates from PCA, in which these characteristics of the community are used: adequate public lighting; piles of garbage; piles of manure; cattle; air pollution; children wearing clean clothes; children wearing shoes; adults wearing clean clothes; adults wearing shoes; tv antennas; glass windows; abandoned buildings; abandoned cars; graffiti; paramilitary guards; private vehicles less than public ones.

Table A2: Balance of observables

High-powered mother		
	Without weights	With weights
Child characteristics		
Age	-0.0151***	0.0002
	(0.0023)	(0.0024)
Female	0.0188	-0.0001
	(0.0137)	(0.0141)
Education	-0.0069	-0.0004
	(0.0086)	(0.0089)
Employment	0.0310*	-0.0008
	(0.0169)	(0.0174)
Married	0.0072	-0.0013
	(0.0238)	(0.0247)
Siblings	0.0196	-0.0002
	(0.0292)	(0.0305)
Household characteristics		
Size	-0.0037	-0.0001
	(0.0031)	(0.0033)
Wealth	0.0604	-0.0015
	(0.0407)	(0.0422)
Savings	0.0504***	0.0013
	(0.0156)	(0.0161)
Non-labour income	-0.0179	-0.0012
	(0.0202)	(0.0210)
Shocks	0.0588***	-0.0011
	(0.0112)	(0.0119)
Previous migrants	-0.0069	0.00004
	(0.0143)	(0.0148)
Relatives in the US	0.0845***	0.0002
	(0.0166)	(0.0174)
Location characteristics		
Rural	-0.0613***	0.0005
	(0.0178)	(0.0182)
Developed community	0.0325	0.0006
	(0.0404)	(0.0413)
Observations	5,481	5,481

Note: linear probability models. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A3: Comparison between estimations without and with weights

Offspring's Migration			
	All	Without parents	Own motivations
Without weights			
High-powered mother	0.0185*	0.0174**	0.0179***
	(0.0095)	(0.0073)	(0.0070)
Average migration if T=0	0.1395	0.0649	0.0569
Percentage change	13.28%	26.89%	31.50%
Controls	no	no	no
Observations	5,653	5,194	5,151
With weights			
High-powered mother	0.0251***	0.0188**	0.0179**
	(0.0096)	(0.0075)	(0.0071)
Average migration if T=0	0.1345	0.0661	0.0583
Percentage change	18.63%	28.41%	30.77%
Controls	no	no	no
Observations	5,481	5,069	5,027

Note: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A4: Sensitivity checks

	Migration		
		Missing=1	Missing=0
High-powered mother	0.0251***	0.0223**	0.0236***
	(0.0095)	(0.0103)	(0.0091)
Average migration if T=0	0.1345	0.1728	0.1286
Percentage change	18.63%	12.90%	18.37%
Controls	yes	yes	yes
Observations	5,481	5,741	5,741

Note: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

	Migration without parents			
		Other migrations=0	Other migrations=0, missing=1	Other migrations=0, missing=0
High-powered mother	0.0192***	0.0167**	0.0140*	0.0155**
	(0.0074)	(0.0069)	(0.0084)	(0.0066)
Average migration if T=0	0.0661	0.0612	0.1028	0.0585
Percentage change	29.03%	27.20%	13.63%	26.46%
Controls	yes	yes	yes	yes
Observations	5,069	5,481	5,741	5,741

Note: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

	Migration for own motivations			
		Other migrations=0	Other migrations=0, missing=1	Other migrations=0, missing=0
High-powered mother	0.0190***	0.0162**	0.0135*	0.0151**
	(0.0071)	(0.0065)	(0.0081)	(0.0062)
Average migration if T=0	0.0583	0.0536	0.0955	0.0512
Percentage change	32.54%	30.20%	14.18%	29.49%
Controls	yes	yes	yes	yes
Observations	5,027	5,481	5,741	5,741

Note: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A5: Robustness check with attriters as migrants

Offspring's Migration		
	without attritors	*with attritors*
High-powered mother	0.0251***	0.0217**
	(0.0095)	(0.0102599)
Average migration if T=0	0.1345	0.1720
Percentage change	18.63%	12.64%
Controls	yes	yes
Observations	5,481	5,733

Note: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A6: Estimation controlling for mother's previous migration

Offspring's Migration			
	All	Without parents	Own motivations
Past migration of household members			
High-powered mother	0.0251***	0.0192***	0.0190***
	(0.0095)	(0.0074)	(0.0071)
Average migration if T=0	0.1345	0.0661	0.0583
Percentage change	18.63%	29.03%	32.54%
Past migration of the mother			
High-powered mother	0.0258***	0.0194***	0.0191***
	(0.0094)	(0.0074)	(0.0071)
Average migration if T=0	0.1345	0.0661	0.0583
Percentage change	19.17%	29.33%	32.80%
Controls	yes	yes	yes
Observations	5,481	5,069	5,027

Note: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A7: Heterogeneity analysis

	Migration		Migration without parents		Migration for own motives	
	Main	Interaction	Main	Interaction	Main	Interaction
Child characteristics						
Female	0.0169	0.0156	0.0065	0.0227	0.0081	0.0201
	(0.0139)	(0.0189)	(0.0109)	(0.0147)	(0.0103)	(0.0140)
Married	0.0275***	-0.0206	0.0173**	0.0167	0.0156**	0.0321
	(0.0101)	(0.0302)	(0.0078)	(0.0233)	(0.0074)	(0.0234)
Employed	0.0192*	0.0200	0.0156*	0.0120	0.0183**	0.0022
	(0.0113)	(0.0206)	(0.0088)	(0.0161)	(0.0086)	(0.0150)
Siblings	0.0093	0.0169	0.0063	0.0138	0.0202	-0.0013
	(0.0384)	(0.0396)	(0.0285)	(0.0295)	(0.0260)	(0.0269)
Household characteristics						
Size $\geq$ median	0.0103	0.0263	0.0173	0.0030	0.0132	.00963
	(0.0145)	(0.0192)	(0.0118)	(0.0151)	(0.0110)	(0.0143)
Savings	0.0332***	-0.0318	0.0256***	-0.0239	0.0275***	-0.0325
	(0.0110)	(0.0217)	(0.0087)	(0.0165)	(0.0083)	(0.0158)
Non-labour income	0.0268***	-0.0106	0.0185**	0.0040	0.0200***	-0.0068
	(0.0102)	(0.0273)	(0.0081)	(0.0201)	(0.0077)	(0.0194)
Shocks	0.0232**	0.0100	0.0211**	-0.0075	0.0199**	-0.0034
	(0.0107)	(0.0232)	(0.0086)	(0.0171)	(0.0082)	(0.0160)
Previous migrants	0.0063	0.0260	0.0011	0.0252	-0.0009	0.0273*
	(0.0183)	(0.0214)	(0.0140)	(0.0165)	(0.0136)	(0.0159)
Relatives in the US	0.0116	0.0628***	0.01116	0.0296*	0.0083	0.0418**
	(0.0107)	(0.0235)	(0.0086)	(0.0168)	(0.0082)	(0.0166)
Location characteristics						
Rural	0.0003	0.0493***	0.0110	0.0156	0.0071	0.0222
	(0.0134)	(0.0190)	(0.0106)	(0.0147)	(0.0101)	(0.0141)
Community developed $\geq$ median	0.0276**	-0.0052	0.0195**	-0.0007	0.0168 *	0.0049
	(0.0116)	(0.0154)	(0.0094)	(0.01221)	(0.0089)	(0.0115)

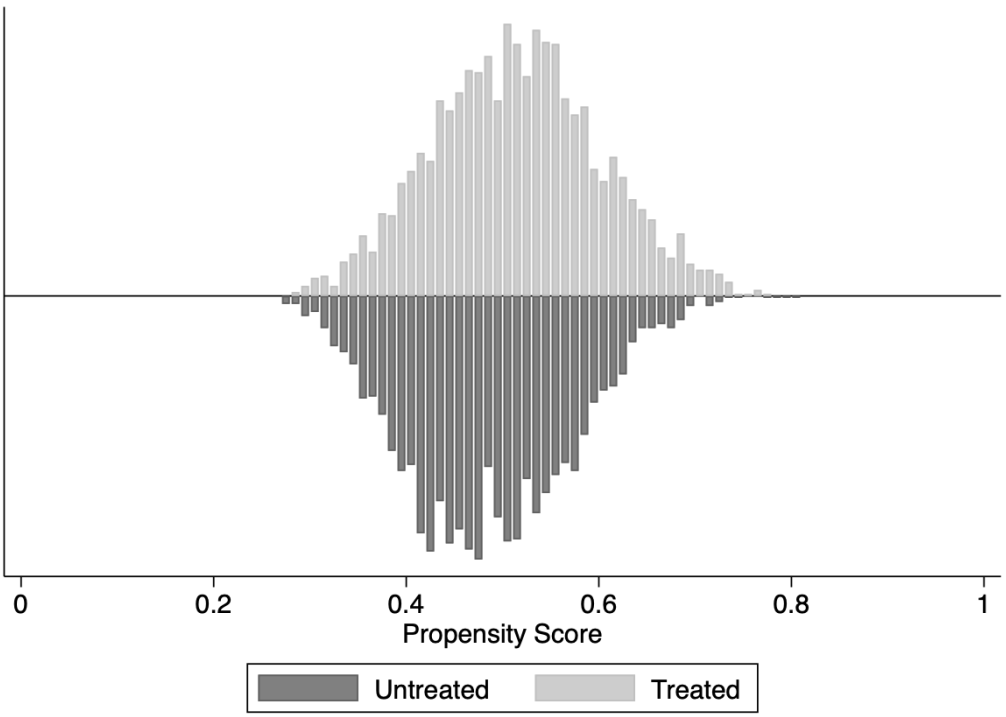
Note: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A8: Parental care

	Mother	Father	
	Mean	Mean	Difference
Showing love and care as main priority	0.7383	0.6751	0.0632***
Activities with the child			
Reading books	0.3375	0.2263	0.1113***
Telling stories	0.3957	0.3176	0.0781***
Singing songs	0.4332	0.2862	0.1470***
Going out	0.6189	0.4990	0.1199***
Playing	0.6595	0.6169	0.0426***

Note: These data refer to 3,856 cohabiting couples with at least one child younger than 15. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Figure A1: Common support



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Chapter 2

Does Removing the Uncertainty over Health Status Change the Decision to Migrate?: Gendered Effects of Randomised HIV Testing in Malawi

Abstract

This chapter examines the underinvestigated nexus between health status and migration, and offers insights into gendered unintended consequences of HIV tests. Indeed, it provides an evaluation of the impact of randomised HIV testing on the migration decision of young women and men in Malawi, a context in which health, marriage and migration are likely to be interlinked. Results suggest that being tested for HIV and becoming certain of not being infected reduces the probability of both migration and short-term movements, only for women. While the decrease in the probability of migration mainly regards married women and may be explained by the avoidance of marital dissolution, the effect of the test on temporary mobility concerns only unmarried women and may be due to an increase in risk aversion. Couple stability could represent a positive outcome, whereas the reduction in short-term journeys may imply that women are not taking advantage of economic and social opportunities that would be beneficial to them.

Keywords: health, HIV, test, migration, marriage, women, Malawi

2.1 Introduction

In sub-Saharan Africa, HIV prevalence is the highest globally. In 2019, Malawi, where 8.9% of the population aged 15-49 years was HIV-positive, was the ninth country in the world for the share of adults infected with the virus (UN AIDS, 2020). Efforts that have been made since the 2000s in order to provide adequate health care have allowed Malawi to improve the health conditions of its inhabitants (Chansa and Pattnaik, 2018). The country committed to universal health coverage and, since 2004, has offered the Essential Health Package (EHP), a set of health services that Malawians can receive without charge. However, the implementation of the EHP, which includes tools to prevent and treat HIV, has been affected by resource constraints (Ministry of Health and Population, Republic of Malawi, 2020). Besides this, the access to HIV services may also be hindered by fears of stigma (Berendes and Rimal, 2011; MacPherson et al., 2011), since discovering to be infected is likely to lead HIV-positive individuals to be exposed to social discrimination (Neuman et al., 2013; Kamen et al., 2015). In particular, in a context where marrying is almost a universal practice (National Statistical Office, Malawi and ICF, 2017), married individuals who become aware of being infected may experience marital instability: the dissolution of the couple may then result in the migration of the separating spouses, and this may explain why infected individuals move more than non-infected ones (Anglewicz, 2011).

In Malawi, migration is highly influenced by noneconomic determinants, marriage-related factors included – especially for women (Beegle and Poulin, 2013a). Even though there is evidence of a relationship between health status and migration, relatively few analyses focus on the migration selection in terms of health. This chapter aims to investigate whether the elimination of the uncertainty about HIV status has an impact on the decision to migrate, since the awareness of own heath

conditions may shape individual expectations and change future scenarios. To this purpose, I use data from the three-round survey *Marriage Transitions in Malawi Project*, which provides longitudinal information about young individuals living in the district of Salima (Beegle and Poulin, n.d.). More specifically, I employ data on randomised HIV testing opportunities given to respondents at the time of the second round, and I assess the intention to treat and the local average treatments effects of these tests on long-term migration and short-term journeys.

