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Conditional cash transfers, migration, and child welfare in rural El Salvador

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Abstract

Governments and households take various initiatives to protect and improve children's welfare. The present research explores how effective some of those initiatives are in protecting child nutrition, increasing schooling, and reducing child labor in rural areas. More specifically, this study asks (1) if an ongoing conditional cash transfers (CCTs) program can help maintain children's nutritional status when rural households experience aggregated economic shocks, (2) how CCTs and remittances from international migrants affect children's school enrollment, (3) how household participation in a CCT program might affect international remittances and migratory decisions, and (4) if the international migration of a household member affects the participation of children and adolescents in labor activities in the home country.

The results of this research indicate that an ongoing CCT program can protect child nutrition against economic shocks, such as the food price crisis of 2008. The analysis shows that children who were just entering the program at the time of the crisis were four percentage points less likely to be wasted than children not yet in the program. Moreover, children in the poorest household experienced a nine-percentage points reduction in the probability of wasting. Also, children who had received the transfers for an average of 24 months were ten percentage points less likely to have stunted growth than children in the program for about 13 months. Again, children in the poorest households saw higher gains, with an 18-percentage points reduction in the probability of being stunted.

The analysis also indicates that the CCT program significantly increased school enrollment among targeted children (aged 6 to 17 years with unfinished primary schooling). Moreover, the evidence indicates that the program increased the enrolment of non-targeted children (those with completed primary school). On the other hand, remittance reception is found to reduce school enrollment. This negative relationship is more pronounced among children in the age corresponding to secondary school. The analysis does not find evidence that the CCT program significantly affects remittance behavior or the school enrollment of children in households receiving remittances.

Finally, migration is found to increase the participation of children and adolescents in labor activities in some instances. The analysis shows that the departure of a migrant increases the probability that children, particularly boys, participate in non-domestic activities, such as working on the family farm or wage employment outside the household. Likewise, the return of a migrant seems to increase the probability that children work in non-domestic activities. At the intensive margin, the return of a migrant is associated with an increase in the time children dedicate to non-domestic labor activities. The analysis could not discard a null relationship between the departure, or the return, of a migrant and the participation of children in domestic work activities, such as cleaning, cooking, or collecting water for household consumption.

Zusammenfassung

Regierungen und Haushalte ergreifen verschiedene Initiativen zum Schutz und zur Verbesserung des Wohlergehens von Kindern. Die vorliegende Studie untersucht, wie wirksam einige dieser Initiativen zum Schutz der Kinderernährung, zur Verbesserung der Schulbildung und zur Reduzierung der Kinderarbeit in ländlichen Gebieten sind. Konkret geht es in dieser Studie um die Fragen, (1) ob ein laufendes Programm für bedingte Geldtransfers (*Conditional Cash Transfers* - CCTs) dazu beitragen kann, den Ernährungszustand von Kindern aufrechtzuerhalten, wenn ländliche Haushalte aggregierten wirtschaftlichen Schocks ausgesetzt sind, (2) wie CCTs und Rücküberweisungen von internationalen Migranten die Einschulung von Kindern beeinflussen, (3) wie sich die Teilnahme eines Haushalts an einem CCT-Programm auf internationale Rücküberweisungen und Migrationsentscheidungen auswirken kann, und (4) ob die internationale Migration eines Haushaltsmitglieds die Beteiligung von Kindern und Jugendlichen an Arbeitsaktivitäten im Heimatland beeinflusst.

Die Ergebnisse dieser Untersuchung deuten darauf hin, dass ein laufendes CCT-Programm die Ernährung von Kindern vor wirtschaftlichen Schocks wie der Lebensmittelpreiskrise von 2008 schützen kann. Die Analyse zeigt, dass Kinder, die zum Zeitpunkt der Krise gerade erst in das Programm aufgenommen wurden, mit einer um vier Prozentpunkte geringeren Wahrscheinlichkeit verschwendet wurden als Kinder, die noch nicht am Programm teilnahmen. Bei Kindern in den ärmsten Haushalten sank die Wahrscheinlichkeit der Unterernährung sogar um neun Prozentpunkte. Außerdem war bei Kindern, die im Durchschnitt 24 Monate lang Transferleistungen erhalten hatten, die Wahrscheinlichkeit einer Unterentwicklung (engl.: *stunting*) um zehn Prozentpunkte geringer als bei Kindern, die erst seit etwa 13 Monaten am Programm teilnahmen. In den ärmsten Haushalten fällt die Wahrscheinlichkeit zu einer Unterentwicklung sogar um 18 Prozentpunkte geringer aus.

Die Analyse zeigt auch, dass das CCT-Programm den Schulbesuch von Zielkindern (im Alter von 6 bis 17 Jahren mit nicht abgeschlossener Grundschulbildung) deutlich erhöht. Darüber hinaus deuten die Beweise darauf hin, dass das Programm die Einschulung von nicht zur Zielgruppe gehörenden Kindern (Personen mit abgeschlossener Grundschule) erhöhte. Andererseits wird festgestellt, dass der Empfang von Geldüberweisungen die Einschulungsrate verringert. Dieser negative Zusammenhang ist bei Kindern im Alter der weiterführenden Schule stärker ausgeprägt. Die Analyse findet keine Hinweise darauf, dass das CCT-Programm das Überweisungsverhalten oder die Einschulungsrate von Kindern in Haushalten, die Überweisungen erhalten, wesentlich beeinflusst.

Schließlich wird festgestellt, dass Migration in einigen Fällen die Beteiligung von Kindern und Jugendlichen an Arbeitstätigkeiten erhöht. Die Analyse zeigt, dass die Abwanderung eines Migranten die Wahrscheinlichkeit erhöht, dass Kinder, insbesondere Jungen, an außerhäuslichen Tätigkeiten teilnehmen, wie z. B. der Arbeit auf dem Bauernhof der Familie oder der Lohnarbeit außerhalb des Haushalts. Ebenso scheint die Rückkehr eines Migranten die Wahrscheinlichkeit zu erhöhen, dass Kinder in außerhäuslichen Tätigkeiten arbeiten. An der Intensitätsgrenze ist die Rückkehr eines Migranten mit einem Anstieg der Zeit verbunden, die Kinder für außerhäusliche Tätigkeiten aufwenden. Die Analyse konnte einen Null Zusammenhang zwischen dem Wegzug oder der Rückkehr eines Migranten und der Beteiligung von Kindern an häuslichen Tätigkeiten wie Putzen, Kochen oder Wasserholen für den Hausgebrauch nicht ausschließen.

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List of Abbreviations and Acronyms

ADS	Salvadoran Demographic Association *(Asociación Demográfica Salvadoreña)*
BCR	Central Reserve Bank of El Salvador (*Banco Central de Reserva de El Salvador*)
CCT	Conditional Cash Transfer
CSR	Rural Solidarity Communities *(Comunidades Solidarias Rural*es)
DIGESTYC	General Directorate of Statistics and Censuses of El Salvador *(Dirección General de Estadísticas y Censos de El Salvador*)
FAO	Food and Agricultural Organization of the United Nations
FUSADES	Salvadoran Foundation for Economic and Social Development *(Fundación Salvadoreña para el Desarrollo Económico y Socia*l)
GDP	Gross Domestic Product
HAZ	Height-for-age Z-score
IFPRI	International Food Policy Research Institute
ILO	International Labor Organization
IIMM	Municipality Marginality Integrated Index *(Índice Integrado de Marginalidad Municipal*)
IOM	International Organization for Migration
FLACSO	Latin-American Faculty of Social Sciences *(Facultad Latinomaméricana de Ciencias Sociales*)
MINDEL	Ministry of Local Development of El Salvador *(Ministerio de Desarrollo Local de El Salvador*)
MINED	Ministry of Education of El Salvador *(Ministerio de Educación*)
MINSAL	Ministry of Health of El Salvador (*Ministerio de Salud de El Salvador*)
NGO	Non-Governmental Organization
OIR	Information and Response Office *(Oficina de Información y Respuesta*)
OLS	Ordinary Least Squares
PPP	Purchasing Power Parity
STP	Technical Secretariat of the Presidency *(Secretaría Técnica de la Presidencia*)

UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNICEF	United Nations Children's Fund
USD	United States Dollar
WHO	World Health Organization
WHZ	Weight-for-height Z-score

1. Introduction

1.1. Motivation

All children should have access to quality education and be free of malnutrition to secure their right to life and develop their full potential. Moreover, households, communities, and countries benefit from investments in education and health as children grow to become productive members of society. Unfortunately, universal access to education and nutritious food is not guaranteed. Despite substantial progress in the last decades, it is estimated that 258 million children and adolescents were not attending school in 2018 (UNESCO Institute for Statistics, 2019), and around 144 million children under five years were stunted in 2019 (UNICEF et al., 2020). Poverty is one of the main drivers behind children's lack of schooling and malnutrition. Children in the poorest households are significantly less likely to start school and more likely to drop out (The World Bank, 2018a). Likewise, children in the poorest families are significantly more likely to suffer malnutrition (FAO et al., 2019). Moreover, poverty also significantly affects the household's ability to cope with economic shocks, such as those provoked by economic downturns or extreme weather events.

National and international agencies promote and implement multiple policies to reduce poverty, increase access to education, and improve child nutrition. Among these policies, the Conditional Cash Transfers (CCT) programs have received considerable attention in past years, especially in Latin America. In essence, these programs require households to increase their investment in children's human capital (for instance, requiring children to enroll and regularly attend school, and follow regular medical checks) in exchange for periodical cash transfers. In Latin America, where these programs are commonly used, around 21% of the total budget for social safety nets is directed to them (The World Bank, 2018b).

Naturally, individual households also implement different actions to improve their welfare and protect their livelihoods against economic shocks. Those actions also have implications for their children's health, nutrition, and education. One of the most visible actions households take is migration and remittances. Estimations indicate that 272 million people (3.5% of the world population) were international migrants in 2020 (IOM, 2020). Moreover, the financial flow of remittances to low- and middle-income countries accounted for 529 billion USD in 2018, more than three times the amount of official development assistance (The World Bank, 2019).

In general, CCT programs have been found to increase school enrollment and improve child nutrition. For instance, the *PROGRESA* program in Mexico was found to increase enrollment in primary and secondary school (Schultz, 2004), increase height-for-age and decrease stunting prevalence among children 12-36 months old (Behrman & Hoddinott, 2005; Gertler, 2004). Similar results were also observed in Colombia (Attanasio et al., 2005, 2010) and Nicaragua (J. Maluccio & Flores Montenegro, 2005). However, little is known about how effective CCT programs are in improving child nutrition or preventing deterioration when households experience aggregated shocks. The program in Nicaragua is one of the few examples where researchers had the opportunity to test CCT effectiveness under such conditions. In that instance, researchers found that, while the program was able to reduce the prevalence of child stunting and underweight on average, in the case of children living in regions where household income was heavily affected by a steep reduction in coffee prices, the program's positive effect disappeared (J. A. Maluccio, 2005).

The effect of migration and remittances on children's welfare is more open to debate. Previous literature on the effect of migration and remittances on children's schooling and labor has not identified a conclusive empirical relationship. On the one hand, temporary economic migration has been found to increase school enrollment and decrease children's participation in labor activities in rural Pakistan (Mansuri, 2006). On the other hand, in Mexico, researchers have identified a negative impact of migration on school attendance but no significant impact on child labor (McKenzie & Rapoport, 2011). Focusing on remittance shocks gives an even more nuanced picture. In Mexico, an unexpected reduction in remittances caused by the 2008-2009 global financial crisis was found to increase child labor and reduce school attendance (Alcaraz et al., 2012). Likewise, In the Philippines, an unexpected increase in the value of remittances caused by the 1997 Asian financial crisis was found to increase children's schooling, reduce the time children spent on unpaid family work, but increase the hours spent in self-employment or paid family work (Yang, 2008).

1.2. Research questions

The present research intends to contribute to the previous literature by exploring the effectiveness of CCT programs in improving or maintaining children's nutritional status when households experience aggregated shocks. The research also intends to contribute to the debate on the empirical relationship between migration, remittances, and children's welfare. Moreover, the research examines how public transfers might affect the behavior of migration and remittances. In particular, this study asks:

(1) If an ongoing CCT program can help maintain children's nutritional status when rural households experience aggregated economic shocks.

(2) How conditional cash transfers and international remittances affect children's school enrollment.

(3) How household participation in a CCT program might affect international remittances and migratory decisions.

(4) If the international migration of a household member affects the probability that children and adolescents in the home country participate in labor activities.

1.3. Country Background

This research focuses on the country of El Salvador to answer the previous questions. Several reasons make the small Central American country an interesting case for analysis. First, a significant proportion of Salvadorans live abroad, and consequently, many Salvadoran households are dependent on remittances for their livelihoods. The actual number of Salvadorans living outside the national borders is not precisely known. However, estimations place the number of Salvadorans in the United States, the main country of destination for Salvadoran migrants, at more than 2.5 million people[1] in 2019, representing more than a third of the 6.4 million Salvadoran living in their country of origin. Although accounts of Salvadorans migrating to the United States can be found for the whole 20th century, Salvadoran migration

[1] Approximately 1.4 million born in El Salvador and 1.1 million born in the United States.

accelerated in the 1980s, years also marked by the country's civil conflict (1980 – 1992). Of the 0.6 million Salvadoran recorded in the 1990 United States Census, almost 90% of those born in El Salvador immigrated to the United States after 1979. The number of Salvadorans in the American union would continue growing in the following decades, reaching almost 1.1 million in 2000 and 1.98 million in 2010, representing 18% and 32% of the population in El Salvador in 2000 and 2010, respectively[2].

Table 1.1: El Salvador, selected statistics

	1988	1998	2008	2014	2018
Population (millions) [(a)]	5.1	5.8	6.1	6.3	6.4
GDP per capita, PPP (constant 2017, international $) [(a)]	--	6,465	7,393	7,990	8,616
Poverty headcount ratio at $5.50 a day (2011 PPP) [(a)]	--	52.5	43.8	35.5	26.3
Remittances (% GDP) [(a)]	5.0	12.2	20.9	18.4	20.7
Primary school enrollment rate (net) [(a)]					
All	--	81.4	94.4	88.2	81.0
Girls	--	87.9	--	88.4	81.4
Boys	--	75.1	--	88.0	80.6
Secondary school enrollment rate (net) [(a)]					
All	--	--	57.3	66.5	61.8
Girls	--	--	57.8	67.5	62.6
Boys	--	--	56.7	65.6	61.1
Children out of school (percentage, 7 - 12 years old) [(b)]					
Urban	--	--	4.1	3.0	1.5
Rural	--	--	8.2	4.4	3.9
Children out of school (percentage, 13 - 18 years old) [(b)]					
Urban	--	--	18.7	18.0	17.0
Rural	--	--	39.4	36.1	35.2
Stunting prevalence (children 0 - 5 years old) [(c)]	31.7	--	21	14	--
Wasting prevalence (children 0 - 5 years old) [(c)]	2.2	--	1.6	2.1	--

Sources: (a) The World Bank (2022) (b) DIGESTYC (2009, 2015, 2019) (c) ADS (2004, 2009) & MINSAL et al. (2017)

Many of the Salvadorans in their home country maintain active relationships with the migrants abroad and depend on remittances for their livelihoods. In the 1992 Salvadoran census,15.1% of the households reported at least one member living abroad, and 11.2% of all households received remittances. Interestingly, in the 2007 census, the proportion of households reporting migrants abroad decreased to 13.5%, but the proportion of households receiving remittances increased to 18.9%[3]. More recent data from surveys indicate that in 2017 more than 56% of

[2] Data on Salvadorans living in the United Sates is based on public samples of the US Census (1990 and 2000) and the American Community Survey (2010 and 2019). Samples obtained via IPUMS US (Ruggles et al., 2022). Data on Salvadoran population from the World Development Indicators (The World Bank, 2022).

[3] Estimations based on public census samples available on IPUMS International (Minnesota Population Center, 2021).

the households in El Salvador had a relative living abroad, although only 16.5% of the households still considered their migrant relatives as part of the household (IOM, 2017). In the same year, remittances sent by Salvadoran migrants reach up to 21.6% of the households in the home country (DIGESTYC, 2018), and the total amount sent typically adds up to more than 20% of the country's GDP in recent years.

Second, despite substantial progress in previous decades, El Salvador still faces substantial challenges in reducing child malnutrition. In 1988, the percentage of Salvadoran children below five years old who were stunted or had low height-for-age was 31.7%, while the proportion of children in the same age group who were wasted or had low weight-for-height was 2.2%[4]. Two decades later, in 2008, the prevalence of low height-for-age was reduced to 20.8%, while low weight-for-height was down to 1.6% (ADS, 2004, 2009). More recently, in 2014, the prevalence of low height-for-age was further reduced to 13.6%, but low weight-for-height increased to 2.1% (MINSAL et al., 2017). However, this general improvement in child nutrition indicators hides important differences between the urban and rural areas in the country. For instance, in 2014, stunting prevalence in urban centers was 11.4%, while in rural regions, the prevalence was up to 16.6%.

Third, El Salvador also faces significant challenges in expanding primary and secondary school enrollment. Children in El Salvador are supposed to start primary school (first to sixth grade) at seven years old. They are expected to continue to lower-secondary or middle school (grades 7th to 9th) at the age of 13 years and progress to upper-secondary school or high school (grades 10th to 11th or 12th, depending on the course of studies) when they turn 16 (UNESCO, 2019). Net enrollment rates in primary school increased nationwide between 1998 and 2008, going from 81.4% to 94.4%. However, thereafter the enrollment rate decreased back to 81% in 2018. Likewise, the net enrollment rate in secondary school increased between 2008 and 2014, going from 57.3% to 66.5%. Nevertheless, like in the case of primary schooling, the enrollment rate in secondary school went down to 61.8% in 2018 (The World Bank, 2022).

Moreover, while female children have caught up with males in school enrollment in the past two decades, important divides persist between urban and rural areas. In 2008, the percentage of children of primary school age that did not attend school was 4.1% in urban areas and 8.2% in rural regions. This difference was repeated for children of secondary school age but with higher magnitudes. In urban areas, 18.7% of adolescents 13 to 18 years old did not attend school, while in rural areas, this proportion was up to 39.4%. After a decade, in 2018, the divide between urban and rural areas persisted, albeit the percentage of children who did not attend school decreased. The percentage of primary-school-aged children who did not attend school was 1.5% in urban centers and 3.9% in rural regions, while for secondary school, this proportion was up to 17% in urban areas and 35.2% in rural regions (DIGESTYC, 2009, 2019).

[4] Children are classified as stunted when their height-for-age is below two standard deviations from the average of a healthy population of reference. Likewise, children are classified as wasted when their weight-for-height is below two standard deviations from the reference population average. Stunting, or low heigh-for-age, usually reflects long-term deficits on nutrition or repeated infections, while wasting indicates a significant weight lost typically caused by severe food intake deficits or disease (WHO Expert Committee, 1995).

1.4. Data and methods overview

This study focuses on one social assistance program in El Salvador known as "*Comunidades Solidarias Rurales" (CSR).* The government of El Salvador phased in the program between 2005 and 2009 in some of the country's poorest municipalities. The program's main objective was to improve the living conditions of Salvadoran families under extreme poverty, with particular emphasis on rural areas. More specifically, the program aimed to improve household income, health, nutrition, and schooling (STP, 2009).

The program's main component was monthly conditional cash transfers to participant households. Two types of transfers were given depending on households' characteristics: A "Health bonus" of 15 USD for households with pregnant women or children under five years old, and an "Education Bonus" of 15 USD for households with children between 5 to 18 years old who are yet to complete primary education. A household qualifying for both groups received a combined transfer worth 20 USD. The program has two sets of conditionalities for the participant households to receive the transfers. First, pregnant women must attend regular medical checks following the Health Ministry's official protocol. Similarly, children up to five years old must attend regular medical checks and comply with the official vaccination scheme. Second, children from 5 to 18 years old, who have not completed primary education, are required to be enrolled at school and regularly attend (STP, 2009).

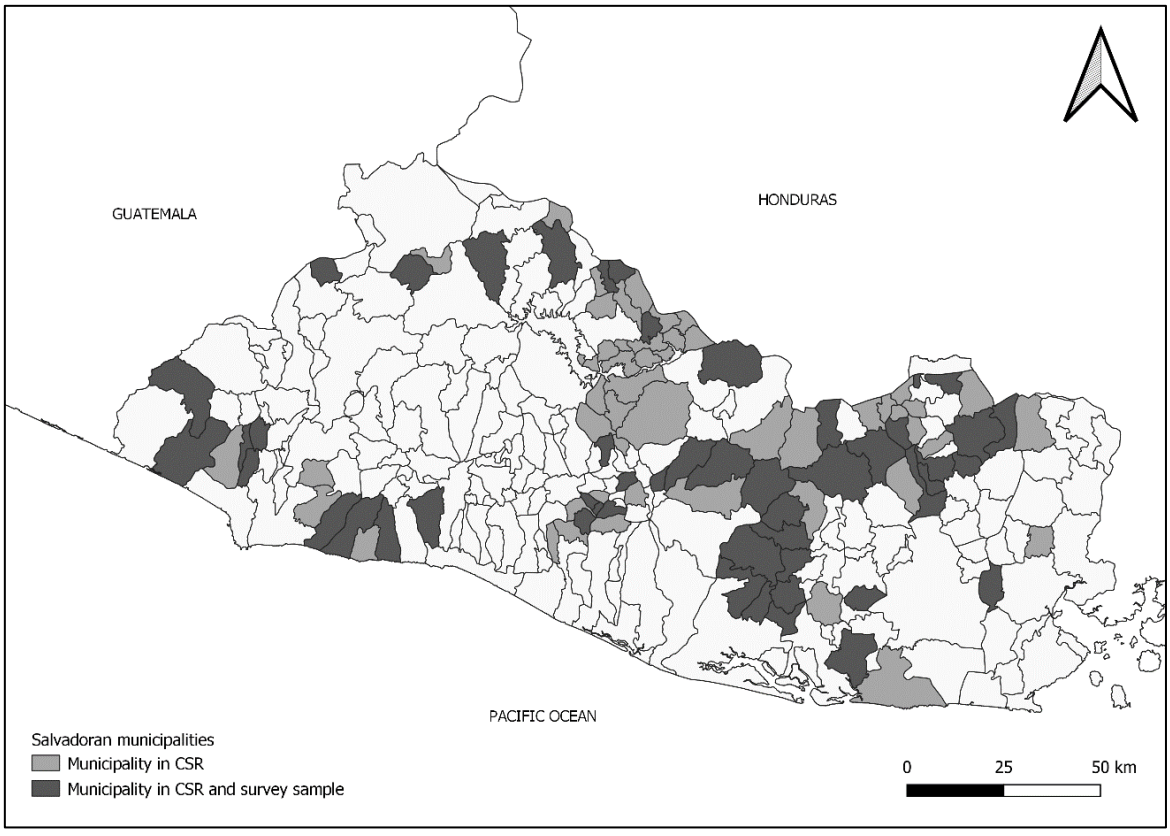

Figure 1.1: Salvadoran municipalities in the CSR program
Source: STP (2009) and Evaluation Survey

The primary data source for the analysis in the following chapters is the survey implemented to evaluate the program's impact. The survey was designed and executed by the International Food Policy Research Institute (IFPRI) and the *Fundación Salvadoreña para el Desarrollo Económico y Social* (FUSADES). It sampled around 2900 households from 50 of the 100 municipalities participating in the CSR program and collected a rich set of information from households and individuals, including demographics, education, migration, and anthropometrics, among other characteristics.

Considering the gradual implementation of the CSR program and the content and timing of the evaluation survey, three principal methodologies were used to identify the impact of the CSR program and migration on the outcomes of interest. First, a difference-in-difference strategy was implemented to identify the impact of the CSR program on nutrition, school enrollment, and migration. Second, an instrumental variables approach was used to account for the endogeneity of migratory decisions in the households and identify the effect of remittances on school enrollment and child labor (geographic variables and historical emigration incidence were used as exogenous instruments). Third, individual fixed effects were used to address the likely unobserved heterogeneity among children in the sample when studying the effect of migration on children's participation in labor activities.

1.5. Summary of the results

The analysis indicates that the program offered some protection to child nutrition against a rapid increase in food prices. When households started to receive the cash transfers almost at the same time as the peak of the food prices in El Salvador in 2008, the program reduced the probability that children three years old or younger were wasted by almost four percentage points. These benefits seem to be concentrated among children at the lower end of the wealth distribution, for whom the reduction in the probability of wasting reached more than nine percentage points. When considering households that have been participating for a more extended period, the analysis found that an exposure to the program of around 24 months reduced the probability of a child being stunted by around ten percentage points, compared with an exposure of around 13 months. Again, the benefits tend to concentrate among children in less wealthy households, for whom the probability of stunting is reduced by around 18 percentage points.

The study also found evidence suggesting that the amount of the transfer matters for child nutrition. Higher accumulated cash transfers are associated with higher weight-for-height and height-for-age scores, and lower wasting and stunting probabilities once individual and household characteristics are accounted for. As an example, back-of-the envelop calculations show that increasing the total amount received during a year by a household with three children by the equivalent of approximately one monthly transfer (i.e., receiving 13 instead of 12 transfers) is associated with an average reduction of 0.5 percentage points in the children's probability of being wasted and a reduction of 1 percentage points in the children's probability of being stunted in comparison with other children with similar characteristics and living in similar households.

The assessment of the CCT program in El Salvador also found a positive effect of the CCT on school enrollment for children between 6 and 12 years old. These results align with the program's initial impact evaluation (IFPRI and FUSADES 2009, 2010a, 2010b). Beyond this

confirmation, the present assessment found evidence of a higher increase in school enrollment associated with the CCT for children in the municipalities participating in the program but outside the targeted age range. This spillover effect, not previously identified, increases the overall positive effect of the CCT program.

Contrary to the public cash transfers, remittances are found to reduce school enrollment rates. This negative effect is mainly driven by children in the age range corresponding to secondary school. Interestingly, the analysis does not find evidence that the CCT program significantly affects the enrollment rate of children in households receiving remittances or the household's remittance behavior or migratory decisions.

Finally, the evidence indicates that migration increases the participation of children and adolescents in work activities in some instances. The analysis shows that the departure of a new migrant increases the probability that children, particularly males, participate in non-domestic activities, such as working on the family farm without payment or wage employment outside the household. On the other end of the migratory experience, the return of a migrant seems to increase the probability that children work in non-domestic activities. At the intensive margin, the return of a migrant is associated with an increase in the time children dedicate to non-domestic labor activities. The evidence is not conclusive when considering domestic work, such as cleaning, cooking, or collecting water for household consumption. The analysis could not discard a null relationship between the departure, or the return, of a migrant and the participation of children in those activities.

1.6. Research outline

The rest of the document is organized into three empirical chapters and one chapter for general conclusions. The first empirical chapter, following this introductory section, investigates if the CCT program in El Salvador was able to offer some protection to children's nutritional status during a period of surging food prices. The second empirical chapter inquiries about the effect of CCTs and remittance reception in the household on children's school enrollment. The chapter also inquiries about the effect of the CCT program on remittances and migration. The third empirical chapter explores how international migration affects children's participation in labor activities in their home country. The final chapter provides concluding remarks, including a summary of the main results and some policy implications.

All three empirical chapters have a similar structure. They start with an introduction that summarizes the chapter and places the research within the previous literature, followed by a theoretical framework, a description of the data and methods used in each specific chapter, some statics describing the main outcomes and explanatory variables, a description and discussion of the main results, and a final section with concluding remarks.

2. Can an ongoing CCT program protect child nutrition against aggregate shocks?

2.1. Introduction

Significantly greater efforts are needed to meet the goal of ending hunger and malnutrition in all its forms by 2030, even more now with the effects of the Covid-19 pandemic and the related disruptions. It was estimated that in 2019, before the pandemic, around 144 million children were stunted, and wasting affected around 47 million children (UNICEF et al., 2020). Now, the situation is even more pressing. The pandemic and the measures implemented to contain it have resulted in a severe economic downturn, increased poverty, and disruptions in global and local supply chains. All this has contributed to an increase in the number of people suffering from hunger and food insecurity (FAO et al., 2021), which in turn results in more children suffering from malnutrition. Estimations indicate that by 2022 the pandemic and related disruptions could result in stunting affecting 2.6 million additional children and wasting affecting 9.3 million additional children (Osendarp et al., 2021).

Governments around the world have tried to tackle the adverse effects of the pandemic and related disruptions on people's livelihoods by implementing thousands of social protection measures[5]. All of those represent a significant financial burden for governments and taxpayers. Unfortunately, given the emergency circumstances and speed at which they were planned and implemented, reliable estimates of their efficacy are hard to come by. Nevertheless, looking back to similar circumstances in the past might shed some light on the topic.

This chapter explores the efficacy of social protection programs, not necessarily designed to provide emergency support, but implemented during periods of crisis. Specifically, this paper asks if Conditional Cash Transfers (CCT) programs help to maintain children's nutritional status when rural households experience aggregated economic shocks.

For answering this question, the analysis focuses on one CCT program: El Salvador's "*Comunidades Solidarias Rurales*" (CSR), which was rolled out in some areas of the country during the food price crisis of 2008. Like most CCT programs, the Salvadoran initiative gave participant households a periodical cash stipend attached to a series of conditions related to human capital investments (mostly children's school attendance and regular medical checks). Despite not being designed to provide emergency support, the program's gradual implementation (between 2005 and 2009) covered the period of the food price crisis of 2008, potentially providing some protection to the participant households against the price shock.

The analysis in this chapter complements the literature on CCT evaluation by focusing on the role of CCT programs in protecting household welfare during economic downturns. Many of those analyses carried out in non-crisis periods have found positive impacts on child nutrition, for instance, in Mexico (Behrman & Hoddinott, 2005; Gertler, 2004; Rivera et al., 2004) and Colombia (Attanasio et al., 2005). However, literature has also found no significant effect on child nutrition in Honduras (IFPRI, 2003), Tanzania (Evans et al., 2014) and Mali (Adubra et

[5] See Gentilini et al. (2021) for a summary of the implemented measures.

al., 2019), or even negative effects on some specific nutrition indicators in Brazil (Morris et al., 2004)[6].

In two cases, researchers had the opportunity to evaluate the impact of CCT programs during aggregated shocks: the programs in Nicaragua and El Salvador. In Nicaragua, the impact evaluation showed that, on average, the program was able to reduce the prevalence of child stunting and underweight (J. Maluccio & Flores Montenegro, 2005). However, when focusing on children living in regions where household income was heavily affected by a steep reduction in coffee prices, researchers found that the program's positive effect on child nutrition disappeared (J. A. Maluccio, 2005). In El Salvador, the findings of the original evaluation report indicate that children participating in the program for two years are significantly less likely to be stunted compared to children who had participated for just one year (IFPRI & FUSADES, 2010a). However, since it was a general evaluation, the role of the program in protecting child nutrition during economic shocks was not explored in detail. Moreover, the analysis did not consider the program's effect on weight-for-height and wasting, nor the effect on children that started in the program almost at the same time as the crisis.

This paper also complements recent research on the effect of preexisting cash transfer programs on household wellbeing during the COVID-19 pandemic, so far focused on food security and self-reported financial and physical health, by exploring the role of cash transfers on child nutrition. In Colombia, additional cash transfers to some participants of a CCT program were found to have a modest effect on the household's financial health and food access (Londoño-Vélez & Querubín, 2022). In Bolivia, using online surveys, researchers found that becoming eligible for the country's noncontributory pension system during the onset of the pandemic reduced households' food and financial insecurity, particularly among low-income households and those who experienced business closures (Bottan et al., 2021). Similarly, in Kenya, cash transfers to rural households, part of a preexisting universal basic income field experiment, were found to positively impact food security, as well as physical and mental health (Baird et al., 2007).

Besides contributing to the previous academic literature on the impact of CCT programs on child nutrition, this analysis has important implications for the design of CCT programs and their use as social protection tools during economic shocks. First, the analysis provides evidence that the use of preexisting cash transfer programs might be helpful in protecting child nutrition against economic shocks. Second, the findings highlight that timely intervention is crucial for effective protection against acute weight loss. Third, the results point out that targeting the support to the poorest households should be a priority since they are the most vulnerable and the most likely to benefit from the interventions.

The rest of the chapter is organized as follows. The following section builds a simple conceptual framework based on microeconomic theory. The third section describes the CSR program and explains the empirical approach to identify its effect on child nutrition. The fourth section reviews the behavior of some of the principal indicators of child nutrition in the survey. The fifth section shows the main results of the analysis. The sixth section provides a brief description of the poverty reduction strategy implemented by the Salvadoran government in more recent years. The seventh and final section concludes.

[6] For systematic reviews of the literature on the impact of CCT programs see: Bastagli et al. (2016); Lagarde et al. (2009); Onwuchekwa et al. (2021).

2.2. Theoretical Framework

Basic microeconomic theory indicates that a consumer's demand depends on the price of the product or service to be purchased, the price of the other goods in the consumption bundle, and the budget available to the consumer. When the analysis corresponds to a household rather than an individual, there are additional considerations. For instance, if the household is not considered a single unit, the interests and objectives of the individual members might be in conflict. In other words, it could be in the interest of some members to increase the consumption of certain goods, while other members would prefer higher consumption of a different set of products and services. This possible conflict of interest is why CCTs are often handed to the mother in the household since it is thought that her objectives and interest are more aligned with those of her children (Fizbein & Schady, 2009)[7]. Another consideration when analyzing households rather than individuals is the possibility that households produce and sell some of the goods they consume, as is the case of households in rural areas involved in agricultural production. In such circumstances, a price increase for the goods produced (and consumed) by the households would generate a rise in profits that could outweigh the traditionally expected reduction in consumer demand (Singh et al., 1986).

Despite the previous concern, and given the available data, which does not disaggregate household consumption by individual members and the fact that most of the households in the sample use their agricultural production for own-consumption or sell a small portion of their production[8], the analysis proceeds considering the household as a single unit. Indeed, this approach limits the scope of questions to explore and omits the important dynamics within the household. Nevertheless, it still provides a simple framework to interpret the available data at the household level. The demand functions for an individual consumer, or unitary household, considering a bundle of two goods, take the following general form:

$$\begin{aligned} x_1 &= f(p_1, p_2, m) \\ x_2 &= f(p_1, p_2, m) \end{aligned} \tag{1}$$

Where x_1 and x_2 are the quantities demanded by the consumer of good 1 and good 2, respectively; p_1 stands for the price of good 1 and p_2 for the prices of good 2, and *m* represents the consumer's budget.

At the moment, assume that good 1 represents food and good 2 comprises all other products a household consumes. If food is a normal good, a change in the household budget will imply a change in food consumption in the same direction, while a price change will translate into a change in demand in the opposite direction. That is:

$$\frac{\partial x_1}{\partial m} > 0 \; ; \; \frac{\partial x_1}{\partial p_1} < 0 \tag{2}$$

[7] Also, Thomas (1990) and Duflo (2003) present empirical evidence that unearned income received by women have a larger impact on child nutritional indicators.

[8] Around 70% of the households in the first round of the survey have some agricultural production. Among these households, 58% produce exclusively for their own consumption, and 18% sell only one quarter or less of their production.