Results show that being tested and discovering to be HIV-negative reduce both permanent and temporary migrations, only for women. The potential mechanisms underlying these impacts depend on the type of migrations considered: while the decrease in long-term migration may be due to the avoidance of couple dissolution, the reduction in short-term journeys may be linked to a possible increase in risk aversion. These unintended consequences of HIV testing may represent for women negative outcomes, which policy makers need to consider. Indeed, while women may benefit from couple stability, they may be disadvantaged by the reduction in short-term mobility, which is generally associated with economic and social activities.

2.2 HIV, Marriage and Migration in Malawi

HIV epidemic is highly embedded in social roots (Kalipeni, Oppong, et al., 2007). In Malawi, like in other sub-Saharan countries largely affected by HIV, social factors play a role in both pre- and post-infection phases.

Despite the effectiveness of condom use in HIV prevention (Bracher et al., 2003; Hearst and Chen, 2004), this tool is widely neglected by Malawians, even when they are aware of the risk of getting infected through unprotected sex (Kalipeni and Ghosh, 2007). While using condoms is considered as unacceptable in marriage

and long-term relationships (Watkins, 2004; Chimbiri, 2007; Tavory and Swidler, 2009), it may be also disregarded with non-regular partners. The disuse of condoms is even more dangerous in a setting where fidelity is rarely implemented (Swidler and Watkins, 2007). Therefore, it is unclear whether resorting to marriage reduces the risk of contagion, considering that extramarital relations are common: indeed, while it is generally agreed that early marriage is detrimental for young girls' health (Clark, 2004; Bongaarts, 2007), being married can be either a risk factor or a strategy to be protected from HIV (Bongaarts, 2007; Reniers, 2008).

Marital status and HIV are further intertwined because healthy individuals may postpone marriage in order to avoid adverse selection (Angelucci and Bennett, 2020), and HIV-positive individuals are more likely to experience marital dissolution (Anglewicz, 2011). The end of the relationship is more common when it is the wife that discovers to be infected, rather than the husband (Porter et al., 2004; Anglewicz and Reniers, 2014). In order to tackle HIV contagion, divorce is not only carried out (Smith and Watkins, 2005; Kalipeni and Ghosh, 2007; Reniers, 2008) but also used, mostly by women, as a threat (Watkins, 2004). Suspects about HIV status are also influenced by the perceptions of the people in the village or in the network in which the individual is included (Watkins, 2004; Schatz, 2005; Smith and Watkins, 2005): these opinions have an effect on worries about HIV infection that may be more powerful than actual individual behaviours (Smith, 2003).

Testing for HIV is psychologically and economically costly. Indeed, being tested may be perceived by the individual's network as a sign of engaging in risky sexual behaviours. Moreover, although the test should be free-of-charge at the point of use according to the EHP, it is found that receiving monetary transfers increases the probability of testing and reduces HIV prevalence (Reniers, 2008; Baird, Garfein, et al., 2012), thus suggesting that economic barriers may still exist.

After the test, learning HIV status has highly heterogenous effects. Discovering to

be HIV-positive is found either to favour (Kaler, 2003), in particular for men, or to discourage (Delavande and Kohler, 2012; De Paula et al., 2014) behaviours that are dangerous for own and partner's health, whereas learning to be HIV-negative may make the individual more worried about the probability to be infected in the future (Delavande and Kohler, 2012). The heterogeneity of the response to the test depends not only on the HIV status itself but also on the prior beliefs and self-assessment of own health. For instance, an overestimated likelihood of having contracted the virus can be either useful or harmful in order to prevent the infection (Anglewicz and Kohler, 2009). Indeed, on the one hand, De Paula et al. (2014) show that, after getting tested, a downward revision of the likelihood of being infected may lead the individual to get involved in unsafe behaviours. On the other hand, Baird, Gong, et al. (2014) find that Malawian young girls invest more in education when they are surprised to be HIV-negative, whereas are more likely to contract Herpes Simplex Virus when they are HIV-positive and did not expect this result.

Independently from the type of effect, evidence suggests that HIV testing modifies the expectations and behaviours of those who undergo it. In this regard, attitudes towards migration may be influenced by HIV tests. Indeed, movements, especially of young family members, may be a household coping strategy spurred by the need for additional earnings, given HIV-infected members' death or impossibility to work (Ansell and Blerk, 2004). Furthermore, migration is closely related to marriage, which is an essential step in the life of Malawians: an HIV-positive result may undermine marital stability, thus causing divorce and possible remarriage, which are likely to imply moving. The HIV-related dissolution of the couple could be the reason why migrants are found to be selected in terms of HIV-positive status (Anglewicz, 2011).

In Malawi, the determinants of migration are gendered. While men mainly move

for economic reasons, women mostly migrate for marriage, which is the main reason for short-distance movements. Matrilocal and patrilocal traditions related to migration patterns used to characterise specific regions and ethnic groups, although these customs have become more mixed during the last century. Women move more than men, and individuals from wealthier households are more likely to move. (Beegle and Poulin, 2013a).

This chapter intends to investigate whether being tested for HIV and knowing the HIV status affect the decision to move and, if so, whether the effect depends on gender. As literature suggests, HIV, marriage and migration are intertwined. Therefore, on the one hand, I expect that migration increases when an individual discovers to be HIV positive because being infected may lead to couple dissolution, which implies moving from the household where the individual is living with the partner (Anglewicz, 2011). In particular, I expect that this impact concerns mainly women, who are more likely to migrate for marriage-related reasons (Beegle and Poulin, 2013a) and are also more likely to be involved in couple dissolution when they discover to be HIV-positive (Porter et al., 2004; Anglewicz and Reniers, 2014). Concerning men, who mainly move for economic reasons and are less likely to divorce when they know to be infected, I expect that discovering to be HIV positive has no or little effect on their probability of migration.

On the other hand, I expect that migration probability decreases with an HIV-negative result because couple stability is strengthened and migration due to divorce or union dissolution does not happen. As stated before, I expect that the reduction in migration regards mainly women, given the reasons explained for the opposite case. Moreover, since discovering to be HIV-negative may make an individual more worried about future infection (Delavande and Kohler, 2012), I expect that moving becomes less likely for women for other two main reasons: (1) an HIV-negative unmarried woman may not migrate for marriage, because she decides to

postpone it in order to avoid adverse selection (Angelucci and Bennett, 2020); (2) an HIV-negative woman, worried about getting infected in the near future, may become more risk-averse and therefore may reduce her mobility, given that moving may imply a higher risk of sexual assault. Regarding men, I do not expect that discovering to be HIV-negative changes their migration, because they are less likely to move for marriage-related motives. If knowing to be HIV-negative made men more worried about future infection, it would be possible that they would decide to postpone marriage, as for women. However, as just mentioned, it is less common that they move for marriage and therefore I expect no or little effect on them. Finally, concerning the decrease in moving due to higher risk aversion and to the possibility of sexual assaults, I consider this possible mechanism as highly gendered and so, also in this case, I expect no or little changes in men's probability of moving.

In the following section, I describe the data that are used to investigate the impact of HIV testing on the decision to migrate of women and men in Malawi.

2.3 Data

The Marriage Transition in Malawi Project (MTM) is a longitudinal survey that collects data about young Malawians living, at the time of the baseline, in the district of Salima in Central Malawi (Beegle and Poulin, n.d.). Multi-level information is provided, covering a three-year time span (2007-2009). Three annual rounds – referring to July and August 2007, 2008 and 2009 – include the whole sample, while two interim rounds named partnership interviews – February and March 2008 and 2009 – contain two-thirds of it. In the first round, all 1,183 respondents are unmarried, and women are 13-21 years old, while men are aged 18-25 years.

The dataset provides details on key life events, such the end of schooling and mar-

riage, which are likely to shape individuals' future paths. Data are also intended to assess the probability to contract HIV: to this purpose, a randomised HIV test is assigned to a portion of respondents in the second round, while another test is offered to the entire sample one year later (Beegle and Poulin, 2013b).

This study focuses on the second-round survey, which contains information about the randomly assigned test for HIV. Among second-round respondents, 617 individuals were assigned to the treatment (56.60%). As presented in *Table 1*, 11% of respondents in the treatment group did not get tested: *Table A1* shows that the probability of being tested is negatively associated with good health conditions and previous HIV tests. Nearly 99% of tested individuals discovered to be HIV-negative [1].

Table 1: Second-round respondents and HIV testing

Second-round respondents	1,090
Assigned to test	*617*
Tested	549
Not tested	68
Not assigned to test	*473*

The survey design planned to track respondents in case of migration. Attrition in the follow-ups is low, since the response rates are equal to 92.14% of the baseline sample in the second-round and 88.59% in the third round. Given that the aim of this analysis is to assess the effect of randomised HIV test on migration behaviour, I consider two types of movements: long-term migrations and short-term journeys. Long-term migrations refer to changes in the place of residence, whereas short-term journeys are represented by the average number of nights that the individual spends away from home per year. As shown in *Table 2*, there are 6 and 80 missing observations, for migration and short-term journeys respectively. Among

[1] There are only 7 individuals, out of 549, who tested positive for the virus.

individuals for which information about movements is available, 34.41% of them migrated after the treatment[2], whereas only 17.43% of them moved temporarily[3].

Table 2: Migration and short-term journeys

	Migration	Short-term journeys
Moved	373	176
Did not move	711	834
Missing	*6*	*80*
Second-round respondents	1,090	1,090

Table 3 shows that the main reasons underlying migration are gender-specific: although noneconomic factors are influential for both females and males, most women migrated to marry, whereas a high proportion of men moved because of work-related motivations.

Table 3: Reason for migration by gender

	Reason					
	Work	Education	Marriage	Family	Other	
Women	16	30	67	64	12	189
Men	48	18	12	58	14	150
	64	48	79	122	26	339

Similarly, *Table 4* illustrates that family-related motives are relevant to the short-term journeys of both women and men, even though it is more probable that males, with respect to females, move in order to take advantage of economic and education opportunities.

[2] 44.47% of migrants are men, and 55.53% are women.
[3] 66.48% of individuals who made short-term movements are men, and 33.52% are women.

Table 4: Reason for short-term journeys by gender

	Reason						
	Work	Education	Partner	Family	Events	Other	
Women	2	9	1	29	13	4	58
Men	16	11	2	68	16	3	116
	18	20	3	97	29	7	174

Table 5: Migrants and non-migrants

	Mean		Difference	(SE)
	Non-migrant	Migrant		
Individual characteristics				
Age	19.4543	19.5282	-0.0739	(0.1612)
Female	0.4937	0.5576	-0.0640 **	(0.0319)
Married	0.1828	0.1689	0.0139	(0.0242)
Education	2.2550	2.3703	-0.1153 ***	(0.0339)
Work	0.6484	0.5952	0.0532 *	(0.0311)
Previous migration	0.4093	0.6836	-0.2744 ***	(0.0304)
Short-term journeys	15.1808	28.51781	-13.3370 ***	(4.5202)
Physical health	2.3150	2.2708	0.0443	(0.0429)
Mental health	0.5983	0.5945	0.0038	(0.0111)
Household characteristics				
Size $>$ median	0.4191	0.4016	0.0175	(0.0315)
Presence of parents	0.6329	0.5175	0.1154 ***	(0.0317)
Children aged $\leq$5 years	0.7806	0.6810	0.0996 *	(0.0582)
Wealth	0.2674	0.3630	-0.0956 ***	(0.0168)
Social benefits	0.6746	0.4717	0.2029 ***	(0.0427)
Low income	3.6507	3.3827	0.2680 ***	(0.0746)
Previous shocks	3.5930	3.1563	0.4366 ***	(0.1267)

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Observable characteristics, reported before a possible migration, significantly differ between individuals who decide to move and those who choose to stay, as presented in *Table 5*. Compared to non-migrants, migrants are higher-educated individuals, who are more likely to have moved in the past and to be employed. Furthermore, migrants' households are less disadvantaged, in terms of wealth, income and shocks,

than non-migrants' ones.

Considering short-term journeys, *Table A2* shows that individuals who move are more likely to be unmarried and employed, with previous mobility experience, and their households receive more social benefits and have experienced more shocks. While it is more probable that long-term migrants are women, there is a higher likelihood for males to be short-term migrants.

2.4 Methodology

In order to assess how eliminating the uncertainty about HIV status affects long- and short-term movements, I estimate the intention to treat effect (*itt*) of randomised HIV testing (Duflo et al., 2007). As shown in *equation 1*, I regress the outcome variable, $y_{ihl}^{(t+1)}$, on the random assignment to treatment, *assigned to test*$_{ihl}^{(t)}$[4], and I control for 15 characteristics at individual- ($I_{ihl}^{(t)}$)[5] and household-level ($H_{hl}^{(t)}$)[6], including location fixed-effects (ζ_l)[7].

$$y_{ihl}^{(t+1)} = \alpha + \beta \; assigned \; to \; test_{ihl}^{(t)} + \gamma \; I_{ihl}^{(t)} + \delta \; H_{hl}^{(t)} + \zeta_l + \epsilon_{ihl} \tag{1}$$

where i=individual, h=household, l=enumeration area

The dependent variable refers either to long-term migration, represented by a binary variable that indicates whether the individual changed the place of residence by moving between the second and third rounds; or to short-term journeys, represented by the average number of nights that the individual spent far from home at

[4]A binary variable that is equal to 1 when the individual is assigned to the treatment, and 0 otherwise.

[5]Gender, marital status, education, employment, previous migrations, short-term journeys, physical health, and mental health. See *Table A3* for a full description of these variables.

[6]Household size, presence of parents, children aged ≤ 5 years, wealth, social benefits, low income, and previous shocks. See *Table A3* for a full description of these variables.

[7]Here location refers to the enumeration area (EA) where the individual lived at the time of the second round. There are 60 enumeration areas.

the time of the third round[8]. While these outcomes are relative to the period after the randomised HIV test[9] ($t+1$), the independent variables refer to the second round (t), during which a portion of respondents was randomly assigned to the treatment[10]. Linear probability models are estimated and separate regressions for women and men are run, in order to account for possible gendered effects of the intervention[11].

Since randomisation was effective, treatment and control groups are balanced in terms of observables, as shown in *Table A4*[12]. However, as presented in the previous section, 11% of second-round respondents who were assigned to the treatment refused to be tested. *Table A1* shows that compliers and non-compliers differ: more specifically, it is more likely that ever-tested individuals with worse physical health decide to get tested for HIV. Therefore, since there is impartial compliance, I assess the local average treatment effect (*late*) (Imbens and Angrist, 1994; Angrist et al., 1996). *Late* reflects the impact of the treatment only on compliers and is estimated by instrumenting the actual treatment (in this case, getting tested) with the random assignment to treatment. This two-stage procedure is presented in *equations 2* and *2.1*: while *equation 2.1* represents the first-stage regression, *equation 2* represents the second-stage regression. In *equation 2*, $tested_{ihl}^{(t)}$ is a binary variable that differentiates tested individuals from not tested ones. I include controls at individual- and household-level, as well as location fixed-effects, as in *equation 1*. Similar to the estimation of the *itt*, regressions are also run by gender.

[8] See *Table A3* for a full description of the variables.
[9] Data about migrations are taken from the third round and from the interviews to married respondents that took place between the second and third rounds. Information about short-term mobility is taken from the third round.
[10] Interviews were carried out before the randomisation, except for four individuals. Anyway, these interviews were done within less than two weeks from the assignment to the test. Therefore, given this short interval, controls from the second round are also used for these respondents.
[11] In the separate regressions, age is included as control. This variable is not added to the regression relative to the whole sample because it is highly correlated with gender.
[12] Here I consider the sample that I use in the analysis.

$$y_{ihl}^{(t+1)} = \omega + \kappa\ tested_{ihl}^{(t)} + \tau\ I_{ihl}^{(t)} + \sigma\ H_{hl}^{(t)} + \upsilon_l + \eta_{ihl} \quad (2)$$

$$tested_{ihl}^{(t)} = \theta + \pi\ assigned\ to\ test_{ihl}^{(t)} + \lambda\ I_{ihl}^{(t)} + \mu\ H_{hl}^{(t)} + \xi_l + \psi_{ihl} \quad (2.1)$$

where i=individual, h=household, l=enumeration area

Furthermore, a heterogeneity analysis is carried out to examine whether the effect of HIV testing differs according to individual and household characteristics. The potential mechanism underlying the impact is explored by considering how *late* varies depending on HIV-related attitudes [13] and marital status. Finally, two outcomes after migration – employment and earnings – are investigated: in this way, it is possible to define the short-term consequences of migration and journeys, and to understand whether moving leads to benefits for the individual [14].

2.5 Results

I present the effects of HIV testing on migration, followed by those on short-term mobility.[15] After discussing the potential mechanisms underlying the impacts, I show economic outcomes after migration, in order to evaluate whether a change in mobility due to discovering health status is a positive or negative unintended consequence of HIV tests.

[13] Whether the individual was previously tested and is worried about infection

[14] In this case, migrant and non-migrant groups are made comparable through propensity score weighting. Therefore, the impacts represent average treatment effects.

[15] Since 55% of individuals who were untested in the second round then declared in the last round to have been tested in the previous 12 months, I replicate the analyses for both long- and short-term mobility considering as "tested" also the individuals who reported this status in the third round: this check shows that the results that are presented in the following sections may be underestimated and the change in the probability of migration may be even larger. However, the information about testing that is used in this check does not allow knowing neither the day in which the respondents have been tested nor whether the test has been done before or after a possible migration. For this reason, I consider the following estimates as more reliable and precise.

2.5.1 Migration

Table 6 shows that getting tested for HIV reduces the probability of migration, only for women. This impact, robust to the inclusion of controls and enumeration area fixed-effects, reflects not only the consequence of the test itself but also the fact that individuals tested negative – given that only 1% of the treatment group discovered to be HIV-positive. Therefore, after the uncertainty about HIV status is removed, the probability of women's migration decreases by nearly 25%[16]

Table 6: Impact of HIV testing on migration

	Migration					
	All		Women		Men	
	itt	late	itt	late	itt	late
HIV test	-0.0684**	-0.0766**	-0.1073***	-0.1193***	-0.0291	-0.0328
	(0.0292)	(0.0327)	(0.0415)	(0.0461)	(0.0410)	(0.0462)
Average migration if T=0	0.3827		0.4333		0.3305	
Percentage change	-17.87%	-20.02%	-24.76%	-27.53%	–	–
Controls and EA fixed effects	no		no		no	
Observations	1,084		559		525	
HIV test	-0.0642**	-0.0720**	-0.0951**	-0.1069**	-0.0340	-0.0387
	(0.0278)	(0.0312)	(0.0399)	(0.0449)	(0.0411)	(0.0468)
Average migration if T=0	0.3809		0.4328		0.3276	
Percentage change	-16.85%	-18.90%	-21.97%	-24.70%	–	–
Controls and EA fixed effects	yes		yes		yes	
Observations	1,074		554		520	

Note: Linear probability models. Robust standard errors in parentheses, ***p<0.01, **p<0.05, *p<0.1.

Table A5 shows that the decrease in female long-term migration is connected to specific HIV-related attitudes. In particular, the effect applies only to women who have been previously tested and were more worried about the infection. Moreover, the test affects mainly married women: this suggests that the reduction in migration may reflect the fact that HIV-negative married women do not change

[16] Considering the estimation of *late*, with controls and fixed-effect included. *Late* is similar to *itt* but slightly larger – as expected.

the location where they live because the dissolution of the couple – which could have happened if there were doubts about the HIV status of one or both partners – does not occur. This potential mechanism is consistent with two factors that characterise the Malawian context, according to previous studies. The first one regards the fact that migration determinants are gender-specific: indeed, women are more likely to migrate for marriage or divorce, with respect to men (Beegle and Poulin, 2013a). The second one refers to the fact that marriage instability and HIV status are interrelated, especially if it is the woman to be HIV-positive or to be suspected of being infected (Porter et al., 2004; Anglewicz, 2011; Anglewicz and Reniers, 2014).

In order to provide further evidence supporting the mechanism linked to the avoidance of couple dissolution, I analyse the reasons for migration of tested and non-tested married women. I need to point out that I have information on migration reasons for 190 women (91% of all female migrants) and, among them, only 37 reported in the second round to be married. Therefore, this extremely small sample represents a considerable limitation for this analysis. Nevertheless, I find that 46% of married women who took the test indicated in the questionnaire "marriage" as reason for migration after the test, compared to nearly 71% of those who have not been tested. Given that these women were already married before the test and before migrating, this answer could mean that they have separated from their partner and maybe married again. Therefore, this may suggest that women who moved for separation or remarriage represent a much higher proportion among non-tested married women, than among tested ones.

Testing whether untested women were more likely to divorce may be another option to empirically validate the proposed mechanism. However, also in this case, the sample is very small: among 109 married women whose marital status is known in the third round, only 13 of them reported to be divorced in the endline. Despite

this limitation, I do a t-test, which does not show significant differences in terms of divorce between tested and untested women, and I also estimate the local average treatment effect of the test on the probability of divorce but no significant results are found. Besides the small number of observations, finding no evidence of higher probability of divorce among untested married women may be also due to the fact that couple dissolution does not necessarily imply a divorce. Indeed, a couple may split by separating rather than divorcing, especially in the short-term. This situation appears to be plausible also considering that there was only a one-year interval between the second and the third rounds. Therefore, this information related to mere separation is not captured by the variable on marital status that I use in this check.

Finally, *Table A5* shows a slight decrease in the probability of migration also for unmarried women. This could be linked to the fact that discovering to be HIV-negative may make women postpone marriage to avoid adverse selection (Angelucci and Bennett, 2020). Due to data constraint, I can only check the proportion of women who moved for marriage among tested women and among untested ones: 26% of tested unmarried women migrated to marry, compared to 34% of untested ones. Although this information is consistent with the hypothesis related to marriage postponement, it is not sufficient to provide evidence of this channel.

2.5.2 Short-term mobility

As regards short-term journeys, there is a negative impact only on women's movements, as shown in *Table 7*. The percentage change is considerable, since the average number of nights that treated women spend far from home per year decreases by 65%[17]. As shown in *Table A5*, the impact of the test on short-term journeys regards only unmarried women and women who were not worried about the in-

[17] Considering the estimation of *late*, with controls and fixed-effect included. *Late* is similar to *itt* but slightly larger – as expected.

fection. This result may be explained by an increase in risk aversion (Delavande and Kohler, 2012): women, who are now aware of not being infected, may become more averse to the risks connected to moving, sexual assaults in particular – which nearly 20% of women in the sample indicate as the main mode of transmission of HIV.

Table 7: Impact of HIV testing on short-term journeys

	Short-term journeys					
	All		Women		Men	
	itt	late	itt	late	itt	late
HIV test	-9.4431**	-10.4923**	-14.1640**	-15.5957**	-3.6043	-4.0472
	(4.7293)	(5.2505)	(6.2184)	(6.8536)	(7.1979)	(8.0756)
Average journeys if T=0	30.5747		26.3022		35.0868	
Percentage change	-30.89%	-34.32%	-53.85%	-59.29%	–	–
Controls and EA fixed effects	no		no		no	
Observations	1,010		531		479	
HIV test	-9.2996**	-10.3533**	-15.5210**	-17.2365**	-2.4691	-2.8020
	(4.7076)	(5.2375)	(6.3191)	(7.0304)	(7.3213)	(8.3034)
Average journeys if T=0	30.2381		26.1873		34.5171	
Percentage change	-30.75%	-34.24%	-59.27%	-65.82%	–	–
Controls and EA fixed effects	yes		yes		yes	
Observations	1,001		527		474	

Note: Linear probability models. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

The analysis of heterogeneity presented in *Table A6* suggests that the impact on migration is related to women with primary or lower education, who have migrated before, are employed and live in wealthier households without their parents. Similar heterogeneous effects are found when considering short-term journeys[18].

2.5.3 Outcomes after long- and short-term mobility

In order to understand whether long- and short-term migrations are beneficial to individuals, outcomes after moving are examined. As illustrated in *Table 8*, while

[18]Except for women's education and the presence of parents within the household.

migration increases men's earnings and their probability to be employed, no effect is found on women. Although migration does not appear advantageous for women in terms of economic opportunities, the consequence of the test would be a positive outcome if the stability of the couple increased women's well-being.

Table 8: Migration and economic opportunities

	Work		Earnings	
	Women	Men	Women	Men
Migration	0.0178	0.0504*	1,076.316	13,262.120***
	(0.0446)	(0.0278)	(1,450.395)	(4,606.265)
Average outcome if T=0	0.4263	0.8762	2,679.530	16,718.730
Controls and EA fixed effects	yes	yes	yes	yes
Observations	502	438	502	438

Note: Linear probability models. Propensity score weights included. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

However, it is worth noticing that, as shown in *Table 9*, there is suggestive evidence that women who move temporarily are more likely to be employed: considering that being tested and discovering to be HIV-negative decrease temporary movements for women, this may indicate that women are not taking advantage of available job opportunities.

Table 9: Short-term journeys and economic opportunities

		Mean		Difference	(SE)
		Did not move	Moved		
Women	Work	0.4280	0.5424	-0.1144*	(0.0685)
	Earnings	3,741.928	4,061.017	-319.089	(2,532.426)
Men	Work	0.8886	0.8966	-0.0080	(0.0334)
	Earnings	22,222.700	17,198.710	5,023.995	(3,754.318)

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Moreover, as previously presented in *Table 4*, short-term movements are mainly related to visiting relatives and attending events: given that mobility and participation in social life may be proxies for women's empowerment (Kabeer, 1999), a decrease in the probability of short-term journeys may imply a reduction in activities that can signal empowerment. Therefore, this unintended consequence of HIV testing on women's short-term mobility may be a negative outcome for them.

2.6 Conclusions

This chapter investigates whether being tested for HIV and removing the uncertainty over being infected affects the decision to move. Data from a randomised HIV testing programme in Malawi are used. In this context, migration determinants are gendered, and health, marriage and migration are interlinked.