Since the conditional cash transfer represents, in essence, an addition to the household income, in principle, it would be expected that household food consumption would increase. On the other hand, the food price increase experienced during 2008 would decrease the household's demand for food. Assuming that these food consumption changes affect all household members, the cash transfer has the potential to improve child nutrition by improving access to food, while food price increases could worsen child nutrition by reducing access to food. Which effect prevails depends on the magnitude of the two effects.

Food is a necessary good for all individuals and households. The demand for necessary goods exhibits a particular behavior relative to income changes: when income increases, the demand for necessary goods increases in a smaller proportion. In other words, the income elasticity of food, and other necessary goods, is less than one, as presented in the equation below. This means that if the household income increases by 1%, the demand for food will increase by less than 1%.

$$\frac{\partial x_1}{\partial m} * \frac{m}{x_1} < 1 \qquad (3)$$

The previous observation for individual consumers has an equivalent empirical regularity at the aggregated level. Engel's law states that "the proportion of income spent on food declines as income rises" (Houthakker, 1957). This statement has one important implication for the distribution of cash transfer programs benefits: lower-income households would tend to spend a higher proportion of the transfer (albeit not all of it) on food. Therefore, it would be expected that the possible benefits of the transfers on child nutrition due to greater access to food are more pronounced in lower-income households. On the other hand, Engel's law also implies that lower-income households would be more affected by an increase in food prices since they spent a higher proportion of their budget on food. Thus, food price increases are likely to impact child nutrition among lower-income households significantly.

So far, all food has been considered to be the same. This assumption is not the case in real life. Households consume different types of food, from staples like maize, rice, or potatoes to products more sparsely eaten, such as red meats or pastries. To incorporate this aspect into the analysis while keeping the exposition simple, consider now Good 1 to be a staple food that offers high levels of calories per monetary unit, maize tortillas for instance, and Good 2 to be a more expensive item, such as beef or other animal-based protein, which the consumer prefers because of its taste and higher nutritional value. As in the previous analysis, one would expect that household consumption of both goods increases as income increases. However, as indicated by Bennett's law[9], it is also expected that, as income increases, households would prefer to fulfill their caloric necessities with protein-rich food rather than starchy tortillas. Therefore, after a certain income level, households may continue to increase their meat consumption while not demanding additional units of tortillas. Moreover, it could be the case that the household reduces its consumption of tortillas to purchase even more meat. Goods that exhibit behavior such as the described for tortillas are considered "inferior goods", i.e., those for which their demand decreases as income increases. Of course, goods are not

[9] Named after Merrill K. Bennett who noted the relationship between income and dietary composition in the paper "International Contrasts in Food Consumption" (Bennett, 1941).

inherently inferior. They exhibit such behavior depending on the consumer's income level and preferences.

Another behavior is possible for inferior goods when their prices change. Suppose that food prices increase so much that it substantially reduces the household's purchasing power and, consequently, poses a threat to the satisfaction of the caloric necessities of the household members. If the staple food stills offer more calories per monetary unit than the non-staple, the household could divert resources from the non-staple food to the staple food in an attempt to maintain the minimum caloric intake. Moreover, it could be the case that the freed resources even allow the households to slightly increase the consumption of the staple food. That is, the price increase could cause an increase in the demand for staple food. In economics, goods that exhibit this behavior are known as "Giffen goods."

How do these theoretical considerations translate to the possible effect of the cash transfer program and the food price increase? First, as household income increases due to the cash transfers, the consumption of non-staple food, a normal good, would rise. If the non-staple food acquired by the household offers a balanced source of macro and micronutrients, the effect of the transfer on child nutrition is expected to be positive. Nevertheless, child nutrition could be negatively affected if the household chooses food rich in processed fats or carbohydrates. Second, staple food consumption could increase or decrease in response to the cash transfer depending on the household's initial income and preferences. If consumption decreases, the effect on child nutrition, positive or negative, would depend on the type of food that substitutes the staple. Third, if the household moves away from protein and micronutrients rich food to save money and fulfill their caloric necessities with less nutritious but caloric-rich food, the effect of the price rise might not be observed in the short-term indicators of child nutrition, such as weight-for-height and wasting, but instead hampers children's future development, as would be eventually reflected in lower height-for-age and stunting[10].

2.3. Empirical Approach

2.3.1. The CSR program

In 2005 the government of El Salvador started the implementation of the anti-poverty program known as "*Red Solidaria,*" later renamed as "*Comunidades Solidarias Rurales*" (CSR). The program's main objective was to improve the living conditions of Salvadoran families under extreme poverty, with particular emphasis on rural areas. More specifically, the program aimed to improve household income, health, nutrition, and schooling. The program had three main components to achieve its goals. First, CCTs were given to eligible households in the poorest municipalities of El Salvador. Second, in the targeted municipalities, the program intended to improve the infrastructure of schools and health services, as well as the infrastructure for the provision of drinking water, sewage, and electricity. Third, the program facilitated business training and micro-credits for small farmers and other entrepreneurs in the participating municipalities (STP, 2009).

The implementation of the CSR program was focalized by geographic region and household. In the first stage, the government classified all 262 Salvadoran municipalities into four groups

[10] An argument advanced by Jensen & Miller (2008) and de Brauw (2011).

(or clusters) according to each municipality's poverty prevalence and the severe stunting prevalence among first-grade pupils in 2000 using partitional cluster analysis[11] (FLACSO Programa El Salvador, 2005). The number of municipalities in each cluster can be observed in Table 1. Municipalities in the "Severe extreme poverty" and "High extreme poverty" were selected to participate in the CSR program.

Within each poverty cluster, the order in which the municipalities entered the program, i.e., the order for receiving the first cash transfers, was defined by considering some additional economic and social characteristics of the municipalities. More specifically, an "Integrated Index of Municipality Marginality" (IIMM) was constructed using indicators at the municipality level, such as the poverty gap, literacy rate, proportion of houses without access to electricity, tap water, or sanitation, among other aspects. Municipalities with higher values of the IIMM were scheduled to enter the program first.

The second stage of the program focalization dealt with household eligibility to receive the CCT. The CSR program gave two different types of CCT depending on the characteristics of the households. The "Health Bonus" consisted of a monthly transfer of 15 USD for households with children under five years old or pregnant women at the moment of the initial program enrollment. The "Educational Bonus" transferred the same amount of money to households with children between 5 and 17 years old who have not completed primary school. A "Combined Bonus" worth 20 USD was given to households eligible for both the Health and Educational Bonus[12]. Households had to comply with a series of conditions to receive the transfers. For the Health Bonus, children and pregnant women were required to attend periodic medical checks and to follow the national vaccination scheme. For the Educational Bonus, children were required to attend school with no more than four unjustified absences per month.

All households in the rural areas of the participant municipalities were eligible to receive the CCT. However, urban households were not always eligible despite having children within the target age. In the "Severe extreme poverty" municipalities, urban households were enrolled in the program provided their dwellings were overcrowded, lacked an improved latrine, had dirt floors, or had at least one construction material deemed as non-durable, for instance, adobe walls or roof made of aluminum sheets in bad conditions. For households in urban areas in the "High extreme poverty" municipalities, their eligibility depended on the application of a proxy mean test, which gave a score to each household based on dwelling characteristics, ownership of durable goods and real estate, employment, and educational characteristics, among other aspects. Moreover, even if a household received a score below the cutoff for no-participation, program officials still needed to verify some additional eligibility criteria in-situ.

[11] In simple terms, the procedure first generates an initial "center" for each of the groups, four in this case. These centers have a value for each of the variables under analysis. Second, the distance between each observation (municipalities in this case) and each center is measured, and the observations are assigned to the group with the closest center. Third, new centers for each cluster are generated by estimating the mean values of the variables of the observations in that clusters. Fourth, the distance between each observation and the new centers is estimated, and observations are re-classified if a different center is now the closest. The third and fourth steps are repeated until the variance (the square sum of the distances) in each cluster is minimized.

[12] For reference, in 2005, the income poverty line in El Salvador for the average rural household with 4.5 members was estimated at 175.05 USD per month, and the "extreme" poverty line was set at 87.53 USD per month (DIGESTYC, 2006). Therefore, the education or health bonus represented approximately 9% of the poverty line and around 17% of the extreme poverty line.

Table 2.1: Municipality Groups in the CSR program

Group	Number of Municipalities	Cluster center: Severe stunting incidence	Cluster center: Extreme poverty incidence	First-year receiving CSR transfers
Severe Extreme Poverty	32	4.83%	49.9%	2005/2006
High Extreme Poverty	68	4.53%	35.6%	2007
Moderate Extreme Poverty	82	3.61%	23.9%	--
Low Extreme Poverty	80	2.56%	12.5%	--

Source: FLACSO Programa El Salvador (2005) & STP (2009)

2.3.2. The evaluation survey

The primary data source for the analysis in this paper is the external evaluation survey for the CSR Program, implemented by the International Food Policy Research Institute (IFPRI) and the Salvadoran Foundation for Economic and Social Development (FUSADES). The data collection consisted mainly of household surveys covering demographic characteristics, employment and agricultural activities, health, and education, among other aspects of the household. Most importantly for this paper, the survey included anthropometric measurements for children under three years old. The evaluation survey took place in four rounds between 2008 and 2010. The data collected during the two first two rounds of the survey are the most relevant for the proposes of this paper. The first round took place between January and February 2008, just when the food inflation in El Salvador started to accelerate, while the second round took place between October and November 2008, just a couple of months after the food prices had reached their peak.

The evaluation survey collected information in 50 of the 100 municipalities participating in the CSR Program. Eleven of the selected municipalities belong to the "Severe Extreme Poverty" cluster and started participating in the CSR program between July and November 2006. These municipalities are grouped for the analysis in survey group 1. The rest of the municipalities belong to the "High Extreme Poverty" cluster, but the time they started in the CSR program differs[13]. The municipalities that started in the program between July and September of 2007 are classified in survey group 2, the municipalities starting in the program between June and October 2008 comprise the survey group 3, and the municipalities that started participating in the program between November and December 2008 are included in the survey group 4.

Within each municipality, the evaluation survey randomly selected two "*cantones*." In El Salvador, municipalities are the smallest administrative division. However, internally, each municipality is further divided into an urban town center and mostly rural "*Cantones.*"[14] For the first round of the survey, two *cantones* per municipality were selected. Within each *canton*, 30 households were randomly selected from census lists: 15 households with children up to 3

[13] Municipalities were selected to have the most similar values in the cluster analysis and IIMM, as well as to have enough *Cantones* and population for the sampling procedure. More details in the selection of municipalities and sampling of households can be found in IFPRI & FUSADES (2008).

[14] In some cases, within each "*cantón*" a more or less urban center is present. Moreover, for "*cantones*" next to the urban center of the municipality, some dwellings officially in the rural area might in fact lay in the urban area.

years old or pregnant women, and 15 households with children between 6 and 12 years old. Households were re-interviewed for subsequent survey rounds if they still met such characteristics. Households that did no longer fit in the last two categories were replaced using the census list or a list of households with recent births collected by the public health clinic in the municipality (de Brauw & Peterman, 2020). In total, 2,921 households were interviewed in the first and second round, 2816 households in the third round, and 2945 in the fourth round.

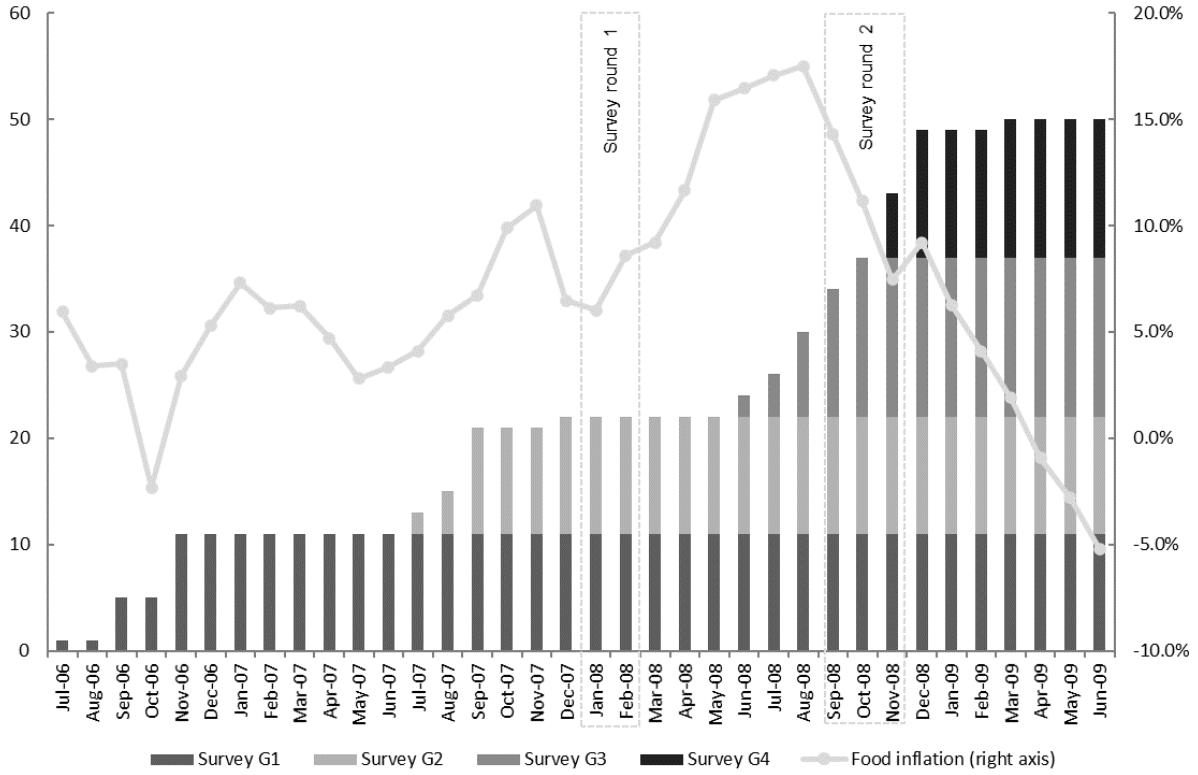

Figure 2.1: CSR groups in the survey and food inflation

Source: Evaluation Survey, STP (2009) & BCR (n.d.)

2.3.3. Identification strategy

For identifying any possible effect of the CSR program on the children's nutritional status during the food price crisis, the analysis in this paper uses a difference-in-difference strategy, similar to that used in the original external evaluation of the program (IFPRI & FUSADES, 2010a, 2010b). This strategy requires observations of at least two time periods, one before the program is implemented and one after the program has started. The strategy also requires observations to be divided into two groups, one with households participating in the program, the treatment group, and the other with households that do not participate, the control group. The program's effect on child nutrition is then estimated by comparing the change between the two periods for the participant group with the change between the two periods for the control group. This procedure is equivalent to estimating the following equation by ordinary least squares[15]:

[15] Or maximum likelihood in case the dependent variable is dichotomous.

$$Y_{imt} = \delta_1 C_{imt} + \delta_2 P_t + \delta_3 (C_{imt} * P_t) + \varepsilon_{imt} \quad (4)$$

Where Y_{imt} is an indicator of the nutritional status of child *i*, living in municipality *m*, at time *t*. The variable C_{imt} takes the value of 1 if the child lives in a municipality scheduled to participate in the CSR program at time *t*, while the variable P takes the value of 0 for the pre-treatment period and 1 for the post-treatment period. The parameter δ_3 captures the causal effect of interest.

As mentioned before, all the municipalities in the "severe extreme poverty" and the "high extreme poverty" were selected to participate in the CSR program, and the evaluation survey only considered households living in these two municipality groups. Fortunately, given the gradual implementation of the CSR program among municipalities, and the multiple rounds of the evaluation survey, it is possible to divide the sample into treatment and control groups. Indeed, by the time of the first round of the survey in January and February of 2007, the municipalities in the first survey group were already participating in the CSR program, many of them for more than one year; the municipalities in the second survey group were also participating in the CSR program, but for approximately six months. On the other hand, the municipalities in the third and fourth survey groups were not yet participating in the CSR program. By the time of the second round of the survey, between September and November 2008, households in the first two survey groups continued to participate in the program, and households in the third survey group started to participate in the program a few months before the data collection, while households in the fourth survey group were not yet participating. By the time of the third and fourth rounds of the evaluation survey, in 2009 and 2010, respectably, all survey groups were participating in the program.

The above considerations suggest using the third survey group as a treatment group and the fourth group as control when comparing the changes from the first to the second round of the survey. It is worth noting that this comparison will only capture the effect of a short exposure to the program, from two to four months (equivalent to one or two cash transfers). Therefore, it is not expected to observe significant changes in the children's long-term nutritional status and development indicators, such as height-for-age and stunting. Nevertheless, it is still likely to observe significant effects on weight-for-height and wasting since the cash transfers might have contributed to the prevention of short-term reductions in food access.

Observing the treatment and control groups for a longer period would have been convenient for identifying any effect on height-for-age and stunting prevalence. Unfortunately, as explained above, the timing of the survey and the program implementation rule out this possibility. However, it is still possible to observe the effect of different exposure times by comparing groups that differ in this aspect. For instance, comparing survey group 1 with survey group 2, using the first two rounds of the survey in a difference-in-difference design, will show what the effect is of almost two years of exposure (the time the group one has been participating in the program) versus an exposure of almost one year (the time group two has been participating).

Common trend assumption

The fundamental identifying assumption in the difference-in-difference strategy is that child nutrition indicators would follow the same trend for the control and the treatment group in the absence of the CCT program. Due to the limitations of the data set, this assumption is not directly testable. However, a common trend in nutrition indicators before the program would provide evidence in favor of the assumption. Unfortunately, there is no data available on the specific indicators monitored in the evaluation survey before the first round of data collection. The only child nutrition indicator available at the municipality level is the stunting prevalence among first-grade pupils in public schools for 1988, 2000, and 2007[16]. The simple average of this indicator by survey group and year is shown in Table 2.2 below.

Table 2.2: Stunting prevalence among first-grade pupils in public sector schools (percentage)

	1988	2000	2007	Diff. 1988 - 2000	Diff 200-2007
Survey Group 1	40.8	25.1	21.7	-15.6	-3.4
Survey Group 2	36.2	34.1	23.7	-2.1	-10.4
Survey Group 3	37.5	26.8	20.8	-10.8	-6.0
Survey Group 4	35.8	25.0	16.6	-10.8	-8.3

Source: Author's estimation based on MINED (2007)

As shown in Table 2.2, all survey groups experienced a reduction in the average stunting prevalence among first graders. This general reduction supports the common trend assumption. In particular, the trends of groups 3 and 4, which serve as the main treatment and control groups in this chapter, are pretty similar. On the other hand, some differences are evident in the reduction rate between groups 1 and 2. The former experienced the largest reduction between 1988 and 2000, but the lowest reduction between 2000 and 2007. While group 2 saw the lowest reduction in stunting between 1988 and 2000 but then caught up in 2007. Moreover, the group averages conceal some municipal outliers, i.e., some municipalities with increased stunting prevalence[17]. To reduce the possible influence of these outliers, they are excluded from the analysis in the robustness checks.

Robustness check for program participation effect.

A possible concern is that preexisting characteristics of the municipalities might drive the program results, especially when municipalities in the control and treatment group are known to differ in some important characteristics (as they belong to different poverty clusters or have different IIMM). Luckily, the program's geographical targeting allows the use of some regression discontinuity design elements within the difference-in-difference strategy to test the robustness of the results. The regression discontinuity strategy is commonly used when treatment is provided following some arbitrary rule that is not under the control of the

[16] Note that severe stunting prevalence (heigh-for-age Z-score lower than three) among first graders was used for the CSR geographic targeting. Unfortunately, only stunting prevalence (height-for-age Z-score lower than two) is available for the three years.

[17] See Appendix A, Table A.1 for the stunting prevalence by municipality and year.

participants, and it exploits the expected similarity between individuals that "just made it" into treatment with those who "just missed it." In the case of the CSR program, households could do little to affect the classification of municipalities in the different poverty clusters or the values of the IIMM. Thus, they had no control over the program's selection of beneficiaries or the order in which municipalities entered the program[18]. Moreover, since treatment (or treatment order) assignment is based on the poverty clusters or the IIMM, these two criteria could be used to define a treatment threshold. The sample can then be trimmed down to consider only municipalities in the vicinity of the threshold, improving the comparability between treatment and control groups.

For households living in municipalities belonging to different poverty clusters, such as survey groups 1 and 2, the threshold for treatment is defined as the border between clusters[19]. As explained in the previous section, to focalize the implementation of the CSR program, municipalities were grouped using partition cluster analysis based on two variables: the extreme poverty prevalence and the prevalence of severe stunting among first-grade pupils. This procedure generates an implicit threshold between clusters, which can be explicitly defined as the set of points equidistant from two cluster centers. If the households living in the municipalities in one of the clusters receive treatment and the households living in the municipalities in the neighbor cluster do not, a regression discontinuity approach can be applied by comparing the households in the municipality treatment cluster that are just above the implicit threshold, with the household living in the control cluster but just below the threshold.

The threshold for treatment is defined in terms of the IIMM for households in municipalities belonging to the same poverty cluster but different survey groups[20]. Municipalities in survey group 3, which entered the program before November 2008, had an IIMM value between 33.61 and 37.93, while municipalities in survey group 4, which entered the program from November 2008, had an IIM value between 31.23 and 33.4. The middle point between the lowest IIMM for group 3 and the highest IIMM for group 4 is considered the treatment threshold (33.505).

Testing for differences due to higher transfers

It would be expected that a program that offers higher cash transfers to participant households also offers better protection against economic shocks. Unfortunately, the CSR program does not have much variation in the transfer's amounts: Households only received either 15 or 20 USD per month. However, it is possible to observe a significantly wider range by considering accumulated transfers per child. Moreover, by focusing on transfers per child, the analysis also considers differences in the relative significance of the transferred amount for the household.

[18] Arguably, household could affect their own selection by moving to a participant municipality. However, this is unlikely to happen in the CSR program. First, after the initial identification of beneficiaries, new beneficiaries were supposed to enter the program only after three years of implementation. Second, moving to a different municipality would be a costly endeavor for some of the poorest households in the country.

[19] This approach is also used in de Brauw & Gilligan (2011) and the original external evaluation of the program IFPRI & FUSADES (2010a, 2010b).

[20] This approach is used the original external evaluation of the program IFPRI & FUSADES (2010a, 2010b).

In other words, the difference between receiving a 20 USD (or 15 USD) transfer in a single children household versus receiving the same amount in a four children household.

For exploring the relationship between nutritional outcomes and the value of the transfers, the following regression is estimated using ordinary less squares:

$$Y_{it} = \delta_0 + \delta_1 ACT_{it} + \delta_2 X_{it} + \delta_3 M_i + \varepsilon_{it} \quad (5)$$

Where, ACT_{it} represents the accumulated per child value of the CCT received by the child's household, X_{it} is a vector of individual and household characteristics, such as age, sex, mother's literacy, and household wealth, and M_i is a categorical variable indicating the municipality where the household is located. This municipality fixed effect is included to capture the effect of the exposure time since all the households located in a given municipality started in the CSR program simultaneously.

Changes in food consumption patterns

The CCT represents an addition to the household budget. Assuming that at least a portion of the transfer is spent on food, the CCT might impact the nutrition of the household members by increasing the amount of food available and allowing the household to acquire better quality food. Unfortunately, the data collected in the evaluation survey offers few opportunities to test the channel through which the cash transfers affect nutrition. Ideally, detailed information about the quantity and type of food consumed by each household member should be available. This is not the case. The data at hand consists of recall information about the household acquisition[21] of some of the most common food products in El Salvador over the previous seven days. Even though it is impossible to know the amount of food consumed in the household or estimate the caloric intake with the data at hand, it is still possible to construct some proxy indicators for household dietary diversity.

The first indicator used in the analysis is simply the number of food groups the household has acquired. For constructing this indicator, the food products acquired by the households are grouped following the FAO/WHO nutrition-sensitive food groups (FAO, 2022). The second indicator used is the proportion of food expenditure by food group.

For identifying possible changes to the indicators of household dietary diversity attributable to the CSR program, the analysis continues to use a difference-in-difference strategy. As before, the basic equation to estimate takes the form of:

$$D_{jmt} = \delta_1 H_{jmt} + \delta_2 P_t + \delta_3 (H_{imt} * P_t) + \varepsilon_{imt} \quad (6)$$

Where D_{jmt} is an indicator of the dietary diversity of household *j*, in municipality *m*, at time *t*. The variable H_{jmt} takes the value of 1 if the household *j* is located in a municipality *m* scheduled to participate in the CSR program at time *t* and 0 otherwise, while the variable P_t takes the

[21] Including items purchased and produced by the family, and items given to the family as a gift.

value of 0 for the pre-treatment period and 1 for the post-treatment period. The causal effect of interest is captured by the parameter δ_3.

Some limitations related to the dietary diversity indicators and identification strategy are worth mentioning. First, suppose changes in dietary diversity occur shortly after the household starts participating in the program. In that case, the comparison between survey groups 1 and 2 is unlikely to show any significant change since both were participating in the program for several months by the time of the survey. Second, the actual distribution of consumption within the household is not known. Therefore, even if the household acquires a more diverse set of food products thanks to the cash transfer, there is no guarantee that the family's younger members will consume the new food products.

2.4. Descriptive statistics

Table 2.3 below presents some of the main indicators for child nutrition for the sample of children three years or younger. Since this paper focuses on the period of the food price crisis, and for the sake of space, this section reports only the estimations for the first two rounds of the evaluation survey. Additional tables dividing the nutritional indicators by household wealth and sex of the children can be found in Appendix A.

The z-scores for weight-for-height are presented in the first two columns of Table 2.3, and the prevalence of wasting in the sample is in Columns (3) and (4). As can be seen, from the first to the second round of the survey, the average weight-for-height score increased for the whole sample and each of the groups. It is worth noting that wasting prevalence for the whole sample is not far from incidence levels in healthy populations (de Onis et al., 2019). Interestingly, wasting prevalence decreases between the first and the second round of the survey for children in groups 1 to 3, precisely those already participating in the CSR program. On the other hand, children in group 4 experienced a rise in wasting prevalence, mainly driven by children in the poorest households (See Table A.3 in Appendix A).

Table 2.3: Child nutrition indicators, children 0 – 3 years old

	WHZ		Wasting		HAZ		Stunting	
	(1) Early 2008	(2) Late 2008	(3) Early 2008	(4) Late 2008	(5) Early 2008	(6) Late 2008	(7) Early 2008	(8) Late 2008
Group 1	0.219	0.372	0.027	0.019	-1.126	-1.089	0.225	0.175
	(0.070)	(0.070)	(0.009)	(0.008)	(0.067)	(0.063)	(0.024)	(0.021)
Group 2	0.160	0.477	0.010	0.008	-1.036	-1.261	0.204	0.250
	(0.058)	(0.061)	(0.006)	(0.005)	(0.070)	(0.056)	(0.023)	(0.023)
Group 3	0.177	0.386	0.039	0.025	-0.951	-1.119	0.200	0.233
	(0.054)	(0.053)	(0.009)	(0.007)	(0.062)	(0.057)	(0.018)	(0.019)
Group 4	0.424	0.525	0.010	0.030	-0.868	-1.124	0.160	0.205
	(0.054)	(0.065)	(0.005)	(0.009)	(0.059)	(0.054)	(0.018)	(0.020)
All	0.249	0.439	0.023	0.021	-0.980	-1.147	0.195	0.218
	(0.030)	(0.031)	(0.004)	(0.004)	(0.033)	(0.029)	(0.010)	(0.010)

Notes: Standard errors in parentheses. WHZ: Weight for height Z-score. HAZ: Height for Age Z-score.
Source: CSR Evaluation survey

In contrast with the behavior of the average weight-for-height score, the average height-for-age score decreased for the whole sample from the first round of the survey to the second round, as can be seen in columns (5) and (6) in Table 2.3. Only the children in the first survey group, those with the longest time of exposure, experienced an improvement in their average height-for-age score. Interestingly, this improvement seems to be driven mostly by children in the poorest households (See Table A.4 in Appendix A). The behavior of the stunting prevalence (shown in columns 7 and 8) is consistent with the behavior of the average height-for-age scores. Stunting prevalence increased for the whole sample between the two first survey rounds. Furthermore, among all groups, only the first one experienced a reduction in the stunting prevalence, which seems to be driven mainly by children living in the poorest household. However, children in the poorest households generally have a higher stunting prevalence than children in wealthier households (See Table A.5 in Appendix A).

2.5. Results

2.5.1. Short-Term Exposure

Table 2.4 below reports the results of the difference-in-difference estimation for the effect of the participation in the CSR program on different child nutrition indicators during the food price crisis. Columns (1) and (3) report the results of OLS regression, where the outcome variables are weight-for-height and height-for-age z-scores, respectively. Column (2) reports the change in the probability of wasting, and Column (4) the change in the probability of stunting. Both probabilities were estimated using *probit* models. For this set of estimations, group 3 is used as the treatment group and survey group 4 as the control group. The first line in the Table includes all children in these two groups, while the second and third lines progressively reduce the sample to consider only children that live in municipalities closer to the treatment threshold (defined in terms of the IIMM). The second line excludes children living in five municipalities, while the third excludes children living in eight municipalities.

Table 2.4: Effect of the CSR program on child nutrition during the food price crisis – Difference-in-Difference point estimates

	(1) WHZ OLS	(2) Wasting *Probit*-Margins	(3) HAZ OLS	(4) Stunting *Probit* - Margins
Survey group 3 & 4, all				
Coefficient	0.117	-0.037***	0.115	-0.0166
Standard error	0.089	0.011	0.113	0.0316
Observations	1,774	1,774	1,774	1,774
Survey group 3 & 4, bandwidth 1				
Coefficient	0.143	-0.034***	0.177	-0.028
Standard error	0.097	0.012	0.129	0.038
Observations	1,453	1,453	1,453	1,453
Survey group 3 & 4, bandwidth 2				
Coefficient	0.185*	-0.039***	0.178	-0.032
Standard error	0.106	0.014	0.142	0.042
Observations	1,256	1,256	1,256	1,256

Standard errors clustered at *cantón* level.
*** p<0.01, ** p<0.05, * p<0.1

As can be seen in Table 2.4 above, participation in the CSR program for a short period (between two to four months) has no impact on height-for-age (Column 3) or the probability of suffering from stunting (column 4). Nevertheless, this short exposition to the program during the food price crisis impacted the probability of suffering from wasting: the point estimates indicate a reduction of around four percentage points in the probability that a child is wasted. Interestingly, no significant effect is observed in weight-for-height (Column 1). The contrasting results suggest that the program mainly benefited those children with the lowest scores for weight-for-height. This interpretation seems to be confirmed by the quantile regressions in Table 2.5, which show only a significant effect of the CSR program on weight-for-height (and height-for-age) for the lower quartile of the score distribution.

Table 2.5: Effect of the CSR program on child nutrition during the food price crisis, quantile regressions – Difference-in-Difference point estimates

	(1) WHZ - OLS	(2) HAZ - OLS
Survey group 3 & 4, percentile 25		
Coefficient	0.240*	0.300*
Standard error	0.134	0.157
Observations	1,774	1,774
Survey group 3 & 4, percentile 50		
Coefficient	0.100	-0.120
Standard error	0.132	0.136
Observations	1,774	1,774
Survey group 3 & 4, percentile 75		
Coefficient	-0.120	0.130
Standard error	0.138	0.178
Observations	1,774	1,774

Standard errors clustered at *cantón* level.
*** p<0.01, ** p<0.05, * p<0.1

Table 2.6 below shows the effect of the CSR program on child nutrition while dividing the sample by household wealth. Even though, in general, households in the sample are among the poorest in El Salvador, the fact that the program included all the households in the targeted geographical areas implies some variation in the household wealth in the sample. An index based on asset ownership and housing conditions is used as a proxy for household wealth. A principal component analysis is used to reduce the multiple variables into a single index. In the first row of Table 2.6, only households at the lower end of the wealth index distribution are included in the sample (quintiles 1 and 2), while in the second row, only households at the upper end of the wealth index distribution are considered (quintiles 4 and 5). As can be observed in Column (2), the reduction in the probability of suffering from wasting seems to benefit mainly to children at the lower end of the wealth distribution: a reduction of almost ten percentage points for children in this group, more than double the point estimate for the average children (Table 2.4 above). Furthermore, children at the lower end of the wealth distribution also see an increase in their weight-for-height z-scores (Column 1). Again, no significant effect on height-for-age z-scores (Column 4) or the probability of suffering from stunting (Column 4) is found.

Table 2.6: Effect of the CSR program on child nutrition during the food price crisis, difference by household wealth – Difference-in-Difference point estimates

	(1) WHZ OLS	(2) Wasting *Probit*-Margins	(3) HAZ OLS	(4) Stunting *Probit*-Margins
Survey group 3 & 4, wealth quintiles 1-2				
Coefficient	0.321**	-0.084***[(a)]	0.086	0.001
Standard error	0.155	0.023	0.157	0.047
Observations	774	774	774	774
Survey group 3 & 4, wealth quintiles 4-5				
Coefficient	-0.039	-0.010	-0.004	0.023
Standard error	0.146	0.017	0.182	0.051
Observations	637	637	637	637

(a) Estimates correspond to a linear probability model. *Probit* estimates are not possible in this case since no child was recorded as wasted in the control group subsample during the first round of the survey. Standard errors clustered at *cantón* level.
*** p<0.01, ** p<0.05, * p<0.1

Possible variations in the effect of the CSR program depending on the sex of the participant children are explored in Table 2.7 below. As in previous tables, the program seems to have no significant effect on the average weight-for-height and height-for-age z-scores. Also, similar to previous tables, the program appears to reduce the probability that a child is wasted (Column 2). Somehow surprisingly, given the short participation period for children in this subsample, the program appears to reduce the probability that a female child is stunted (Column 4). Nevertheless, it is worth remembering that stunting prevalence increased for all groups in the sample. Therefore, this piece of evidence suggests that the program prevented some girls in the treatment group from becoming stunted, rather than indicating that the program significantly contributed to the recovery process from stunting.

Table 2.7: Effect of the CSR program on child nutrition during the food price crisis, difference by sex – Difference-in-Difference point estimates

	(1) WHZ OLS	(2) Wasting *Probit*-Margins	(3) HAZ OLS	(4) Stunting *Probit*-Margins
Female children				
Coefficient	0.095	-0.034**	0.189	-0.081*
Standard error	0.161	0.017	0.118	0.045
Observations	887	887	887	887
Male children				
Coefficient	0.154	-0.042**	0.056	0.042
Standard error	0.112	0.020	0.162	0.048
Observations	887	887	887	887

Standard errors clustered at *cantón* level.
*** p<0.01, ** p<0.05, * p<0.1

2.5.2. Longer-term exposure

Possible differences in the effect of the program due to variation in the exposure time are explored in Table 2.8 below. The analysis continues to use the difference-in-difference strategy described in previous sections, but it varies the control and treatment groups. In the upper section of the Table, survey group 1 is used as the treatment group, while survey group 2 is

used as the control group. In the bottom section of the Table, survey group 2 is used as the treatment group and survey group 3 as control. As mentioned before, by the time of the second survey, households in the first group had been participating in the program, on average, for almost 24 months. In contrast, households in the second group had been participating in the program for about 13 months, and households in the third group had been participating for about two months on average. As in previous tables, each line in the Table progressively reduces the sample to consider only children that live in municipalities closer to the treatment threshold (defined in terms of the distance to the poverty cluster threshold in the uppers section of the Table, and in terms of the IIMM for the lower section).

Table 2.8: Effect of the CSR program on child nutrition during the food price crisis, difference by time exposure – Difference-in-Difference point estimates

	(1) WHZ OLS	(2) Wasting *Probit*-Margins	(3) HAZ OLS	(4) Stunting *Probit*-Margins
Survey group 1 & 2, all				
Coefficient	-0.178*	-0.010	0.266**	-0.097**
Standard error	0.088	0.016	0.123	0.039
Observations	1,276	1,276	1,276	1,276
Survey group 1 & 2, bandwidth 1				
Coefficient	-0.126	-0.003	0.244*	-0.082*
Standard error	0.089	0.015	0.142	0.043
Observations	1,042	1,042	1,042	1,042
Survey group 1 & 2, bandwidth 2				
Coefficient	-0.049	-0.002	0.322**	-0.113**
Standard error	0.102	0.017	0.136	0.044
Observations	816	816	816	816
Survey group 2 & 3, all				
Coefficient	0.110	0.013	-0.093	0.017
Standard error	0.090	0.011	0.117	0.038
Observations	1,638	1,638	1,638	1,638
Survey group 2 & 3, bandwidth 1				
Coefficient	0.135	0.016	-0.121	0.025
Standard error	0.092	0.011	0.123	0.039
Observations	1,505	1,505	1,505	1,505
Survey group 2 & 3, bandwidth 2				
Coefficient	0.230*	-0.002	0.006	-0.002
Standard error	0.113	0.015	0.186	0.051
Observations	802	802	802	802

Standard errors clustered at *cantón* level.
*** p<0.01, ** p<0.05, * p<0.1

As can be seen in the upper section of Table 2.8, in Columns (1) and (2), in general, children living in households with an average time of exposure of 24 months do not have different weight-for-height or different probability of suffering from wasting than children with 13 months of exposure. Just in the first line, a significant reduction in the weight-for-height score is observed. However, it is worth remembering that all survey groups experienced an increase in the average weight-for-height scores. What the coefficient indicates is that survey group 1 saw a lower increase than group 2. Moreover, when the sample is restricted to households in more similar municipalities, the coefficient value diminishes and loses its statistical significance. On the other hand, in Columns (3) and (4), a statistically significant effect of the longer exposure

to the program is observed. In Column (3), the coefficients indicate an increase of about 0.3 points in the height-for-age score for children with 24 months of exposure in comparison with those with 13 months of exposure. In Column (4), the estimates indicate a reduction in the probability of stunting of around ten percentage points for the children with the longest exposure time. In the lower section of Table 2.8, where survey group 2 is compared with survey group 3, coefficients in the first column suggest that those children with around 13 months of exposure to the program experience a larger increase in their weight-for-height scores than children with an average exposure of two months. However, no clear picture emerges from the coefficients in columns (2) to (4).

Table 2.9 continues exploring the differences in the effect of the CSR program due to different time exposures but divides the sample by household wealth. Interestingly, when comparing children in the first survey group with children in the second group in the top part of the Table, the program seems to significantly reduce the weight-for-height score for children in the upper part of the wealth distribution (Column 1). However, no effect is observed in the probability of suffering wasting (Column 2). On the other hand, the program's positive effect on height-for-age is concentrated in the lower part of the wealth distribution: the z-scores increase by more than 0.3 points (Column 3), and the probability of suffering stunting diminishes by more than 18 percentage points. No statistically significant effect is observed in the bottom part of the Table, where survey group 2 is compared with survey group 3.

Table 2.9: Effect of the CSR program on child nutrition during the food price crisis, difference by time exposure and household wealth – Difference-in-Difference point estimates

	(1) WHZ OLS	(2) Wasting *Probit*-Margins	(3) HAZ OLS	(4) Stunting *Probit*-Margins
Survey group 1 & 2, wealth quintiles 1-2				
Coefficient	-0.215	-0.018	0.334*	-0.187***
Standard error	0.128	0.029	0.166	0.059
Observations	610	610	610	610
Survey group 1 & 2, wealth quintiles 4-5				
Coefficient	-0.366**	0.013	0.290	-0.070
Standard error	0.168	0.023	0.190	0.070
Observations	425	425	425	425
Survey group 2 & 3, wealth quintiles 1-2				
Coefficient	0.077	0.027	-0.156	0.042
Standard error	0.139	0.019	0.162	0.049
Observations	844	844	844	844
Survey group 2 & 3, wealth quintiles 4-5				
Coefficient	0.231	0.008	-0.023	-0.028
Standard error	0.159	0.024	0.196	0.057
Observations	481	481	481	481

Standard errors clustered at *cantón* level.
*** p<0.01, ** p<0.05, * p<0.1

Table 2.10 also explores possible variations in the effect of the program, this time by the sex of the participant children. As can be seen in the upper section of the Table, when comparing children in survey group 1 with children in survey group 2, the program seems to have no effect on weight-for-age or wasting. However, in line with the previous tables, the program appears

to positively affect height-for-age and stunting, especially among female children. On the other hand, when comparing children in survey group 2 with survey group 3, in the lower section of the Table, no significant effect of the program is observed on height-for-age scores or stunting. Perhaps surprisingly, the coefficient for male children wasting in Column (2) seems to indicate that the program increased the probability that a boy is wasted. However, this result is explained by the relatively larger reduction in wasting prevalence observed in group 3 (a group just entering the program by the time of the second survey), while survey group 2 experienced almost no variation in wasting prevalence. These results suggest that the program effectively prevents child wasting (or even helping some children recover) in the short term, but this effect disappears after one year.

Table 2.10: Effect of the CSR program on child nutrition during the food price crisis, difference by time exposure and sex – Difference-in-Difference point estimates

	(1) WHZ OLS	(2) Wasting *Probit*-Margins	(3) HAZ OLS	(4) Stunting *Probit*-Margins
Survey group 1 & 2, female children				
Coefficient	-0.190	-0.0004[(a)]	0.435***	-0.100***
Standard error	0.129	0.019	0.144	0.0508208
Observations	627	627	627	627
Survey group 1 & 2, male children				
Coefficient	-0.179	-0.019	0.112	-0.094
Standard error	0.141	0.024	0.173	0.068
Observations	649	649	649	649
Survey group 2 & 3, female children				
Coefficient	0.127	-0.011	-0.254*	0.054
Standard error	0.138	0.017	0.143	0.045
Observations	840	840	840	840
Survey group 2 & 3, male children				
Coefficient	0.090	0.039	0.045	-0.016
Standard error	0.128	0.019	0.154	0.067
Observations	798	798	798	798

(a) Estimates correspond to a linear probability model. *Probit* estimates are not possible in this case since no male child was recorded as wasted in group 2 during the first round of the survey.
Standard errors clustered at *cantón* level.
*** p<0.01, ** p<0.05, * p<0.1

All in all, the evidence from the short-term and long-term analysis indicates that the CSR program had substantial benefits for child nutrition when households faced the unexpected shock in food prices in 2008. The opportune reception of the first payments by the time of the food price shocks appears to have prevented the deterioration of weight-for-height scores for those children most at risk of suffering wasting. Albeit the program's effect on the average weight-for-height scores appeared to be more prominent around one year of exposure. The program also seems to have offered the best protection against the decline in height-for-age and rising stunting for those children with around two years of exposure.

2.5.3. Accumulated transfers

A question that remains is if higher amounts transferred to the household could offer further protection to child nutrition. This issue is explored in Table 2.11 below, where the value of the

accumulated transfers per child (in natural logarithm) received by the household up to the second round of the evaluation survey is the explanatory variable of interest for the weight-for-height (Column 1) and the height-for-age (Column 2) scores, and the probability of suffering wasting (Column 2) and stunting (Column 4). Coefficients in Columns (1) and (2) were estimated with Ordinary Least Squared regressions, while coefficients in Columns (3) and (4) are marginal effects estimated from Probit regressions. All the regressions in Table 2.11 include children in survey groups 1 to 3 during the second round of the survey. Group 4 is excluded since they were still not participating in the program by the time of the second round of the survey.

Table 2.11: Accumulated CCTs per child and nutrition (Late 2008)

VARIABLES	(1) WHZ OLS	(2) Wasting *Probit*-Margins	(3) HAZ OLS	(4) Stunting *Probit*-Margins
Accumulated CCT per child[(a)(b)]	0.226**	-0.048*	0.413***	-0.116***
	(0.111)	(0.026)	(0.076)	(0.024)
Child's sex (Female=1)	0.134*	-0.046***	0.234***	-0.068**
	(0.075)	(0.017)	(0.064)	(0.029)
Age (months)	-0.014***	-0.001	-0.030***	0.007***
	(0.004)	(0.001)	(0.003)	(0.001)
Mother literacy	0.030	-0.005	0.108	-0.064*
	(0.097)	(0.023)	(0.099)	(0.033)
Improved water source	0.172	-0.020	0.041	-0.035
	(0.110)	(0.025)	(0.085)	(0.036)
Asset index	0.012	-0.016***	0.070***	-0.021***
	(0.020)	(0.006)	(0.021)	(0.007)
Num of Kids 13 to 17	-0.019	-0.030*	0.007	-0.032**
	(0.048)	(0.016)	(0.044)	(0.014)
Num. Adults 18 to 59	0.074**	-0.011	-0.009	-0.001
	(0.036)	(0.010)	(0.038)	(0.014)
Num. Adults 60 or older	-0.021	-0.011	0.010	-0.006
	(0.028)	(0.021)	(0.027)	(0.014)
Constant	-0.757		-2.857***	
	(0.492)		(0.412)	
Observations	1,032	383[(c)]	1,032	1,011
R-squared	0.083		0.191	

(a) Variable in natural logarithm. (b) Children between 0 to 12 years old. (c) The number of observations in Column (2) is significantly reduced since municipal fixed effects are included and, in many municipalities, no wasted children were recorded. Clustered standard errors in parentheses. Municipality fixed effect included.
*** p<0.01, ** p<0.05, * p<0.1

As can be seen in Table 2.11 above, once some child's and household's characteristics are controlled for, the value of accumulated cash transfers is associated with higher weight-for-height (Column 1) and height-for-age scores (Column 3) and lower wasting (Column 2) and stunting probabilities (Column 4). The coefficients in Columns (1) and (3) indicate that a 1% increase in the value of the accumulated transfers per child received by the household is associated with an average increase of 0.002 points in the weight-for-height score and 0.004 points in the height-for-age score. Likewise, the coefficients in Columns (2) and (4) indicate that a 1% increase in the accumulated transfer is associated with an average reduction of

about 0.05 percentage points in a child's probability to be wasted and 0.1 percentage points in the probability of being stunted.

The results in Table 2.11 suggest that the value of the cash transfers is associated with better child nutrition outcomes[22]. Nevertheless, their practical meaning is not immediately clear. An example might help to understand that meaning. The accumulated transfers in one year for a household receiving the combined bonus are 240 USD. If the household has three children aged 12 years or younger[23], the accumulated transfers per child are equal to 80 USD. A 10% increase in this value is equivalent to an addition of 24 USD for the whole year, which is not much higher than an additional transfer during the year, i.e., receiving 13 instead of 12 cash transfers. Had a household received those additional resources, it would be expected that a child has a 0.02 higher weight-for-height score, 0.04 higher height-for-age score, 0.5 percentage points lower probability of being wasted, and one percentage point lower probability of being stunted.

2.5.4. Food Consumption patterns

The CCT represents an addition to the household budget. Assuming that at least a portion of the transfer is spent on food, the CCT might impact the nutrition of the household members by improving food availability and quality. Unfortunately, the data collected in the evaluation survey offers few opportunities to test the channel through which the cash transfers affect nutrition. As explained before, it was only possible to calculate two proxy indicators for dietary diversity: the number of food groups consumed by the household and the proportion of the household's food budget spent on each food group.

Table 2.12 below presents the estimated effect of the CSR program on the dietary diversity indicators following a difference-in-difference strategy. In Column (1), the number of food groups consumed by the household is the outcome variable, while in Columns (2) to (4), the outcome variables are the proportion of the food budget spent in three selected food groups: Cereals and their products[24] (Column 2), Meat and meat products (Column 3), and Vegetables and their products (Column 4). Each line in the Table shows the results with a different combination of treatment and control groups.

The results in Table 2.12 show no significant change in the dietary diversity indicators due to the CSR program. Interestingly, results showing a meager impact of cash transfers on dietary diversity seem to be not uncommon. For instance, Hoddinott & Wiesmann (2010) report that the consumption of fruits, vegetables, and meats increased as a response to the CCT programs in Mexico and Nicaragua, but no change was observed in Honduras. The same authors also report an increase in the number of food groups consumed by beneficiary households only in the case of Nicaragua. Another example comes from Tanzania, where authors did not find a significant change in the consumption of almost any food item (Evans et al., 2014).

Nevertheless, this apparent lack of change in the outcome variables does not necessarily mean that the CSR program did not affect dietary diversity. As explained before, it might be the case that changes in food consumption patterns occur shortly after households enter the

[22] Similar results are found for the Mexican program *Progresa/Oportunidades*. See Fernald et al., (2008).
[23] The average number of children of 12 years old or younger in the sample is 2.74.
[24] The group includes maize, the main staple food in El Salvador.

program, in which case the data in the survey would fail to capture such changes due to the timing of the survey[25]. On the other hand, if the program indeed had little effect on dietary diversity in the household, it might have impacted the total amount of food purchased and the total caloric intake. Unfortunately, there is no data available to observe these changes.

Table 2.12: Effect of the CSR program on food consumption patterns – OLS point estimates

	(1) Number of Food groups purchased	(2) Expenditure proportion in food group 1	(3) Expenditure proportion in food group 7	(4) Expenditure proportion in food group 9
Survey groups 3 & 4				
Coefficient	0.052	-0.018	0.017	0.000
Standard error	0.142	0.016	0.010	0.005
Observations	2,979	2,979	2,979	2,979
Survey groups 1 & 2				
Coefficient	-0.275	0.002	0.010	0.007
Standard error	0.185	0.017	0.012	0.007
Observations	2,205	2,205	2,205	2,205
Survey groups 2 & 3				
Coefficient	-0.266	-0.002	-0.001	-0.007
Standard error	0.171	0.018	0.011	0.006
Observations	2,753	2,753	2,753	2,753

Clustered standard errors at municipality level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

2.6. The CSR program in recent years

Since the 2008 food price crisis, Salvadoran households have endured multiple shocks with potential negative effects on children's health and development, from the 2009 global economic crisis to tropical storms, droughts, and, more recently, the global Covid-19 pandemic and a new period of surging food prices in 2022[26]. The results in this chapter have shown that the CSR program has the potential to protect child nutrition in the face of economic shocks. However, after 17 years since the program's introduction, it is natural to question the relevance of the CSR program in recent years.

The CSR program operated in El Salvador up to 2019. In 2018 a new program known as "*Familias Sostenibles*" was set up to replace the CSR program and its sister program for urban households. The change was part of a renewed government strategy for poverty reduction, which included an update to the national register of households eligible for social assistance programs, cash transfers to the elderly without pensions, and active labor market policies targeting vulnerable households, among other components (STP, 2017b). The "*Familias Sostenibles*" kept the CCTs as a central component. However, the targeted population and eligibility criteria were modified. Prospective beneficiaries would be identified in urban and rural areas using a proxy means test, households with pregnant women or children up to two years

[25] A similar argument is presented by Pellerano et al., 2014. They explain that quantitative evidence suggests household increasing total food consumption and food variety around the days the cash transfers are received. Therefore, a seven-day recall period for food consumption might fail to capture changes these changes.

[26] The annual food inflation reached 14.4% in June 2022 (BCR, 2022).

old would be eligible to receive a health bonus, and households with children and adolescents enrolled in secondary school would be eligible to receive an education bonus[27]. Moreover, the amount of the transfers was also increased from 15 USD to 20 USD (STP, 2017a)

Despite the renewal of the social assistance strategy in 2018, it is unclear how much the administration has advanced in implementing the new CCT program. At its peak in 2009, the CSR program provided education and health transfers to 105,824 families. In 2019, the number of participating families went down to 39,590 (OIR-MINDEL, 2022a). Unfortunately, there is no publicly available information about the number of families participating or eligible to participate in the new CCT program from 2020 onwards (OIR-MINDEL, 2022b).

2.7. Conclusions

The main objective of this paper was to explore if conditional cash transfer programs, a type of non-adaptative safety net common in Latin America and other developing regions, can offer some protection to child nutrition against aggregated shocks. This question continues to be highly relevant because of the still high number of children suffering from malnutrition worldwide, the harmful effect of malnutrition on physical and cognitive development, and its subsequent negative impact on productivity and economic growth. To achieve its objective, the paper looked back to the food price crisis of 2008 and the cash transfer program implemented in El Salvador during that time. The data from the evaluation survey for the Salvadoran program, which was collected coincidently around the time of the crisis, offered the opportunity to observe the effect of the shock and the cash transfer. By focusing on child nutrition, the paper complements the literature about the use of pre-existing cash transfer programs as part of the emergency response to systemic crises, such as the covid-19 pandemic and the related disruptions, that have mainly focused on food security and self-reported financial, physical, and mental health.

The analysis results indicate that the program indeed offered some protection to child nutrition against a shock in food prices. When households started to receive the cash transfers almost at the same time as the peak of the food prices in El Salvador, the program reduced the probability that children three years old or younger were wasted by almost four percentage points. These benefits seem to be concentrated among children at the lower end of the wealth distribution, for whom the reduction in the probability of wasting reached more than nine percentage points. Also, the timely reception of the transfer appears to have prevented some girls from becoming stunted. When considering households that have been participating for a more extended period, the analysis found that exposure to the program of around 24 months reduced the probability of a child being stunted by around ten percentage points, in comparison with an exposure of around 13 months. Again, the benefits tend to concentrate among children in less wealthy households, for whom the probability of stunting is reduced by around 18 percentage points.

The study also found some evidence suggesting that the amount of the transfer matters. Higher accumulated cash transfers are associated with higher weight-for-height and height-for-age

[27] In the CSR program the health bonus was given to household with children below five years old, and the education bonus was intended to household with children who had not completed primary schooling. See section 2.3.1 in this chapter for more details.

scores, and lower wasting and stunting probabilities once individual and household characteristics are accounted for. As an example, back-of-the envelop calculations show that increasing the total amount received during a year by a household with three children by the equivalent of approximately one monthly transfer (i.e., receiving 13 instead of 12 transfers) is associated with an average reduction of 0.5 percentage points in the children's probability of being wasted and a reduction of 1 percentage points in the children's probability of being stunted in comparison with other children with similar characteristics and living in similar households.

The time and content of the data collected for the evaluation of the Salvadoran CCT program were key for this study. However, some limitations prevented the paper from exploring some of the mechanisms driving the observed results. Most importantly, the data collected did not contain details of the food consumption for the individual members of the household or the household as a whole. Therefore, it was not possible to observe directly how the rise in food prices affected the household's food consumption patterns and the distribution of food among individual members. Likewise, it was not possible to test if the CCT program affected the patterns of food consumption and distribution within or across households, or if the program prevented changes to these patterns caused by the food price rise.

Despite the previous limitations, the results presented in this paper have some important implications for the design of CCT programs and their potential use for the response to aggregated shocks. First, as shown by the analysis, a running CCT program was indeed able to prevent the deterioration of child nutrition during a crisis. The use of a running program in response to shocks has several advantages. For instance, the list of program participants can serve as the basis for the list of emergency response beneficiaries since vulnerable individuals have already been identified, and previously excluded people might be added if waiting lists (or local census like in the case of El Salvador) are up to date. Moreover, using the program's infrastructure and mechanisms could expedite the response to the crisis. Second, timely response and adaptation are important for adequate crisis response. As the analysis showed, the ability of the Salvadoran program to reduce child wasting during the crisis seems to come mainly from the coincidence of the first payment to a group of households and the peak of the food crisis. Moreover, some evidence suggests that increasing the value of the cash transfers might reduce child stunting and wasting. Third, regular livelihood support and emergency response programs need to focus on the most vulnerable people to use public resources more efficiently. In an emergency, such as the Covid-19 pandemic, non-targeted transfers, or a significant expansion on the beneficiaries of existing programs might be the only practical way to provide some social protection to the population in need. Nevertheless, this study confirms that programs' benefits to child nutrition, even during a crisis, are concentrated among the poorest households. Therefore, providing targeted support to the most vulnerable groups should always be prioritized.

3. Interaction Between Public and Private Cash Transfers, and their Effect on School Enrollment

3.1. Introduction

Poverty reduction and education coverage increase in rural areas remain challenges for El Salvador, as well as for most developing countries. In 2017, for instance, poverty afflicted almost a third of all the households living in the rural areas of El Salvador, with 7.7% of the families living in extreme poverty, whereas in urban areas, poverty affected 27.4 % of the households, and extreme poverty is down to 5.3% of the households. Likewise, in the rural areas, children between 7 and 15 years old had an enrollment rate of 89.7%, while their peers in the urban areas had an enrollment rate of 96.1% (DIGESTYC, 2018).

The public administration in El Salvador and individual households implement various actions intended to alleviate poverty and increase school attendance. Most notably, in late 2005 El Salvador Government began implementing a Conditional Cash Transfer (CCT) program, known as *Comunidades Solidarias Rurales* (CSR), which targeted some of the poorest rural communities in the country. The program intended to break the intergenerational transmission of poverty by requiring parents to invest in the human capital formation of their children in exchange for a monthly stipend. On their side, households also implement different strategies to increase their income and reduce its volatility. In particular, it seems that migration and remittances are one of the most extended strategies among rural households in El Salvador: Around 19% of the households have at least one migrant abroad, and 26% of the households receive remittances (DIGESTYC, 2018).

The simultaneous use of these two different strategies, both intended to improve the welfare of rural households, raises the questions of how effective they are in accomplishing their goals and how the public transfers might affect the behavior of the private transfer. In particular, this paper asks (1) how conditional cash transfers and international remittances affect children's school enrollment and (2) how household participation in a CCT program might affect international remittances and migratory decisions.

Like in the previous chapter, the present analysis relies mainly upon the household survey collected to evaluate the impact of the CSR program. The survey was collected in four rounds between 2008 and 2010, and contains rich information on demographic characteristics, income-generating activities, agricultural and livestock production, migration, and remittances. Most of the households in the survey were interviewed in at least two rounds, giving the dataset a longitudinal dimension that helps solve some of the usual identification problems that arise with non-experimental data. Moreover, the gradual implementation of the CSR program across surveyed municipalities allows the construction of clearly defined control and treatment groups.

Previous research generally finds a positive impact of CCT programs on schooling. For instance, that is the conclusion in studies for Mexico (Schultz, 2004), Colombia (Attanasio et al., 2010), Nicaragua (J. Maluccio & Flores Montenegro, 2005), and the previous impact evaluation of the program in El Salvador (IFPRI & FUSADES, 2009, 2010a, 2010b). Conversely, the evidence regarding the relationship between remittances (or migration) and schooling is not conclusive. A negative effect of migration and remittances on schooling has been found in studies for Mexico (McKenzie & Rapoport, 2011) and Guatemala (Davis & Brazil,

2016). However, evidence of remittances positively affecting schooling was found in the Philippines (Yang, 2008), and evidence indicating that migration increases schooling is reported for Pakistan (Mansuri, 2006). Moreover, previous studies for El Salvador have reached nuanced conclusions: remittances appear to have a null effect on school attendance for children aged 10 to 14 years, but a negative effect for adolescents aged 15 to 18 years (Acosta, 2011a). Most of the previous literature consistently concludes that CCT reception does not increase or displace remittances incidence or amount. Examples are in studies for Mexico (Teruel & Davis, 2000), Honduras, and Nicaragua (Olinto et al., 2006). Although, an exception is found in a study for Colombia, which points to CCTs increasing inter-household transfers (García & Cuartas, 2021).

Besides reassessing the impact of the Salvadoran CCT program, this study contributes to the previous literature by providing evidence of possible spillover effects of the CCT program. The paper also provides additional evidence of the effects of international remittances on school enrollment and explores the interaction between public cash transfers and private interhousehold transfers. More specifically, the paper contributes by exploring possible crowding-out effects of the CCTs on international remittances and by inquiring how the public transfers affect the school enrollment of children in remittance receiving households.

The rest of the chapter continues in section two with a review of the relevant theoretical framework, explaining the effect of household income changes on private transfers and the effect of remittances on children's schooling. The third section on data and methodology describes the CSR program in El Salvador, the survey data, and the empirical methodology used for the analysis. The fourth section presents the main findings of the analysis. It begins with the assessment of the effect of the CSR program on school enrollment, continues with the analysis of remittances and schooling, the assessment of the effect of the CSR program on remittances, and finalizes focusing on the CCT effect on households receiving remittances. The fifth section concludes.

3.2. Theoretical framework

This section presents a short review of how remittance reception in the household could affect children's schooling and how CCTs might affect remittance reception. The expected relationship between CCTs and school enrollment is straightforward since the reception of the cash transfers is conditional to school enrollment. Therefore, this section focuses first on the relationship between remittances and schooling and second on the relationship between CCTs and remittances. In short, remittances could increase productive household investments, including human capital. Besides remittances, the household migratory experience might change the expected returns of education and therefore impact the educational investment in the household. Moreover, the migration of one or both parents could result in insufficient support for the children, negatively affecting school performance. At the same time, remittances could be affected by CCTs. In simple terms, a CCT translates to a (temporary) income increase for the household. How the migrant's remittance behavior might change due to this income increase (provided migrants know about the CCT program and its characteristics) depends primarily on the motivation the migrant has for sending remittances.

3.2.1. Migration and remittances effect on education

Remittances might affect educational investments differently than other forms of income (such as wages or profits from agricultural production) if the household considers remittances temporal. In such a case, and following the permanent income hypothesis, it is more likely that a fraction of the remittances is saved and invested. To see this, consider a household that lives for three periods and whose objective is to maximize its lifetime utility, constrained to the budget restriction imposed by its expected income and initial asset holdings. Assume that the household expects to receive a constant labor income each period, but income from remittances is only expected in the second period. For simplicity, assume that the interest rate and household discount factor are equal to zero. Under the conditions mentioned above, the optimization problem for the households translates to:

$$Max\ E(U) = \sum_{t=1}^{3} E\big(U(c_t)\big) \quad S.T. \quad A_0 + \sum_{t=1}^{3} E(y_t) \geq \sum_{t=1}^{3} E(c_t) \tag{1}$$

Where $U(\cdot)$ Is the instantaneous utility function of the household, c_t is the household consumption at time *t,* y_t represent the household income at time *t*, and A_o stands for the initial household asset holdings.

Under the conditions mentioned above, the optimal household consumption is equal for each period, equivalent to a third of the initial assets holdings plus a third of the life-long income.

$$E(c_t) = \frac{1}{3}A_0 + \frac{1}{3}\sum_{t=1}^{3} y_t \tag{2}$$

However, the current income is not equal for each period. In periods 1 and 3, income is comprised only of wages (*w*), while period 2 includes wages and remittances (*R*). Therefore, savings (current income minus current consumption) will vary.

$$\begin{aligned} E(s_1) &= -\frac{1}{3}A_0 - \frac{1}{3}E(R) \\ E(s_2) &= -\frac{1}{3}A_0 + \frac{2}{3}E(R) \\ E(s_3) &= -\frac{1}{3}A_0 - \frac{1}{3}E(R) \end{aligned} \tag{3}$$

As can be seen in *t=1* and *t=2,* the household will experience negative savings. In *t=3*, however, positive savings might occur as long as one-third of the value of the initial assets is lower than two-thirds of the expected value of the remittances. Therefore, the higher the remittances value in relation to the household wealth, the more likely the household is to save a portion of the remittances. This observation implies that, for a given value of remittances, the

wealthier the household, the less likely it is to save a portion of remittances and subsequently invest it.

Of course, households do not have to invest their savings from remittances or other income sources in human capital formation. If the objective of the household is to maximize its lifelong utility, it will use its savings on investments with higher expected returns, which is not necessarily human capital. Moreover, the expected returns from education might vary across households. In particular, expected returns could depend on the location of the future employer. Therefore, remittances and prospective migration (inspired by the household's previous migratory experience or remittance reception) could change the household's behavior concerning educational investment. For households where children are planning to migrate, perhaps following the steps of their parents, investments in secondary or higher education might not be worthwhile since these achievements could not be recognized in the foreign labor market. Conversely, for households with children planning to stay in their home country, higher investments in education could be the only way to secure higher income in the future.

The previous insights assume that the household acts as a unit while allocating resources or that children follow their parents' instructions perfectly. It should be evident that this is not necessarily the case. Children can fail to follow their parents' wishes, and more so if the parents are away in a foreign country and cannot supervise their offspring effectively. Then, even if the remittances are earmarked for education, children might fail to comply and use their time in other activities. Thus, migration might harm children's education as long as it implies parental absence.

3.2.2. Motives to remit and the effect of CCTs on remittance reception

The literature on remittances generally distinguishes six non-exclusive motives to remit: altruistic behavior between household members, migrant's payments in exchange for services provided by the household in the home country, strategic arrangements between migrants and individuals/potential migrants in the home country, insurance arrangements between household members, migrant's repayment of investments made by the household, and migrant's intention to secure inheritance[28]. Below, the altruistic and exchange motives are explained in more detail since they provide clearer insights into the possible effect of a temporary pre-transfer income for the household in the home country.

If the primary motivation to remit is the migrant's altruism, the theory suggests that an increase in the household income in the home country will reduce remittances. The following explanation borrows from Lucas & Stark (1985) but emphasizes income changes as Rapoport & Docquier (2006). Consider the case of two individuals, one living abroad ($i = m$) and one remaining in the home country ($i = h$). Assume that both individuals care for the well-being of the other. Thus, each utility function (U_i) depends on the satisfaction the person derives from his or her own consumption ($V_i(c_i)$) and the satisfaction the other individual obtains from his or her consumption. The previous statement can be written as:

[28] A more detailed explanation of each motive, as well as a review of the literature can be found at Rapoport & Docquier (2006).

$$U_m(c_m, c_h) = (1 - \beta_m)V_m(c_m) + \beta_m U_h(c_h, c_m)$$
$$U_h(c_h, c_m) = (1 - \beta_h)V_h(c_h) + \beta_h U_m(c_m, c_h) \quad (4)$$

Where:

β_i represents the weight individual i gives to the utility of the other individual relative to his or her own utility.

$$V_i'(\cdot) > 0 \; and \; V_i''(\cdot) < 0$$

Solving the previous equations for $V_h(c_h)$ and $V_m(c_m)$ yields:

$$U_m(c_m, c_h) = (1 - \alpha_m)V_m(c_m) + \alpha_m V_h(c_h)$$
$$U_h(c_h, c_m) = (1 - \alpha_h)V_h(c_h) + \alpha_h V_m(c_m, c_h) \quad (5)$$

Where:

$$\alpha_m = \frac{\beta_m(1-\beta_h)}{1-\beta_m\beta_h} \; ; \; \alpha_h = \frac{\beta_h(1-\beta_m)}{1-\beta_m\beta_h}$$

As usual, the consumption of each individual is constrained by the resources at his or her disposal. In this example, the migrant disposes of his or her labor income (w_m) minus the remittance (R), while the individual in the home country disposes of his or her labor income (y_h) plus the remittances:

$$c_m \leq y_m = w_m - R$$
$$c_h \leq y_h = w_h + R \quad (6)$$

If both individuals maximize their utilities, then it must be the that (from the migrant's perspective):

$$(1 - \alpha_m)\frac{dV_m(c_m)}{dc_m} = \alpha_m \frac{dV_h(c_h)}{dc_h} \quad (7)$$

The conditions above establish that both individuals' (weighted) marginal utilities must be equal. If that is not the case, individuals can increase their utilities by varying their consumption. For instance, if the person in the home country experiences a reduction in labor income, which leads to a reduction in consumption, the following condition will occur:

$$(1-\alpha_m)\frac{dV_m(c_m)}{dc_m} < \alpha_m \frac{dV_h(c_h)}{dc_h} \tag{8}$$

In such a scenario, the migrant can increase his or her overall utility by reducing his or her own consumption and increasing the consumption of the individual in the home country. Therefore, the migrant would reduce his or her expenses and increase the amount to remit. The opposite will happen if labor income in the home country increases. This situation can be seen directly using a specific utility function, for instance $V_i(\cdot) = \ln(\cdot)$. Solving the optimization problem from the migrant perspective, and assuming prices are equal in the home country and abroad, yields:

$$(1-\alpha_m)c_h = \alpha_m c_m \tag{9}$$

The expression above can be rewritten as follows using the individual budget restrictions:

$$\begin{gathered}(1-\alpha_m)(w_h+R) = \alpha_m(w_m-R) \\ R = \alpha_m w_m - (1-\alpha_m)w_h\end{gathered} \tag{10}$$

Where it becomes evident that

$$\frac{\partial R}{\partial w_m} > 0 \text{ and } \frac{\partial R}{\partial w_h} < 0 \tag{11}$$

Different conclusions about the effect of the recipient income on the amount remitted emerge if the migrant remittances are intended to pay for some services provided in the home country (for instance, taking care of assets or other family members): An increase in the recipient's income could result in either higher or lower remittances. Below, the explanation of this ambiguous conclusion follows the one presented in Rapoport & Docquier (2006), which adapts from Cox (1987).

Suppose the migrant remits to pay for a fixed amount of a service ($\bar{X}$). To simplify, also assume that the migrant's utility (V_m) depends only on his or her own consumption (c_m) and one service procured in the home country. The utility of the recipient (V_h) depends on his or her consumption (c_h) and the service provision. However, the effort to provide the service causes him disutility. The conditions described above can be written as:

$$\begin{gathered}V_m = V_m(c_m, \bar{X}), \text{ where } \frac{\partial V_m}{\partial c_m} > 0\,, \frac{\partial' V_m}{\partial c_m'} < 0\,;\ \frac{\partial V_m}{\partial \bar{X}} > 0\,, \frac{\partial' V_m}{\partial \bar{X}'} < 0 \\ V_h = V_h(c_h, \bar{X}), \text{ where } \frac{\partial V_h}{\partial c_h} > 0\,, \frac{\partial' V_h}{\partial c_h'} < 0\,;\ \frac{\partial V_h}{\partial \bar{X}} < 0\,, \frac{\partial' V_m}{\partial \bar{X}'} > 0\end{gathered} \tag{12}$$

As usual, the consumption of both individuals is restricted by the resources at their disposal. For the migrant, this is his or her labor income (w_m) minus remittances (R), while for the recipient, this is his or her labor income (w_h) plus the remittances.

$$\begin{aligned} c_m &\leq y_m = w_m - R \\ c_h &\leq y_h = w_h + R \end{aligned} \tag{13}$$

Suppose the migrant is willing to transfer only the minimal amount required for the service to be provided, while the recipient is willing to provide the service as long as:

$$V_h(c_h, \bar{X}) \geq V_h(c_h, 0) \tag{14}$$

Which, once the budget restriction is considered, can be written as:

$$V_h(c_h(w_h + R), \bar{X}) \geq V_h(c_h(w_h), 0) \tag{15}$$

If the previous equation is solved for R, and considering only the equality condition, the solution would take the form of:

$$R = R(w_h, \bar{X}) \tag{16}$$

To find the partial derivative of R with respect to w_h, without specifying a utility function, the implicit function theorem can be used. The result would take the following form:

$$\frac{\partial R}{\partial w_h} = -\frac{\frac{\partial V_h(c_h, \bar{X})}{\partial c_h} - \frac{\partial V_h(c_h, 0)}{\partial c_h}}{\frac{\partial V_h(c_h, \bar{X})}{\partial c_h}} \tag{17}$$

It is not immediately apparent how remittances would react to a receptor's pre-transfer income change in the expression above. First, it is necessary to know more about how consumption and service provision interact in the marginal utility of the receptor. If the provision of the good does not affect c_h marginal utility (which can be the case in a separable and additive utility function), this would be higher at $R = 0$, since a lower quantity of c_h can be acquired. Therefore, the numerator sign in the expression above would be negative, and the whole right-hand side of the equation would be positive, which means remittances would increase with higher pre-transfer income. However, if $c_h$and $\bar{X}$ are somehow complementary, the marginal utility of

c_h could be higher when $\bar{X} > 0$. Thus, the whole expression turns positive, meaning higher pre-transfer income reduces the amount received in remittances.