Results show that getting tested and becoming certain of being HIV-negative decreases the probability of long-term migration and short-term journeys for women but not for men. The effect on migration regards mainly married women and women who were more worried about infection at the time of the second round, whereas the impact on temporary movements concerns only unmarried women. While the decrease in migration can be explained by the avoidance of the dissolution of marriage, the reduction in short-term mobility may be linked to increased risk aversion. Moreover, the impacts on both types of movements refer to less disadvantaged women. It is worth underlining that these effects are short-term: as time passes, individuals may become again uncertain about their HIV status and the impact on mobility of a previous HIV test is likely to disappear.

This study highlights the existence of different gender norms and preferences, which may lead to differential effects of learning HIV status for women and men. Moreover, it provides insights into the unintended effects of HIV tests and offers

evidence of selectivity of migrants in terms of health conditions. This work also suggests that getting tested may lead to negative consequences for women: indeed, the decrease in short-term mobility may indicate that women are not taking advantage of beneficial economic and social opportunities.

Appendix

Table A1: Compliance

Being tested		
HIV-related characteristics		
Ever tested	0.1144 ***	(0.0299)
Worried about infection	0.0032	(0.0252)
Likely to be currently infected	0.0264	(0.0336)
Individual characteristics		
Female	-0.0135	(0.0283)
Married	0.0124	(0.0385)
Secondary education	-0.0458	(0.0300)
Work	-0.0171	(0.0293)
Previous migrations	0.0002	(0.0261)
Short-term journeys	-0.0005 ***	(0.0002)
Physical health		
Good	-0.1326 **	(0.0555)
Very good	-0.1522 ***	(0.0551)
Mental health	-0.0157	(0.0635)
Household characteristics		
Size > median	0.0002	(0.0330)
Presence of parents	0.0367	(0.0258)
Children aged ≤5 years	0.0031	(0.0166)
Wealth	0.0443	(0.0612)
Social benefits	-0.0033	(0.0167)
Low income		
Expenses are met	-0.0665 *	(0.0370)
Using savings to meet expenses	-0.0054	(0.0518)
Borrowing to meet expenses	-0.0621	(0.0394)
Previous shocks	0.0279 ***	(0.0088)
Observations	609	

Note: Marginal effects from probit model. Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1.

Table A2: Short-term journeys

	Mean		Difference	(SE)
	Did not move	Moved		
Individual characteristics				
Age	19.3010	20.1364	-0.8354 ***	(0.2038)
Female	0.5659	0.3352	0.2307 ***	(0.0396)
Married	0.1918	0.1307	0.0612 **	(0.0289)
Education	2.2892	2.3237	-0.0345	(0.0431)
Work	0.6139	0.7330	-0.1190 ***	(0.0375)
Previous migrations	0.4976	0.4602	0.0374	(0.0415)
Short-term journeys	16.6307	29.6266	-12.9959 **	(5.6557)
Physical health	2.2770	2.3409	-0.0639	(0.0565)
Mental health	0.5952	0.5972	-0.0020	(0.0155)
Household characteristics				
Size $>$ median	0.4154	0.4318	-0.0165	(0.0412)
Presence of parents	0.5870	0.6364	-0.0493	(0.0402)
Children aged $\leq$5 years	0.7650	0.6875	0.0775	(0.0698)
Wealth	0.2977	0.2796	0.0181	(0.0191)
Social benefits	0.5942	0.7200	-0.1258 **	(0.0611)
Low income	2.5702	2.6800	-0.1098	(0.0910)
Previous shocks	3.3830	3.8800	-0.4970 ***	(0.1703)

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A3: Description of variables

Variable	Mean	SD	Type	Note
Movements				
Migration	0.3441	0.4753	Binary	Compared to the previous round, the individual has changed the place of residence (nearby village/elsewhere in Salima/elsewhere in Malawi). All movements occurred within the country.
Short-term journeys	25.1021	71.9946	Continuous	Average number of nights that the individual spends far from home per year. This information is taken from the third-round survey as weekly average and is transformed into yearly average.
HIV-related characteristics				
Ever tested	0.4004	0.4902	Binary	
Worried about infection	0.3673	0.4823	Binary	
Likely to be currently infected	0.1857	0.3890	Binary	
Individual characteristics				
Age	19.4771	2.5073	Continuous	
Female	0.5156	0.5000	Binary	
Married	0.1789	0.3834	Binary	
Secondary education	0.3226	0.4677	Binary	At least secondary education.
Work	0.6312	0.4827	Binary	Not specified whether formal or informal paid work. Cash or in kind payments.
Previous migrations	0.5028	0.5002	Binary	Any movement since the individual was 15 years old.

Variable	Mean	SD	Type	Note
Short-term journeys	19.7569	64.1545	Continuous	At the time of the second round, average number of nights that the individual spends far from home per year. This information is taken from the survey as weekly average and is transformed into yearly average.
Physical health	2.3009	0.6744	Categorical	1: fair/poor/very poor, 2: good, 3: very good
Mental health	0.5971	0.1722	Continuous	Normalised index, in which 0 expresses good mental health and 1 poor mental health. The index is created with PCA, for which the following information is used: the individual assessed the frequency of these events in the last two weeks (1) being able to concentrate, (2) unable to sleep because of worries, (3) feeling to be playing a useful part in things, (4) feeling to be capable of making decisions, (5) feeling under strain, (6) being able to enjoy day-to-day activities, (7) being able to face problems, (8) feeling unhappy and depressed, (9) losing confidence in yourself, (10) thinking of yourself as worthless person, (11) feeling happy.
Household characteristics				
Size $>$ median	0.4127	0.4925	Binary	
Presence of parents	0.5910	0.4919	Binary	
Children aged $\leq$5 years	0.7486	0.9137	Continuous	

Variable	Mean	SD	Type	Note
Wealth	0.2989	0.2495	Continuous	Normalised index, in which 0 expresses the lowest wealth and 1 the highest. The index is created with PCA, for which asset ownership and characteristics of the house are used: (i) ownership of (1) bed, (2) table, (3) chair, (4) sofa, (5) television, (6) coffee table, (7) wardrobe, (8) mattress, (9) radio, (10) CD player, (11) bike, (12) lantern, (13) clock, (14) iron, (15) panga (knife), (16) hoe, (17) axe, (18) sickle, (19) pestle; (ii) owned land; (iii) single house; (iv) poor construction materials; (v) walls, floor and roof made of high-quality materials; (vi) number of rooms; (vii) electricity; (viii) cooking fuel; (ix) landline telephone; (x) cellphone; (xi) poor toilet facilities.
Social benefits	0.6026	0.6882	Continuous	Number of different types of benefits that the household received in the last year: (i) distribution of food/maize; (ii) food-for-work programme or cash-for-work programme; (iii) inputs-for-work programme; (iv) distribution of Likuni Phala to children and mothers; (v) supplementary feeding for malnourished children; (vi) starter pack (TIP) distribution of agricultural inputs; (vii) agricultural input supply programme; (viii) other free agricultural inputs distributions; (ix) scholarships for secondary education; (x) scholarships for tertiary education; (xi) direct cash transfers; (xii) other program by government, donors, NGOs or church groups.
Low income	2.5814	1.1209	Categorical	1: building savings, 2: expenses are met, 3: using savings to meet expenses, 4: borrowing to meet expenses
Previous shocks	3.4388	2.0077	Continuous	Number of shocks that the household experienced in the last year: (i) lower crop yields due to drought or floods; (ii) crop disease or crop pests; dead or stolen livestock; (iii) household business failure (non-agricultural); (iv) loss of salaried employment or non-payment of salary; (v) end of regular assistance, aid, or remittances; (vi) fall in sale prices for crops; (vii) rise in price of food; (viii) illness or accident of household member; (ix) birth; (x) death of the head of the household; (xi) death of working member of the household; (xii) death of other family member; (xiii) family break-up; (xiv) theft; (xv) damage/destruction of the dwelling.

Table A4: Balance of baseline observables

	Mean		Difference	(SE)
	Control	Treatment		
Individual characteristics				
Age	19.5793	19.3987	0.18058	(0.1537)
Female	0.5074	0.5219	-0.0145	(0.0306)
Married	0.1755	0.1815	-0.0060	(0.0234)
Education	0.3149	0.3284	-0.0135	(0.0287)
Work	0.6364	0.6272	0.0091	(0.0295)
Previous migrations	0.5159	0.4927	0.0231	(0.0306)
Short-term journeys	19.7327	19.7754	-0.0427	(3.9225)
Physical health	2.3044	2.2982	0.0062	(0.0412)
Mental health	0.6015	0.5938	0.0077	(0.0105)
Household characteristics				
Size $>$ median	0.4068	0.4172	-0.0104	(0.0301)
Presence of parents	0.5826	0.5974	-0.0148	(0.0301)
Children aged $\leq$5 years	0.7125	0.7763	-0.0639	(0.0558)
Wealth	0.2951	0.3019	-0.0068	(0.0153)
Social benefits	0.6038	0.6016	0.0022	(0.0421)
Low income	2.5890	2.5756	0.0134	(0.0686)
Previous shocks	3.4216	3.4520	-0.0304	(0.1229)

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A5: Possible mechanisms

	Migration			*Short-term journeys*		
	late			late		
	All	Women	Men	All	Women	Men
Whole sample	-0.0766** (0.0327)	-0.1193*** (0.04614)	-0.0328 (0.0462)	-10.4923** (5.2505)	-15.5957** (6.8536)	-4.0472 (8.0756)
	-0.0806	*-0.1233*	*-0.0353*	*-0.0722*	*-0.1167*	*-0.0260*
Previously tested	-0.1052** (0.0485)	-0.1445** (0.0701)	-0.0675 (0.0672)	-16.0151* (8.3600)	-17.6269* (9.7045)	-13.3836 (13.5469)
	-0.1099	*-0.1491*	*-0.0715*	*-0.1013*	*-0.1386*	*-0.0737*
Never tested	-0.0518 (0.0440)	-0.0986 (0.0610)	-0.0007 (0.0631)	-5.6479 (6.6007)	-14.4747 (9.4438)	5.2389 (9.2959)
	-0.0548	*-0.1020*	*-0.0007*	*-0.0416*	*-0.1051*	*0.0392*
Worried about infection	-0.1104** (0.0551)	-0.2045*** (0.0772)	-0.0097 (0.0780)	-13.3515 (9.505)	-9.7269 (12.9430)	-16.7406 (13.9095)
	-0.1154	*-0.2124*	*-0.0102*	*-0.0872*	*-0.0644*	*-0.1084*
Not worried about infection	-0.0600 (0.0410)	-0.0719 (0.0580)	-0.0501 (0.0575)	-8.6642 (6.1985)	-17.6442** (7.5258)	2.5065 (10.1963)
	-0.0632	*-0.0740*	*-0.0545*	*-0.0623*	*-0.1493*	*0.0159*
Married	-0.1387* (0.0772)	-0.2391** (0.1024)	0.0233 (0.1128)	-2.2637 (7.0964)	-4.4500 (8.5096)	0.7082 (12.7312)
	-0.14789	*-0.2474*	*0.0264*	*-0.0260*	*-0.0534*	*0.0077*
Unmarried	-0.0629* (0.0362)	-0.0884* (0.0518)	-0.0406 (0.0505)	-12.3457** (6.1985)	-18.8340** (8.4165)	-4.4165 (9.2084)
	-0.0660	*-0.0914*	*-0.0433*	*-0.0798*	*-0.1312*	*-0.0269*

Note: Controls and EA fixed effects not included. Standardised coefficients in italics. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A6: Heterogeneity analysis

	Migration		Short-term journeys	
	late		late	
	Women	Men	Women	Men
Whole sample	-0.1193***	0.0328	-15.5957**	-4.0472
	(0.04614)	(0.0462)	(6.8536)	(8.0756)
Primary education or lower	-0.1269**	0.0165	-1.2139	-0.6148
	(0.0544)	(0.0525)	(5.8896)	(7.1333)
Secondary education or higher	-0.1087	-0.1205	-53.0213***	-9.8314
	(0.0877)	(0.0898)	(19.1067)	(20.4455)
Work	-0.1705**	-0.0150	-32.2338***	-1.8084
	(0.0726)	(0.0494)	(11.0619)	(8.7087)
No work	-0.0832	-0.1282	-3.8806	-18.4673
	(0.0600)	(0.1264)	(8.4962)	(8.7087)
Previous migration	-0.1393**	0.0136	-21.8435**	-7.1789
	(0.0694)	(0.0677)	(9.8191)	(11.9685)
No previous migration	-0.0827	-0.0853	-10.6348	-.5717
	(0.0568)	(0.0564)	(9.5324)	(10.7738)
Parents present	-0.0387	0.0002	-14.6802	-3.2300
	(0.0578)	(0.0566)	(9.8772)	(11.0572)
Parents absent	-0.2382***	-0.0707	-17.0976**	-5.6040
	(0.0751)	(0.0764)	(8.4625)	(11.6194)
Wealth $>$ median	-0.1378**	-0.1267*	-17.4911*	-3.1533
	(0.0636)	(0.0709)	(9.9550)	(12.5548)
Wealth $\leq$ median	-0.1004	0.04511	-13.6233	-4.9059
	(0.0670)	(0.0583)	(9.4465)	(10.5248)
Social benefits	-0.1215*	0.0052	-12.9024	-3.6271
	(0.0659)	(0.0560)	(11.2002)	(11.7874)
No social benefits	-0.1125*	-0.0906	-18.2201**	-5.1444
	(0.0644)	(0.0718)	(8.2058)	(10.3016)
Sufficient income	-0.1598***	-0.0703	-23.4201***	-8.8134
	(0.0563)	(0.0591)	(8.5906)	(10.5726)
Insufficient income	-0.0305	0.0332	1.3724	2.1240
	(0.0815)	(0.0697)	(10.8790)	(12.1172)

Note: Controls and EA fixed effects not included. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

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Chapter 3

Parenting Skills and Women's Empowerment: Evidence from a Randomised Intervention in Bangladesh

Abstract

This chapter provides an evaluation of the spillover effects on female empowerment of a randomised intervention, Save the Children's Early Childhood Stimulation Programme, which offered to Bangladeshi mothers opportunities to develop parenting skills and improve parental knowledge. Results show that the programme empowered women in terms of their decision-making power and parenting-related education is found to be the mechanism underlying this effect. There is evidence of a relationship between fathers' previous migration and mothers' power, since the intervention had an empowerment effect only on women whose partner had not migrated before the baseline and was absent at the time of the first-round.