Finally, a word about remittances as an insurance mechanism is also in place. Rural areas in developing countries are generally characterized by high-income risk, originating from agricultural and livestock production dependence on meteorological conditions. For many rural households accessing insurance markets to deal with the income risk is not always possible, either because the market does not exist or due to high premiums. In such a context, a possible household strategy to insure against income risk is to diversify its income sources. This strategy could include seeding migrant workers to urban areas or a foreign country, where income shocks are expected to be uncorrelated to the conditions in the home location (Lucas & Stark, 1985; Stark & Levhari, 1982). Under such an arrangement, migrants are expected to remit in case the household experience an income shock, and the household members in the home location are expected to support the migrant in case of an income shock in the host location (for instance, unemployment). The amount to be remitted in good and bad times is an informal contractual arrangement between the migrant and the rest of the household. Thus, the amount depends on the bargaining power of each side (Lucas & Stark, 1985; Rapoport & Docquier, 2006). How this contract will change the household income increases will also depend on the bargaining power of the agents. If the migrant holds more weight in the bargaining process, he or she could deem the household to be more financially secure and reduce remittances. On the other hand, remittances could be unaffected if the household weights more in the barging. Another possibility is that income growth also increases the household bargaining power. In this case, the household members could renegotiate the original arrangement to their favor and demand a higher amount in remittances.

3.3. Data and methods

3.3.1. The CCT Program

The conditional cash transfer program known as *Comunidades Solidarias Rurales* started in late 2005 and targeted the rural households in the 100 poorest municipalities in El Salvador. The monthly cash transfers were divided into two types depending on the household characteristics: A “Health bonus” of 15 USD for households with pregnant women or children under five years old, and an “Education Bonus” of 15 USD for households with children between 5 to 18 years old who are yet to complete primary education. A household qualifying for both groups received a combined transfer worth 20 USD. The program has two sets of conditionalities for the participant households to receive the transfers. First, pregnant women must attend regular medical checks following the Health Ministry’s official protocol. Similarly, children up to five years old must attend regular medical checks and comply with the official vaccination scheme. Second, children from 5 to 18 years old, who have not completed primary education[29], are required to be enrolled at school and regularly attend (STP, 2009).

As explained in the previous chapter, for the geographical targeting, the Government of El Salvador classified all 262 Salvadoran municipalities into four categories based on the municipal incidence of extreme income poverty and severe stunting among first-grade pupils:

[29] In El Salvador primary education last six school years. Children are supposed to be enroll in the first year of primary education at the age of seven.

(1) severe extreme poverty, (2) high extreme poverty, (3) moderate extreme poverty, and (5) low extreme poverty. Municipalities in the severe and high extreme poverty categories were incorporated into the program, while municipalities in the moderate and low extreme poverty clusters were excluded. The program was implemented gradually among the participating municipalities. Those in the severe extreme poverty group received the first CSR installment between 2005 and 2006, while municipalities in the high poverty group received the first installment between 2007 and 2009. Within each cluster, the order in which the municipalities entered the program was decided using a so-called "Municipality Marginality Index." This index was constructed using the information at the municipality level on the poverty gap, adult literacy, children's school enrollment, housing conditions, and access to water and electricity (FLACSO Programa El Salvador, 2005).

3.3.2. The evaluation survey

The primary information source for the analysis in this chapter continues to be the household survey conducted to evaluate the impact of the CSR program. The survey was implemented by the International Food Policy Research Institute (IFPRI) and the Salvadoran Foundation for Economic and Social Development (FUSADES) in El Salvador in four rounds between 2008 and 2010. The survey collected information about household composition, employment, agricultural production, migration and remittances, and negative shocks (such as crime victimization and crop losses), among other aspects.

Table 3.1: CSR groups in the survey

Group	Municipalities	Year of first payment	Month of first payment
1	11	2006	Jul-Nov 2006 (Mostly Nov. 2006)
2	11	2007	Jul – Sep 2007
3	16	2008	Jun – Oct 2008
4	12	2008	Nov – Dec. 2008[30]

Source: Evaluation survey and STP (2009)

As explained before, The IFPRI – FUSADES survey took place in 50 participating municipalities[31]. Within each of these municipalities, two rural *cantones* were selected, and within each of these *cantones*, 30 households were randomly selected from census lists: 15 households with children up to 3 years old or pregnant women and 15 households with children between 6 and 12 years old. Households were re-interviewed for subsequent survey rounds if they still met such characteristics. The households that no longer fit in the two categories were replaced using the census list or a list of households with recent births collected by the public health clinic in the municipality (de Brauw & Peterman, 2020). In the first and second survey rounds, 2,921 households were interviewed, while in the third and fourth rounds, 2,816 and 2,945 households were interviewed, respectively.

[30] One municipality entered at the beginning of 2009.
[31] More details in the selection of municipalities and sampling of households can be found in IFPRI & FUSADES (2008).

3.3.3. Identification strategy

The gradual implementation of the program and the longitudinal component of the survey provides the opportunity to apply a difference in difference strategy to evaluate the effect of the CCT reception on school enrollment at the municipality level. This approach requires observations for at least two time periods, before and after treatment, and for two groups, one receiving treatment and the other not receiving it. The treatment effect over the outcome of interest is then estimated by comparing the change between the two periods for the treatment group with the change between the two periods for the control group. The basic estimation equation is as follows:

$$Y_{imt} = \delta_1 \gamma_m + \delta_2 \lambda_t + \delta_3 D_{mt} + \varepsilon_{imt} \quad (18)$$

Where Y_{imt} is an indicator variable taking the value of 1 if the individual *i*, living in municipality *m*, was enrolled at school at time *t*, and 0 otherwise. The categorical variable γ_m represents the municipalities in the sample, while the indicator variable λ_t takes the value of 0 for the pre-treatment period and 1 for the post-treatment period. The indicator variable D_{mt} takes the value of 1 if the municipality *m* was receiving the CCT in the post-treatment period and the value of 0 in any other case. The parameter δ_3 captures the causal effect of interest.

Similar to the initial impact evaluation of the CSR program (de Brauw & Gilligan, 2011; IFPRI & FUSADES, 2009, 2010a, 2010b), the comparison groups are formed by considering which municipalities were likely to see their enrollment decisions affected by the CCT for a given school year. In other words, it is necessary to identify which municipalities were receiving the CCT when the household decided to enroll their children for the upcoming school year. For instance, municipality group 1 received the first CSR installment during the second half of 2006. Since the school year in El Salvador typically starts around February, the enrollment decisions for the school year 2006[32] taken by households in this group were not affected by the program. For the school year 2007, group 1 was already receiving the monthly stipends and was required to comply with the program conditions. Thus, their enrollment decisions for 2007 were affected by the program. On the other hand, municipality group 2 did not receive any cash transfer from the CSR program until the second half of 2007. Therefore, the enrollment decisions households in group 2 made for school years 2006 and 2007 were not affected by the program. Likewise, municipalities in groups 3 and 4 did not receive their first installment until the second half of 2008, and thus their enrollment decisions for school years 2006, 2007, and 2008 were not affected by the program. The previous observations suggest that for 2006 and 2007, municipality group 1 can be taken as a treatment group, while the rest of the municipalities can serve as the control group. Likewise, for 2007 and 2008, municipalities in group 2 can be considered the treatment group, while municipalities in groups 3 and 4 can be considered the control group.

[32] Enrollment decisions for year 2006 were asked retrospectively in the first round of the survey.

Table 3.2: Is the CSR group receiving the CCT by the time of school enrolment?

Group	2006	2007	2008	2009	2010
1	No	Yes	Yes	Yes	Yes
2	No	No	Yes	Yes	Yes
3	No	No	No	Yes	Yes
4	No	No	No	Yes	Yes

The fundamental identifying assumption in the proposed difference-in-difference strategy is that school enrollment would follow the same trend for the control and the treatment group in the absence of the CSR program. Due to the limitations of the data set, this assumption is not directly testable. However, a common trend in school enrollment before the start of the program would provide evidence in favor of the assumption. Tables 3.4 and 3.5 in the next section show school enrollment rates for all the municipality groups from 2005 to 2010. As can be seen in Table 3.4, all groups experienced positive changes in the school enrollment rates for children aged 7 to 12 years before the CSR program was implemented, offering support to the identifying assumption. A trend in the opposite direction is observed in the school enrollment rates of adolescents aged 13 to 16 years in almost all municipality groups, again offering some support to the common trend assumption.

Regarding the estimation of the remittances' effect on school enrollment, it is necessary to consider that households with migrants or receiving remittances are likely not a random sample from the general population. Most likely, these households differ in observable and unobservable characteristics from the general population. Moreover, it is probable that some of the unobservable characteristics correlated with remittance reception also correlate with school enrollment decisions. This endogeneity of the migratory decisions will bias the coefficients estimated with ordinary less squared regressions. A common strategy to address the endogeneity problem is to use instrumental variables. These variables are correlated with the endogenous regressor but not with the unobserved characteristics of the unit of observation. Thus, the instrument affects the outcome variable of interest only through its effect on the endogenous regressor. These properties are used to construct an unbiased estimator for the effect of the endogenous variable over the outcome variable.

In this case, two instruments are proposed: the proportion of households in the community with migrants abroad registered in the 1992 population census (DIGESTYC, 1992)[33] and the distance from the village centroid to the border with Honduras. Both variables are expected to indicate the presence of migratory networks, which, by sharing information among members, reduce the cost of moving to a different location and thus increase migration and remittances. It would be expected that the more households with migratory experience in a community, the more information would be available to facilitate migration. At the same time, the distance to the Honduran border indicates the likelihood of past migratory experiences in the community. Before the war between El Salvador and Honduras in 1969, many Salvadoran migrants were farmers who moved to Honduras looking for agricultural land (PNUD, 2005). After the war, most of these migrants were forced to return to El Salvador. However, the previous migratory

[33]A census extract was obtained from IPUMS International (Minnesota Population Center, 2021). The publicly available sample allows to estimate the percentage of households with members living abroad at the municipality level in most cases. However, relatively less populated municipalities are grouped together in the sample.

experience might have facilitated further waves of migration to different countries. Moreover, some areas close to the Honduran border were heavily affected by the Salvadoran civil conflict (1980 – 1992), which caused a significant population displacement to neighboring countries and the United States (Jones, 1989).

While migratory networks are expected to increase emigration, they are unlikely to directly affect current school enrollment decisions for children and adolescents. Although it could be argued that children quit studying to migrate, this seems not to be the case: just around 3% of all the international migrants registered in the survey were of school age. It can also be argued that border regions might have different economic conditions than the rest of the country, affecting migration patterns. However, the sample used for this study comprises similar municipalities regarding income and poverty levels, thus limiting this concern.

The basic two-equation system to be estimated is as follows:

$$\begin{aligned} y_{it} &= X'_{it}\beta_{11} + \beta_{12}R_{it} \\ R_{it} &= X'_{it}\beta_{21} + \beta_{22}M_i + \beta_{23}K_i \end{aligned} \tag{19}$$

Where y_{it} is a binary variable taking the value of 1 if individual *i* is enrolled at school at time *t*, and 0 otherwise; X_{it} is a vector of individual and household characteristics likely to be related to school enrollment decisions; R_{it} is a binary variable taking the value of 1 if individual *i* lives in a household receiving remittances at time *t*, M_i is the proportion of international migrants to the municipality population, and K_i is the distance in kilometers from the village centroid to the border of El Salvador with Honduras.

Even though the binary nature of the endogenous variable in the first stage equation suggests the use of non-linear models, like *probit* or *logit*, to obtain the fitted values for the second stage equation, such a procedure will result in inconsistent estimators of the coefficients since the residuals in the first stage regression are not guaranteed to be uncorrelated with the predicted values and covariates (Angrist & Pischke, 2009). Instead, the predicted values obtained from the non-linear model are used as instruments in the two-stage least square estimation [34]. The results obtained using the fitted values as instruments are reported in the next section, while the regular instrumental variable estimation results are reported in Table B.1 in Appendix B.

As explained in the previous sections, CCT reception in the household might have a "crowding out (or in) effect" on remittances. In other words, if migrants sending remittances back to El Salvador notice the household's additional income coming from the government's cash transfer, they might decide to halt or diminish remittances. A change in the opposite direction is also possible, with households receiving CCTs experiencing increased remittances due to new migration spells, or the decisions made by migrants already abroad. To identify these possible effects, it is again possible to use the gradual implementation of the CSR program,

[34] Note that this is not the same as using the fitted values from a non-linear first stage to estimate the second stage equation. Instead, the fitted values are first obtained and then used as instruments in the first stage regression, along with the other covariates and the original instrument. This approach is equivalent to a two-stage least squares estimation with generated instruments (See Wooldridge (2010) Chapter 6). A similar approach is also used by Alcaraz et al. (2012) in their study of the effect of remittances on schooling and child labor in Mexico.

and the longitudinal dimension of the evaluation survey, for constructing a difference in difference estimation. Like the CCT and school enrollment evaluation, designing the comparison groups is essential. In this case, the primary classification condition is the coincidence between remittances reception and CCT reception for all, or most, of the 12 months before the survey. If the household had not received the CCT for most of the past 12 months, it would be expected that the public transfers would not influence remittance reception.

By the time of the evaluation survey first round, January to February 2008, the municipalities in group 1 had been receiving the CCT for more than one year, municipalities in group number two had been receiving the CCT for three to five months, and municipalities in group 4 and 5 were not enrolled in the program yet. By the time of the survey's second round (September to November 2008), municipalities in groups 1 and 2 had been receiving the CCT for more than 12 months, while municipalities in group 3 received the first installment a couple of months before the survey, and municipalities in group 4 had not received the cash transfer yet. By the third and four rounds of the evaluation survey, all groups received the CCT for 12 months or more.

Table 3.3: Is the municipality group receiving CCTs for most of the 12 months before the survey?

Group	Survey round 1 (Jan. 2008)	Survey round 2 (Oct. 2008)	Survey round 3 (Oct. 2009)	Survey round 4 (Oct. 2010)
1	Yes	Yes	Yes	Yes
2	No*	Yes	Yes	Yes
3	No	No	Yes	Yes
4	No	No	Yes	Yes

* Most of the municipalities entered in September 2007

The previous timeline suggests that group 2 can be used as a treatment group since these municipalities change from a low exposure by the time of the survey's first round to full exposure to treatment by the second round. Municipalities in groups 3 and 4 can then be regarded as control groups since they are not exposed to treatment before the baseline survey and remain mostly unexposed by the time of the second survey.

The basic equation to estimate follows the standard difference in difference structure:

$$R_{jmt} = \alpha_1 \gamma_m + \alpha_2 \lambda_t + \alpha_3 D_{mt} + \varepsilon_{imt} \quad (20)$$

Where R_{jmt} is an indicator variable taking the value of 1 if the household *j*, located in municipality *m*, was receiving remittances at time *t*, and 0 otherwise. γ_m and λ_t are categorical variables for the municipalities and years in the sample, respectively. D_{mt} is an indicator variable taking the value of 1 if the municipality *m* received the CCT at time *t*, and 0 otherwise. The parameter α_3 captures the causal effect of interest.

Besides the possible effect on remittance incidence, the CCT could affect the household income from remittances. Since the value of the remittances is observed only for those

households that self-select to migration and remittance, and this selection is unlikely to be random, simple OLS estimates of the CCT effect would be biased. To address this issue, a Heckman selection model is used (Heckman, 1979). The specific equation for the remittances value and selection are written below.

$$T_{jmt} = \omega_{11}\gamma_m + \omega_{12}\lambda_t + \omega_{13}D_{mt} + \varepsilon_{imt}$$
$$R_{it} = \omega_{21}X_{it} + \omega_{22}M_i + u_{imt} \quad (21)$$

Where T_{jmt} represents the annual income from international remittances received by household *j*, in municipality *m*, in year *t*. The rest of the terms are defined as in previous equations.

Finally, to evaluate how the CCT affects the school enrollment decisions of those households also receiving remittances, the basic difference in difference model is extended to incorporate the remittance reception status of the household and an interaction term with the CCT treatment variable. This specification is equivalent to running two separate regressions, one for households receiving remittances and the other for households not receiving remittances, thus capturing possible differences in the effect of the CCT between the two subsamples. The equation to be estimated is as follows:

$$Y_{imt} = \pi_1\gamma_m + \pi_2\lambda_t + \pi_3 D_{mt} + \pi_4(\gamma_m * R_{it}) + \pi_5(\lambda_t * R_{it}) + \pi_6(D_{mt} * R_{it}) + \varepsilon_{imt} \quad (22)$$

Where the variables are defined as in the previous equations.

3.4. Descriptive statistics

Despite substantial progress in the early 2000s, El Salvador still faces significant challenges in expanding primary and secondary school enrollment. Children in El Salvador are expected to start primary school (first to sixth grade) at seven years old. They would continue to lower-secondary or middle school (grades 7th to 9th) at the age of 13 years and progress to upper-secondary school or high school (grades 10th to 11th or 12th, depending on the course of studies) when they turn 16 (UNESCO, 2019). Between 1998 and 2008, net enrollment rates in primary school increased nationwide, going from 81.4% to 94.4%. However, thereafter the enrollment rate decreased back to 81% in 2018. Likewise, the net enrollment rate in secondary school increased between 2000 and 2014, going from 47.9% to 66.5%. Nevertheless, like in the case of primary schooling, the enrollment rate in secondary school went down to 61.8% in 2018 (The World Bank, 2022).

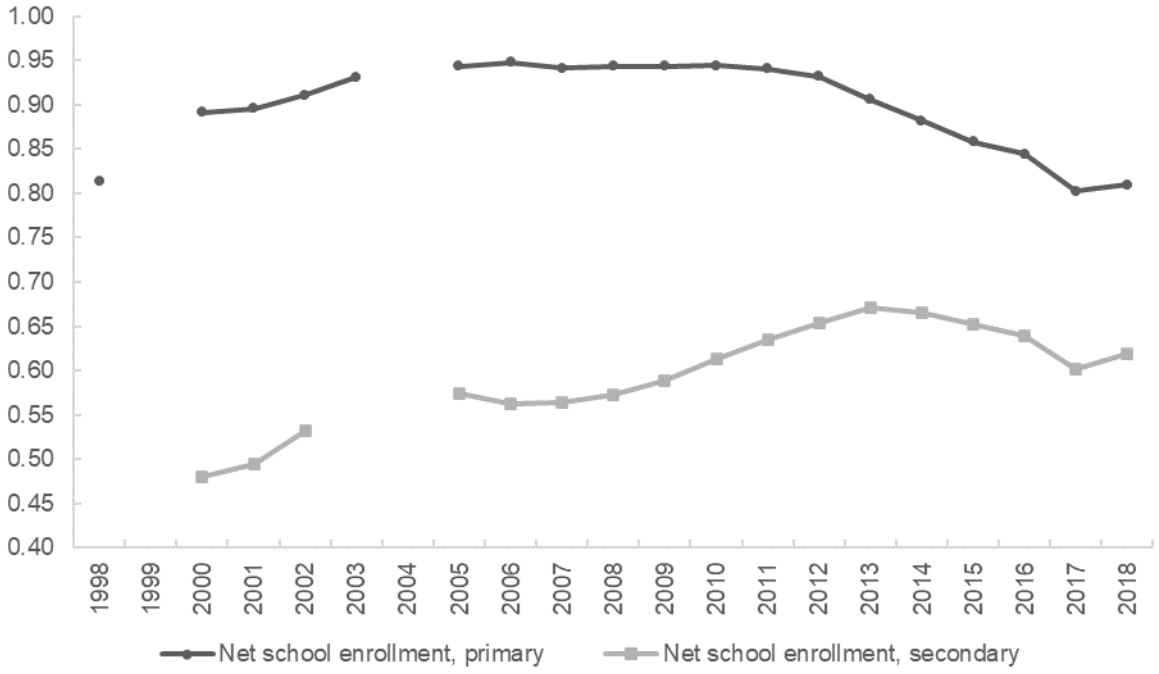

Figure 3.1: National school enrolment rates by level, El Salvador

Data source: The World Bank (2022)

The school enrollment rates obtained from the evaluation survey for children participating or scheduled to participate in the CSR program are not comparable with the national enrollment rates shown above, mainly because the survey-based enrollment rates are estimated by age group, not by school grade or level[35]. Nevertheless, it is interesting to observe how the enrollment rate for children 7 to 12 years old in the survey, the age corresponding to primary school, gradually increased as the CSR program was phased in (see Table 3.4). In 2005, before the program was implemented in any municipality group, children 7 to 12 years old in the sample had an enrollment rate of 90.2%, below the national net rate for primary school. By 2010, when all municipality groups were participating in the CSR program, the enrollment rate for children 7 to 12 years old went up to 99.2%, above the national rate for primary school.

The enrollment rates for children 13 to 16 years old in the sample are shown in Table 3.5 further below. Adolescents in this age group are expected to attend secondary school. Nevertheless, the table includes all adolescents in the age group, regardless of their school level. Therefore, some of these individuals might still participate in the program, but others are likely to be left out since they have completed primary schooling. Remarkably, the enrollment rates for this age group are considerably lower than for the younger cohort[36]. The behavior is also different. Between 2005 and 2007, enrollment rates decrease for the whole subsample, a behavior driven by municipalities in groups 2, 3, and 4. From 2008 onwards, however, the tendency reversed.

[35] At minimum, data at school level on the number of children enrolled by course and the total number of children in the area of interest would be needed to estimate school enrollment rates by educational level. The evaluation survey did not collect such data.

[36] The enrollment rate for this subsample is also higher than the national rate for secondary school, most likely due to the inclusion of adolescents still attending primary school.

Table 3.4: School enrollment rates by CSR group and year, children 7 to 12 years old

Group	Indicator	2005	2006	2007	2008	2009	2010
1	Enrollment rate	0.922	0.968	0.987	0.989	0.987	0.990
	Standard error	0.010	0.007	0.004	0.004	0.004	0.004
	Observations	655	695	747	744	639	699
2	Enrollment rate	0.903	0.933	0.952	0.986	0.985	0.991
	Standard error	0.011	0.009	0.007	0.004	0.004	0.003
	Observations	753	816	814	828	814	811
3	Enrollment rate	0.897	0.927	0.949	0.943	0.982	0.995
	Standard error	0.010	0.008	0.007	0.007	0.004	0.002
	Observations	978	1,058	1,133	1,161	1,121	1,025
4	Enrollment rate	0.889	0.918	0.939	0.942	0.986	0.988
	Standard error	0.012	0.010	0.008	0.008	0.005	0.004
	Observations	692	756	804	877	690	775
All	Enrollment rate	0.902	0.935	0.955	0.962	0.985	0.992
	Standard error	0.005	0.004	0.003	0.003	0.002	0.002
	Observations	3,078	3,325	3,498	3,610	3,264	3,310

Data source: CSR Evaluation survey.

Table 3.5: School enrollment rates by CSR group and year, children 13 to 16 years old

Group	Indicator	2005	2006	2007	2008	2009	2010
1	Enrollment rate	0.717	0.763	0.778	0.814	0.776	0.815
	Standard error	0.041	0.030	0.025	0.021	0.022	0.020
	Observations	120	207	288	355	361	363
2	Enrollment rate	0.709	0.691	0.684	0.779	0.794	0.820
	Standard error	0.036	0.030	0.024	0.021	0.020	0.019
	Observations	158	236	364	398	422	422
3	Enrollment rate	0.781	0.772	0.708	0.712	0.756	0.780
	Standard error	0.029	0.023	0.022	0.019	0.018	0.017
	Observations	201	324	448	546	586	573
4	Enrollment rate	0.851	0.772	0.704	0.734	0.818	0.793
	Standard error	0.031	0.028	0.026	0.022	0.022	0.021
	Observations	134	224	318	406	307	367
All	Enrollment rate	0.765	0.751	0.715	0.754	0.781	0.800
	Standard error	0.017	0.014	0.012	0.010	0.010	0.010
	Observations	613	991	1,418	1,705	1,676	1,725

Data source: CSR Evaluation survey.

Table 3.6 presents the school enrollment rates for children between 7 and 12 years old in the sample, divided by year and remittance reception. A simple comparison between the two groups points to a slightly higher enrollment rate among children living in a household receiving remittances during 2007 and 2008. In later years, however, this difference disappears. In Table 3.7, which reports the school enrollment rates for children 13 to 16 years old, a higher

enrollment rate is observable between 2007 and 2010 for children in a household receiving remittances.

Table 3.6: School enrollment rates by remittance reception and year, children 7 to 12 years old

Remittance reception	Indicator	2007	2008	2009	2010
No	Enrollment rate	0.952	0.960	0.986	0.992
	Standard error	0.004	0.004	0.002	0.002
	Observations	2,790	2,718	2,542	2,609
Yes	Enrollment rate	0.970	0.967	0.979	0.990
	Standard error	0.006	0.006	0.005	0.004
	Observations	708	892	722	701
All	Enrollment rate	0.955	0.962	0.985	0.992
	Standard error	0.003	0.003	0.002	0.002
	Observations	3,498	3,610	3,264	3,310

Data source: CSR Evaluation survey.

Table 3.7: School enrollment rates by remittance reception and year, children 13 to 16 years old

Remittances reception	Indicator	2007	2008	2009	2010
No	Enrollment rate	0.714	0.744	0.773	0.803
	Standard error	0.014	0.012	0.012	0.011
	Observations	1,117	1,283	1,304	1,337
Yes	Enrollment rate	0.721	0.787	0.809	0.789
	Standard error	0.026	0.020	0.020	0.021
	Observations	301	422	372	388
All	Enrollment rate	0.715	0.754	0.781	0.800
	Standard error	0.012	0.010	0.010	0.010
	Observations	1,418	1,705	1,676	1,725

Data source: CSR Evaluation survey.

Interestingly, the proportion of households receiving remittances in the sample increased for all municipality groups between 2007 and 2008, with the most noticeable change in group 3, which saw an increase of almost six percentage points (see Table 3.8). Between 2008 and 2009, the change goes in a different direction for all the municipality groups, except group 1. Most likely, this reversion is associated with the global financial crisis that heavily impacted the United States, the top destination country for Salvadoran international migrants. Similar to the behavior of the proportion of households receiving remittances, the average annual household income from remittances significantly increases from 2007 to 2008 (see Table 3.9). However, differently from the remittance incidence behavior, the remittance income increased in 2009.

Table 3.8: Proportion of household receiving international remittances by year and CSR entry group

Group	Indicator	2007	2008	2009	2010
1	Proportion	0.206	0.243	0.246	0.204
	Standard error	0.016	0.017	0.018	0.016
	Observations	621	629	565	648
2	Proportion	0.164	0.219	0.171	0.186
	Standard error	0.015	0.016	0.015	0.015
	Observations	651	654	632	660
3	Proportion	0.171	0.229	0.181	0.193
	Standard error	0.012	0.014	0.013	0.013
	Observations	942	926	914	935
4	Proportion	0.203	0.243	0.228	0.207
	Standard error	0.015	0.016	0.017	0.015
	Observations	705	712	606	702
All	Proportion	0.185	0.233	0.202	0.197
	Standard error	0.007	0.008	0.008	0.007
	Observations	2,919	2,921	2,717	2,945

Data source: CSR Evaluation survey.

Table 3.9: Average yearly household income from international remittances by CSR entry group and year, USD

Group	Indicator	2007	2008	2009	2010
1	Average	1241.5	1674.3	1930.7	2199.7
	Standard error	113.7	139.4	153.2	160.9
	Observations	127	152	107	106
2	Average	1339.1	1976.1	2001.0	1819.1
	Standard error	171.8	240.8	190.8	153.2
	Observations	107	142	89	92
3	Average	1598.6	1782.4	2203.6	2107.7
	Standard error	128.7	128.9	202.1	235.1
	Observations	159	212	126	135
4	Average	1459.7	1759.1	1905.6	2076.6
	Standard error	111.6	162.8	191.4	175.0
	Observations	142	173	95	116
All	Average	1425.1	1792.8	2022.4	2062.2
	Standard error	65.3	82.6	93.8	97.2
	Observations	535	679	417	449

Data source: CSR Evaluation survey. Note: Only households receiving remittances are included in the average

3.5. Results

3.5.1. CCT reception and school enrollment

Table 3.10 below reports the results of the estimation of a difference-in-difference model for the effect of the reception of the CSR monthly stipend over the probability of school enrollment for children aged 7 to 12 years old. As previously explained, municipalities entered the program in different batches, providing the opportunity to construct different treatment and control groups depending on the year. Each column in Table 3.10 reports the estimations for a different treatment and control group combination.

The first column uses enrollment data from 2006 and 2007 and reports the comparison between children in municipality group 1, which started receiving the cash transfer in late 2006, and children in municipality groups 2 to 4, which started receiving the transfer from late 2007 onwards. Unlike the previous impact assessment of the CSR program, the present analysis shows a small negative effect of the CCT on school enrollment for municipality group 1. However, this estimate is not large enough to rule out a null effect of the CCT program. In the previous assessments, the estimation used only municipality group 2 to compare municipality group 1. Nevertheless, the estimation reported in Column (2) remains negative when using this narrower comparison group and misses statistical significance[37]. When observing the results in Columns (1) and (2), it is worth considering that children in municipality group 1 had an enrollment rate of almost 97% in 2006, before the CSR program was implemented in the group. Given the already high enrollment rate, it is likely that the few children still out of school were less responsive to the program than the children in other groups.

Table 3.10: Effect of CCT reception on school enrollment, children 7 – 12

VARIABLES	(1) *Probit* - Margins G1 vs. G2-G4	(2) *Probit* - Margins G1 vs. G2	(3) *Probit* - Margins G2 vs. G3-G4	(4) *Probit* - Margins G2 vs. G3
CCT Effect	-0.0024 (0.0083)	-0.0012 (0.0105)	0.0356*** (0.0116)	0.0391 *** (0.0131)
Observations	6,823	3,072	5,612	3,934

Clustered standard errors at *cantón* level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Column (3) in Table 3.10 uses enrollment data from 2007 and 2008 and reports the comparison between children in municipality group 2, which started receiving the CCT in the second half of 2007, and children in municipality groups 3 and 4, which started receiving the CCT in the second half of 2008. In this case, it is possible to observe a statistically significant increase in the probability of school enrollment for children living in the municipalities receiving the CCT.

[37] The previous assessment of the CSR program also trimmed-down the treatment and control groups to restrict the comparison to the most similar municipalities in terms of the variables used for their inclusion in the CSR program. For more details see IFPRI & FUSADES (2009).

In Column (4), where the comparison group is restricted to just the municipality group 3, a similar increase in the enrollment rate associated with the CCT reception is also observed.

Interestingly, the effect of the CCT seems to be larger for older children. Table 3.11 displays the results for the estimation of the CCT effect on the school enrollment of children aged 13 to 16 years old, using the municipality groups 2 to 4 in the years 2007 and 2008[38]. Children in this age range are supposed to attend middle and high school. This age group is not the CSR program's primary focus, which provides the stipend until children complete primary school. Although, households with children under 18 years old who have not finished primary school were entitled to receive the program's transfer. In column (1), the CCT reception is found to increase the probability of school enrollment by 7.9 percentage points, irrespective of the grade the child is enrolled in. Column (2) restricts the sample to children that have completed primary school. A significant increase of 9.6 percentage points in school enrollment probability is also observed here.

The effect of the CSR program on the school enrollment of eligible children identified in the previous paragraphs is in line with most evidence collected for different CCT programs. Positive effects on school enrollment have been observed in programs such as Mexico's *Progresa/Oportunidades* (Schultz, 2004), Nicaragua's Red de Protección Social (J. Maluccio & Flores Montenegro, 2005), Colombia's *Familias en Acción* (Attanasio et al., 2005), Brazil's Bolsa Escola/Bolsa Familia (de Brauw et al., 2015; Glewwe & Kassouf, 2012), among others. Less common is the evidence of spillover effects among non-eligible households. Similar to the positive spillovers observed in El Salvador, Bobonis & Finan (2009) documented an increase in secondary school enrollment among non-eligible children living in geographical areas where Mexico's *Progresa/Oportunidades* was implemented. On the other hand, Galiani & McEwan (2013) reported no consistent effect of the Honduran CCT program on enrollment rates of non-eligible children in the areas where the program was implemented. The authors argue that the difference in results between the Honduran and Mexican cases might be due to the relatively small amount of the cash transfers in Honduras.

3.5.2. Remittances and school enrollment

Table 3.12 looks at the relationship between remittances and school enrollment. For this set of estimations, the sample was restricted to households and individuals during the second round of the survey. This restriction was done to reduce the possible effect of the CSR program on the household's remittances and migratory decisions while also using the information on remittance reception and school enrollment reported for matching periods. Using the second round of the survey also allows including adolescents up to 17 years old in the regressions. Columns (1) and (2) report the results for children 7 to 12 years old, while columns (3) and (4) report the results for children 13 to 17 years old. Columns (1) and (3) show the average change in the probability of school enrollment associated with a marginal change in the dependent variables. Column (2) and (4) displays the results of an instrumental variable regression using a two-stage least squares estimator[39].

[38] Information about school enrollment for children in this age range is incomplete for the year 2006. Information of school enrollment for children above 16 years old is incomplete in 2006 and 2007.

[39] An additional set of estimations using the two instruments in the first stage, rather than the remittance reception predicted, is presented in the Table B.1 in the Appendix B. The results, although differ in

Table 3.11: Effect of CCT reception on school enrollment, children 13 – 16

VARIABLES	(1) *Probit* - Margins All grades	(2) *Probit*- Margins Above 6th grade
CCT Effect	0.0779** (0.0395)	0.0947** (0.0426)
Observations	2,478	2,033

Clustered standard errors at *cantón* level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Similar to the simple comparison of enrollment rates in the descriptive statistics, in Table 3.12, the estimation in Column (1) points to remittances slightly increasing the probability of children being enrolled at school. However, this apparent positive effect is not statistically significant. On the other hand, the estimation in column (2), which controls for the endogeneity of remittance reception, indicates that remittances reduce the probability of school enrollment for this group of children. Remittance reception also seems to positively impact school enrollment for children aged 13 to 16 years old, as seen in Column (3). Nevertheless, in Column (4), in which the endogeneity of remittance reception is accounted for, the international transfers lower the probability that children in this age group are enrolled at school.

The evidence described above differs in some respects from previous research on El Salvador[40]. Acosta (2011a) reported a heterogeneous relationship between remittances and school attendance. On the one hand, remittances do not seem to affect school attendance for children 10 to 14 years, but they appear to decrease attendance for adolescents 15 to 18 years old[41]. The different samples might explain the difference between the results from Acosta (2011a) and those presented here. Acosta used a national sample covering urban and rural populations, whereas the present analysis focuses on rural populations in some of the country's poorest areas. This difference is significant because children's participation in labor activities is significantly more common in rural areas[42]. This pattern suggests that children in the current sample are more likely to face labor as their main opportunity cost for education (rather than leisure), and therefore they are also more likely to become involved in labor activities -perhaps due to the absence of an adult household member- than their peers in urban areas.

magnitude, generally maintain their signs and statistically significance. Moreover, since in such specifications the first stage equation is overidentified, the validity of the instruments can be tested. In all cases, the null hypothesis that the instruments are uncorrelated with the error term cannot be rejected, which constitutes evidence in favor of the validity of the instruments used.

[40] Albeit, as indicated in previous sections, the literature about the effect of international migration and remittances on schooling has not been conclusive.

[41] Moreover, remittances are also found to increase school attendance for girls but decrease it for boys. On average, when considering all children and adolescents 10 to 18 years, remittances are found to have no significant effect on school enrollment.

[42] In 2017, for instance, 15.5% of children 7 to 17 years old were working in the rural areas (excluding domestic work), while in urban areas this percentage drops to 8% (Data source: DIGESTYC, 2018).

Table 3.12: Effect of remittances on school enrollment by age group

VARIABLES	(1) *Probit* - Margins Children 7 - 12	(2) IV 2SLS Children 7 -12	(3) *Probit* - Margins Children 13 - 17	(4) IV - 2SLS Children 13 -17
Remittances	0.0007	-0.0694*	0.0198	-0.1716*
	(0.0085)	(0.0385)	(0.0242)	(0.0944)
Child sex (male=1)	0.0012	0.0012	-0.0116	-0.0138
	(0.0063)	(0.0058)	(0.0193)	(0.0241)
Child age	0.0875***	0.1056***	-0.1033***	-0.1114***
	(0.0241)	(0.0247)	(0.0061)	(0.0074)
Child age squared	-0.0044***	-0.0052***		
	(0.0013)	(0.0013)		
Eldest child (=1)	0.0101	0.0121**	0.0578***	0.0557***
	(0.0072)	(0.0060)	(0.0210)	(0.0210)
H. head age	-0.0025	-0.0018	0.0084	0.0113
	(0.0018)	(0.0019)	(0.0067)	(0.0082)
H. head age squared	0.0000	0.0000	-0.0001	-0.0001
	(0.0000)	(0.0000)	(0.0001)	(0.0001)
H. head sex (male=1)	-0.0032	-0.0133	-0.0438*	-0.0752**
	(0.0074)	(0.0093)	(0.0232)	(0.0312)
H. head married	0.0019	0.0052	0.0392	0.0488
	(0.0094)	(0.0134)	(0.0297)	(0.0315)
H. head literacy (literate=1)	0.0104	0.0120	0.0940***	0.0834***
	(0.0073)	(0.0091)	(0.0215)	(0.0247)
H. dependency ratio	-0.0622**	-0.0301	-0.1707**	-0.0774
	(0.0273)	(0.0367)	(0.0846)	(0.1076)
H. uses agri. Land (yes=1)	0.0030	-0.0028	-0.0318	-0.0417
	(0.0087)	(0.0096)	(0.0293)	(0.0323)
H. wealth index score	0.0049***	0.0099***	0.0193***	0.0322***
	(0.0019)	(0.0035)	(0.0054)	(0.0082)
Sch. grades in municip.[(a)]	0.0012**	0.0014***	-0.0035**	-0.0025
	(0.0006)	(0.0005)	(0.0015)	(0.0016)
Municip. Adult unemp. Rate	-0.4420*	-0.5858	0.3646	0.3394
	(0.2484)	(0.4547)	(0.8043)	(1.1162)
Constant		0.5161***	-0.0158	2.2108***
		(0.1173)	(0.0282)	(0.2570)
Observations	3,406	3,406	1,843	1,843

(a) Number of school grades in the municipality per 1000 inhabitants. Fixed effects for municipality groups in the CSR program included. Clustered standard errors at *cantón* level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Regardless of the nuances with respect to previous research, the results in Table 3.12 might seem puzzling when considering just the expected effect of remittances on education. As explained above, the permanent income hypothesis suggests that the international transfers should increase household investment, possibly including human capital investments, as long as they are considered temporary. This theory also suggested that households at the lower end of the wealth distribution should be more likely to save and invest their temporary income. Therefore, if this “temporary income effect” is at play, it should be more likely to see a positive effect of remittance on school enrollment among less wealthy households. Table 3.13 separates the sample according to the distribution of the wealth index used in the regressions.

Following Filmer & Pritchett (2001), the index is constructed from asset ownership and dwelling conditions indicators using principal component analysis. In columns (1) and (3), the two lowest quintiles of the wealth distribution are considered, while in columns (2) and (4), only the two highest quintiles are included in the regression. Noticeably, the effect of remittances on school enrollment remains negative for the four groups, albeit the estimated coefficients lose their statical significant when dividing the sample.

Table 3.13: Effect of remittances on school enrollment by age and household wealth quintiles

VARIABLES	(1) IV - 2SLS Age 7-12 Quintiles 1-2	(2) IV - 2SLS Age 7-12 Quintiles 4-5	(3) IV - 2SLS Age 13-16 Quintiles 1-2	(4) IV - 2SLS Age 13-16 Quintiles 4-5
Remittances	-0.1382	-0.0739	-0.2670	-0.1524
	(0.1368)	(0.0457)	(0.2147)	(0.0969)
Child sex (male=1)	-0.0113	0.0108	0.0226	-0.0369
	(0.0110)	(0.0073)	(0.0334)	(0.0283)
Child age	0.1116**	0.0972***	-0.1298***	-0.1026***
	(0.0455)	(0.0283)	(0.0115)	(0.0101)
Child age squared	-0.0054**	-0.0049***		
	(0.0023)	(0.0014)		
Eldest child (=1)	0.0089	0.0155*	0.0678**	0.0457*
	(0.0112)	(0.0082)	(0.0332)	(0.0266)
H. head age	-0.0016	-0.0018	0.0103	0.0134
	(0.0044)	(0.0022)	(0.0149)	(0.0097)
H. head age squared	0.0000	0.0000	-0.0001	-0.0001
	(0.0000)	(0.0000)	(0.0001)	(0.0001)
H. head sex (male=1)	-0.0116	-0.0199	-0.0777	-0.0938**
	(0.0180)	(0.0124)	(0.0521)	(0.0379)
H. head married	0.0086	0.0036	0.0307	0.0756*
	(0.0243)	(0.0134)	(0.0585)	(0.0386)
H. head literacy (literate=1)	0.0208	0.0016	0.0899**	0.0834***
	(0.0186)	(0.0118)	(0.0365)	(0.0316)
H. dependency ratio	-0.0332	-0.0168	-0.1086	-0.0445
	(0.0777)	(0.0374)	(0.1992)	(0.1071)
H. uses agri. Land (yes=1)	-0.0095	0.0026	-0.0488	-0.0191
	(0.0215)	(0.0123)	(0.0625)	(0.0404)
H. wealth index score	0.0211	0.0089*	0.0249	0.0104
	(0.0138)	(0.0049)	(0.0266)	(0.0102)
Sch. grades in municip.[(a)]	0.0019**	0.0015**	0.0008	-0.0053**
	(0.0009)	(0.0007)	(0.0024)	(0.0021)
Municip Adult unempl. Rate.	-1.3502*	-0.1013	-1.4452	1.9165*
	(0.6935)	(0.4041)	(1.6860)	(1.0041)
Constant	0.5304**	0.5370***	2.6572***	1.9576***
	(0.2377)	(0.1513)	(0.4284)	(0.3166)
Observations	1,378	2,028	751	1,092

(a) Number of school grades in the municipality per 1000 inhabitants. Fixed effects for municipality groups in the CSR program included. Clustered standard errors at *cantón* level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Besides the effect remittances might have on schooling due to their supposed temporary nature, international migration also affect schooling in almost inseparable forms[43]. Indeed, around 70% of the households receiving remittances also had one or more members living abroad. Hence, using the data at hand, a meaningful separation of the two effects is hardly feasible. To test if the absence of a family member plays a role, one could explore differences in school enrollment rates between children living in households receiving remittances but without a family member abroad and children living in households just with international migrants. This comparison is made in Table 3.14. As seen in the table's second line, the enrollment rates for children in households receiving remittances with migrants and without migrants (second line) are pretty similar. However, the enrollment rate of children with migrants abroad but not receiving remittances (second column, first line) is significantly lower than for those receiving remittances. This observation suggests that the absence of family members negatively affects children's schooling, but the income from remittances acts in the opposite direction.

Another explanation for the observed negative effect of remittances is that children living in a household receiving this income expect lower returns from formal education, perhaps because they hope to migrate themselves in the future, and the perspective jobs do not require much formal training. Indeed, family reunification appears to be an important motivation for Salvadoran migrants. In a survey in three major urban areas in the United States, 45% of the Salvadoran migrants interviewed indicated that family reunification was a motivation for their migration, and 26% were considering bringing their children to the United States (Abuelafia et al., 2019). However, the CSR survey offers limited data to support the hypothesis that migration perspectives reduce school enrollment and achievement. Albeit, on average current migrants aged 18 to 65 years have more than one additional year of formal education than the comparable population in El Salvador (5.7 vs. 4.1 years), this educational attainment is still below the completion of primary schooling.

Table 3.14: School enrollment rates by remittances reception and migration of at least one household member, children 7 to 17 years old

	Without migrants abroad	With migrants abroad
Does not receive remittances	85.96%	84.79%
	(0.0055)	(0.0205)
Receives remittances	87.67%	88.34%
	(0.0172)	(0.0100)

Standard errors in parentheses.

3.5.3. CCTs and remittances

Table 3.15 looks into the question of public cash transfers crowding out (or crowding in) remittances. It is expected that if the CCT indeed affects household remittance decisions, the household's behavioral changes will translate to a lower or higher probability of receiving remittances. Like in the estimation of the CCT effect on school enrollment, Table 3.15 reports

[43] In the Appendix B Table B.2, regressions in Table 3.13 are repeated but replacing the indicator for international remittances by a dummy variable indicating if the household has at least one member living abroad. The results are in general similar to those in Table 3.13, but the coefficients are estimated with less precision.

the results of a difference in difference estimation. In this case, however, only group 2 is used as the treatment group, and groups 3 and 4 form the control group. As explained in the previous section, this is due to the periods when the groups received the CCT. The dependent variable in each column is whether or not the household receives remittances. The explanatory variable of interest, the CCT effect, comes from the interaction term between the year 2008 (the period after treatment) and a treatment group indicator.

In all the different comparison groups presented in Table 3.15, the CCT does not appear to significantly affect the household's probability of receiving remittances. In column (1), the households in municipality group 2 are compared with households in municipality groups 3 and 4, while in column (2), group 2 is compared with group 3, and in column (3), group 2 is compared with group 4. The coefficient for the interaction term between the year after treatment and the treatment indicator is not statistically different from zero in any of the columns.

Table 3.15: Effect of CCT reception in the municipality on the household probability of receiving remittances

VARIABLES	(1) *Probit* - Margins G2 vs. G3, G4	(2) *Probit* - Margins G2 vs. G3	(3) *Probit* - Margins G2 vs. G4
CCT Effect	0.0032	-0.0044	0.0136
	(0.0212)	(0.0229)	(0.0255)
Observations	4,588	3,172	2,720

Clustered standard errors at cantón level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Although it is not possible to identify a significant effect of the CSR program on the probability of receiving remittances, it is still possible that those households receiving remittances experience changes in the amount received due to the additional income from the CCT. This scenario is explored in Table 3.16 below. The dependent variable, in this case, is the annual household income from remittances, while the explanatory variables are the same as in the previous regressions: a treatment group indicator, a time trend, and the interaction between the two previous variables. Like in the previous estimations, results for different treatment-control group combinations are reported. The coefficients for the selection equation are reported next to the results for the principal regression. As can be seen below, the estimations reported in Table 3.16 suggest a positive effect of the CCT reception over the amount received in remittances. However, the increase in remittance income is not statistically significant at the usual levels in any estimation.

Even if the CCT does not change the probability of receiving remittances in the short term or the amount of cash received by the household, the CCT could eventually impact remittances via increased migration if the public transfers help relax liquidity constraints limiting new migratory ventures. To explore this possibility, Table 3.17 reports the result of a similar differences-in-differences model where the dependent variable indicates whether or not one

or more of the household members live abroad. As seen in the table, the CCT program does not significantly impact the household's probability of having a migrant member.

Table 3.16: Effect of CCT reception in the municipality on yearly household remittances income

	(1) G2 vs G3, G4		(2) G2 vs G3		(3) G2 vs G4	
VARIABLES	(1a) Remitt. income	(1b) Remitt. Recep.	(2a) Remitt. income	(2b) Remitt. Recep.	(3a) Remitt. income	(3b) Remitt. Recep.
Treatment group	-43.0954		-121.8336		13.4891	
	(221.6730)		(257.2256)		(272.0059)	
Year	294.4192*		263.7227		309.0509	
	(150.5622)		(214.2956)		(239.0441)	
CCT Effect	381.7286		415.7008		360.6759	
	(291.5162)		(337.8221)		(359.9782)	
H. head age		0.0092		0.00003		0.0073
		(0.0089)		(0.0110)		(0.0112)
H. head age squared		0.00004		0.0001		0.0001
		(0.0001)		(0.0001)		(0.0001)
H. head sex (male=1)		-0.6082***		-0.6979***		-0.5376***
		(0.0556)		(0.0689)		(0.0713)
H. head married		0.1254*		0.2051**		0.1694**
		(0.0656)		(0.0836)		(0.0832)
H. head literacy (literate=1)		-0.1093**		-0.0513		-0.1288*
		(0.0551)		(0.0669)		(0.0703)
H. dependency ratio		0.9261***		0.9753***		0.8754***
		(0.1491)		(0.1857)		(0.1884)
H. uses agri. Land (yes=1)		-0.0630		-0.0277		-0.1557**
		(0.0592)		(0.0745)		(0.0751)
H. wealth index score		0.2191***		0.2094***		0.2313***
		(0.0129)		(0.0156)		(0.0167)
Distance to the border		-0.0072***		-0.0031**		-0.0069***
		(0.0010)		(0.0013)		(0.0013)
Emigration rate		2.3821***		5.3974***		1.3634***
		(0.3846)		(0.6899)		(0.4283)
Constant	2,598.5***	-1.5992***	2,535.4***	-1.9770***	2,503.3***	-1.4108***
	(195.1134)	(0.2489)	(241.4779)	(0.3125)	(295.9932)	(0.3111)
Lambda		-1,034.6***		-947.29***		-998.62***
		(145.7186)		(172.3018)		(211.6997)
Rho		-0.4879		-0.4358		-0.4451
Sigma		2120.703		2173.7193		2243.5988
Observations	4,487	4,487	3,108	3,108	2,656	2,656

(a) Distance in kilometers. *** p<0.01, ** p<0.05, * p<0.1

Table 3.17: Effect of CCT reception in the municipality on the household probability of having a migrant abroad

VARIABLES	(1) *Probit* - Margins G2 vs. G3, G4	(2) *Probit* - Margins G2 vs. G3	(3) *Probit* - Margins G2 vs. G4
CCT Effect	-0.0053 (0.0181)	0.001 (0.0188)	-0.0136 (0.0217)
Observations	4,590	3,173	2,721

Clustered standard errors at municipality level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

In summary, the previous analysis does not find evidence that households participating in the CSR program experienced changes in the remittance incidence or its value, nor changes in migration incidence. Previous research in Mexico (Teruel & Davis, 2000), Nicaragua and Honduras (Olinto et al., 2006) has also found no evidence of changes in the behavior of private monetary transfers in the short run. However, the findings of García & Cuartas (2021) point to a significant increase in the private transfers among households participating in a CCT program in Colombia. Nevertheless, this change is caused primarily by the behavior of monetary and in-kind transfers from neighbors and relatives living in the same municipality, not remittances from international migrants. Previous research on Mexico's *Progresa* indicates a slight reduction in migration to the United States among participant households (Stecklov et al., 2005). Some of the coefficients in Table 3.16 also suggest a reduction in migration. However, they are not estimated with enough precision to rule out a null effect. Interestingly, evidence on the long-run effect of CCT programs points to a slight increase in emigration, at least in the case of Honduras (Molina Millán et al., 2020). Such long-run effects of the CSR program are beyond the scope of this chapter.

3.5.4. CCT effect on remittance recipients

So far, the reviewed evidence indicates that remittances have a negative impact on school enrollment for children 7 to 17 years old. On the other hand, the CSR program is found to positively affect school enrollment for children 7 to 12 years old and 13 to 16 years old. These contrasting results bring the question of how the CCT program could affect school enrollment decisions for children living in households also receiving remittances. Table 3.18 turns to this question by presenting the predicted change in the school enrollment probabilities for children living in households receiving remittances and those not receiving remittances. In this exercise, enrollment rates for 2007 and 2008 were compared. The second survey group is defined as the treatment group, while survey groups 3 and 4 were considered the control group.

In Table 3.18 below, Column (1) reports the results for children 7 to 12 years old, while Column (2) reports the results for children 13 to 16. Similar to the previous estimations, for children in households not receiving remittances, the effect of the CCT program is an increase in the probability of school enrollment for both age groups. On the other hand, for children in households receiving remittances, the CCT seems to have little to no effect on school

enrollment for younger children. For older children, the CCT appears to increase the probability of school enrollment. However, the coefficient for the effect of CCT reception is lower than for children not receiving remittances, and it is not estimated with enough precession to exclude a null effect.

A possible explanation for the previous results is that households receiving remittances face, on average, fewer liquidity constraints for their productive investments than non-receptor households. Therefore, if the CCT affects school enrollment by easing liquidity contains for the household human capital investments, it follows that households that do not face such liquidity constraints would not change their school enrollment decisions due to the CCT. The data on current income offers some support to this hypothesis. The median gross income per capita in households receiving remittances is significantly higher than in households not receiving remittances: 35 USD versus 15 USD per month. Hence, for an average-size family of six people that does not receive remittances, the education bonus of 15 USD would represent 16.7% of its monthly income, while for a family of the same size that receives remittances, the bonus would represent 7%.

Table 3.18: Effect of CCT on school enrollment by remittance reception status

	(1) *Probit* - Margins 7 - 12	(3) Probit - *Margins* 13 - 16
CCT Effect, no remittance receptors.	0.0349***	0.1145**
	(0.0136)	(0.0452)
CCT Effect, remittance receptors	0.0005	0.0783
	(0.0225)	(0.0575)
Observations	5,081	2,235

Clustered standard errors at *cantón* level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

3.6. Conclusions

The assessment of the CCT program in El Salvador presented in this paper found a positive effect of the CCT on school enrollment for children between 6 and 12 years old. These results are in line with the original impact evaluation of the program (IFPRI and FUSADES 2009, 2010a, 2010b). Beyond this confirmation, the present assessment found evidence of a higher increase in school enrollment associated with the CCT for children living in the municipalities participating in the program but outside the targeted age range. This spillover effect, not previously identified, increases the overall positive effect of the CCT program.

An important question that remains to be explored is the possible heterogeneous effects of the CCT depending on the pupils' sex and age. In the rural areas of El Salvador, there is little difference in school attendance between boys and girls at the beginning of school age. However, boys have a lower attendance rate by the age of secondary school. It would be of interest to find out if the CCT program does not only increase the enrollment rates for all children but also reduces the differences between boys and girls in this age group. Unfortunately, the sample size in the evaluation survey prevented this more detailed analysis.

Once the remittance endogeneity is taken into account, these private transfers are found to reduce school enrollment in the sample. This negative effect is especially noticeable for children aged 13 to 16 years old, the age range corresponding to middle and high school in El Salvador.

One of the main questions motivating this paper is the possible displacement of remittances by public cash transfers. However, the analysis of the data at hand indicates that the CSR program in El Salvador does not significantly affect remittances behavior, at least during the period analyzed. No evidence is found indicating that the reception of the CCT in the municipality lowers remittance reception incidence. Likewise, CCT reception seems not to affect the remittance amount. Despite these findings, further research is needed to corroborate them over a more extended period. Moreover, research is also needed to explore how differences in the CCT program characteristics, such as the transfer's amount or the conditionalities, could change its effect on private transfers.

While the CCT reception increases school enrollment, remittances act in the opposite direction. This fact raises the question of how the CCT program might affect the school enrollment decisions in households receiving remittances. The data analysis indicates that the CCT does not significantly affect school enrollment rates for children in this type of household.

In summary, the CCT program in El Salvador is found to increase school enrollment for its targeted population and older children not originally targeted but with noticeable lower initial enrollment rates. Conversely, remittance reception in the household decreases school enrollment. No evidence was found indicating that the CCT program changes remittances behavior, international migration decisions, or enrollment rates among children in households receiving remittances.

4. Migration and child work in rural El Salvador

4.1. Introduction

Children's participation in labor activities can have detrimental effects on their development. Existing evidence indicates that working children have lower school achievement and worse physical and mental health than non-working children. Moreover, working as a child is associated with long-lasting consequences such as poor physical health and labor market outcomes in adult life (See Batomen Kuimi et al., 2018; Edmonds, 2007; Sturrock & Hodes, 2016 for reviews). Unfortunately, despite progress in recent decades, it is estimated that 160 million children, equivalent to one of every ten children worldwide, were working at the start of 2020 (ILO & UNICEF, 2021). Given the extent of child labor worldwide and the daring consequences for children's development, it is not surprising that researchers have dedicated considerable efforts to understand the different aspects influencing children's participation in labor activities. Among those factors, literature has pointed to parents' characteristics, household composition, school costs, economic shocks, household income, and productive household assets[44].

This study intends to contribute to the previous literature by focusing on one possible aspect influencing child participation in labor activities: international migration. In particular, the main research question in this chapter is: does the international migration of a household member affect children's participation in labor activities? More in detail, the chapter investigates the effect of international migration on domestic and non-domestic labor activities. Moreover, the chapter divides international migration into two categories: the departure of new migrants and the return of former migrants.

The analysis relies on survey data from rural households in El Salvador to answer this question. The data offers an excellent opportunity for the analysis since the sampled population has a relatively high incidence of international migration (around 15%), and children and adolescents often get involved in household agricultural production and domestic work. Besides information about labor activities, schooling, and migration, the data collected included other household and individual characteristics such as demographics, agricultural production, dwelling conditions, and health. Moreover, the data collection took place in four rounds over three years, providing a longitudinal dimension that allows addressing some of the usual identification issues when analyzing individual or household behavior. Specifically, individual fixed effects are used to address the potential endogeneity of the household migratory decision and estimate their effect on the variables of interest.

Previous literature has not been conclusive about the empirical relationship between international migration (or remittances) and children's participation in labor activities. On the one hand, migration was found to reduce children's participation in labor activities in rural Pakistan (Mansuri, 2006) and some specific regions of Tanzania (Dimova et al., 2015). Likewise, evidence from Ecuador indicates that remittances reception in the household reduces the incidence of child work (Calero et al., 2009) and negative shocks to remittances, i.e., a reduction in remittances, were found to increase children's participation in labor activities in Mexico (Alcaraz et al., 2012). On the other hand, researchers have arrived at more nuanced

[44] See Edmonds (2007) for a review of the empirical literature.

conclusions in the Philippines and El Salvador. In the first case, positive shocks to remittances, i.e., higher remittances, were found to reduce time spent in unpaid family work but increase hours spent in self-employment or paid family work (Yang, 2008). While in El Salvador, remittance reception in the household decreases children's participation in paid labor but has the opposite effect on family unpaid work (Acosta, 2011a). Also, in El Salvador, the migration of a household member was found to reduce child labor in rural households (Acosta, 2011b).

Different from most previous research, this study considers labor activities more comprehensively. The paper analyses the effect of migration on domestic work activities, such as cleaning and cooking for the own household, and non-domestic work (sometimes called market-oriented or economic work), such as unpaid agricultural work and wage work. Moreover, the paper adds to the previous literature by analyzing two milestones in the migration experience: the departure of new migrants and the return of former migrants to the households. Also, the paper contributes to previous work by exploring the mechanisms explaining the relationship between migration and children's work.

The rest of the chapter continues in section two with a review of the relevant theoretical framework, explaining the effect of migration on children's participation in labor activities. The third section describes the survey data and empirical methodology used for the analysis. The fourth section presents the main findings of the analysis. The fifth section discusses possible mechanisms that explain the observed results. The sixth section concludes.

4.2. Theoretical framework

There are several avenues for the migration of a household member to affect children's participation in labor activities. This section briefly describes these possible mechanisms, including changes in adult labor supply caused by the departure or return of an adult member, the potential changes in income caused by remittances, and the expectation of future migration for the household children. In many of these mechanisms, an implicit assumption is that households only require their children to work if the income from adults is very low or below what the household requires for subsistence. This assumption is known as *the Luxurious axiom* (Basu & Hoang Van, 1998)[45]. Most of the exposition explains the relationship between the departure of an adult household member and child labor. The relationship between the return of an adult migrant to the household in the home country and child labor is reviewed at the end of the section.

4.2.1. Migrant departure

Perhaps the most intuitive channel for migration to affect children's participation in labor activities is by changing the number of working adults in the household. The departure of adult household members will reduce the labor force available for household production or might reduce income from wage work outside the household. In the case of household production, children might need to substitute adult labor if the household cannot find suitable adult laborers

[45] It could be argued, however, than some light work is desirable in certain context. For instance, in subsistence agriculture, working along adult members serves to pass farming techniques that are not often taught at school.

from outside the household, perhaps because the adult labor offered in the area is scarce. Moreover, the household might prefer their own members for specific activities to reduce supervision costs or preserve privacy. Children might also need to participate in labor activities to compensate for lost wages if remittances fail to materialize and income falls below what the household requires for subsistence.

Migration can also affect child labor through remittance income. One possibility is that the pre-migration adult income in the household was below the subsistence level and needed to be complemented by income from working children. If remittances from migrants abroad increase household income above the subsistence level, it follows that children will no longer need to work after the migration of a household member. However, income from remittances can also have the opposite effect. If this income is used to set up new household production activities or expand those already in place, the household demand for labor will increase. Once again, if the household cannot find suitable adult workers in the local labor market or prefers family workers, work from the household's children might be needed. This positive correlation between the household's productive assets and children's work has been labeled a *wealth paradox* (Bhalotra & Heady, 2003).

Income from remittances can also affect children's participation in labor activities when they help households cope with economic shocks. In a context where insurance markets are not accessible, households might use migration and remittances as insurance against income risk. Households could send migrant workers to urban areas or a foreign country, where income shocks are expected to be uncorrelated with the conditions in the home location. Then, under the insurance arrangement, migrants will be expected to remit in case the household experiences an income shock, and the household members in the home location will also be expected to support the migrant in case of an income shock in the host location (Lucas & Stark, 1985; Stark & Levhari, 1982). The availability of the remittance resources in case of emergency can prevent the household from resorting to other coping mechanisms, such as requiring the younger members to work.

A third possibility for migration to affect child participation in labor activities is by generating future migration prospects. If a household expects a child to migrate in the future, the current value of the child's activities is likely to change, affecting time allocation between schooling and labor. On the one hand, if the child is expected to migrate to a location where the returns to local education are low (or simply education acquired in the home country is not recognized), the household could benefit from halting school investments and sending the child to work to increase current income. On the other hand, if the expected returns to education in the host country are high, the household could opt for the opposite strategy: increasing its investment in schooling and removing the child from work to attain higher schooling.

4.2.2. Return migration

In principle, the return of a migrant to the household in the home country would be expected to have the opposite effect on child labor than the migrants' departure. However, this conclusion does not necessarily hold in all cases. Indeed, the return of an adult migrant will increase the labor supply in the household, potentially reducing the need for children to participate in labor activities. Nevertheless, this increase in the household workforce does not necessarily translate to more adults working and generating income. Returned migrants,

especially those forced to return or those who spent several years abroad, could experience significant obstacles for their reintegration into the local labor market. Returned migrants might face a mismatch between their foreign-acquired abilities and experience and those required by local employers. Moreover, it has been documented that returned migrants face discrimination in countries like El Salvador due to the social stigma that associates returned migrants with gang members and criminals deported from the host country (Dingeman-Cerda, 2014). If returned migrants cannot reintegrate into income-generating activities, children might still need to participate in labor activities.

The effect of a migrant return and the remittance disruption also has various nuances. Certainly, remittances will be disrupted when migrants return to their home country, potentially reducing current household income and increasing the need for children to work. However, returning migrants may bring financial resources for productive investments in their home country. In such a scenario, children could be spared working if household income increases with the profits from the new investments, or they could be required to work more if the necessary labor for the new productive activities cannot be found outside the household.

Finally, the effect of return migration on the migratory prospects of other household members is also not apparent beforehand. On the one hand, it seems reasonable to expect that household members considering migrating in the future, including children and adolescents, become discouraged about their project if they are made aware of the hardships some migrants have experienced. On the other hand, return migrants could also share knowledge with their families, making the journey seem more feasible for prospective migrants. Moreover, if the migrants' return worsens the household's economic situation, other family members, including children and adolescents, could consider migration as an option to improve their own and family welfare.

4.3. Data and methods

4.3.1. Data

Like in previous chapters, the primary data source for the analysis is the survey conducted to evaluate the impact of the conditional cash transfer program known as "*Comunidades Solidarias Rurales*" (CSR)[46]. The survey, implemented by the International Food Policy Research Institute (IFPRI) and the Salvadoran Foundation for Economic and Social Development (FUSADES) in El Salvador in four rounds between 2008 and 2010, collected information from 50 of the 100 municipalities included in the CSR program. Eleven of the sampled municipalities started participating in the CSR program between July and November 2006. These municipalities are grouped for analysis in survey group 1. The municipalities that started in the program between July and September 2007 are classified in survey group 2, while the municipalities starting in the program between June and October 2008 comprise survey group 3, and the municipalities that started with the program between November and December 2008 are included in survey group 4[47].

[46] For a rapid description of the program see Chapter 1. For details on the targeting strategy see: FLACSO Programa El Salvador (2005). For details on the program operation see: STP (2009).

[47] More details in the selection of municipalities and sampling of households can be found in: IFPRI & FUSADES (2008).

Within each municipality, the evaluation survey randomly selected two "*cantones*." In El Salvador, municipalities are the smallest administrative division. However, each municipality is divided into an urban town center and mostly rural "*Cantones.*" For the first round of the survey, two *cantones* per municipality were selected. Within each *cantón*, 30 households were randomly selected from census lists: 15 households with children up to 3 years old or pregnant women and 15 households with children between 6 and 12 years old. Households were re-interviewed for subsequent survey rounds if they still met such characteristics. Households that no longer fit in the last two categories were replaced using the census list or a list of households with recent births collected by the public health clinic in the municipality (de Brauw & Peterman, 2020). The first round of data collection occurred between January and February 2008, while the following rounds took place during October and November of 2008, 2009, and 2010. In total, 2,921 households were interviewed for the first and second rounds, 2,816 households for the third round, and 2,945 for the fourth round.

4.3.2. Methods

To identify the effect of migration on the children's participation in labor activities, it is necessary to consider that households with migrants are likely not a random sample from the general population. Most likely, these households differ in observable and unobservable characteristics from the general population. Moreover, it is probable that some of the unobservable characteristics correlated with migratory decisions also correlate with labor decisions. Provided that the source of unobserved heterogeneity is specific to the observation unit and does not vary over time, this potential endogeneity issue can be addressed using individual fixed effects. Indeed, it is likely that unobservable characteristics that affect migratory and schooling decisions, such as risk aversion or personal ability, do not change from one year to another. The basic regression model can be expressed as follows:

$$y_{it} = X'_{it}\beta_{11} + \beta_{12}M_{it} + \eta_i + \varepsilon_{it} \quad (3)$$

Where y_{it} is a dichotomous variable taking the value of 1 if individual *i* is working at time *t*, and 0 otherwise; X_{it} is a vector of individual and household characteristics that vary over time; M_{it} is a binary variable taking the value of 1 if individual *i* lives in a household with international migrants or returned migrants at time *t*, and 0 otherwise; η_i captures observed and unobserved characteristics for each individual child, and ε_{it} represents the unobserved time-variant characteristics of each child, which are assumed to be uncorrelated with the migratory decisions of the household.

Besides the decision for a child to work, migration is likely to affect the time a child dedicates to work activities. Since only non-negative hours for working individuals are observable, censored variable models, such as Tobit, might seem appropriate to identify the association between migration and time worked. However, since those models do not account for the endogeneity of the migratory decisions, their results will be biased. Instead, the individual fixed-effects strategies explained before are still preferred. The basic estimation for the individual fixed-effect approach would follow equation (3), with y representing the weekly hours worked by the individual.

4.4. Descriptive statistics

The tables below give a brief picture of the participation of children and adolescents in labor activities. The tables divide children into three categories: those in households without international migrants, those in households with new migrants abroad, and those with recent former migrants. A household is classified as having a new migrant if a member has departed to live abroad in the 12 months before the interview. Households experiencing the return of a migrant are identified by observing changes in the number of migrants living abroad between survey rounds[48].

For practical purposes, a child is considered to work if he or she participates in the production of goods or provision of services for sale, barter, or family self-consumption, with or without payment[49]. This definition of work does not exclude domestic work done for the child's own household. However, a distinction must be made between domestic work and non-domestic work since the survey at hand measures both types of work differently. Domestic work comprises activities such as cleaning, and water and firewood collection performed at any time during the 12 months before the survey. Conversely, non-domestic work includes activities such as unpaid work on the family farm or wage employment outside the household performed during the seven days before the survey.

Table 4.1: Proportion of children participating in labor activities by age groups. Pooled sample

		Domestic work			Non-domestic work		
Age	Indicator	Non-migrants	New migrants	Return migrants	Non-migrants	New migrants	Return migrants
7 to 12	Work incidence	0.611	0.606	0.620	0.078	0.154	0.131
	Standard error	0.005	0.037	0.042	0.003	0.027	0.029
	Valid obs.	10,677	175	137	10,677	175	137
13 to 17	Work incidence	0.832	0.817	0.835	0.361	0.429	0.433
	Standard error	0.005	0.035	0.038	0.006	0.044	0.051
	Valid obs.	6,036	126	97	6,036	126	97
7 to 17	Work incidence	0.691	0.694	0.709	0.180	0.269	0.256
	Standard error	0.004	0.027	0.030	0.003	0.026	0.029
	Valid obs.	16,713	301	234	16,713	301	234

Source: CSR Evaluation survey.

Table 4.1 above shows the proportion of children participating in domestic and non-domestic work by age group and recent migration experience in the household. As can be seen, the proportion of children involved in domestic work activities is similar across households with different recent migratory histories. On the other hand, less similarity is observed in the case of non-domestic work. Children living in households with members recently leaving the country or with returned migrants consistently report a higher incidence of non-domestic labor activities than their peers in non-migrant households. The difference in labor activity participation

[48] This indirect form of identifying returned migrants is necessary since, with the exception of the first round of data collection, the survey did not ask for migrants returning to the household. Moreover, some migrants might return to live in El Salvador but not with the household they left originally.