Keywords: parenting, knowledge, mother, decision-making, empowerment, migration, Bangladesh

3.1 Introduction

Save the Children's Early Childhood Stimulation (ECS) Programme, an intervention implemented in Bangladesh in 2014 and 2015, aimed to improve child development by inducing changes in parenting behaviours. Households with children aged 3-18 months were randomly selected to receive materials and counselling services that could facilitate cognitively stimulating parent-child interactions (Chinen and Bos, 2016). Besides the intended objectives of the programme, the training could have affected parents' behaviours in situations other than child-rearing. In particular, it could have provided mothers, who were the main recipients of the treatment, with information and skills that can also be used in the processes of intra-household bargaining.

Employing recently released and under-used data, this chapter investigates whether the ECS programme led to female empowerment, thus providing policy-relevant insights into the spillover effects of an intervention that was relatively inexpensive and can represent a replicable strategy to obtain multiple outcomes at individual- and household-level. The assessment of the impact on female empowerment is particularly interesting since the programme gave opportunities for improvements in knowledge and did not provide economic benefits.

Furthermore, this chapter also contributes to the growing body of literature on the relationship between male migration and female power (Antman, 2018). Indeed, it analyses whether men's previous migration experiences played a role in shaping the empowerment effect of the programme.

Results show that the intervention increased women's decision-making autonomy and decreased their exclusion from household bargaining. The effect was particularly large on low-educated women, living in poorer households.

The mechanism explaining this empowerment impact is found to be the parenting-related education: indeed, mothers whose baseline parenting knowledge was low were affected the most by the training. Moreover, this channel is also supported by suggestive evidence of improved parental ability for treated mothers.

The effect on decision-making power concerns only mothers who, at the time of the baseline, cohabited with their partner, whereas women living in households where their children's father was absent did not experience any improvement. Similarly, for women who at the time of the baseline reported that their husband had migration experience, the impact of the programme is either null or small, because they were relatively more empowered even before the intervention: this is consistent with previous studies, which find a positive relationship between men's migration and women's power, and provides insights into the heterogeneity of the effect of the training.

3.2 Women in Bangladesh

Bangladesh ranks 129, out of 162 countries, in terms of equality between men and women, considering the 2018 Gender Inequality Index, a multidimensional measure that is calculated by using outcomes relative to reproductive health, empowerment and labour market (UNDP, 2019). Cultural norms have contributed to defining the status of women within the society: as described by Heintz et al. (2018), in a context in which patrilineal inheritance and female seclusion have been practiced, women are likely to be economically dependent on men and to face poor living conditions in case of loss of the main wage-earner male household member – a concept that Cain et al. (1979) refer to as patriarchal risk. Data from 2014 Bangladesh Demographic and Health Survey show that 34% of female respondents aged 15-49 years were working at the time of the survey, compared to 85% of their

male counterparts. Among ever-married women who were involved in some forms of employment, 8% of them were unpaid and, when they received remuneration, they made decisions on how to allocate these resources autonomously in 32% of cases (National Institute of Population Research and Training et al., 2016). Social pressures to adhere to purdah, a practice that restricts female mobility and presence in public places, play a role in determining the types of occupation that women are engaged in (Anderson and Eswaran, 2009). Home-based activities, such as the rearing of livestock, are indeed the most common tasks that women perform, and female employment out of the house may signal family's economic destitution, since working outside the dwelling – taking low-skilled and informal jobs, in particular – is generally avoided unless it is necessary for meeting household's basic needs (Heintz et al., 2018).

Intimate partner violence is common, with a higher prevalence in rural areas and poorer households. According to the Report on Violence Against Women published by the Bangladesh Bureau of Statistics, in 2015 72.6% of Bangladeshi ever-married women aged 15 years and over have experienced, at least once in their lifetime, any form of partner violence, which remained undisclosed – to both local authorities and close people – in the vast majority of cases. More specifically, 54.7% of them have been victims of physical or sexual aggressions, 55.4% of controlling behaviour, and 28.7% of emotional violence. Besides abuses perpetrated by the spouse, Bangladeshi women are also likely to face non-partner assaults, experienced by nearly 30% of them during their life. Highly-educated women are less likely to experience both partner and non-partner violence against them (Bangladesh Bureau of Statistics, 2016).

Like violence, early marriage is also negatively associated with female education: in 2014, the median age at first marriage of Bangladeshi women with at least secondary education is nearly five years higher than the one of lower-educated women.

Marriage before 18 years has been largely practiced in Bangladesh: although the minimum marriage age for women is indeed 18, slightly less than three-fourths of women aged between 20 and 49 years got married before having reached the legal age (National Institute of Population Research and Training et al., 2016). Marriage at young ages may lead to greater power imbalance within the household given a possibly large age gap between spouses (Bangladesh Bureau of Statistics et al., 2017) .

It is not easy to measure female empowerment, since the process is not directly observable (Mahmud et al., 2012). Previous studies on Bangladesh have highlighted the existence of conditions and resources, representing the determinants of empowerment, such as women's age, education, membership of NGOs or other organisations, economic security and access to media. Decision-making is the most common way to measure power dynamics in Bangladeshi households, while control over assets, mobility and participation in social and political life have also been used as proxies for women's power (Bose et al., 2009; Schuler, Islam, et al., 2010; Mahmud et al., 2012; Head et al., 2015; Kabeer, 2017; Kabeer et al., 2018; Ambler et al., 2021). Examples of ways in which women's empowerment has been obtained are improved access to credit, in-kind and cash transfers, and paid job opportunities (Kabeer, 2001; Pitt et al., 2006; Porter, 2016; Kabeer, 2017). Among the benefits of empowerment, besides positive changes for women themselves, there also are improvements in nutrition and food security, for the household and children in particular (Sraboni et al., 2014; Holland and Rammohan, 2019).

Female empowerment is likely to be connected also to male migration. The internal migration of Bangladeshi men is generally a tool for looking for economic opportunities and escaping from poverty, and temporary migration may represent a strategy to cope with the lean period and the timing of dry and wet seasons. (Marshall and Rahman, 2013; Bangladesh Bureau of Statistics, 2015b; Khandker

et al., 2012; Bryan et al., 2014). Given the high costs and risks that migrants and their households should bear, international migration from Bangladesh is mainly experienced by wealthier households with considerable asset endowments (Mendola, 2008; Bangladesh Bureau of Statistics, 2015a). In this context, Hadi (2001) finds that husband's international migration is positively correlated with the decision-making power of the wife, and the explanations for this association include the absence of the spouse and the transmissions of different values. Bose et al. (2009) also suggest the existence of a relationship between women's power and spouses' absence, mainly due to migration. According to Schuler, Lenzi, et al. (2018), Bangladeshi men perceive women's empowerment as a consequence of men's migration, as well as of other changes and interventions at micro- and macro-level. Fakir and Abedin (2020) illustrate that male migration results in women's empowerment, in terms of asset ownership, control over minor expenses, mobility, and lower domestic abuse.

In the following section, I provide the description of the ECS intervention, which offered women the opportunity to improve their knowledge and skills. These potential improvements may have empowered women in terms of bargaining power, thus making them more likely to make decisions.

3.3 Early Childhood Stimulation Programme

The objective of the ECS Programme, created by Save the Children, was to improve the development of Bangladeshi children through changes in parents' behaviours. This intervention was integrated into a government programme, the National Nutrition Services (NNS), in collaboration with the Ministry of Health and Family Welfare. The treatment consisted of the distribution of programme materials and of the provision of counselling services at community clinics or during

visits to households.

The programme involved three sub-districts in Bangladesh – Muladi, Satkania and Kulaura[1] – and, in each of these sub-districts, the treatment was randomised at union-level[2]: 78 community clinics were randomly assigned to treatment and control groups[3]. Within the catchment area of each clinic, households with children aged 3-18 months were randomly selected and mothers were the main recipients of the training[4]. Two surveys were conducted, a baseline survey – during the period between November 2013 and January 2014 – and an endline survey – during the period September–December 2015[5]. The programme implementation started in January 2014 and lasted approximately one year, until August 2015.

Three types of materials were distributed: the child development card, the picture books and the key message picture booklet. The child development card provided examples of cognitively stimulating practices and included simple recommendations with pictures. Illustrations in the household and nature picture books could be used by mothers to teach words and promote children's language development, and the key message picture booklet helped mothers to learn the key messages of the programme[6].

Counselling services were offered during routine households visits, visits to community clinics, and Expanded Programme of Immunisation events, during which health workers[7] showed mothers how to use programme materials. During the

[1] These sub-districts were selected because the NNS programme was piloted there.
[2] Bangladesh is composed of 7 divisions, which are subdivided into districts. Districts are divided into sub-districts (upazilas), which are divided into unions (Chinen and Bos, 2016).
[3] 39 to treatment and 39 to control.
[4] 2,574 household were randomly targeted. Around 92% of the families live within 3 km from clinics.
[5] Attrition is low (3.4%) and is mainly due to migration.
[6] (i) Taking care of yourself during pregnancy, (ii) giving love and affection to the child, (iii) playing games with the child, (iv) talking with the child, (v) practicing positive discipline, (vi) practicing responsive feeding, (vii) practicing hand washing, (viii) sharing the knowledge with others.
[7] Community health care providers, health assistants or family welfare assistants.

implementation of the intervention, other activities were added, such as counselling services during Growth Monitoring Promotion events and community support groups.

The effects of the ECS programme were evaluated by the American Institutes for Research. Cognitive and anthropometric benefits for children were found, and parenting knowledge and health were the only outcomes about parents that were investigated. While no effect on parental knowledge was found, findings from focus groups suggested mothers' increased awareness of child development practices, only in the treatment group (Chinen and Bos, 2016).

In the analysis that follows, I examine whether the programme was beneficial not only to children but also to mothers themselves. In particular, I investigate whether there was an increase in mothers' participation in intra-household decision-making due to the acquisition of new skills. To this purpose, given that the outcome that I analyse highly depends on the presence of other decision-makers, I consider only mothers who, at the time of the baseline, were cohabiting with their partner. I need to acknowledge that, as shown in *Table A1*, these mothers were less educated, less empowered and less likely to go outside to visit friends or relatives, compared to mothers whose partner was absent, thus being more in need of empowerment.

3.4 Methodology

I estimate two types of effects, the intention to treat effect (itt) – β_1 in *equation (1)* –, which is assessed by regressing the outcome on the random assignment to treatment, and the local average treatment effect ($late$) – β_2 in *equation (2)* –, which is needed to address imperfect compliance (Imbens and Angrist, 1994; Angrist et al., 1996; Duflo et al., 2007). Indeed, non-compliers represent 25% of

the sample that is used in the analysis[8]: there are 486 no-shows (assigned to the treatment group but untreated – nearly 47% of the treatment group) and 29 cross-overs (assigned to the control group but treated)[9]. Therefore, I use the random assignment to treatment, A_{ihcs}, as an instrument for the actual treatment, T_{ihcs}, and I obtain the effect of the intervention only on compliers[10].

$$y_{ihcs}^{(t+1)} = \alpha_1 + \beta_1 A_{ihcs}^{(t)} + \gamma_1 I_{ihcs}^{(t)} + \delta_1 H_{hcs}^{(t)} + \zeta_1 C_{cs}^{(t)} + \phi_{1s} + \epsilon_{1ihcs} \tag{1}$$

$$y_{ihcs}^{(t+1)} = \alpha_2 + \beta_2 T_{ihcs}^{(t)} + \gamma_2 I_{ihcs}^{(t)} + \delta_2 H_{hcs}^{(t)} + \zeta_2 C_{cs}^{(t)} + \phi_{2s} + \epsilon_{2ihcs} \tag{2}$$

$$T_{ihcs}^{(t)} = \theta + \kappa A_{ihcs}^{(t)} + \lambda I_{ihcs}^{(t)} + \mu H_{hcs}^{(t)} + \pi C_{cs}^{(t)} + \rho_s + \eta_{ihcs} \tag{2.1}$$

where i=mother, h=household, c=community, and s=sub-district

Information about household decisions is used to measure mothers' power, which is the outcome of interest. During the interviews at the time of the endline, mothers were asked which household member usually made ten different decisions, related to food, children and expenditures[11]. I consider two dimensions of decision-making power, autonomy and exclusion; autonomy refers to the fact that mothers make decisions on their own, whereas exclusion indicates that they do not participate in intra-household bargaining[12]. Therefore, I create two indexes, one for autonomy

[8] 2,055 mothers living with their partner.

[9] See *Table A2* for an analysis of compliance.

[10] *Equations 2.1* and *2* describe the two-step procedure, representing first- and second-stage regressions respectively. The binary variable A_{ihcs} is equal to 1 when the mother is assigned to the treatment and is equal to 0 when the mother is not assigned to the treatment. The binary variable T_{ihcs} is equal to 1 when the mother is treated and is equal to 0 when the mother is not treated.

[11] (i) what food is prepared every day, (ii) how much money the household spends on food, (iii) what food is bought for household consumption, (iv) the food the child is fed with, (v) buying important things for the family, (vi) how earnings are spent, (vii) what to do when your child is seriously ill, (viii) when to take your child to a health facility for checks or Immunisation, (ix) buying toys and any play material for the child, and (x) taking the child outside the house to visit family or friends.

[12] This means that mothers do not make decisions, neither alone nor with other household members.

and the other for exclusion, through principal component analysis, and I also generate a set of other outcome variables in order to check the sensitivity of results[13]. Furthermore, in order to provide a clearer picture of intra-household dynamics, variables relative to each decision are created. Indeed, for each choice, three different indicators are constructed: the first one compares autonomous decision and exclusion, the second one compares collective decision and exclusion, and the third compares autonomous and collective decisions[14].

The characteristics of mothers (I_{ihcs}), households (H_{hcs}), and communities (C_{cs})[15], as well as sub-district fixed effects (ϕ_{2s}), are included in the regressions. While the outcome refers to the endline ($t+1$), all controls are taken from the baseline survey[16](t). Linear probability models are estimated.

I check the robustness of results by improving the balance of baseline observables with propensity score weights[17]. In order to explore the potential mechanism explaining the impact of the programme, an index for baseline parenting knowledge is created using principal component analysis (further details can be found in *Table A6*). I examine the nexus between female empowerment and male migration by investigating whether the empowerment effect of the intervention varies according

[13]The indexes are normalised: 1 stands for highest autonomy (or exclusion) and 0 stands for the lowest autonomy (or exclusion). The other variables that I create represent the shares of decisions – all, child-related and expenditure-related – that are made autonomously by the mother or for which the mother is excluded. See *Table A3* for further details.

[14]The first one is equal to 1 when the decision is made by the mother and is equal 0 when the mother is excluded. The second one is equal to 1 when the decision is made by the mother and other household members jointly, and is equal to 0 when the mother is excluded. The third one is equal to 1 when the decision is autonomous and is equal to 0 when the decision is collective.

[15](1) Mother characteristics: age, education, employment, decision-making power, mobility, depression, time preference. (2) H_{hcs} stands for the characteristics of the household, the child and the father. Household: size, presence of mother-in-law, Muslim, wealth, liquidity constraint, magazines and newspapers at home. Child: age, gender, siblings. Father: previous migration. (3) Community characteristics: main economic activity. See *Table A3*.

[16]Apart from the characteristic the community, which refers to the endline. However, given the preponderance of agriculture, it represents a good proxy.

[17]See *Table A4* for the analysis of baseline observables. I compute propensity score weights as follows: $w_i^1 = \frac{1}{\widehat{ps}}, w_i^0 = \frac{1}{(1-\widehat{ps})}$, where $\widehat{ps}$ is the propensity score. w_i^1 is assigned to the treatment group and w_i^0 is assigned the control group. This check concerns only the estimates of *itt*.

to the migration behaviour of fathers. Finally, I examine whether the impact of the training is heterogeneous according to a number of characteristics of the mothers and the households.

3.5 Results

I distinguish between autonomy and exclusion, in order to allow a comprehensive understanding of the changes in intra-household dynamics that resulted from the programme. Considering both of these dimensions, the intervention empowered mothers, as shown in *Table 1.* Controlling for observable characteristics and including sub-district fixed-effects, a positive impact of the training is found and is not sensitive to the type of outcome variables that has been used. The ECS Programme increased indeed mothers' autonomy in all decisions, as the results referring to the autonomy index and the share of all decisions suggest, and reduced their exclusion from the process of decision-making. While the empowerment effect on child-related decisions is consistent with the objectives of the intervention, the positive impact on mothers' participation in the process of making choices about expenditures is less expected and represents a major spillover effect, given that Bangladeshi women have generally little say in the intra-household allocation of resources.

The intention to treat and local average treatment effects are similar, although the latter is larger. Considering the magnitude of the local average treatment effect, the autonomy index is 27% higher for treated mothers, while the exclusion index is 25% lower. Moreover, as regards the proportion of decisions that are made by the mother on her own, receiving the treatment increased the share of total decisions by 26%, and raised the shares of child- and expenditure-related decisions – by 25% and 62%, respectively. Mothers became not only more autonomous but

also in general more included in the decision-making, either on their own or with other family members, since their exclusion decreased by 25% for all decisions, by 35% for child-related choices, and 27% for expenditure-related ones. Propensity score weighting is used to check the robustness of results, which do not change even when the balance of baseline observables improves[18].

Table 1: Impact of the ECS Programme on mothers' empowerment

	Index	Share of decisions		
		All	Child	Expenditures
		Autonomy		
Itt	0.0201**	0.0271***	0.0352***	0.0173**
	(0.0084)	(0.0091)	(0.0119)	(0.0083)
	0.0503	*0.0604*	*0.0575*	*0.0463*
Late	0.0395**	0.0551***	0.0694***	0.0344**
	(0.0167)	(0.0182)	(0.0241)	(0.0165)
	0.0891	*0.1104*	*0.1021*	*0.0827*
		Exclusion		
Itt	-0.0237***	-0.0292***	-0.0223***	-0.0567***
	(0.0081)	(0.0091)	(0.0079)	(0.0145)
	-0.0589	*-0.0650*	*-0.0592*	*-0.0823*
Late	-0.0514***	-0.0636***	-0.0470***	-0.1212***
	(0.0164)	(0.0186)	(0.0159)	(0.0298)
	-0.1152	*-0.1273*	*-0.1125*	*-0.1584*
Observations	1,992	1,992	1,992	1,992
Controls and sub-district FE	yes	yes	yes	yes

Note: Linear probability models. Standardised coefficients in italics. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

[18]See *Table A5*.

Since the variable about decisions on expenditures includes the purchase of children's toys, I separate this child-related expenditure from the others: in this way, I intend to check whether mothers' empowerment in terms of decision-making on resource allocation is driven by a type of purchase that is closely related to the training programme. To this purpose, I create four new variables. The first two concern autonomy and exclusion regarding decisions about food spending, major purchases and earnings allocation; and the other two are similar to the last variables, but I also exclude the decision about food spending, since food-related

Table 2: Impact of the ECS Programme on decisions about expenditures

	Share of decisions about expenditures		
		Excluding expenditures about	
		Child	Child and food
	Autonomy		
Late	0.0344**	0.0104	0.0043
	(0.0165)	(0.0157)	(0.0153)
	0.0827	*0.0269*	*0.0114*
	Exclusion		
Late	-0.1212***	-0.1159***	-0.1113***
	(0.0298)	(0.0345)	(0.0350)
	-0.1584	*-0.1297*	*-0.1223*
Observations	1,992	1,992	1,992
Controls and sub-district FE	yes	yes	yes

Note: Linear probability models. Standardised coefficients in italics. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

activities, similar to child-related ones, are traditionally assigned to women. The results presented in *Table 2* show that, on the one hand, the empowerment effect regarding autonomy is no longer found and this suggests that the impact that has been previously detected is related to the autonomous decision on the purchase of

toys; on the other hand, as regards exclusion, results are not sensitive to the use of the new dependent variables: this finding implies that the effect on mother's exclusion from decision-making about expenditures persists, even when purchases related to children and food are not considered. I also underline that, although the impact on autonomy about decisions on expenditures is linked to buying toys for children, it is still an important effect in a context in which women's decision-making autonomy is generally low.

Since ten different decisions are considered in the survey, I investigate for which ones mothers have begun to play a more considerable role. *Table 3* shows that mothers have become more powerful in the decision-making about food preparation and child-related outcomes.[19] Given that it is generally more likely for women to be involved in these types of decision-making with respect to others, it may be argued that the programme reinforced a pre-existing specialisation, rather than leading to empowerment. However, it is necessary to acknowledge that, concerning these food- and child-related decisions, mothers may have to compete with other female household members – their mother-in-law, in particular – and this makes the impact of the programme important in these cases.

The main spillover effect of the training regards the decisions about the allocation of resources: mothers have indeed experienced an increase in their influence on the process of decision-making about food spending, major purchases, allocation of earnings and purchase of toys. For these choices (except for major purchases), their role as decision-maker has become more considerable in terms of both autonomous and collective decisions.

[19]The results presented in Table 3 are local average treatment effects. Regressions include control at individual, household and community level, as well as sub-district fixed effects.

Table 3: Impact of the ECS Programme on single decisions

	Autonomous decision *vs* Exclusion	Collective decision *vs* Exclusion	Autonomous decision *vs* Collective decision
Food preparation	0.0879***	0.1176**	0.1423***
	(0.0314)	(0.0543)	(0.0437)
	0.1274	*0.1290*	*0.1342*
Food spending	0.0772**	0.1278***	0.0170
	(0.0387)	(0.0453)	(0.0400)
	0.1080	*0.1152*	*0.0247*
Food to buy	0.0089	-0.0041	0.0340
	(0.0519)	(0.0448)	(0.0404)
	0.0093	*-0.0038*	*0.0417*
Food for the child	0.0131	0.0346	0.0966**
	(0.0228)	(0.0491)	(0.0416)
	0.0257	*0.0501*	*0.0897*
Major purchases	0.0240	0.1087***	-0.0247
	(0.0525)	(0.0373)	(0.0247)
	0.0284	*0.1145*	*-0.0460*
Allocation of earnings	0.0773**	0.1215***	0.0382
	(0.0314)	(0.0432)	(0.0256)
	0.1506	*0.1101*	*0.0821*
Child's illness	0.1380**	0.0169	0.0629**
	(0.0655)	(0.0236)	(0.0308)
	0.1375	*0.0294*	*0.0854*
Child to health centre	0.0874***	0.0594*	0.1076***
	(0.0281)	(0.0594)	(0.0396)
	0.1469	*0.1101*	*0.0996*
Purchase of toys	0.2577***	0.1293***	0.1050**
	(0.0579)	(0.0468)	(0.0414)
	0.2408	*0.1266*	*0.1154*
Child outside	-0.0018	0.0836**	-0.0446
	(0.0420)	(0.0332)	(0.0382)
	-0.0019	*0.1173*	*0.0482*

Note: Linear probability models. Standardised coefficients in italics. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Parenting-related education is assumed to be the channel underlying the effect of the programme on female empowerment: after the training, mothers are likely to be more knowledgeable about child development than before – and more than other household members. This increased knowledge would allow them to have more informed interactions with family members and become more influential in household decision-making. Results presented in *Table 4* support this hypothesis:

Table 4: Potential mechanism

	Late		
		Baseline parenting knowledge	
		≥median	<median
Autonomy			
Index	0.0395**	0.0155	0.0597**
	(0.0167)	(0.0219)	(0.0256)
	0.0891	*0.0356*	*0.1410*
Share of decisions	0.0551***	0.0267	0.0824***
	(0.0182)	(0.0241)	(0.0285)
	0.1104	*0.0726*	*0.1719*
Share of decisions about the child	0.0694***	0.0487	0.0888**
	(0.0241)	(0.0325)	(0.0374)
	0.1021	*0.0546*	*0.1396*
Share of decisions about expenditures	0.0344**	0.0168	0.00508**
	(0.0165)	(0.0220)	(0.0244)
	0.0827	*0.0404*	*0.1307*
Exclusion			
Index	-0.0514***	-0.0372*	-0.0604**
	(0.0164)	(0.0221)	(0.0274)
	-0.1152	*-0.0855*	*-0.1291*
Share of decisions	-0.0636***	-0.0494**	-0.0683**
	(0.0186)	(0.0251)	(0.0307)
	-0.1273	*-0.1015*	*-0.1320*
Share of decisions about the child	-0.0470***	-0.0348	-0.0602**
	(0.0159)	(0.0214)	(0.0277)
	-0.1125	*-0.0864*	*-0.1349*
Share of decisions about expenditures	-0.1212***	-0.0956**	-0.1185**
	(0.0298)	(0.0403)	(0.0479)
	-0.1584	*-0.1271*	*-0.1537*

Note: Linear probability models. Standardised coefficients in italics. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

mothers who had a parenting knowledge lower than the median at the baseline are the ones for which the training had an empowerment effect. Mother who have already had a high parenting knowledge before the treatment experienced minor or no changes in their role within the household[20].