[49] For a discussion on the definition of child labor see Edmonds (2007).

between age groups is more or less expected. Younger children (7 to 12 years) participate in domestic and non-domestic labor activities significantly less often than older children (13 to 17 years).

In Table 4.2, children and adolescents are divided by sex. As can be observed, the proportion of female children and adolescents participating in domestic work activities is significantly higher than that of male children and adolescents in this type of activity. Conversely, the proportion of male children participating in non-domestic work activities is significantly higher than that of female children[50]. Similar to Table 4.1, the proportion of male or female children participating in domestic work activities is similar across households with different recent migratory histories. Also similar to the previous table, female, and male children in households with new or returned migrants consistently report participating in non-domestic labor activities more often than their peers in non-migrant households.

Table 4.2: Proportion of children participating in labor activities by sex. Pooled sample

		Domestic work			Non-domestic work		
Sex	Indicator	Non-migrants	New migrants	Return migrants	Non-migrants	New migrants	Return migrants
Female	Work incidence	0.764	0.735	0.754	0.075	0.146	0.119
	Standard error	0.005	0.036	0.039	0.003	0.029	0.029
	Valid obs.	8,260	151	126	8,260	151	126
Male	Work incidence	0.619	0.653	0.657	0.282	0.393	0.417
	Standard error	0.005	0.039	0.046	0.005	0.040	0.048
	Valid obs.	8,450	150	108	8,450	150	108

Source: CSR Evaluation survey.

Table 4.3: Domestic work activities, children 7 to 17 years old. Pooled sample

	Non-migrants	New migrants	Return migrants
Cleaning and cooking	38.1%	37.2%	39.4%
Small children care	11.1%	8.1%	11.4%
Elderly/sick person care	0.5%	0.6%	0.0%
Water collection	17.1%	15.4%	13.1%
Firewood collection	28.4%	32.3%	27.0%
School homework help/supervision	4.9%	6.4%	9.0%

Source: CSR Evaluation survey. Note: Column total is higher than 100% due to individuals with multiple activities.

Table 4.3 above shows the domestic work activities performed by children and adolescents in the sample, while Table 4.4 below displays the employment categories for working children and adolescents. The most common domestic work activity for children and adolescents is cleaning and cooking for the family, followed by firewood and water collection. As can be seen

[50] There might be multiple explanations for the significant difference between boys and girls, including household heads underestimating girls working activities. Unfortunately, the information in the survey does not allow for exploring the source of this difference.

in Table 4.4 shows, most children and adolescents work in activities related to agriculture. The most common form of employment is working in the family agricultural business without payment. The second most common form of employment for children in non-migrant households is working in agricultural activities for an employer outside the family. The second most common form of employment for children in households with new or returned migrants is self-employment in agricultural activities (mostly older adolescents working household plots).

Table 4.4: Type of employment, children 7 to 17 years old. Pooled sample

	Non-migrants	New migrants	Return migrants
Own agricultural business	7.3%	15.2%	11.3%
Own non-agricultural business	0.7%	0.0%	0.0%
Family agricultural business without payment	71.4%	62.0%	66.2%
Family non-agricultural business w/o payment	6.1%	8.7%	12.7%
Waged employee in agricultural activities	10.2%	8.7%	5.6%
Waged employee in non-agricultural activities	4.0%	2.2%	2.8%
Other	0.3%	3.3%	1.4%

Source: CSR Evaluation survey. Note: Column total is higher than 100% due to individuals with multiple activities.

Table 4.5: Children's average weekly hours worked. Pooled sample

		Domestic work				
Group	Indicator	Boys & Girls (7 to 12)	Boys & Girls (13 to 17)	Boys & Girls (7 to 17)	Girls (7 to 17)	Boys (7 to 17)
Non-migrants	Average hours	11.43	17.75	14.22	18.09	9.58
	Standard error	0.14	0.23	0.13	0.20	0.15
	Valid obs.	6,376	5,051	11,427	6,237	5,190
New migrants	Average hours	10.90	18.39	14.61	19.58	8.92
	Standard error	1.10	1.82	1.09	1.68	1.07
	Valid obs.	104	102	206	110	96
Return Migrants	Average hours	10.26	15.21	12.67	15.05	9.49
	Standard error	1.24	1.65	1.04	1.36	1.55
	Valid obs.	85	81	166	95	71
		Non-domestic work				
Group	Indicator	Boys & Girls (7 to 12)	Boys & Girls (13 to 17)	Boys & Girls (7 to 17)	Girls (7 to 17)	Boys (7 to 17)
Non-migrants	Average hours	14.66	24.32	21.66	18.00	22.60
	Standard error	0.43	0.38	0.31	0.79	0.33
	Valid obs.	830	2,179	3,009	622	2,384
New migrants	Average hours	13.89	20.12	18.04	11.78	20.37
	Standard error	3.54	1.98	1.79	2.22	2.24
	Valid obs.	27	54	81	22	59
Return Migrants	Average hours	13.33	21.36	18.95	12.67	21.04
	Standard error	2.48	2.27	1.81	2.93	2.13
	Valid obs.	18	42	60	15	45

Source: CSR Evaluation survey. children and adolescents in the survey. Children who were not working (or reported no hours worked) are omitted.

Table 4.5 above reports the average weekly hours worked by children and adolescents in the survey. Children who were not working (or reported no hours worked) are omitted. The upper section of the table shows the average hours worked in domestic activities in a regular week[51]. The lower section displays the average hours worked in non-domestic activities during the week before the survey. As can be seen, adolescents tend to spend more hours than younger children in domestic and non-domestic working activities. Female children and adolescents spend significantly more time than male children and adolescents in domestic work activities, but this difference runs opposite in non-domestic work. Interestingly, children in migrant households tend to report slightly fewer work hours per week. This difference appears to be more prominent among small female children. However, the relatively small number of working children in these categories makes the estimated average less precise.

4.5. Results

Below, Tables 4.6 to 4.9 show the estimated effect of recent migration episodes on children's participation in labor activities. Tables 4.6 and 4.7 show the estimated impact of recent migration episodes on the probability that children participate in labor activities. Tables 4.8 and 4.9 report the estimated effect of a recent migration episode on the time children devote to labor activities. In all tables, the first three columns consider the effect of the explanatory variables on domestic work activities such as cleaning, cooking, or collecting water for household consumption. The last three columns in all tables study non-domestic work activities such as working on the family farm without payment or wage employment outside the household. As explained before, the survey design imposes the distinction between the two types of activities.

In all tables in the current section, Columns (1) and (4) report the average effect of a new migration episode for male and female children together, while Columns (2) and (5) consider only female children, and Columns (3) and (6) includes only male children. Besides the migration of a household member, other explanatory variables included in the regressions are the child's age, the household dependency ratio, a household wealth index[52] , and the unemployment rate among adults in the municipality of residency.

Table 4.6 below reports the estimated effect of a new migrant leaving the household on children's participation in work activities. As can be observed in Column (1), the migrant's departure seems to reduce the probability that children and adolescents participate in domestic activities. This reduction also seems to be the case when considering only female children (Column 2) and only male children (Column 3). However, none of the estimated coefficients is statistically significant at the conventional levels. On the other hand, as can be seen in Column (4), a new migrant leaving the household appears to increase the probability that children and adolescents participate in non-domestic work[53]. This effect seems to be driven by male

[51] Unfortunately, the time devoted to taking care of small children, elderly or sick persons is not captured from the second round of the survey onwards. Therefore, the working hours reported in Table 4.5 exclude those activities.

[52] The index is constructed like in previous chapters, starting with variables indicating household asset ownership and dwelling conditions, and using principal component analysis to compute a single index.

[53]The opposite signs on Columns (1) and (4) might suggest individuals moving from domestic to non-domestic work. Albeit a logical possibility, the different time windows for reporting the two work types preclude a more solid conclusion. What is more, since domestic work activities reported in a given

children, who experience a significant increase in their probability of working in this type of activity (Column 6). On the contrary, female children experience almost no change (Column 5).

Table 4.6: New migration effect on children's participation in work activities (individual fixed effects)

VARIABLES	(1) Dom. work Boys & Girls	(2) Dom. work Girls	(3) Dom. work Boys	(4) Non-dom. work – Boys & Girls	(5) Non-dom. work - Girls	(6) Non-dom. work - Boys
New migration	-0.0432	-0.0760	-0.0188	0.0718	-0.0107	0.1574**
	(0.0551)	(0.0824)	(0.0740)	(0.0501)	(0.0595)	(0.0754)
Child's age	0.0122	0.0073	-0.0018	0.0239***	0.0042	0.0290***
	(0.0074)	(0.0129)	(0.0134)	(0.0059)	(0.0075)	(0.0105)
H. Dep. Ratio	0.3376***	0.3946***	0.2603**	-0.0157	-0.1700***	0.1311
	(0.0816)	(0.1068)	(0.1255)	(0.0632)	(0.0656)	(0.1068)
H. Wealth index	0.0099*	0.0074	0.0155*	0.0058	-0.0013	0.0135**
	(0.0058)	(0.0077)	(0.0086)	(0.0042)	(0.0049)	(0.0066)
Unemp. Rate[(a)]	-0.1665	-0.0124	-0.3337	-0.4982***	-0.5223**	-0.5268*
	(0.2876)	(0.3980)	(0.4241)	(0.1816)	(0.2027)	(0.2919)
Constant	0.2566***	0.3203**	0.4037**	-0.1367*	0.1235	-0.2411*
	(0.0961)	(0.1555)	(0.1639)	(0.0744)	(0.0877)	(0.1250)
Observations	17,133	8,422	8,708	16,935	8,363	8,569
R-squared	0.0356	0.0559	0.0234	0.0562	0.0171	0.1076
Indv. panels	8,954	4,550	4,650	8,905	4,534	4,616

Robust standard errors in parentheses. Survey rounds fixed effects included. (a) Unemployment rate among adults (18 to 64 years) in the municipality.
*** p<0.01, ** p<0.05, * p<0.1

On the other end of the migratory experience, as can be observed in Table 4.7, on average, the return of a migrant appears to have little impact on the probability that children and adolescents participate in domestic activities (Column 1). The relationship between the return of a migrant and the probability of working in domestic activities appears to be stronger among male children (Column 3) than for female children (Column 2). Nevertheless, the coefficients are not estimated with sufficient precision to rule out a null relationship. On the contrary, as can be observed in Column (4), the return of a migrant significantly increases the probability that children and adolescents participate in non-domestic activities. This relationship seems similar for female and male children (Columns 5 and 6, respectively). However, the estimated coefficients when separating children by sex lose statistical significance.

The relationship between the departure of a migrant and the time children spend in working activities are reported in Table 4.8. As can be observed in Columns (1) and (4), the migrant's departure appears to affect time performing domestic and non-domestic work in opposite directions. While a new migrant leaving the household is associated with a time reduction in domestic activities, it is associated with an increase in non-domestic activities. However, the analysis cannot rule out a null association in both cases. When the relationship between migration and time working is allowed to vary by child's sex, female and male children appear to experience a slight increase in the time devoted to domestic activities (Columns 2 and 3)

survey round cover the last 12 months they could had happen before a new migrant reported in the same round has left the household (or a former migrant has returned).

and a slight decrease in the time spent in non-domestic activities (Columns 5 and 6). Nonetheless, as with the combined sample, the coefficients are not estimated with enough precision to rule out a null effect.

Table 4.7: Return migration effect on children's participation in work activities (individual fixed effects)

VARIABLES	(1) Dom. work Boys & Girls	(2) Dom. work Girls	(3) Dom. work Boys	(4) Non-dom. work - Boys & Girls	(5) Non-dom. work - Girls	(6) Non-dom. work - Boys
Return migration	0.0289	0.0146	0.0397	0.0781**	0.0652	0.0828
	(0.0506)	(0.0684)	(0.0744)	(0.0384)	(0.0516)	(0.0562)
Child's age	0.0109	0.0096	-0.0059	0.0254***	0.0055	0.0292***
	(0.0075)	(0.0128)	(0.0134)	(0.0060)	(0.0075)	(0.0106)
H. Dep. Ratio	0.3697***	0.4249***	0.2879**	-0.0054	-0.1861***	0.1632
	(0.0818)	(0.1055)	(0.1268)	(0.0633)	(0.0662)	(0.1070)
H. Wealth index	0.0102*	0.0083	0.0148*	0.0061	-0.0008	0.0134**
	(0.0058)	(0.0077)	(0.0087)	(0.0041)	(0.0049)	(0.0065)
Unemp. Rate[(a)]	-0.1558	0.0621	-0.3851	-0.4800***	-0.5335***	-0.4504
	(0.2878)	(0.3970)	(0.4257)	(0.1814)	(0.2037)	(0.2921)
Constant	0.2482**	0.2737*	0.4294***	-0.1599**	0.1197	-0.2655**
	(0.0966)	(0.1538)	(0.1651)	(0.0748)	(0.0879)	(0.1257)
Observations	17,064	8,395	8,666	16,868	8,338	8,527
R-squared	0.0358	0.0563	0.0233	0.0559	0.0174	0.1062
Indv. panels	8,880	4,513	4,605	8,832	4,498	4,571

Robust standard errors in parentheses. Survey rounds fixed effects included. (a) Unemployment rate among adults (18 to 64 years) in the municipality.
*** p<0.01, ** p<0.05, * p<0.1

Table 4.8: New migration effect on children's hours worked (individual fixed effects)

VARIABLES	(1) Dom. work Boys & Girls	(2) Dom. work Girls	(3) Dom. work Boys	(4) Non-dom. work - Boys & Girls	(5) Non-dom. work - Girls	(6) Non-dom. work - Boys
New migration	0.9541	0.3569	1.3280	-0.4048	-0.5405	-0.3492
	(1.5742)	(2.4755)	(1.9287)	(1.5055)	(0.5858)	(2.9465)
Child's age	0.4286**	0.1615	0.0775	0.7095***	-0.2980*	0.6695*
	(0.1988)	(0.3881)	(0.3095)	(0.1957)	(0.1650)	(0.3417)
H. Dep. Ratio	5.7550***	6.8026*	3.6876	-1.0382	-4.0829***	0.8384
	(2.0910)	(3.4857)	(2.3376)	(1.8546)	(1.5728)	(3.2245)
H. Wealth index	-0.1475	-0.4312*	0.1466	0.1358	-0.0146	0.2367
	(0.1367)	(0.2426)	(0.1369)	(0.1036)	(0.1010)	(0.1747)
Unemp. Rate[(a)]	2.1403	5.3797	-1.5056	-8.1567	-8.9190	-4.8847
	(7.3635)	(11.7294)	(9.0694)	(5.1629)	(5.6473)	(8.4031)
Constant	0.0914	4.1722	3.0101	-4.1215*	6.8492***	-3.7614
	(2.5039)	(4.7768)	(3.3970)	(2.4644)	(2.0386)	(3.9852)
Observations	16,914	8,315	8,596	16,935	8,363	8,569
R-squared	0.0075	0.0258	0.0042	0.0226	0.0066	0.0421
Indv. panels	8,889	4,512	4,619	8,905	4,534	4,616

Robust standard errors in parentheses. Survey rounds fixed effects included. (a) Unemployment rate among adults (18 to 64 years) in the municipality.
*** p<0.01, ** p<0.05, * p<0.1

The return of a migrant also seems to be associated with a reduction in the time children spend in domestic work but an increase in the time they spend in non-domestic work (Table 4.9, Columns 1 and 4). On this occasion, however, the coefficient for non-domestic work time is estimated with enough precision to rule out a null relationship at the usual statistical thresholds (Column 4). When considering female and male children separately, return migration seems to be associated with a slight reduction in time female and male children spend in domestic activities (Columns 2 and 3) and an increase in the time spent in non-domestic activities (Columns 5 and 6). Nevertheless, only the coefficient corresponding to male children in non-domestic activities (Column 6) is estimated with enough precision to rule out a null relationship at the conventional statistical levels.

Table 4.9: Return migration effect on children's hours worked (individual fixed effects)

VARIABLES	(1) Dom. work Boys & Girls	(2) Dom. work Girls	(3) Dom. work Boys	(4) Non-dom. work - Boys & Girls	(5) Non-dom. work - Girls	(6) Non-dom. work - Boys
Return migration	-0.9187	-1.4184	-0.5097	1.5910**	0.6377	2.3458*
	(0.9631)	(1.7023)	(0.8745)	(0.7917)	(0.8562)	(1.3622)
Child's age	0.4252**	0.2162	0.0687	0.7813***	-0.2674	0.7861**
	(0.2002)	(0.3878)	(0.3079)	(0.1935)	(0.1657)	(0.3251)
H. Dep. Ratio	5.9736***	7.3269**	3.4358	-0.9293	-4.1615***	1.1550
	(2.0990)	(3.4992)	(2.3374)	(1.8537)	(1.5949)	(3.2143)
H. Wealth index	-0.1142	-0.3936	0.1572	0.1332	-0.0090	0.2317
	(0.1362)	(0.2418)	(0.1365)	(0.1031)	(0.1013)	(0.1737)
Unemp. Rate[(a)]	2.6137	6.4548	-2.7597	-6.6661	-9.1173	-1.3993
	(7.3404)	(11.6796)	(9.0407)	(5.1222)	(5.6317)	(8.3151)
Constant	-0.0190	3.2182	3.3705	-5.0361**	6.5509***	-5.3631
	(2.5114)	(4.7682)	(3.3828)	(2.4610)	(2.0414)	(3.8983)
Observations	16,849	8,291	8,555	16,868	8,338	8,527
R-squared	0.0075	0.0258	0.0038	0.0240	0.0066	0.0446
Indv. panels	8,816	4,476	4,574	8,832	4,498	4,571

Robust standard errors in parentheses. Survey rounds fixed effects included. (a) Unemployment rate among adults (18 to 64 years) in the municipality.
*** p<0.01, ** p<0.05, * p<0.1

4.6. Discussion

The results in the previous section suggest that a new migrant leaving the household increases the probability that children, particularly males, participate in non-domestic work activities. The evidence also suggests that the return of a migrant increases the probability of children participating in non-domestic activities. The evidence is not conclusive for domestic work activities. These results are different from those of previous research in El Salvador. Acosta (2011b) found that migration appears to reduce the probability of children participating in non-domestic work activities[54]. One possible explanation for the different results is the time for new

[54] Related work from the same author concludes that remittances reception reduce children's wage labor but increases unpaid labor (Acosta, 2011a). However, that study is not comparable with the present research for multiple reasons including differences in the reference population, variables of interest and identification strategy.

migrants to be registered. In the present research, new migrants were registered if they left the household less than one year before the interview, while Acosta (2011b) registered new migrants that left the household up to two years before the survey. The longer period for migrants to integrate into the host country might facilitate them to financially support their families in the home country, making child work less necessary. Unlike the present study, Acosta (2011b) does not consider return migration.

The rest of this section explores some possible explanations for the previous results, including labor supply differences between migrant and non-migrant households, the impact of remittances reception, shock exposure, and migration patterns. First, however, it is worth checking if the children's participation in labor activities has some relationship with school enrollment or the time children use for school-related activities.

4.6.1. Child labor and schooling

One of the main concerns about children's work is that it might be detrimental to human capital formation. Nevertheless, previous research points to a complex relationship between child labor and human capital accumulation. First, the intensity of work and the type of work seem to play a significant role in whether children attend school. Using microdata from a sample of 34 countries, Edmonds (2007) documents how school attendance rates decline gradually for children working 8 to 29 hours per week, followed by a rapid decline for children working more than 30 hours. Using data from Mexico, Levison et al. (2001) found that boys are almost 11 percentage points more likely than girls to work and not attend school when the definition of work is limited to non-domestic activities. However, boys are only 2.6 more likely than girls to work and not attend school when including domestic chores. Second, work intensity also seems to play a role when considering school attainment. For instance, using a panel survey from Ethiopia Mussa et al. (2019) observed that after 16 years of the first survey, full-time working children completed significantly fewer years of formal education than their non-working-student peers. However, no significant difference is observed between the years of education attained by children that combined school and work and those attained by non-working students.

Identifying a causal link between child labor and school attendance, enrollment or attainment is beyond the scope of this paper. Here, the objective is just to observe any apparent correlation between school enrollment and children's participation in work activities[55]. As before, the analysis distinguishes between domestic and non-domestic work. Additionally, the analysis classifies children's work according to the weekly hours spent on the activity to consider the role of work intensity. In the case of domestic work, children are considered to perform "light work" if they spend 20 hours or less a week in all the domestic work activities. In the case of non-domestic work, children 7 to 12 years old are considered to participate in "light-work" if they spend less than seven hours a week in all non-domestic work activities or if an adolescent 13 to 17 years old spend less than 15 hours a week in the work activities.[56]

[55] Unfortunately, the survey does not collect data on actual school attendance during the week before the survey.

[56] These definitions are a modification of the "permitted light work" concept found in ILO & UNICEF (2021).

As shown in the upper section of Table 4.10, participating in light domestic work is associated with a slight increase in the probability of school enrollment, especially among female children and adolescents (Column 4). On the contrary, participating in non-light domestic work is associated with a reduction in the probability of school enrollment. This reduction is especially noticeable among adolescents (Column 3). In the lower section of the table, it can be observed that participating in non-domestic activities is associated with a reduction in the probability of school enrolment, disregarding the time duration of the activities. However, this reduction is considerably more pronounced for non-light work activities, especially among adolescents (Column 3).

Table 4.10: Change in the probably of school enrollment (marginal effects – *probit* regressions)

VARIABLES	(1) Boys and Girls 7 - 17	(2) Boys and Girls 7 - 12	(3) Boys and Girls 13 - 17	(4) Girls 7 - 17	(5) Boys 7 - 17
DOMESTIC					
Light work	0.0161***	0.0011	-0.0078	0.0447***	-0.0020
	(0.0056)	(0.0032)	(0.0138)	(0.0102)	(0.0066)
Non-light Work	-0.0525***	-0.0108*	-0.1455***	-0.0511***	-0.0012
	(0.0075)	(0.0059)	(0.0169)	(0.0113)	(0.0106)
Observations	21,512	13,581	7,931	10,662	10,850
NON-DOMESTIC					
Light work	-0.0151**	-0.0123	-0.0338**	-0.0272**	-0.0204**
	(0.0074)	(0.0126)	(0.0148)	(0.0134)	(0.0085)
Non-light work	-0.1190***	-0.0344***	-0.2394***	-0.0848***	-0.1451***
	(0.0084)	(0.0100)	(0.0146)	(0.0151)	(0.0099)
Observations	21,312	13,516	7,796	10,615	10,697

Clustered standard errors at the individual level in parentheses. Individual and household-level controls were included in all regressions. Survey rounds and survey groups fixed effects included.
*** p<0.01, ** p<0.05, * p<0.1

Besides school enrollment, participating in labor activities might impact the time children spend in school-related activities, i.e., school homework. Table 4.11 below reports the change in the weekly hours spent on school homework associated with participation in labor activities. Again, to consider the role of work intensity, the table distinguishes between light work and non-light work. As can be observed, while controlling for individual and household characteristics, and provided children are enrolled in school, participating in work activities is generally associated with a reduction in the time spent in school homework. As expected, this reduction tends to be more pronounced for non-light work and it is especially noticeable among adolescents (Column 3).

Table 4.11: Change in weekly hours devoted to school homework (marginal effects - Tobit regressions)

VARIABLES	(1) Boys and Girls 7 - 17	(2) Boys and Girls 7 - 12	(3) Boys and Girls 13 - 17	(4) Girls 7 - 17	(5) Boys 7 - 17
DOMESTIC					
Light work	-0.1788***	-0.1731**	-0.3654**	0.0806	-0.3522***
	(0.0657)	(0.0722)	(0.1606)	(0.1036)	(0.0855)
Non-light Work	-0.2086*	0.0994	-0.8158***	-0.1767	-0.0322
	(0.1072)	(0.1395)	(0.1964)	(0.1434)	(0.1880)
Observations	18,866	13,127	5,739	9,181	9,616
NON-DOMESTIC					
Light work	-0.3130**	-0.2730	-0.4037**	-0.4609**	-0.2129
	(0.1306)	(0.2248)	(0.1698)	(0.2172)	(0.1673)
Non-light work	-0.5748***	-0.2653*	-0.8166***	-0.6827***	-0.5002***
	(0.0952)	(0.1369)	(0.1422)	(0.2267)	(0.1119)
Observations	18,723	13,063	5,660	9,153	9,508

Standard errors in parentheses. Individual and household-level controls were included in all regressions. Survey rounds and survey groups fixed effects included.
*** p<0.01, ** p<0.05, * p<0.1

4.6.2. Household composition and child labor

Perhaps the most intuitive explanation for migration to affect children's participation in labor activities is the change in the labor supply of adults in the household. Certainly, households in the sample with new migrants abroad have fewer adults than households with no migrants. As seen in Table 4.12 Column (1), the average number of working-age adults (18 to 64 years old) in households with new migrants is 0.197 lower than in non-migrant households. At the same time, the average number of minors (17 years or younger) is 0.326 higher in households with new migrants than in households with no migrants (Column 2), and little difference exists in the number of seniors (adults 65 years or older, Column 3). All the previous differences make the dependency ratio higher in households with new migrants than in households with no migrants (Column 4).

Table 4.12: Household composition (pooled sample)

	(1) Num. of adults	(2) Num. of minors	(3) Num. of seniors	(4) Dependency ratio
I. No migrants	2.321	2.988	0.142	0.553
	(0.011)	(0.018)	(0.004)	(0.002)
II. New migrants	2.124	3.314	0.168	0.626
	(0.105)	(0.162)	(0.040)	(0.016)
III. Return migrants	2.991	3.045	0.225	0.507
	(0.113)	(0.140)	(0.052)	(0.013)
IV. Difference (II -I)	-0.197	0.326	0.026	0.073
	(0.106)	(0.163)	(0.040)	(0.016)
V. Difference (III - I)	0.670	0.057	0.083	-0.046
	(0.114)	(0.142)	(0.052)	(0.013)

Standard errors in parentheses

Households in the sample that experienced the return of a migrant have, on average, 0.67 more adult members than households with no migrants (Column 1). These households also have slightly higher average numbers of minors and seniors (Columns 2 and 3) than households with no migrants. Overall, households with returned migrants have an average lower dependency ratio than households with no migrants (Column 4)

The sex of the migrant might also affect the probability that children engage in work activities. More precisely, the sex of the migrant might affect the type of work children perform. Given that women in the household more often perform domestic work, their absence might result in children, especially female children, participating in those activities. Conversely, since men tend to participate more often in non-domestic work, their migration is more likely to result in children, especially male children, participating in those activities. The relationship between the sex of the migrant and the type of work children do in the household is explored below. Only children in households with a recent migratory experience are included in the analysis since the main interest is to observe differences among this subpopulation. Unfortunately, the analysis cannot account for the endogenous decision on who the migrant is within the household. Therefore, the results reported below should not be interpreted as a causal relationship.

Table 4.13: Change in the probability of participating in work activities and female migration (marginal effects – *probit* regressions. Pooled sample).

VARIABLES	(1) Dom. Work Boys & Girls	(2) Dom. Work Girls	(3) Dom. Work Boys	(4) Non-Dom. Work Boys & Girls	(5) Non-Dom. Work Girls	(6) Non-Dom. Work Boys
Female new mig.	0.1458**	0.1238	0.1686*	0.1270**	0.0041	0.2610***
	(0.0613)	(0.0796)	(0.0897)	(0.0547)	(0.0692)	(0.0834)
Observations	240	125	115	237	123	114
Female return mig.	0.0625	0.1366*	-0.0172	0.1663**	0.1157	0.2166**
	(0.0767)	(0.0816)	(0.1089)	(0.0756)	(0.0923)	(0.1003)
Observations	220	114	106	218	114	104

Standard errors in parentheses. Individual and household-level controls were included in all regressions. Survey rounds and survey groups fixed effects included. Base category: male migrants.
*** p<0.01, ** p<0.05, * p<0.1

Table 4.13 above shows the change in the probability that a child participates in work activities when the last household migrant is a female compared with the case the last migrant is a male[57]. The regressions included individual, household, and community-level characteristics as controls[58]. The upper section of the table focuses on new migration, while the bottom section focuses on return migration. As can be seen in Column (1), boys and girls are more likely to work in domestic activities when the new migrant leaving the household is a female. This relationship seems to be stronger in boys (Column 3). Likewise, boys and girls are more likely to work in non-domestic activities when the new migrant is a female (Column 4). This

[57] Approximately 68% of the new migrants reported in the survey are males, and 32% are females.
[58] See Table C.5 in the Appendix for the coefficients of the *Probit* regressions.

association is again almost entirely driven by boys (Column 6). When the returning migrant is a female, girls become more likely to work in domestic activities, whereas boys seem to experience little change in their probability of working in this type of activity (Columns 2 and 3, respectively). Regarding non-domestic activities, the return of a female migrant increases the probability that boys and girls work (Column 4), but it is mainly boys who drive this relationship (Column 6).

The influence of the sex of the migrant on the time children work is explored in Table 4.14 below. The table shows the change in the hours children work when the last household migrant is a female, compared with the case the last migrant is a male. Like in the previous table, regressions are limited to households with a recent migratory experience and include individual, household, and community-level controls[59]. Also, like in the previous table, the upper section reports the results for new migrants while the lower section reports the results for return migrants. In general, results in Table 4.14 suggest that children in households with recent female migrants (new or returned) work longer hours than those with recent male migrants. This difference is significantly larger in the case of non-domestic work activities and boys (Column 6).

Table 4.14: Change in the hours worked and female migration (marginal effects – Tobit regressions. Pooled sample).

VARIABLES	(1) Dom. Work Boys & Girls	(2) Dom. Work Girls	(3) Dom. Work Boys	(4) Non-Dom. Work Boys & Girls	(5) Non-Dom. Work Girls	(6) Non-Dom. Work Boys
Female new mig.	3.5356	2.7328	4.3872	7.0044	0.3937	14.1369**
	(2.4458)	(3.1273)	(3.3415)	(4.8752)	(7.3057)	(5.5846)
Observations	237	122	115	237	123	114
Female return mig.	3.7982	2.1697	5.5497	13.3184**	7.3165	19.8975***
	(3.2464)	(4.2172)	(4.0383)	(6.6814)	(9.9710)	(7.0289)
Observations	220	114	106	218	114	104

Standard errors in parentheses. Individual and household-level controls were included in all regressions. Survey rounds and survey groups fixed effects included. Base category: male migrants.
*** p<0.01, ** p<0.05, * p<0.1

The evidence that female migration is associated with higher probabilities that children participate in non-domestic activities and work for longer hours than male migration might seem counterintuitive at first. After all, female adults tend to participate more in domestic activities, while male adults tend to participate significantly more in non-domestic activities[60]. One possible explanation is that adult females in the household become more involved in non-domestic activities when no male adults are available to take on such activities. Then, when working a female migrate children are more likely to assume the work left by the female adult

[59] See Table C.6 in Appendix C for the coefficients of the Tobit regressions

[60] In the pooled sample, the percentage of adults working in domestic activities is 97% for females and 78% for males. The percentage working in non-domestic activities is 52% for females and 89% for males.

since no adult male is available. Conversely, when a male adult emigrates, the work left is assumed primarily by a female adult. A full exploration of this hypothesis is beyond the scope of this paper. However, some descriptive data offer support for the hypothesis. The probability that an adult female works in non-domestic activities has an inverse relationship with the proportion of adult males in the household (See Table C.7 in the Appendix), and the proportion of male adults is significantly lower in households with recent migrants than in households with no migrants (0.14 versus 0.2).

The kinship between migrants and the children in the home country might also influence the effect of a new migration episode on children's participation in labor activities. For instance, if one of the parents of the children in the household is a migrant, remittances are likely to flow more regularly and to be intended to improve children's wellbeing, thus possibly reducing the need for children to work. Another possibility, however, is that parental migration offers children a more tangible future migration opportunity, potentially increasing the value of current work if locally acquired education is not valuable in the host country.

Table 4.15: Change in the probability of participating in work activities and parental migration (marginal effects – *probit* regressions. Pooled sample)

VARIABLES	(1) Dom. Work Boys & Girls	(2) Dom. Work Girls	(3) Dom. Work Boys	(4) Non-Dom. Work Boys & Girls	(5) Non-Dom. Work Girls	(6) Non-Dom. Work Boys
Parental new mig.	0.0413	0.0259	0.0575	0.0392	-0.0176	0.0978
	(0.0770)	(0.0900)	(0.1025)	(0.0668)	(0.0706)	(0.0973)
Observations	237	123	114	234	121	113
Parental return mig.	-0.0554	-0.0388	-0.0732	0.0516	0.0645	0.0362
	(0.0713)	(0.0886)	(0.0913)	(0.0598)	(0.0635)	(0.0877)
Observations	220	114	106	218	114	104

Standard errors in parentheses. Individual and household-level controls were included in all regressions. Survey rounds and survey groups fixed effects included. Base category: non-parental migration. *** p<0.01, ** p<0.05, * p<0.1

Table 4.15 above explores the influence of parental migration. The table shows the change in the probability that a child participates in work activities when the last household migrant is one of the child's parents, compared with the case the last migrant is another household member[61] [62]. Only households with a recent migration episode are used in this exercise since the main interest is identifying differences among those households. Like in previous tables, the upper section reports the regression results for new migrants, while the lower section reports the results for return migrants. As seen in the upper section of the table, the emigration of a child's mother or father is generally related to a slight increase in the child's probability of working in domestic and non-domestic activities. In the bottom section of the table, the return

[61] Unfortunately, the personal relationship between migrants and children in the households was not registered in the survey. However, it was possible to infer such relationship based in the reported relationships between migrants and the household head.

[62] See Table C.8 in the Appendix for the coefficients of the *Probit* regressions.

migration of one of the parents is related to a slight decrease in the probability that children perform domestic work activities and a slight increase in the probability of participating in non-domestic work activities. However, none of the coefficients in the table are estimated with enough precision to rule out a null relationship.

The influence of parental migration on the time children work is explored in Table 4.16 below. The table shows the change in the hours a child work when the last household migrant is the child's father or the mother, compared with the case the last migrant is not the child's father or mother. Like in previous tables, regressions are limited to households with a recent migratory experience and include individual, household, and community-level controls[63]. In general, the results in Table 4.16 suggest no significant differences between the hours worked by children whose parents have recently migrated (or returned) and children who have experienced the migration (or return) of other household members.

Table 4.16: Change in the hours worked and parental migration (marginal effects – Tobit regressions. Pooled sample).