Given that a previous impact evaluation of the programme did not find improvements in parenting knowledge (Chinen and Bos, 2016), I investigate whether there has been a variation in parental ability. Due to several differences in questions about parenting between endline and baseline, I consider every answer about parental knowledge given in the endline and I look for comparable ones in the baseline.[21] Then, I regress dummy variables representing each statement that the mother agrees with at the time of the endline on the actual treatment, instrumented by the treatment assignment, on a dummy for the same or comparable statement in the baseline and on all controls used in the main analysis. The estimates presented in *Table 5* show improvements in parenting knowledge[22] and increases in the probability of positive responsive feeding. These results support the proposed education-related mechanism, since the training actually allowed mothers to learn more about parenting. It is also worth noting that during focus groups treated mothers appeared to be more knowledgeable in terms of parenting with respect to untreated ones. However, I also need to acknowledge that the limitations due to the different questionnaires may have affected the results, thus causing a possible underestimation of the real effect on parental knowledge. Therefore, it would be interesting to replicate this analysis considering the direct observation of mother's behaviours, in order to provide further evidence of improvements in parenting ability.

[20] See *Table A6* for the description of the index for baseline parenting knowledge.

[21] See *Table A7*.

[22] Improvements regard the following statements: "Parents can teach things by playing with children", "Singing to children is good for their development", "Parents can teach things to their children by reading to them", "Mothers can teach things to the child while doing household chores", "Children can learn while playing", "Children benefit from books only when they learn how to read".

Table 5: Improvements in parenting knowledge

Late	
Mother agrees with the following statements	Cognitive Stimulation
Concerning childcare, fathers are naturally clumsy	0.0600 (0.0414)
	0.0560
Parents can teach things by playing with children	0.0297** (0.0126)
	0.0852
Children understand only words they can say	-0.0258 (0.0440)
	-0.0234
Singing to children is good for their development	0.0671*** (0.0220)
	0.1179
Talking to children (< 3 yo) is not important: they do not understand	-0.0433 (0.0277)
	-0.0612
Teaching names of simple objects is good for child development	0.0033 (0.0140)
	0.0090
Children should only play with toys not with household utensils	0.0310 (0.0422)
	0.0284
Parents can teach things to their children by reading to them	0.0242* (0.0144)
	0.0668
Soothing crying children by talking is spoiling	-0.0066 (0.0265)
	-0.0097
Mothers can teach things to the child while doing household chores	0.0294** (0.0149)
	0.0765
Children (< 3 yo) can learn from picture books	0.0166 (0.0176)
	0.0365
Children can learn while playing	0.0217** (0.0109)
	0.0722
Children benefit from books only when they learn how to read	-0.0803* (0.0445)
	-0.0728
Children learn more from the TV than from parents	-0.0368 (0.0359)
	-0.0404
	Responsive Feeding
Caressing	0.1041*** (0.0390)
	0.1071
Playing	0.1297*** (0.0438)
	0.1181
Entertaining	0.0481 (0.0441)
	0.04389
Giving other food	0.0038 (0.0446)
	0.0035

Note: Linear probability models. Standardised coefficients in italics. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Results in *Table 6* suggest that fathers' migration determined whether female empowerment occurred: indeed, the programme had a positive effect on mothers only when fathers had never migrated. Given that nearly all households in which fathers were absent at the time of the baseline include previously migrated fathers, this heterogeneous impact is consistent with the previous results.

Table 6: Fathers' previous migrations

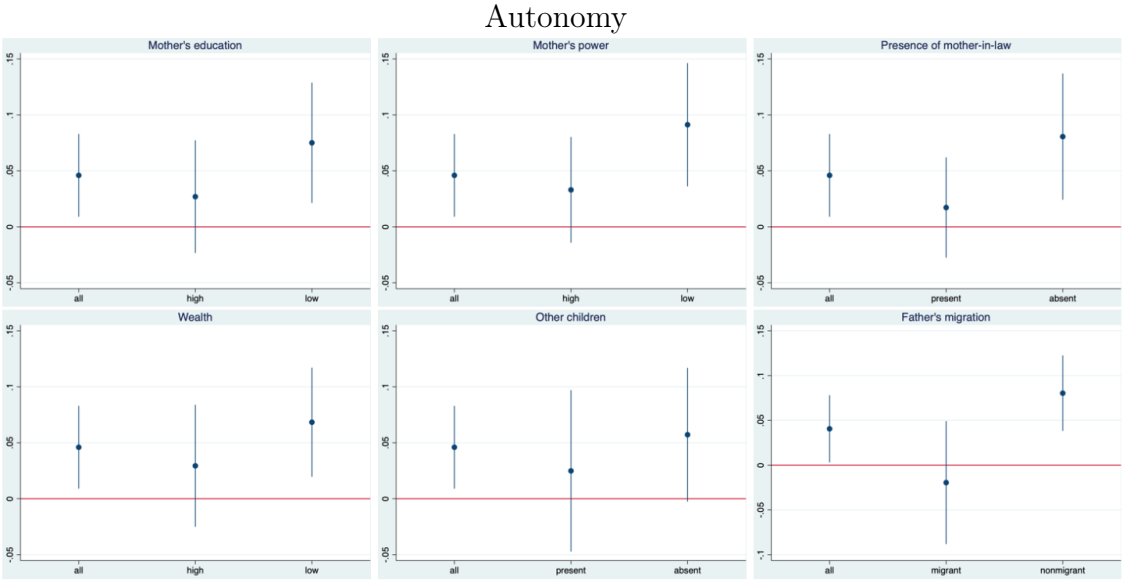
	Late			
	Autonomy		*Exclusion*	
	Index	Share of decisions	Index	Share of decisions
Father is absent	0.0280	0.0537	0.0571	0.0707
	(0.0621)	(0.0608)	(0.0400)	(0.0437)
	0.0123	*0.0679*	*0.1161*	*0.1316*
Father is present	0.0395**	0.0551***	-0.0514***	-0.0636***
	(0.0167)	(0.0182)	(0.0164)	(0.0186)
Before the baseline, father				
Migrated	-0.0208	-0.0096	-0.0002	0.0022
	(0.0339)	(0.0342)	(0.0249)	(0.0282)
	-0.0322	*-0.0147*	*-0.0004*	*0.0044*
Did not migrate	0.0604***	0.0804***	-0.0517***	-0.0655***
	(0.0198)	(0.0215)	(0.0194)	(0.0219)
	0.1356	*0.1604*	*-0.1126*	*-0.1286*
Migrated $\geq$ 3 months	-0.0179	-0.0122	0.0005	0.0032
	(0.0400)	(0.0396)	(0.0272)	(0.0307)
	-0.0260	*-0.0171*	*0.0011*	*0.0063*
Did not migrate or	0.0601***	0.0801***	-0.0450**	-0.0572***
migrated $<$ 3 months	(0.0188)	(0.0205)	(0.0183)	(0.0207)
	0.1356	*0.1610*	*-0.0991*	*-0.1132*
Migrated $\geq$ 6 months	-0.0094	-0.0004	0.0099	0.0157
	(0.0407)	(0.0407)	(0.0289)	(0.0324)
	-0.0137	*-0.0006*	*0.0218*	*0.0307*
Did not migrate or	0.0514***	0.0705***	-0.0458**	-0.0584***
migrated $<$ 6 months	(0.0192)	(0.0207)	(0.0179)	(0.0202)
	0.1123	*0.1388*	*-0.1008*	*-0.1156*

Note: Linear probability models. Controls and sub-district fixed effects included. Standardised coefficients in italics. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Moreover, this finding is connected to the fact that women's power and husbands' migration are likely to be intertwined: consistent with the existence of a positive association between male migration and female empowerment found in previous studies, the wives of men with migration experience have already been relatively more powerful and, for this reason, the training may have not provided scope for further improvements[23].

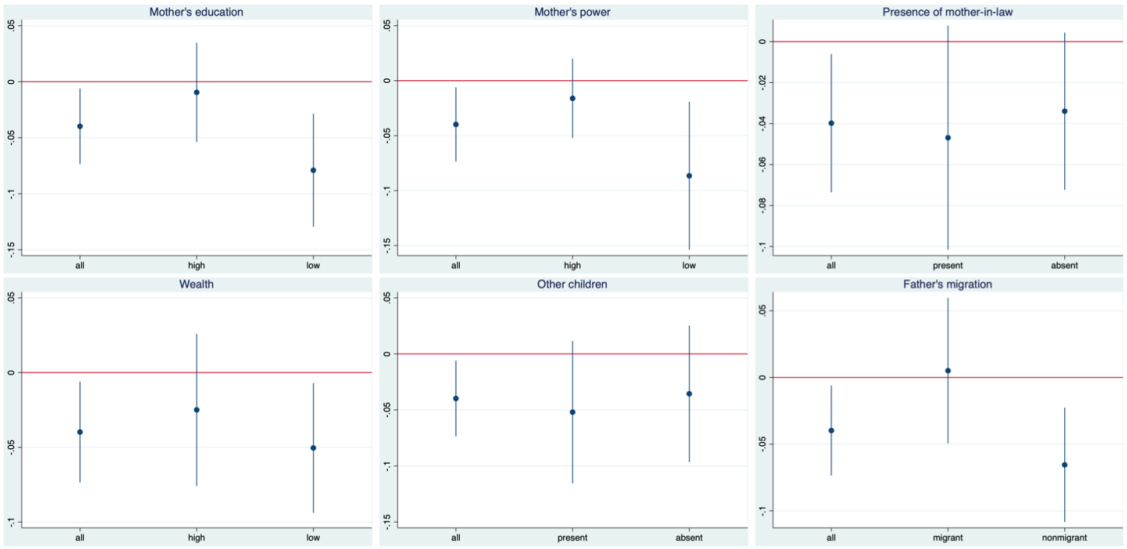
The heterogeneity analysis shown in *Figure 1* suggests that, considering both autonomy and exclusion, the impact of the programme was larger for low-educated and less empowered mothers, living in poorer households. When the mother-in-law was absent, no differences in the effects are found for the exclusion, while the effect on autonomy was stronger. The impact was not heterogeneous in terms of the presence of other children.

Figure 1: Impact of the ECS Programme on mothers' empowerment, analysis of heterogeneity



[23]See *Table A1* and *Table A8* for comparisons between households where the father has previously migrated (or was absent at the time of the baseline) and households where the father has not migrated (or was present at the time of the baseline).

Exclusion



3.6 Conclusions

This chapter investigates the impact of the ECS Programme on women's empowerment, while also providing insights into the relationship between female power and male migration.

Save the Children's intervention offered mothers of children aged 3-18 months opportunities for improvements in parental skills. The training improved mothers' autonomy and participation in decision-making: in a context in which female bargaining power is generally low, mothers' role in intra-household bargaining became more considerable not only for food- and child-related choices but also for decisions about the allocation of resources. This spillover effect is particularly remarkable because the programme did not include cash or in-kind transfers and was relatively inexpensive – it cost nearly 7 dollar per child whose development was expected to be improved (Chinen and Bos, 2016).

Parenting-related education is the channel that underlies the impact on empowerment, since mothers with a lower pre-treatment parenting ability experienced the largest improvement. I also find evidence that the parenting knowledge of treated

mothers actually improved. Moreover, the heterogeneity analysis shows that this effect was stronger on mothers who were less educated and less empowered at the time of the baseline, living in poorer households.

The empowerment effect applies only to mothers whose spouse has not migrated before the first-round and was present at the time of the baseline, thus suggesting the existence of a relationship between women's position within the household and husbands' migration – as shown in previous studies.

Finally, it would be interesting to investigate the effects on women's empowerment of other training programmes, similar in terms of costs and design but addressing topics that are not traditionally related to women.

Appendix

Table A1: Comparison between households based on father's presence

	Father			
	Present	Absent		
	Mean	Mean	Difference	(SE)
Mother characteristics				
Age	25.7498	24.8044	0.9454***	(0.2627
Education	6.3296	8.0339	-1.7043***	(0.1489)
Employment	0.0561	0.0484	0.0077	(0.0117)
Decision-making power	0.3495	0.5220	-0.1725***	(0.0209)
Mobility	0.4388	0.5349	-0.0961***	(0.0269)
Depression	0.1574	0.1993	-0.0419***	(0.0097)
Time preference	0.5742	0.5542	0.0200	(0.0268)
Household characteristics				
Size	5.9981	6.0193	-0.0212	(0.1423)
Presence of mother-in-law	0.3966	0.5880	-0.1914***	(0.0265)
Muslim	0.8443	0.9422	-0.0979***	(0.0140)
Wealth	0.4022	0.5705	-0.1684***	(0.0109)
Liquidity constraint	3.1671	2.2313	0.9357***	(0.0801)
Magazines and newspapers at home	0.1816	0.2470	-0.0654***	(0.0229)
Child characteristics				
Age (months)	12.0496	12.4386	-0.3889*	(0.2093)
Female	0.4929	0.4578	0.0351	(0.0269)
Siblings	1.3800	0.9494	0.4307***	(0.0608)
Father characteristics				
Previous migration	35.0823	311.0169	-275.9346***	5.7890
Community characteristics				
Main economic activity	0.9207	0.9422	-0.0215*	(0.0129)

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A2: Compliance

Treated		
Mother characteristics		
Age	-0.0006	(0.0029)
Education	0.0073*	(0.0041)
Employment	-0.1829***	(0.0554)
Decision-making power	-0.0046	(0.0347)
Mobility	-0.0135	(0.0214)
Depression	0.1514**	(0.0681)
Time preference	-0.0239	(0.0201)
Household characteristics		
Size	0.0012	(0.0059)
Presence of mother-in-law	0.0289	(0.0267)
Muslim	0.0722**	(0.0312)
Wealth	-0.1317*	(0.0704)
Liquidity constraint	-0.0119	(0.0078)
Magazines and newspapers at home	0.0696***	(0.0078)
Child characteristics		
Age (months)	-0.0070***	(0.0025)
Female	-0.0104	(0.0199)
Siblings	0.0086	(0.0121)
Father characteristics		
Previous migration	-0.00001	(0.0001)
Community characteristics		
Main economic activity	0.0020	(0.0400)
Observations	1,992	

Note: Households in which the father was present at the time of the baseline. Sub-district fixed effects included. Marginal effects from probit model. Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1.

Table A3: Description of variables

Variable	Mean	SD	Type	Note
Autonomy				
Index	0.1598	0.1991	Continuous	Normalised index, in which 0 expresses the lowest autonomy and 1 the highest. The index is created with PCA, for which the following information about autonomous decisions is used: the mother makes decisions on her own about (i) what food is prepared every day, (ii) how much money the household spends on food, (iii) what food is bought for household consumption, (iv) the food the child is fed with, (v) buying important things for the family, (vi) how earnings would be spent, (vii) when to take your child to a health facility for checks or immunisation, (ix) buying toys and any play material for the child, (x) taking the child outside to visit family or friends.
Share of decisions	0.2297	0.2243	Continuous	Share of decisions that the mother makes on her own. See the description of the autonomy index for all decisions that are considered.
Share of decisions about the child	0.2913	0.3067	Continuous	Share of decisions about the child that the mother makes on her own. The child-related decisions are: (i) the food the child is fed with, (ii) when to take your child to a health facility for checks or immunisation, (iii) buying toys and any play material for the child, (iv) taking the child outside to visit family or friends, (v) taking the child outside to visit family or friends.

Variable	Mean	SD	Type	Note
Share of decisions about expenditures	0.0747	0.1863	Continuous	Share of decisions about expenditures that the mother makes on her own. The expenditure-related decisions are: (i) how much money the household spends on food, (ii) buying important things for the family, (iii) how earnings would be spent, (iv) buying toys and any play material for the child.
Exclusion				
Index	0.1543	0.2003	Continuous	Normalised index, in which 0 expresses the lowest exclusion and 1 the highest. The index is created with PCA. See the description of the autonomy index for all decisions that are considered.
Share of decisions	0.1953	0.2242	Continuous	Share of decisions from which the mother is excluded. See the description of the autonomy index for all decisions that are considered.
Share of decisions about the child	0.0920	0.1875	Continuous	Share of decisions about the child from which the mother is excluded. See the description of the variable relative to autonomy.
Share of decisions about expenditures	0.3333	0.3441	Continuous	Share of decisions about expenditures from which the mother is excluded. See the description of the variable relative to autonomy.
Single decisions				
Autonomous decision *vs* exclusion			Binary	The variable takes the value 1 if the mother makes the decision on her own and 0 if the mother is excluded. Ten variables are created, reflecting the decisions that are considered.

Variable	Mean	SD	Type	Note
Collective decision *vs* exclusion			Binary	The variable takes the value 1 if the mother makes the decision with other household members and 0 if the mother is excluded. Ten variables are created, reflecting the decisions that are considered.
Autonomous decision *vs* collective decision			Binary	The variable takes the value 1 if the mother makes the decision on her own and 0 if the mother makes the decision with other household members. Ten variables are created, reflecting the decisions that are considered.
Mother characteristics				
Age	25.7498	5.1257	Continuous	
Education	6.3296	3.2750	Continuous	Years of education.
Employment	0.0561	0.2302	Binary	
Decision-making power	0.3495	0.3047	Continuous	Normalized index, in which 0 expresses the lowest exclusion and 1 the highest. The index is created with PCA, for which the following information about decisions is used: the mother is the main decision-maker for decisions about (i) what food is prepared every day, (ii) how much money the household spends on food, (iii) buying important things for the family, (iv) how earnings would be spent, (v) what to do when the child is seriously ill.
Mobility	0.4388	0.4964	Binary	This variable takes the value 1 if the mother visits friends/relatives twice a month or more and takes the value 0 if she does not visit or visits friends/relatives less than twice a month.

Variable	Mean	SD	Type	Note
Depression	0.1574	0.1514	Continuous	Normalised index, in which 0 expresses good mental health and 1 poor mental health. The index is created with PCA, for which the following information is used: in the last week, how many days the mother felt (i) sad, (ii) lonely, (iii) like crying, (iv) that she was enjoying life, (v) depressed, (vi) interested in doing things.
Time preference	0.5742	0.4946	Binary	The mother is asked whether she would prefer to receive 500 Taka today, or 750 Taka after 7 days. The variable takes value 1 for the first option, and 0 for the second.
Household characteristics				
Size	5.9981	2.2815	Continuous	
Presence of mother-in-law	0.3966	0.4893	Binary	
Muslim	0.8443	0.3627	Binary	
Wealth	0.4022	0.1967	Continuous	Normalised index, in which 0 expresses the lowest wealth and 1 the highest. The index is created with PCA, for which asset ownership and characteristics of the house are used: (i) ownership of (1) house, (2) land, (3) auto-bike, (4) rickshaw, (5) bicycle, (6) motorcycle, (7) radio, (8) television, (9) cellphone, (10) non-mobile phone, (11) refrigerator, (12) wardrobe, (13) table, (14) chair, (15) electric fan, (16) DVD player, (17) farm animals, (ii) piped water source, (iii) own latrine, (iv) improved latrine, (v) finished floor, (vi) finished walls, (vii) finished roof, (viii) cooking fuel, (ix) rooms per household member, (x) electricity.

Variable	Mean	SD	Type	Note
Liquidity constraint	3.1671	1.5370	Categorical	The mother is asked how easy it would be for a household member to get 500 Taka in cash by the day after. 1: very easy, 2: somewhat easy, 3: neither easy nor difficult, 4: somewhat difficult, 5: very difficult, 6: impossible.
Magazines and newspapers at home	0.1816	0.3856	Binary	
Child characteristics				
Age (months)	12.0496	3.9805	Continuous	
Female	0.4929	0.5001	Binary	
Siblings	1.3800	1.3955	Continuous	
Father characteristics				
Previous migration	35.0823	87.9294	Continuous	Number of days the father spent away from home during the year before the baseline.
Community characteristics				
Main economic activity	0.9207	0.2703	Binary	1: paddy or vegetable cultivation, 0: business or day labour.

Table A4: Balance of baseline observables

	Control	Treatment		
	Mean	Mean	Difference	(SE)
Mother characteristics				
Age	25.7076	25.7913	-0.0837	(0.2263)
Education	6.3307	6.3285	0.002	(0.1445)
Employment	0.0619	0.0504	0.0115	(0.0102)
Decision-making power	0.3420	0.3570	-0.0150	(0.0135)
Mobility	0.4446	0.4331	0.0114	(0.0219)
Depression	0.1544	0.1604	-0.0059	(0.0067)
Time preference	0.5735	0.5749	-0.0013	(0.0218)
Household characteristics				
Size	5.9422	6.0531	-0.1110	(0.1006)
Presence of mother-in-law	0.4069	0.3865	0.0204	(0.0216)
Muslim	0.8275	0.8609	-0.0334**	(0.0160)
Wealth	0.4031	0.4012	0.0020	(0.0088)
Liquidity constraint	3.2149	3.1199	0.0950	(0.0678)
Magazines and newspapers at home	0.1719	0.1911	-0.0192	(0.0170)
Child characteristics				
Age (months)	12.2824	11.8203	0.4621***	(0.1754)
Female	0.5010	0.4850	0.0160	(0.0221)
Siblings	1.3088	1.4502	-0.1414**	(0.0615)
Father characteristics				
Previous migration	36.4976	33.6877	2.8099	(3.8833)
Community characteristics				
Main economic activity	0.9441	0.8976	0.0465***	(0.0119)

Note: Households in which the father was present at the time of the baseline. Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A5: Robustness check with propensity score weights

	Autonomy			
	Index	Share of decisions		
		All	Child	Expenditures
Itt, without weights	0.0201**	0.0271***	0.0352***	0.0173**
	(0.0084)	(0.0091)	(0.0119)	(0.0083)
	0.0503	*0.0604*	*0.0575*	*0.0463*
Itt, with weights	0.0201**	0.0271***	0.0351***	0.0169**
	(0.0083)	(0.0090)	(0.0119)	(0.0082)
	0.0503	*0.0603*	*0.0574*	*0.0451*
	Exclusion			
Itt, without weights	-0.0237***	-0.0292***	-0.0223***	-0.0567***
	(0.0081)	(0.0091)	(0.0079)	(0.0145)
	-0.0589	*-0.0650*	*-0.0592*	*-0.0823*
Itt, with weights	-0.0238***	-0.0292***	-0.0222***	-0.0561***
	(0.0081)	(0.0091)	(0.0079)	(0.0145)
	-0.0591	*-0.0651*	*-0.0589*	*-0.0815*
Observations	1,992	1,992	1,992	1,992

Note: Linear probability models. Controls and sub-district FE included. Standardised coefficients in italics. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A6: First component from PCA, used to create the index for baseline parenting knowledge

Variables	First component
Mother agrees with the following statements	
Soothing a crying child is spoiling	-0.1558
Child is mischievous	-0.1681
Singing and talking to the child is important	0.0700
Talking helps child development	0.1436
Concerning childcare, father is naturally clumsy	-0.0537
Teaching names is important	0.1365
Playing games is important	0.1256
Mother's responsive child feeding	
Caressing	0.5097
Playing	0.5373
Entertaining	0.4932
Giving other food	0.3050

Table A7: Questions about cognitive stimulation knowledge

E: Fathers are naturally clumsy when it comes to taking care of children B: Fathers are naturally clumsy when it comes to taking care of babies
E: Parents can teach things to their children by playing with them B: It is important to play games with the baby
E: Children understand only words they can say B: Infants understand only words they can say
E: Singing to child is good for him/her development B: It is important to talk and sing to your baby
E: Talking to young children (under 3 years old) is not important because they do not understand words yet B: Talking to a child about things he (she) is doing helps its mental development
E: Teaching your child the names of simple objects is good for him/her development B: It is important to teach the baby names of simple objects and colours
E: Children should only play with toys not with household utensils B: It is important to play games with the baby
E: Parents can teach things to their children by reading to them B: It is important to teach the baby names of simple objects and colours
E: The more you soothe your crying child by talking to him/her, the more you spoil B: A baby should not be held when he (she) is crying because this will make him (her) want to be held all the time
E: Mothers can teach things to the child while doing household chores B: It is important to teach the baby names of simple objects and colours
E: Young children (under 3 years old) can learn things from picture books B: It is important to teach the baby names of simple objects and colours
E: Children can learn several things while playing B: It is important to play games with the baby
E: Children benefit from books only when they learn how to read B: Infants understand only words they can say
E: Children learn more from the TV than from parents B: It is important to talk and sing to your baby

Note: E indicates endline questions, whereas B indicates baseline questions.

Table A8: Comparison between households based on father's previous migration

	Father			
	Non-migrant	Migrant		
	Mean	Mean	Difference	(SE)
Mother characteristics				
Age	25.9492	24.9696	0.9796***	(0.2087)
Education	6.0737	7.5619	-1.4883***	(0.1273)
Employment	0.0656	0.0360	0.0295***	(0.0088)
Decision-making power	0.3564	0.4166	-0.0602 ***	(0.0140)
Mobility	0.4337	0.4932	-0.0596***	(0.0209)
Depression	0.1602	0.1716	-0.0114*	(0.0067)
Time preference	0.5780	0.5584	0.0196	(0.0208)
Household characteristics				
Size	6.0025	6.0000	0.0025	(0.0995)
Presence of mother-in-law	0.3858	0.5056	-0.1198***	(0.0208)
Muslim	0.8293	0.9169	-0.0875***	(0.0133)
Wealth	0.3915	0.4990	-0.1075***	(0.0087)
Liquidity constraint	3.2716	2.5450	0.7265***	(0.0635)
Magazines and newspapers at home	0.1789	0.2162	-0.0373**	(0.0169)
Child characteristics				
Age (months)	12.0571	12.2169	-0.1597	(0.1652)
Female	0.4873	0.4865	0.0008	(0.0210)
Siblings	1.4518	1.0584	0.3933***	(0.0526)
Community characteristics				
Main economic activity	0.9289	0.9157	0.0132	(0.0113)

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

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