VARIABLES	(1) Dom. Work Boys & Girls	(2) Dom. Work Girls	(3) Dom. Work Boys	(4) Non-Dom. Work Boys & Girls	(5) Non-Dom. Work Girls	(6) Non-Dom. Work Boys
Parental new mig.	2.8407	3.4566	2.1924	-1.4463	-7.0320	4.5349
	(2.8418)	(3.4057)	(3.5568)	(5.2676)	(7.0544)	(6.0339)
Observations	234	120	114	234	121	113
Parental return mig.	1.9515	1.2396	2.7172	4.7192	1.7902	7.9298
	(2.8380)	(3.6208)	(3.5597)	(6.1742)	(8.5449)	(6.6858)
Observations	220	114	106	218	114	104

Standard errors in parentheses. Individual and household-level controls were included in all regressions. Survey rounds and survey groups fixed effects included. Base category: non-parental migration. *** p<0.01, ** p<0.05, * p<0.1

4.6.3. Remittances

Remittances might reduce or increase the need for children to work depending on how much they lift household income and provide resources for productive investment. Around 74% of households with international migrants (recent and non-recent migrants) receive remittances, an overlap that makes it challenging to observe possible differences between households receiving and not receiving remittances. Moreover, even when households with a recent migratory experience have a lower remittance incidence[64], it is not possible to know for this sample when the remittances started (or stopped) and how often they were received. Nevertheless, Tables 4.17 and 4.18 below explore changes in the probability of working and

[63] See Table C.9 in the Appendix for the coefficients of the Tobit regressions.
[64] Approximately 67% of households reporting a migrant leaving in the last 12 months also report receiving remittances, and only 18 % of the households with return migrants reported receiving remittances.

time worked associated with remittance reception. The analysis includes only children in households with a recent migratory episode. The regressions include individual, household, and community-level controls[65]. Like in previous tables, the upper section in each table focuses on new migrants, while the bottom section focuses on return migrants. The results should be taken with caution, given the limitations previously described.

The coefficients in the upper section of Table 4.17, Columns (4) to (6), indicate that children in households with a recent emigration episode, who also receive remittances have a higher probability of working in non-domestic activities compared with children in households with recent international migrants but not receiving remittances. Remittance reception seems to operate differently for households with a recently returned migrant: it decreases the probability that children participate in domestic and non-domestic labor activities. However, these last coefficients are not estimated with enough precision to rule out a null effect.

Table 4.17: Remittance reception and children's probability of working (marginal effects – *Probit* regressions. Pooled sample)

VARIABLES	(1) Dom. Work Boys & Girls	(2) Dom. Work Girls	(3) Dom. Work Boys	(4) Non-Dom. Work Boys & Girls	(5) Non-Dom. Work Girls	(6) Non-Dom. Work Boys
Remittances - New mig.	-0.0179	-0.0533	0.0163	0.1105**	0.0991*	0.1206*
	(0.0588)	(0.0763)	(0.0821)	(0.0469)	(0.0533)	(0.0700)
Observations	276	136	140	273	134	139
Remittances - Return mig.	-0.1192	-0.0266	-0.2198	-0.0310	-0.0025	-0.0601
	(0.0892)	(0.1020)	(0.1480)	(0.0825)	(0.0909)	(0.1290)
Observations	225	117	108	223	117	106

Standard errors in parentheses. Individual and household-level controls were included in all regressions. Survey rounds and survey groups fixed effects included. Base category: households not receiving remittances. *** p<0.01, ** p<0.05, * p<0.1

Table 4.18 below shows the change in the hours worked associated with remittance reception for children in households with a recent migratory episode. As seen in Columns (1) to (3) in the upper section of the table, children in households with a recent migrant and receiving remittances tend to work fewer hours in domestic activities than children in households with recent migrants but not receiving remittances. On the contrary, as shown in Columns (4) to (6), children receiving remittances tend to work more hours in non-domestic activities. The coefficients in the lower section of the table appear to indicate that children in households experiencing the return of a migrant and receiving remittances tend to work fewer hours in domestic and non-domestic activities than their peers in households with recent return migrants but not receiving remittances. However, these coefficients are not estimated with enough precision to rule out a null association.

[65] See Tables C.10 and C11 in the Appendix for the coefficients of the *Probit* and Tobit regressions.

Table 4.18: Remittance reception and children's hours worked (marginal effects – Tobit regressions. Pooled sample)

VARIABLES	(1) Dom. Work Boys & Girls	(2) Dom. Work Girls	(3) Dom. Work Boys	(4) Non-Dom. Work Boys & Girls	(5) Non-Dom. Work Girls	(6) Non-Dom. Work Boys
Remittances - New mig.	-3.9881* (2.3677)	-7.1185** (3.0735)	-1.0141 (3.2736)	10.9325** (4.4959)	12.6201* (6.6863)	9.3056* (5.2042)
Observations	273	133	140	273	134	139
Remittances - Return mig.	-6.0953 (3.7522)	-3.4345 (4.4781)	-8.9780 (5.8607)	-5.3594 (8.1396)	-4.2643 (11.9406)	-6.5681 (9.9002)
Observations	225	117	108	223	117	106

Standard errors in parentheses. Individual and household-level controls were included in all regressions. Survey rounds and survey groups fixed effects included. Base category: households not receiving remittances. *** p<0.01, ** p<0.05, * p<0.1

The data in sample indicate that reception of international remittances translates to a higher disposable income. Households receiving these international transfers have a median per capita income of 38 USD per month, while those not receiving the transfer have a median per capita income of 17.5 USD per month. Since most households with migrants receive remittances, they also report a higher median income compared with non-migrant households (35.2 USD versus 18.5 USD). Households with recent migrants have a median income per capita of 31.8 USD, similar to that of households with migrants that have been abroad for a longer time.

On the other hand, households experiencing the return of a migrant have a median income significantly lower at 18.5 USD[66]. The substantially lower income and remittance reception suggest that children in households with recently returned migrants might be required to work to compensate for the lost revenue from remittances, especially if former migrants face a hard time securing employment in the local labor market. The economic reintegration of returned migrants is a subject that deserves further research. Nevertheless, in a series of in-depth interviews with former migrants (see Appendix C-II), most stated that the main challenge they face when returning to El Salvador is securing employment. Moreover, government officials and employees from Non-Governmental Organizations (NGOs) working with migrant reintegration expressed former migrants face even more difficulties in El Salvador's labor market when they return than before leaving. Local employers often do not value the working experience former migrants have acquired abroad, and many returned migrants have to endure the social stigma that considers them criminals.

Less clear is the observed higher probability of working among children in households with recent migrants, whose families have higher incomes. One possibility is that higher income helps finance productive investments in the context of credit constraints[67]. However, this use

[66] The income estimations for households with recent migrants or returned migrants should be taken with caution since, as explained before, it is not known when they started (or stopped) receiving remittances or how frequent they received the transfers.

[67] The use of financial service is not widespread in the sample, and even less among migrant households. Around 21% of migrant households requested a loan from private or public providers

of remittances cannot fully explain children's higher participation in labor activities. For instance, focusing on agricultural land investments[68], households with new migrants indeed own significantly larger land plots than households with no migrants: 2.6 versus 1.1 hectares. However, not all households with new migrants seem to experience growth in their holdings the year the new migrant leaves (the time when child work is measured in the survey). The average plot size the year before a migrant's departure is practically the same as the average size the year a migrant departs (2.3 hectares). Therefore, it seems that income from remittances does not always translate into agricultural investments in the short term, at least when measured with land acquisitions.

Despite the previous observations, households with future new migrants still own, on average, larger agricultural plots than households with no migrants, even before the migrant's departure. These more extensive land holdings, combined with the reduction in the adult labor force noted in the previous section, might also help explain why children in households with recent new migrants are more likely to work than children in households with no migrants. Furthermore, 60% of households with migrants do not hire external workers for their agricultural production, implying that most of these households rely exclusively on their members, including children and adolescents, for agricultural production. It is also worth noting that, in households with and without migrants, boys are four times more likely to directly participate in household agricultural production than females, which might explain why male children, in particular, experience an increase in their probability of working when a migrant leaves the household.

A final avenue for migration and remittances to affect children's participation in labor activities is by serving as an alternative coping strategy. When experiencing shocks to their livelihoods, households might decide to send their children to work. However, if migrants supplement household income via additional remittance, the need for children to work might be avoided. However, if migrant households experience more frequent or more extensive shocks than non-migrant households, children could still be required to support their families with their labor. This possibility is explored by reviewing the shocks households in the sample experienced in the last five years[69]. Interestingly, 37% of households with new migrants abroad reported having suffered at least one shock in the last five years, while 42% of households with no migrants reported suffering shocks. The proportion of households with returned migrants reporting shocks is practically equal to that of households with no migrants.

4.6.4. Migration expectations

Finally, children and adolescents in migrant households might be more likely to work (and drop out of school) because they hope to migrate in the future. This possibility is not directly testable with the survey at hand since personal expectations about migration are not recorded. Perhaps

between the first and third round of the survey, while 26% of non-migrant households did so. When excluding informal lenders such as friends and relatives, which tend to lend significantly lower amounts, credit use is still less common among migrant households (11%) than among non-migrant households (13%).

[68] Agriculture for household consumption and trade is the main productive activity of households in the sample, with 86% of them engage in the activity. This proportion is equal between households with and without migrants.

[69] Unfortunately, the survey does not record the exact time of occurrence. The shocks included are dwelling damages, crops or animal loses, crime victimization, serious accident, illness, or dead of a household member.

surveys directed at migrants in the host country are better positioned to gain insights into migration expectations. For instance, in a survey of recent migrants in three major urban areas in the United States, 45% of Salvadoran migrants indicated that family reunification was a motivation for their migration, and 26% were considering bringing their children to the United States (Abuelafia et al., 2019). However, these insights can only suggest that children and adolescents with close relatives abroad might indeed expect to migrate to reunite with their families. Further research in this area is indeed needed.

4.7. Conclusions

The main objective of this chapter was to identify the effect of a recent migratory experience of a household member on the participation of children in labor activities. The results indicate that migration is likely to increase the participation of children and adolescents in work activities in some instances. The analysis indicates that the departure of a new migrant increases the probability that children, especially boys, participate in non-domestic work activities. On the other end of the migratory experience, the return of a migrant seems to increase the probability that children work in non-domestic activities. At the intensive margin, the return of a migrant is associated with an increase in the time children dedicate to non-domestic labor activities. Again, these last results are mainly driven by males. The evidence is not conclusive when considering domestic work. The analysis could not rule out a null effect of the departure or return of migrants on the participation of children in those activities.

The research also explored the role of female and parental migration on children's participation in labor activities. Interestingly, children in households experiencing the recent departure of a female migrant are more likely to participate in domestic and non-domestic work activities than children in households experiencing the departure of a male migrant. This association is more robust in the case of male children than for female children. On the other end of the migratory journey, children in households facing the return of a female migrant are more likely to participate in non-domestic work activities than children experiencing the return of a male migrant. Again, these last results are driven by male children. The return of a female migrant is also associated with female children working more often in domestic activities when compared with children in households with male returned migrants. The analysis did not find any systematic differences in children's participation in labor activities between those experiencing the migration of at least one parent and those experiencing the migration of other household members.

The analysis of the mechanisms potentially explaining the relationship between migration and children's work, albeit exploratory, provided some valuable insights. As expected, the recent emigration of a household member is related to a higher dependency ratio, suggesting that households with recent migrants might be more prone to include children in their labor activities to compensate for the absence of adult household members. Moreover, households with recent departing migrants hold more agricultural land than non-migrant households, and most do not hire external labor, increasing the need to use household labor in agricultural activities. Since boys are substantially more likely than girls to participate in household agricultural production, the labor supply reduction caused by emigration seems to affect boys particularly. On the other hand, the evidence suggests that children in households experiencing the return of a migrant are likely to be required to work to compensate for income disruptions rather than

adult labor scarcity. Households experiencing the return of a migrant in the sample were significantly less likely to receive remittances and registered substantially lower per capita income than households with non-migrants. Moreover, in-depth interviews with returned migrants and other key informants indicate that return migrants face severe difficulties in reintegrating into El Salvador's labor market.

Certainly, migration and remittances are likely to affect El Salvador's households positively as they provide resources to finance current consumption and productive investments. Moreover, in aggregated terms, migration and remittances might help reduce poverty and inequality levels in the country. Nevertheless, the evidence in the present research has shown that migration also has some negative consequences since it is related to the higher participation of children in labor activities, which is associated with lower school attendance. If children's work translates to lower school achievement and human capital formation, children's future welfare could be compromised as their employment and income perspectives worsen. Likewise, El Salvador's economic growth and development might suffer in the long run with lower human capital accumulation.

This analysis provides some insights for policymakers to design actions to prevent or ease the burden of children's work associated with recent household migratory experiences. For instance, some actions to prevent dropouts and improve school attainment include guidelines for teachers and other staff to identify and support at-risk children. These guidelines need to recognize that children, especially boys, in households experiencing the recent departure or return of a migrant are more likely to become involved in labor activities and that working children are less likely to be enrolled at school. Beyond the schooling area, efforts to reduce the need for children to work must address the adult's need to work. For instance, actions that facilitate the economic and labor market reintegration of returned migrants might reduce the need for children to participate in labor activities by reducing the income disruptions associated with the migrant's return.

5. Conclusions

Every child should be free of the burden of malnutrition and have access to quality education to secure their right to life and develop their full potential. Governments and private households take a variety of actions that directly or indirectly impact children's welfare. The present research intended to explore how effective some of those public and private initiatives are in protecting child nutrition, increasing schooling, and reducing child labor in rural areas. More specifically, this study asked (1) if an ongoing CCT program can help maintain children's nutritional status when rural households experience aggregated economic shocks, (2) how CCTs and remittances from international migrants affect children's school enrollment, (3) how household participation in a CCT program might affect international remittances and migratory decisions, and (4) if international migration increases the probability of being involved in labor activities for children and adolescents in the home country

The research focused on studying one CCT program to answer the previous questions: El Salvador's "*Comunidades Solidarias Rurales*" (CSR). Several reasons made the program and the country appealing for the research, including the relatively high incidence of international migration and remittances and the persistent challenges the country faces in expanding school enrollment and reducing child malnutrition. Moreover, the program implementation schedule and the timing and design of the evaluation survey offered a unique opportunity to study the program's effects during the global food price crisis of 2008.

Between 2007 and 2008, the prices of some food staples experienced a rapid increase in the global markets. In El Salvador, the local food prices followed a similar trend, with food inflation peaking during the third quarter of 2008. The evidence presented in the first chapter indicates that an ongoing CCT program offered some protection to child nutrition against the potentially negative effect of the rapid increase in food prices. When focusing on the households that started in the program almost at the same time as the food prices reached their peak, the analysis showed that the CCT program reduced the probability that a child is wasted by around four percentage points compared to children not yet in the program. Moreover, among children living in the poorest household, the reduction in the probability of wasting was more than nine percentage points. Also, the timely reception of the transfer appears to have prevented some girls from becoming stunted. When analyzing children in households enrolled in the program before the crisis, the results indicate that those with the most prolonged exposure had lower probabilities of being stunted. About two months after the food prices peaked in the country, children living in households that had been participating in the program for an average of 24 months had a ten percentage points lower probability of being stunted than children in households that had participated for an average of 13 months. Again, those in the poorest households saw higher gains, as the probability of being stunted is reduced by around 18 percentage points.

Despite substantial progress in the previous decades, El Salvador still faces challenges in increasing school enrollment. In particular, enrollment rates in secondary school are significantly lower than in primary schooling, and children in rural areas are significantly less likely to attend school than children in the cities. The evidence presented in chapter two indicates that CCTs are an effective tool to tackle these issues. The assessment of the effect of the CSR program indicates that the reception of the CCT in the municipality significantly increases school enrollment rates for children aged 7 to 12, the age bracket corresponding to

primary school, and the program's target population. Furthermore, the current assessment finds strong evidence that CCT reception increases school enrollment for children aged 13 to 16 years, the age corresponding to secondary school, who were not directly targeted by the program.

On the other hand, remittance reception in the household is found to reduce school enrollment rates. This negative effect is mainly driven by children in the age range corresponding to secondary school. The analysis in chapter two does not find evidence that the CCT program significantly affects remittance behavior or the enrollment rate of children in households receiving remittances.

The fourth chapter looked into the relationship between international migration and child labor. The evidence indicates that migration increases the participation of children and adolescents in labor activities in some instances. The analysis indicates that the departure of a new migrant increases the probability that children, in particular boys, participate in non-domestic activities, such as working on the family farm without payment or wage employment outside the household. On the other end of the migratory experience, the return of a migrant seems to increase the probability that children work in non-domestic activities. At the intensive margin, the return of a migrant is associated with an increase in the time children dedicate to non-domestic labor activities. Again, male children seem to drive these last results. The evidence is not conclusive when considering domestic work, such as cleaning, cooking, or collecting water for household consumption. The analysis could not discard a null relationship between the departure, or the return, of a migrant and the participation of children in those activities.

The time and content of the collected data for evaluating the Salvadoran CCT program were key for this study. However, some limitations prevented this study from exploring some mechanisms driving the observed results and identifying causal and long-term relationships. First, the data collected did not contain details of the food consumption for the individual members of the household or the household as a whole. Therefore, it was impossible to observe directly how the rise in food prices affected the household's food consumption patterns and distribution among individual members. Likewise, it was not possible to test if the CCT program affected the household's food consumption pattern and distribution or if the program prevented changes to these patterns caused by the food price rise.

Second, the analysis of the mechanism explaining the observed relationship between migration and child labor was primarily exploratory. This limitation arises mainly from the endogeneity of migratory decisions and remittance reception. Ideally, researchers could exploit some exogenous variation in both variables. Unfortunately, such an experimental setting is seldom possible, with just a few examples using exchange rate shocks or economic downturns in the host countries, which affect the value of remittances (See Alcaraz et al., 2012 & Yang, 2008).

Third, given the time frame of the household survey data, the analysis focused on the short-term effect of CCTs, migration, and remittances. Studying their long-term effects represents a challenging but exciting opportunity. Such analysis requires data covering several years or decades, ideally following the same households and individuals over time. What is more, collecting data on migration and remittances requires special considerations for tracking migrants, changing household composition, and evolving personal relationships in the host and home country. Despite these challenges, researchers have found higher school attainment among CCT beneficiaries persisting several years after the initial exposure. However, less is

known about the CCT's long-term effects on employment, income, or poverty[70]. Likewise, little is known about how migration and remittances affect children's future school attainment, employment, or earnings.

Despite the limitations, the results of this study have some relevant policy implications. As shown in chapter one, a running CCT program has the potential to prevent the deterioration of child nutrition during periods of surging food prices. The use of a running program in response to shocks has several advantages. For instance, the list of program participants can serve as the basis for the list of emergency response beneficiaries since vulnerable individuals have already been identified, and previously excluded people might be added if waiting lists (or local census like in the case of El Salvador) are up to date. Moreover, using the program's infrastructure and mechanisms could expedite the response to the crisis. At the same time, opportune interventions and program adaptation are important for adequate crisis response. As the analysis showed, the ability of the Salvadoran program to reduce child wasting during the crisis seems to come mainly from the coincidence of the first payment to a group of households and the peak in the food prices. Moreover, some evidence suggests that increasing the value of the cash transfers might reduce child stunting and wasting.

The analysis in chapter one also suggests that regular livelihood support and emergency response programs should focus on the most vulnerable people to use public resources more efficiently. In an emergency, such as the Covid-19 pandemic, non-targeted transfers, or a significant expansion of the beneficiaries of existing programs might be the only practical way to provide some social protection to the population in need. Nevertheless, this study confirms that programs' benefits to child nutrition, even during a crisis, are concentrated among the poorest households. Therefore, providing targeted support to the most vulnerable groups should always be prioritized.

CCTs also have a great potential to increase school enrollment, as shown in the second chapter and several previous studies. On the other hand, migration and remittance reception in the household are found to reduce school enrollment and increase children's participation in labor activities. As international migration remains an option for a significant number of households in El Salvador and other countries in Central America, governments will need to pay increasing attention to the challenges it brings to those left behind. Remarkably, the evidence suggests that CCTs are less effective in increasing school enrollment among remittance receptors than non-receptors. Therefore, public initiatives trying to increase school enrollment among children in migrant households would need to consider the specific characteristics of their target population in their intervention.

Indeed, more research is needed to identify the precise mechanisms behind the reduction in school enrollment among children in households receiving remittances. However, the analysis in the previous chapters gives some valuable insights. For instance, the results in the fourth chapter indicate that children's participation in labor activities is associated with a lower probability of school enrollment. At the same time, the analysis suggests that income disruptions following the return of a migrant, and the need to compensate for the reduction of the adult workforce after a migrant's departure, are among the likely reasons behind the higher participation of children in labor activities in migrant households. It is likely that the children's work effort, and potential lack of schooling, have lasting consequences for their human capital formation. Therefore, timely support to children in households with recent migrants and flexible

[70] See Millán et al. (2019) for a critical review of the literature.

study programs for working children might reduce migration's negative effect on children's schooling. Moreover, actions aiming to facilitate the economic reintegration of returned migrants might reduce the need for children to work by reducing income disruptions.

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7. Appendix A

Table A.1: Stunting prevalence among first grade pupils in public sector schools (percentage)

MUNICIPALITY	SURVEY GROUP	1988	2000	2007
MASAHUAT	1	43.4	21.6	16.96
SANTIAGO DE LA FRONTERA	1	31.5	15.8	20.13
SANTO DOMINGO DE GUZMAN	1	38.8	26.57	22.71
LA LAGUNA	1	58.6	27.98	35.66
SAN FRANCISCO MORAZAN	1	50	38.51	34.29
PARAISO DE OSORIO	1	49.5	21.88	16.67
SANTA CLARA	1	23.1	26.47	23.47
SAN ESTEBAN CATARINA	1	14.7	20.28	8.98
ESTANZUELAS	1	39.2	18.14	12.14
SAN AGUSTIN	1	49.5	11.86	11.39
SAN SIMON	1	50	47.48	36.67
JUJUTLA	2	30.1	25.17	20.17
TACUBA	2	46.6	59.56	48.34
SANTA ISABEL ISHUATAN	2	25.5	29.29	15.38
MONTE SAN JUAN	2	46.4	25.33	34.64
SAN FRANCISCO JAVIER	2	29.7	13.09	12.74
SESORI	2	23.5	24.62	16.63
ARAMBALA	2	N.A.	41.3	9.38
CACAOPERA	2	N.A.	40.63	40.82
CORINTO	2	51	57.15	18.18
CHILANGA	2	36.9	26.07	21.66
YAMABAL	2	36.4	33.33	23.16
SAN PEDRO PUXTLA	3	51.4	37.83	22.59
SANTA CATARINA MASAHUAT	3	37.8	34.31	25.51
AGUA CALIENTE	3	25.3	17.58	19.78
COMASAGUA	3	37.3	22.19	25.62
CHILTIUPAN	3	41.4	29.73	29.31
TEOTEPEQUE	3	29	25.73	20.36
SAN CRISTOBAL	3	28.5	33.33	27.47
VICTORIA	3	45.6	21.97	14.41
SAN ILDEFONSO	3	31.4	17.36	15.74
ALEGRIA	3	39.2	27.18	23.86
TECAPAN	3	20.3	35.53	24.38
SAN GERARDO	3	N.A.	24.79	15.38
LOLOTIQUILLO	3	25.8	12.98	19.86
SAN FERNANDO	3	N.A.	41.38	8.51
SENSENBRA	3	75	19.59	18.63
EL CARRIZAL	4	45.6	39	22.09
SAN JOSE LAS FLORES	4	N.A.	27.78	0
SAN EMIGDIO	4	33.3	28.21	16.46
SAN JUAN TEPEZONTES	4	46.8	28.1	17.97

MUNICIPALITY	SURVEY GROUP	1988	2000	2007
SANTA MARIA OSTUMA	4	45	22.17	21.76
SAN LORENZO	4	38.2	18.11	13.27
BERLIN	4	37.9	32.79	21.27
CONCEPCION BATRES	4	36.5	11.26	13.27
MERCEDES UMANA	4	25.3	27.27	15.09
OZATLAN	4	31.1	22.38	20.68
CIUDAD BARRIOS	4	33.5	30.92	22.66
SAN JORGE	4	30.4	11.97	10.07
YAYANTIQUE	4	25.5	24.49	21.79

N.A.: Not available
Source: Ministerio de Educación (2007)

Table A.2: Average Z-score weight for height, children 0 – 3 years old

	All		Poor		Rich		Boys		Girls	
	Early 2008	Late 2008	Early 2008	Late 2008	Early 2008	Late 2008	Early 2008	Late 2008	Early 2008	Late 2008
Group 1	0.219	0.372	0.177	0.299	0.306	0.399	0.238	0.402	0.197	0.337
	(0.070)	(0.070)	(0.115)	(0.112)	(0.104)	(0.100)	(0.103)	(0.101)	(0.095)	(0.097)
Group 2	0.160	0.477	0.151	0.458	0.041	0.502	0.249	0.574	0.068	0.389
	(0.058)	(0.061)	(0.083)	(0.081)	(0.108)	(0.113)	(0.082)	(0.098)	(0.082)	(0.074)
Group 3	0.177	0.386	0.133	0.362	0.223	0.457	0.004	0.242	0.333	0.527
	(0.054)	(0.053)	(0.078)	(0.077)	(0.099)	(0.093)	(0.082)	(0.078)	(0.071)	(0.070)
Group 4	0.424	0.525	0.312	0.256	0.533	0.795	0.394	0.496	0.458	0.557
	(0.054)	(0.065)	(0.098)	(0.111)	(0.080)	(0.095)	(0.079)	(0.088)	(0.075)	(0.096)
All	0.249	0.439	0.185	0.355	0.319	0.554	0.213	0.415	0.286	0.464
	(0.030)	(0.031)	(0.046)	(0.046)	(0.049)	(0.050)	(0.043)	(0.045)	(0.040)	(0.042)

Note: Standard errors in parentheses
Source: CSR Evaluation survey

Table A.3: Prevalence of wasting, children 0 – 3 years old

	All		Poor		Rich		Boys		Girls	
	Early 2008	Late 2008	Early 2008	Late 2008	Early 2008	Late 2008	Early 2008	Late 2008	Early 2008	Late 2008
Group 1	0.027	0.019	0.036	0.022	0.008	0.015	0.032	0.030	0.021	0.007
	(0.009)	(0.008)	(0.018)	(0.013)	(0.008)	(0.011)	(0.014)	(0.013)	(0.012)	(0.007)
Group 2	0.010	0.008	0.006	0.010	0.022	0.010	0.000	0.012	0.019	0.005
	(0.006)	(0.005)	(0.006)	(0.007)	(0.015)	(0.010)	(0.000)	(0.008)	(0.011)	(0.005)
Group 3	0.039	0.025	0.053	0.030	0.034	0.014	0.061	0.033	0.019	0.016
	(0.009)	(0.007)	(0.014)	(0.011)	(0.015)	(0.010)	(0.016)	(0.012)	(0.009)	(0.008)
Group 4	0.010	0.030	0.007	0.061	0.016	0.006	0.014	0.025	0.005	0.036
	(0.005)	(0.009)	(0.007)	(0.020)	(0.009)	(0.006)	(0.008)	(0.011)	(0.005)	(0.014)
All	0.023	0.021	0.028	0.029	0.020	0.011	0.029	0.026	0.016	0.017
	(0.004)	(0.004)	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)	(0.006)	(0.005)	(0.005)

Note: Standard errors in parentheses
Source: CSR Evaluation survey

Table A.4: Average Z-score height for age, children 0 – 3 years old

	All		Poor		Rich		Boys		Girls	
	Early 2008	Late 2008	Early 2008	Late 2008	Early 2008	Late 2008	Early 2008	Late 2008	Early 2008	Late 2008
Group 1	-1.126	-1.089	-1.432	-1.315	-0.810	-0.930	-1.178	-1.125	-1.069	-1.047
	(0.067)	(0.063)	(0.106)	(0.093)	(0.103)	(0.091)	(0.102)	(0.091)	(0.085)	(0.086)
Group 2	-1.036	-1.261	-1.144	-1.350	-0.707	-1.057	-1.257	-1.327	-0.808	-1.201
	(0.070)	(0.056)	(0.092)	(0.079)	(0.140)	(0.095)	(0.093)	(0.085)	(0.103)	(0.075)
Group 3	-0.951	-1.119	-1.191	-1.265	-0.497	-0.878	-1.049	-1.212	-0.864	-1.028
	(0.062)	(0.057)	(0.082)	(0.082)	(0.119)	(0.102)	(0.096)	(0.081)	(0.081)	(0.079)
Group 4	-0.868	-1.124	-1.243	-1.364	-0.625	-0.924	-0.981	-1.173	-0.744	-1.073
	(0.059)	(0.054)	(0.096)	(0.082)	(0.079)	(0.086)	(0.087)	(0.079)	(0.079)	(0.073)
All	-0.980	-1.147	-1.231	-1.319	-0.646	-0.938	-1.099	-1.208	-0.859	-1.084
	(0.033)	(0.029)	(0.047)	(0.042)	(0.053)	(0.047)	(0.048)	(0.042)	(0.044)	(0.040)

Note: Standard errors in parentheses
Source: CSR Evaluation survey

Table A.5: Prevalence of stunting, children 0 – 3 years old

	All		Poor		Rich		Boys		Girls	
	Early 2008	Late 2008	Early 2008	Late 2008	Early 2008	Late 2008	Early 2008	Late 2008	Early 2008	Late 2008
Group 1	0.225	0.175	0.324	0.215	0.164	0.128	0.268	0.199	0.177	0.148
	(0.024)	(0.021)	(0.045)	(0.035)	(0.033)	(0.029)	(0.035)	(0.031)	(0.032)	(0.029)
Group 2	0.204	0.250	0.206	0.282	0.143	0.182	0.233	0.262	0.175	0.239
	(0.023)	(0.023)	(0.032)	(0.032)	(0.037)	(0.039)	(0.034)	(0.034)	(0.031)	(0.031)
Group 3	0.200	0.233	0.239	0.282	0.106	0.172	0.223	0.274	0.179	0.194
	(0.018)	(0.019)	(0.027)	(0.029)	(0.025)	(0.031)	(0.027)	(0.029)	(0.024)	(0.025)
Group 4	0.160	0.205	0.250	0.278	0.094	0.128	0.214	0.218	0.102	0.191
	(0.018)	(0.020)	(0.036)	(0.037)	(0.021)	(0.026)	(0.028)	(0.029)	(0.022)	(0.028)
All	0.195	0.218	0.247	0.269	0.121	0.150	0.232	0.241	0.158	0.195
	(0.010)	(0.010)	(0.017)	(0.016)	(0.014)	(0.015)	(0.015)	(0.015)	(0.013)	(0.014)

Note: Standard errors in parentheses
Source: CSR Evaluation survey

8. Appendix B

Table B.1: Effect of Remittances on school enrollment (alternative IV specification)

VARIABLES	(1) IV 2SLS Children 7 -12	(2) IV 2SLS Children 13 -17
Remittances	-0.1151***	-0.2277*
	(0.0436)	(0.1269)
Child sex (male=1)	0.0010	-0.0139
	(0.0065)	(0.0199)
Child age	0.1082***	-0.1118***
	(0.0253)	(0.0073)
Child age squared	-0.0054***	
	(0.0013)	
Eldest child (=1)	0.0147*	0.0561**
	(0.0083)	(0.0220)
H. head age	-0.0015	0.0119*
	(0.0018)	(0.0071)
H. head age squared	0.0000	-0.0001
	(0.0000)	(0.0001)
H. head sex (male=1)	-0.0199**	-0.0836***
	(0.0098)	(0.0302)
H. head married	0.0064	0.0517*
	(0.0098)	(0.0305)
H. head literacy (literate=1)	0.0100	0.0796***
	(0.0075)	(0.0233)
H. dependency ratio	-0.0078	-0.0514
	(0.0339)	(0.1039)
H. uses agri. Land (yes=1)	-0.0051	-0.0445
	(0.0091)	(0.0314)
H. wealth index score	0.0131***	0.0360***
	(0.0035)	(0.0101)
Sch. grades in municip.[(a)]	0.0017***	-0.0023
	(0.0006)	(0.0017)
Municip Adult unempl. Rate	-0.5636**	0.3445
	(0.2829)	(0.8410)
Constant	0.4883***	2.1880***
	(0.1307)	(0.2252)
Observations	3,406	1,843
Sargan overid. test (p-value)	0.5893	0.4241

(a) Number of school grades in the municipality per 1000 inhabitants. Fixed effects for municipality groups in the CSR program included. Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table B.2: Effect of the migration of a household member on school enrollment

VARIABLES	(1) *Probit* - Margins Children 7 - 12	(2) IV 2SLS Children 7 -12	(3) *Probit* - Margins Children 13 - 17	(4) IV - 2SLS Children 13 -17
Migration	0.0230	-0.0559	0.0217	-0.1701
	(0.1234)	(0.0428)	(0.0847)	(0.1091)
Child sex (male=1)	0.0166	0.0011	-0.0380	-0.0176
	(0.0867)	(0.0058)	(0.0668)	(0.0246)
Child age	1.2140***	0.1045***	-0.4311	-0.1109***
	(0.3271)	(0.0247)	(0.6154)	(0.0073)
Child age squared	-0.0608***	-0.0052***	0.0025	
	(0.0173)	(0.0013)	(0.0205)	
Eldest child (=1)	0.1495	0.0105*	0.1943***	0.0519**
	(0.1136)	(0.0061)	(0.0749)	(0.0213)
H. head age	-0.0351	-0.0013	0.0289	0.0125
	(0.0246)	(0.0021)	(0.0232)	(0.0085)
H. head age squared	0.0003	0.0000	-0.0003	-0.0001
	(0.0002)	(0.0000)	(0.0002)	(0.0001)
H. head sex (male=1)	-0.0419	-0.0126	-0.1569*	-0.0824**
	(0.1021)	(0.0095)	(0.0813)	(0.0341)
H. head married	0.0262	0.0049	0.1342	0.0489
	(0.1272)	(0.0136)	(0.0989)	(0.0313)
H. head literacy (literate=1)	0.1404	0.0125	0.3141***	0.0874***
	(0.0946)	(0.0091)	(0.0719)	(0.0252)
H. dependency ratio	-0.8715**	-0.0381	-0.5617*	-0.0931
	(0.3790)	(0.0375)	(0.2928)	(0.1016)
H. uses agri. Land (yes=1)	0.0416	-0.0024	-0.1170	-0.0319
	(0.1153)	(0.0100)	(0.1058)	(0.0324)
H. wealth index score	0.0665***	0.0087**	0.0702***	0.0315***
	(0.0253)	(0.0037)	(0.0188)	(0.0089)
Sch. grades in municip.[(a)]	0.0170**	0.0014***	-0.0119**	-0.0021
	(0.0085)	(0.0005)	(0.0053)	(0.0017)
Municip Adult unempl. Rate	-6.1430*	-0.6095	1.2469	0.3211
	(3.4277)	(0.4140)	(2.7825)	(1.0175)
Constant	-2.4955	0.5105***	6.3391	2.1714***
	(1.6700)	(0.1204)	(4.6753)	(0.2606)
Observations	3,406	3,406	1,843	1,843

(a) Number of school grades in the municipality per 1000 inhabitants. Fixed effects for municipality groups in the CSR program included. Clustered standard errors at *cantón* level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table B.3: Effect of the migration of a household member on school enrollment (Alternative IV specification)

VARIABLES	(1) IV 2SLS Children 7 -12	(2) IV 2SLS Children 13 -17
Migration	-0.1285**	-0.2410*
	(0.0523)	(0.1370)
Child sex (male=1)	0.0005	-0.0192
	(0.0065)	(0.0201)
Child age	0.1084***	-0.1111***
	(0.0255)	(0.0073)
Child age squared	-0.0054***	
	(0.0013)	
Eldest child (=1)	0.0139*	0.0510**
	(0.0082)	(0.0220)
H. head age	-0.0000	0.0138*
	(0.0020)	(0.0074)
H. head age squared	0.0000	-0.0001
	(0.0000)	(0.0001)
H. head sex (male=1)	-0.0246**	-0.0960***
	(0.0115)	(0.0353)
H. head married	0.0069	0.0526*
	(0.0099)	(0.0307)
H. head literacy (literate=1)	0.0092	0.0842***
	(0.0077)	(0.0225)
H. dependency ratio	-0.0044	-0.0665
	(0.0360)	(0.0998)
H. uses agri. Land (yes=1)	-0.0066	-0.0314
	(0.0094)	(0.0307)
H. wealth index score	0.0135***	0.0361***
	(0.0039)	(0.0102)
Sch. grades in municip.[(a)]	0.0019***	-0.0016
	(0.0006)	(0.0019)
Municip Adult unempl. Rate.	-0.5966**	0.3200
	(0.2834)	(0.8404)
Constant	0.4484***	2.1259***
	(0.1361)	(0.2360)
Observations	3,406	1,843
Sargan overidentification test (p-value)	0.2809	0.3809

(a) Number of school grades in the municipality per 1000 inhabitants. Fixed effects for municipality groups in the CSR program included. Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

9. Appendix C

Table C.1: School enrollment and children's participation in domestic work (*Probit* regressions)

VARIABLES	(1) Boys and Girls 7 - 17	(2) Boys and Girls 7 - 12	(3) Boys and Girls 13 - 17	(4) Girls 7 - 17	(5) Boys 7 - 17
Light work	0.1113***	0.0242	-0.0337	0.3059***	-0.0121
	(0.0371)	(0.0535)	(0.0540)	(0.0646)	(0.0444)
Non-light work	-0.2991***	-0.1589**	-0.5167***	-0.2830***	0.0073
	(0.0424)	(0.0793)	(0.0613)	(0.0632)	(0.0717)
Child sex (male=1)	0.0176	-0.0662	0.0151		
	(0.0332)	(0.0522)	(0.0441)		
Child age	-0.2382***	0.0670***	-0.3953***	-0.2527***	-0.2188***
	(0.0070)	(0.0168)	(0.0137)	(0.0101)	(0.0098)
H. Head age	0.0486***	-0.0075	0.0665***	0.0779***	0.0039
	(0.0067)	(0.0137)	(0.0083)	(0.0086)	(0.0111)
H. Head age squared	-0.0005***	0.0000	-0.0006***	-0.0007***	-0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
H. head sex (male=1)	-0.0824**	0.0072	-0.1307***	-0.1179**	-0.0380
	(0.0352)	(0.0594)	(0.0456)	(0.0507)	(0.0499)
H. head married	0.0585	-0.1347*	0.1388**	0.0524	0.0755
	(0.0444)	(0.0738)	(0.0580)	(0.0631)	(0.0625)
H. head literacy (literate=1)	0.1447***	0.1261**	0.1647***	0.1165**	0.1696***
	(0.0322)	(0.0556)	(0.0414)	(0.0461)	(0.0447)
H. dependency ratio	-0.1530	-0.4998**	-0.1154	0.1711	-0.5102***
	(0.1228)	(0.2140)	(0.1582)	(0.1794)	(0.1698)
H. uses agri. Land (yes=1)	-0.0253	0.1224*	-0.0889	-0.0337	-0.0232
	(0.0423)	(0.0654)	(0.0560)	(0.0565)	(0.0647)
H. wealth index score)	0.0626***	0.0605***	0.0632***	0.0638***	0.0571***
	(0.0080)	(0.0152)	(0.0101)	(0.0112)	(0.0117)
Sch. grades in municip.[(a)]	-0.0015	0.0099**	-0.0063**	0.0072**	-0.0090***
	(0.0024)	(0.0044)	(0.0031)	(0.0033)	(0.0034)
Municip. Adult unemp. Rate	2.8030***	0.9347	3.7892***	3.2104***	2.5024**
	(0.7946)	(1.1239)	(1.0316)	(1.1239)	(1.1201)
CSR group 2	-0.0524	-0.1551	-0.0585	-0.0692	-0.0384
	(0.0483)	(0.0995)	(0.0609)	(0.0649)	(0.0726)
CSR group 3	-0.2413***	-0.4132***	-0.2120***	-0.1383**	-0.3499***
	(0.0451)	(0.0906)	(0.0572)	(0.0619)	(0.0655)
CSR group 4	-0.2335***	-0.4469***	-0.1753***	-0.0986	-0.3569***
	(0.0494)	(0.0950)	(0.0632)	(0.0696)	(0.0706)
Survey round 2	0.0139	0.1573***	-0.1254***	0.0288	0.0186
	(0.0357)	(0.0564)	(0.0454)	(0.0512)	(0.0507)
Survey round 3	0.1794***	0.4987***	-0.0367	0.1929***	0.2023***
	(0.0375)	(0.0681)	(0.0491)	(0.0549)	(0.0520)
Survey round 4	0.2432***	0.7182***	0.0208	0.1682***	0.3575***
	(0.0382)	(0.0819)	(0.0506)	(0.0542)	(0.0553)
Constant	3.0954***	1.6570***	5.3161***	2.1029***	4.3680***
	(0.2171)	(0.3922)	(0.3414)	(0.2910)	(0.3426)
Observations	21,435	13,537	7,898	10,633	10,802

(a) Number of school grades in the municipality per 1000 inhabitants. Clustered standard errors at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.2: School enrollment and children's participation in non-domestic work (*Probit* regressions)

VARIABLES	(1) Boys and Girls 7 - 17	(2) Boys and Girls 7 - 12	(3) Boys and Girls 13 - 17	(4) Girls 7 - 17	(5) Boys 7 - 17
Light work	-0.1117**	-0.2293	-0.1417**	-0.1725**	-0.1823***
	(0.0499)	(0.1572)	(0.0585)	(0.0767)	(0.0685)
Non-light work	-0.6543***	-0.4436***	-0.8488***	-0.4596***	-0.8529***
	(0.0386)	(0.0919)	(0.0501)	(0.0702)	(0.0474)
Child sex (male=1)	0.3403***	-0.0131	0.5971***		
	(0.0354)	(0.0539)	(0.0476)		
Child age	-0.2222***	0.0773***	-0.3703***	-0.2645***	-0.1600***
	(0.0071)	(0.0174)	(0.0140)	(0.0101)	(0.0105)
H. Head age	0.0544***	-0.0062	0.0767***	0.0795***	0.0082
	(0.0068)	(0.0139)	(0.0085)	(0.0086)	(0.0115)
H. Head age squared	-0.0005***	0.0000	-0.0007***	-0.0008***	-0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
H. head sex (male=1)	-0.0807**	0.0086	-0.1364***	-0.1190**	-0.0365
	(0.0354)	(0.0599)	(0.0458)	(0.0498)	(0.0515)
H. head married	0.0418	-0.1457**	0.1323**	0.0388	0.0632
	(0.0446)	(0.0740)	(0.0589)	(0.0627)	(0.0641)
H. head literacy (literate=1)	0.1360***	0.1277**	0.1483***	0.1206***	0.1519***
	(0.0323)	(0.0560)	(0.0419)	(0.0458)	(0.0459)
H. dependency ratio	-0.0212	-0.4619**	0.0860	0.1764	-0.2240
	(0.1242)	(0.2173)	(0.1614)	(0.1772)	(0.1763)
H. uses agri. Land (yes=1)	0.0244	0.1449**	-0.0380	-0.0460	0.1368**
	(0.0428)	(0.0660)	(0.0580)	(0.0554)	(0.0681)
H. wealth index score)	0.0627***	0.0586***	0.0666***	0.0710***	0.0545***
	(0.0081)	(0.0153)	(0.0101)	(0.0111)	(0.0119)
Sch. grades in municip.[(a)]	-0.0002	0.0097**	-0.0037	0.0055*	-0.0058
	(0.0024)	(0.0046)	(0.0031)	(0.0033)	(0.0036)
Municip. Adult unemp. Rate	2.3779***	1.0183	2.9202***	3.6226***	0.9944
	(0.8154)	(1.1383)	(1.0727)	(1.1225)	(1.1840)
CSR group 2	-0.0347	-0.1576	-0.0331	-0.0509	-0.0140
	(0.0491)	(0.1031)	(0.0608)	(0.0639)	(0.0771)
CSR group 3	-0.2483***	-0.4201***	-0.2205***	-0.1657***	-0.3435***
	(0.0453)	(0.0915)	(0.0574)	(0.0613)	(0.0672)
CSR group 4	-0.2270***	-0.4575***	-0.1558**	-0.1215*	-0.3538***
	(0.0496)	(0.0958)	(0.0635)	(0.0691)	(0.0720)
Survey round 2	0.0467	0.1932***	-0.1359***	0.0540	0.0600
	(0.0371)	(0.0561)	(0.0485)	(0.0512)	(0.0551)
Survey round 3	0.1994***	0.5351***	-0.0664	0.1894***	0.2341***
	(0.0386)	(0.0691)	(0.0516)	(0.0545)	(0.0559)
Survey round 4	0.3041***	0.7631***	0.0451	0.2114***	0.4582***
	(0.0395)	(0.0829)	(0.0532)	(0.0543)	(0.0594)
Constant	2.5678***	1.4694***	4.3268***	2.3153***	3.4753***
	(0.2156)	(0.3918)	(0.3435)	(0.2898)	(0.3484)
Observations	21,244	13,475	7,769	10,599	10,645

(a) Number of school grades in the municipality per 1000 inhabitants. Clustered standard errors at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.3: Domestic work and time spent by children on school homework (Tobit regressions)

VARIABLES	(1) Boys and Girls 7 - 17	(2) Boys and Girls 7 - 12	(3) Boys and Girls 13 - 17	(4) Girls 7 - 17	(5) Boys 7 - 17
Light work	-0.2572**	-0.2346**	-0.5851**	0.1234	-0.5475***
	(0.1012)	(0.1102)	(0.2477)	(0.1585)	(0.1323)
Non-light work	-0.2964*	0.1917	-1.3251***	-0.2743	-0.0492
	(0.1667)	(0.2087)	(0.3138)	(0.2232)	(0.2871)
Child sex (male=1)	-0.3058***	-0.0986	-0.9123***		
	(0.0919)	(0.1031)	(0.1913)		
Child age	0.1151***	0.1793***	-0.0157	0.1594***	0.0770***
	(0.0185)	(0.0312)	(0.0712)	(0.0279)	(0.0247)
H. Head age	-0.0475**	-0.0745***	0.0348	-0.0745**	-0.0201
	(0.0239)	(0.0257)	(0.0564)	(0.0341)	(0.0336)
H. Head age squared	0.0004	0.0006**	-0.0003	0.0007**	0.0001
	(0.0002)	(0.0003)	(0.0006)	(0.0003)	(0.0003)
H. head sex (male=1)	-0.4329***	-0.4329***	-0.4515**	-0.4411***	-0.4358***
	(0.1121)	(0.1278)	(0.2230)	(0.1632)	(0.1546)
H. head married	0.0011	-0.0748	0.2158	-0.0042	0.0221
	(0.1388)	(0.1580)	(0.2733)	(0.1955)	(0.1966)
H. head literacy (literate=1)	0.2113**	0.1083	0.4358**	0.1818	0.2378*
	(0.0967)	(0.1115)	(0.1882)	(0.1391)	(0.1345)
H. dependency ratio	-1.2622***	-1.6523***	-0.3286	-1.2124**	-1.2767**
	(0.3821)	(0.4370)	(0.7609)	(0.5455)	(0.5344)
H. uses agri. Land (yes=1)	-0.4920***	-0.3714**	-0.7802***	-0.3550**	-0.6277***
	(0.1277)	(0.1450)	(0.2656)	(0.1779)	(0.1834)
H. wealth index score)	0.1059***	0.0765***	0.1741***	0.1305***	0.0728**
	(0.0220)	(0.0250)	(0.0440)	(0.0326)	(0.0298)
Sch. grades in municip.[(a)]	-0.0286***	-0.0260***	-0.0335**	-0.0246***	-0.0333***
	(0.0067)	(0.0076)	(0.0132)	(0.0094)	(0.0096)
Municip. Adult unemp. Rate	16.3673***	17.4059***	14.1451***	19.4171***	13.4937***
	(2.7266)	(3.1612)	(5.3004)	(4.0461)	(3.6832)
CSR group 2	-0.2911**	-0.4611***	0.0810	-0.1849	-0.4133**
	(0.1368)	(0.1595)	(0.2589)	(0.1960)	(0.1902)
CSR group 3	-0.5123***	-0.6197***	-0.2841	-0.4449**	-0.5854***
	(0.1319)	(0.1529)	(0.2529)	(0.1887)	(0.1843)
CSR group 4	0.1619	0.1830	0.1140	0.1364	0.1955
	(0.1453)	(0.1688)	(0.2775)	(0.2088)	(0.2012)
Survey round 2	1.4386***	1.0449***	2.4759***	1.4976***	1.3777***
	(0.1460)	(0.1685)	(0.2904)	(0.2104)	(0.2029)
Survey round 3	0.8042***	0.4999***	1.5823***	0.8771***	0.7518***
	(0.1397)	(0.1583)	(0.2842)	(0.2038)	(0.1939)
Survey round 4	0.6881***	0.3484**	1.5825***	0.4660**	-0.5475***
	(0.1428)	(0.1654)	(0.2786)	(0.2030)	(0.1323)
Constant	7.5143***	7.9875***	6.5165***	7.0887***	7.4751***
	(0.7024)	(0.7965)	(1.8775)	(0.9883)	(1.0016)
Observations	18,797	13,074	5,723	9,181	9,616

(a) Number of school grades in the municipality per 1000 inhabitants. Standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table C.4: non-domestic work and time spent by children on school homework (Tobit regressions)

VARIABLES	(1) Boys and Girls 7 - 17	(2) Boys and Girls 7 - 12	(3) Boys and Girls 13 - 17	(4) Girls 7 - 17	(5) Boys 7 - 17
Light work	-0.4767**	-0.3878	-0.6293**	-0.7260**	-0.3303
	(0.2076)	(0.3492)	(0.2747)	(0.3516)	(0.2621)
Non-light work	-0.8923***	-0.4339**	-1.2745***	-1.0910***	-0.7902***
	(0.1563)	(0.2141)	(0.2398)	(0.3785)	(0.1810)
Child sex (male=1)	-0.1135	-0.0615	-0.1991		
	(0.0913)	(0.1022)	(0.1948)		
Child age	0.1344***	0.1808***	0.0353	0.1626***	0.1017***
	(0.0184)	(0.0304)	(0.0716)	(0.0256)	(0.0267)
H. Head age	-0.0499**	-0.0755***	0.0356	-0.0758**	-0.0271
	(0.0237)	(0.0255)	(0.0563)	(0.0341)	(0.0331)
H. Head age squared	0.0004*	0.0006**	-0.0004	0.0007**	0.0001
	(0.0002)	(0.0003)	(0.0006)	(0.0003)	(0.0003)
H. head sex (male=1)	-0.3873***	-0.3966***	-0.3706*	-0.4218***	-0.3698**
	(0.1120)	(0.1279)	(0.2220)	(0.1635)	(0.1545)
H. head married	0.0045	-0.0364	0.1284	-0.0339	0.0535
	(0.1372)	(0.1562)	(0.2716)	(0.1951)	(0.1928)
H. head literacy (literate=1)	0.1871*	0.0876	0.4144**	0.1809	0.1955
	(0.0964)	(0.1113)	(0.1876)	(0.1390)	(0.1340)
H. dependency ratio	-1.2537***	-1.6293***	-0.3307	-1.2232**	-1.3065**
	(0.3807)	(0.4368)	(0.7655)	(0.5448)	(0.5311)
H. uses agri. Land (yes=1)	-0.4364***	-0.3593**	-0.6529**	-0.3476*	-0.5353***
	(0.1288)	(0.1457)	(0.2713)	(0.1783)	(0.1866)
H. wealth index score)	0.1112***	0.0807***	0.1887***	0.1366***	0.0849***
	(0.0219)	(0.0248)	(0.0439)	(0.0325)	(0.0296)
Sch. grades in municip.[(a)]	-0.0260***	-0.0248***	-0.0273**	-0.0252***	-0.0282***
	(0.0067)	(0.0076)	(0.0133)	(0.0095)	(0.0096)
Municip. Adult unemp. Rate	16.1944***	17.5253***	13.3865**	19.3719***	13.3278***
	(2.7363)	(3.1748)	(5.3271)	(4.0649)	(3.6910)
CSR group 2	-0.3072**	-0.4255***	-0.0406	-0.1520	-0.4635**
	(0.1363)	(0.1598)	(0.2577)	(0.1954)	(0.1897)
CSR group 3	-0.5283***	-0.5938***	-0.3709	-0.4350**	-0.6302***
	(0.1315)	(0.1531)	(0.2529)	(0.1887)	(0.1834)
CSR group 4	0.1362	0.1784	0.0554	0.1312	0.1398
	(0.1445)	(0.1678)	(0.2789)	(0.2088)	(0.1997)
Survey round 2	1.5022***	1.1164***	2.4911***	1.5587***	1.4518***
	(0.1460)	(0.1678)	(0.2937)	(0.2125)	(0.2012)
Survey round 3	0.8923***	0.6066***	1.6173***	0.9729***	0.8315***
	(0.1399)	(0.1578)	(0.2881)	(0.2034)	(0.1932)
Survey round 4	0.7770***	0.4246**	1.6719***	0.5834***	0.9719***
	(0.1432)	(0.1648)	(0.2837)	(0.2020)	(0.2037)
Constant	7.0174***	7.7104***	4.9596***	7.0668***	7.0017***
	(0.7029)	(0.7954)	(1.8812)	(0.9802)	(1.0013)
Observations	18,661	13,015	5,646	9,153	9,508

(a) Number of school grades in the municipality per 1000 inhabitants. Standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table C.5: Children's participation in work activities and female migration (*Probit* regressions)

VARIABLES	(1) Domestic work New migrant	(2) Domestic work Return migrant	(3) Non-domestic work New migrant	(4) Non-domestic work Return migrant
Last migrant sex (female=1)	0.5545*	-0.0624	1.0780***	0.8099**
	(0.3137)	(0.3930)	(0.3747)	(0.3724)
Child sex (female=1)	0.3090	0.1527	-0.8716***	-1.1831***
	(0.2175)	(0.2405)	(0.2470)	(0.2833)
(Last migrant sex)*(Child sex)	-0.0966	0.6653	-1.0539*	-0.1559
	(0.4335)	(0.4621)	(0.5380)	(0.5227)
Child age	0.1384***	0.1821***	0.2159***	0.2640***
	(0.0320)	(0.0388)	(0.0396)	(0.0454)
Eldest child	0.2546	0.2866	0.1363	-0.1996
	(0.2188)	(0.2509)	(0.2692)	(0.3187)
H. Head age	0.0313	-0.0153	0.0212	0.0705
	(0.0655)	(0.0595)	(0.0730)	(0.0744)
H. Head age squared	-0.0005	-0.0001	-0.0006	-0.0009
	(0.0007)	(0.0006)	(0.0007)	(0.0007)
H. head sex (male=1)	0.2665	-0.2001	-0.0486	-0.4234
	(0.2901)	(0.2845)	(0.3552)	(0.3006)
H. head married	0.2191	0.8123***	0.1894	0.2802
	(0.2904)	(0.3104)	(0.3538)	(0.3842)
H. head literacy (literate=1)	-0.1324	-0.1986	-0.2016	0.2658
	(0.2271)	(0.2791)	(0.2545)	(0.2780)
H. dependency ratio	1.0987	1.6108	0.5343	2.8128**
	(0.7001)	(1.0215)	(0.9068)	(1.1124)
H. uses agri. Land (yes=1)	0.0061	-0.2214	1.8145***	0.1136
	(0.2736)	(0.5076)	(0.3861)	(0.6812)
H. wealth index score)	-0.0307	0.0081	-0.0965	0.0457
	(0.0529)	(0.0592)	(0.0632)	(0.0729)
Sch. grades in municip.[(a)]	0.0089	-0.0257	0.0148	-0.0094
	(0.0182)	(0.0229)	(0.0218)	(0.0238)
Municip. Adult unemp. Rate	2.4536	-1.6922	2.3299	1.3962
	(7.3641)	(7.7554)	(9.6573)	(8.0400)
CSR group 2	-0.2703	0.5591	1.0574***	-0.5428
	(0.2774)	(0.3561)	(0.3348)	(0.3544)
CSR group 3	0.1231	-0.1485	0.2696	-0.3801
	(0.2785)	(0.3256)	(0.3326)	(0.3648)
CSR group 4	-0.3510	-0.7391**	0.7431*	-0.7484**
	(0.3190)	(0.3185)	(0.4228)	(0.3218)
Survey round 2	0.5496		-1.7298**	
	(0.6474)		(0.7069)	
Survey round 3	0.9047	-0.2497	-1.0187	0.2971
	(0.6559)	(0.2680)	(0.6991)	(0.3036)
Survey round 4	0.5065	0.5471*	-1.3416*	0.7132**
	(0.7078)	(0.2905)	(0.7627)	(0.2965)
Constant	-3.4604*	-1.3261	-3.9967*	-6.5075***
	(1.9400)	(1.9447)	(2.1736)	(2.4895)
Observations	240	220	237	218

(a) Number of school grades in the municipality per 1000 inhabitants. Clustered standard errors at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.6: Hours worked by children and female migration (Tobit regressions)

VARIABLES	(1) Domestic work New migrant	(3) Domestic work Return migrant	(5) Non-domestic work New migrant	(7) Non-domestic work Return migrant
Last migrant sex (female=1)	4.3872	5.5497	14.1369**	19.8975***
	(3.3415)	(4.0383)	(5.5846)	(7.0289)
Child sex (female=1)	11.2141***	7.7827***	-18.3602***	-21.8324***
	(2.3901)	(2.5313)	(4.6860)	(5.3042)
(Last migrant sex)*(Child sex)	-1.6544	-3.3800	-13.7431	-12.5811
	(4.2305)	(5.1159)	(8.7091)	(11.1327)
Child age	1.9935***	1.9592***	4.0470***	5.1057***
	(0.3358)	(0.3821)	(0.6936)	(0.8852)
Eldest child	3.4731	2.0382	-2.2118	-4.9919
	(2.3605)	(2.7141)	(4.5154)	(6.1439)
H. Head age	0.1931	0.3908	0.6192	1.3038
	(0.6760)	(0.6587)	(1.5783)	(1.4509)
H. Head age squared	-0.0040	-0.0040	-0.0130	-0.0171
	(0.0067)	(0.0062)	(0.0158)	(0.0135)
H. head sex (male=1)	4.9874	0.6849	-2.8114	-7.2939
	(3.1073)	(2.9472)	(5.9344)	(5.8682)
H. head married	3.9247	6.6897*	-2.2087	4.2830
	(3.1414)	(3.4378)	(5.9406)	(6.8976)
H. head literacy (literate=1)	-3.5615	-3.7678	-2.1675	4.1414
	(2.3080)	(2.9221)	(4.6693)	(6.1068)
H. dependency ratio	13.7418*	28.1384***	11.7255	34.8005
	(7.7325)	(10.5403)	(14.8863)	(21.7420)
H. uses agri. Land (yes=1)	-2.2431	-2.1871	33.2920***	1.8732
	(2.7387)	(5.0513)	(7.1470)	(11.2303)
H. wealth index score)	-1.2532**	0.0442	-1.7287	-0.2394
	(0.5723)	(0.6775)	(1.0888)	(1.3758)
Sch. grades in municip.[(a)]	0.4527**	-0.1899	0.4989	0.0375
	(0.1903)	(0.2225)	(0.3535)	(0.4600)
Municip. Adult unemp. Rate	-14.8385	13.9600	-92.5124	10.0820
	(79.9608)	(85.0410)	(170.7526)	(166.0222)
CSR group 2	-3.8953	-3.1586	20.2912***	-10.2754
	(2.8993)	(3.3782)	(6.3818)	(6.6788)
CSR group 3	1.3258	-2.5016	11.1664*	-5.9468
	(2.9821)	(3.2798)	(6.2974)	(6.6086)
CSR group 4	-1.4245	-7.0669**	26.4664***	-10.3769
	(3.5978)	(3.2205)	(7.3893)	(6.4318)
Survey round 2	-11.8923		-24.0584**	
	(7.2921)		(10.8900)	
Survey round 3	-8.3427	-6.0867**	-16.0822	6.3671
	(7.4397)	(2.9676)	(11.1725)	(6.3354)
Survey round 4	-13.6697*	-3.0209	-19.7682	9.7694
	(8.0833)	(2.9449)	(12.5454)	(6.1366)
Constant	-32.7089	-39.0193*	-86.4885*	-115.0338**
	(20.1041)	(20.1337)	(44.9558)	(47.4788)
Observations	237	220	237	218

(a) Number of school grades in the municipality per 1000 inhabitants. Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table C. 7: Female participation in non-domestic work activities (*Probit* regression)

VARIABLES	(1) *Female participation in non-domestic work*
Proportion of adult males in household	-0.4151***
	(0.1543)
Age	0.0180***
	(0.0012)
Household head age	-0.0011
	(0.0049)
Household head age squared	-0.0001*
	(0.0001)
Household head sex (male=1)	0.0270
	(0.0299)
Household head marital status (married=1)	-0.2126***
	(0.0374)
Household head literacy (=1)	-0.0230
	(0.0269)
Household dependency ratio	0.7857***
	(0.1102)
Household owns agricultural land	0.2906***
	(0.0314)
Household wealth index	0.0264***
	(0.0062)
Municipality adult unemployment rate	-4.4838***
	(0.6148)
Observations	14,243

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

Table C.8: Children's participation in work activities and parental migration (*Probit* regressions)

VARIABLES	(1) Domestic work New migrant	(3) Domestic work Return migrant	(5) Non-domestic work New migrant	(7) Non-domestic work Return migrant
Parental migration	0.0885	-0.1571	-0.1005	0.4107
	(0.3064)	(0.3585)	(0.4012)	(0.4134)
Child's sex (male=1)	-0.2990	-0.2622	0.8636**	1.3977***
	(0.2919)	(0.2927)	(0.3607)	(0.3526)
(Parent. migration)*(Child's sex)	0.0903	-0.1079	0.4778	-0.2807
	(0.3754)	(0.4205)	(0.4727)	(0.4586)
Child age	0.1299***	0.1754***	0.1912***	0.2518***
	(0.0311)	(0.0374)	(0.0375)	(0.0443)
Eldest child	0.2942	0.3224	0.2286	-0.1200
	(0.2206)	(0.2492)	(0.2645)	(0.3113)
H. Head age	0.0104	0.0244	-0.0028	0.0620
	(0.0679)	(0.0693)	(0.0819)	(0.0751)
H. Head age squared	-0.0002	-0.0004	-0.0003	-0.0007
	(0.0007)	(0.0006)	(0.0008)	(0.0007)
H. head sex (male=1)	0.3277	-0.2389	0.0947	-0.3093
	(0.2974)	(0.2927)	(0.3496)	(0.2931)
H. head married	0.1846	0.8477***	0.0817	0.3219
	(0.3074)	(0.3119)	(0.3540)	(0.3594)
H. head literacy (literate=1)	-0.1053	-0.2592	-0.1624	0.2153
	(0.2284)	(0.2881)	(0.2572)	(0.2701)
H. dependency ratio	1.3323*	1.6305	0.9559	2.8831**
	(0.6867)	(1.0413)	(0.8538)	(1.1896)
H. uses agri. Land (yes=1)	-0.0017	-0.4432	1.7210***	-0.1852
	(0.2792)	(0.5026)	(0.4023)	(0.6658)
H. wealth index score)	-0.0288	0.0092	-0.0870	0.0338
	(0.0529)	(0.0600)	(0.0611)	(0.0678)
Sch. grades in municip.[(a)]	0.0104	-0.0209	0.0124	0.0005
	(0.0186)	(0.0226)	(0.0217)	(0.0232)
Municip. Adult unemp. Rate	3.6097	-1.3993	2.4157	0.8768
	(7.3349)	(7.6532)	(10.3034)	(8.0532)
CSR group 2	-0.2755	0.5558	0.9817***	-0.3812
	(0.2701)	(0.3586)	(0.3198)	(0.3440)
CSR group 3	0.1726	-0.1869	0.2772	-0.2783
	(0.2750)	(0.3205)	(0.3299)	(0.3657)
CSR group 4	-0.4017	-0.7459**	0.4900	-0.6633**
	(0.3281)	(0.3262)	(0.4425)	(0.3309)
Survey round 2	0.7733		-1.3411*	
	(0.6584)		(0.7850)	
Survey round 3	1.0748	-0.3314	-0.6048	0.1253
	(0.6627)	(0.2560)	(0.7766)	(0.3019)
Survey round 4	0.8887	0.4817*	-0.7079	0.5670*
	(0.7201)	(0.2750)	(0.8264)	(0.2958)
Constant	-3.0689	-1.8633	-4.5821**	-7.6318***
	(1.9574)	(2.0634)	(2.2308)	(2.4836)
Observations	237	220	234	218

(a) Number of school grades in the municipality per 1000 inhabitants. Clustered standard errors at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.9: Hours worked by children and parental migration (Tobit regressions)

VARIABLES	(1) Domestic work New migrant	(3) Domestic work Return migrant	(5) Non-domestic work New migrant	(7) Non-domestic work Return migrant
Parental migration	3.4566	1.2396	-7.0320	1.7902
	(3.4057)	(3.6208)	(7.0544)	(8.5449)
Child's sex (male=1)	-9.8409***	-7.6580**	15.5789**	22.9330***
	(3.1180)	(3.0747)	(6.2176)	(6.8816)
(Parent. migration)*(Child's sex)	-1.2641	1.4775	11.5668	6.1397
	(4.0191)	(4.4051)	(7.8958)	(9.2587)
Child age	1.9565***	1.9277***	3.7378***	4.9873***
	(0.3372)	(0.3766)	(0.6709)	(0.8820)
Eldest child	3.6168	2.2165	-1.0857	-4.5197
	(2.4040)	(2.6982)	(4.5952)	(6.2154)
H. Head age	-0.1859	0.2901	0.4622	0.9580
	(0.7438)	(0.6991)	(1.6958)	(1.5323)
H. Head age squared	-0.0002	-0.0024	-0.0103	-0.0109
	(0.0072)	(0.0065)	(0.0169)	(0.0140)
H. head sex (male=1)	5.3350*	0.9375	0.3592	-5.3969
	(3.1316)	(2.9689)	(5.9395)	(5.9850)
H. head married	4.0931	6.9253**	-5.0050	4.6161
	(3.2717)	(3.4288)	(6.2338)	(7.0538)
H. head literacy (literate=1)	-2.9398	-3.6448	-2.3617	3.2152
	(2.4124)	(2.9485)	(4.8032)	(6.2478)
H. dependency ratio	16.1621**	29.1977***	17.1291	38.5576*
	(7.6432)	(10.9110)	(14.9234)	(23.2749)
H. uses agri. Land (yes=1)	-2.6062	-3.0186	33.3600***	-1.4107
	(2.8219)	(4.9498)	(7.1832)	(11.4298)
H. wealth index score)	-1.3069**	0.0232	-1.6236	-0.3256
	(0.5872)	(0.6781)	(1.1161)	(1.3876)
Sch. grades in municip.[(a)]	0.4422**	-0.1636	0.4443	0.1576
	(0.1945)	(0.2202)	(0.3629)	(0.4716)
Municip. Adult unemp. Rate	3.5155	9.8178	-60.3977	-4.5418
	(81.6422)	(85.2410)	(174.9641)	(172.9779)
CSR group 2	-3.7355	-2.7556	19.4210***	-7.4144
	(2.9666)	(3.3911)	(6.4245)	(6.7297)
CSR group 3	1.6371	-2.5413	11.7602*	-5.4209
	(3.0037)	(3.2979)	(6.3640)	(6.7727)
CSR group 4	-2.5096	-7.1798**	23.7248***	-10.5273
	(3.7294)	(3.2878)	(7.5360)	(6.9189)
Survey round 2	-9.5759		-20.1202*	
	(7.4614)		(11.0431)	
Survey round 3	-6.3524	-6.7778**	-10.2895	2.5675
	(7.5571)	(2.9008)	(11.1025)	(6.2869)
Survey round 4	-9.8216	-3.6445	-12.2198	7.0262
	(8.2401)	(2.9097)	(12.6636)	(6.2879)
Constant	-17.9298	-30.1129	-102.0122**	-133.2790***
	(20.7251)	(20.0157)	(46.8475)	(48.7327)
Observations	234	220	234	218

(a) Number of school grades in the municipality per 1000 inhabitants. Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table C.10: Remittance reception and children's probability of working (*Probit* regressions)

VARIABLES	(1) Domestic work New migrant	(3) Domestic work Return migrant	(5) Non-domestic work New migrant	(7) Non-domestic work Return migrant
Remittances	-0.1904	-0.1065	0.6390*	-0.0162
	(0.2775)	(0.4015)	(0.3624)	(0.5928)
Child's sex (male=1)	-0.4455	-0.2516	1.2424***	1.2524***
	(0.3013)	(0.2179)	(0.3634)	(0.2489)
(Remit.)*(Child's sex)	0.2410	-0.6495	-0.1717	-0.2073
	(0.3599)	(0.6467)	(0.4278)	(0.7379)
Child age	0.1251***	0.1729***	0.1888***	0.2502***
	(0.0288)	(0.0382)	(0.0341)	(0.0436)
Eldest child	0.3083	0.4029	0.1124	-0.1523
	(0.2065)	(0.2559)	(0.2417)	(0.3016)
H. Head age	0.0383	0.0103	-0.0278	0.0933
	(0.0619)	(0.0587)	(0.0645)	(0.0709)
H. Head age squared	-0.0004	-0.0002	-0.0000	-0.0009
	(0.0006)	(0.0005)	(0.0006)	(0.0006)
H. head sex (male=1)	0.1794	-0.2234	0.1013	-0.3603
	(0.2568)	(0.2891)	(0.3138)	(0.2943)
H. head married	0.1815	0.6400**	0.0016	0.3385
	(0.2639)	(0.3086)	(0.3003)	(0.3565)
H. head literacy (literate=1)	-0.1851	-0.2366	0.0140	0.1863
	(0.2019)	(0.2824)	(0.2301)	(0.2673)
H. dependency ratio	1.2232**	1.4886	0.4851	2.5621**
	(0.6223)	(1.0222)	(0.7760)	(1.1197)
H. uses agri. Land (yes=1)	0.0611	-0.4559	1.8825***	0.1807
	(0.2675)	(0.4904)	(0.3975)	(0.6061)
H. wealth index score)	0.0053	0.0332	-0.1652***	0.0227
	(0.0493)	(0.0595)	(0.0613)	(0.0697)
Sch. grades in municip.[(a)]	0.0123	-0.0202	0.0170	-0.0020
	(0.0162)	(0.0232)	(0.0196)	(0.0235)
Municip. Adult unemp. Rate	-4.3204	-4.1447	4.4636	0.8207
	(6.5075)	(7.5684)	(8.2133)	(8.2053)
CSR group 2	-0.2804	0.5484	0.8703***	-0.3002
	(0.2556)	(0.3418)	(0.3196)	(0.3347)
CSR group 3	0.2169	-0.2250	0.2589	-0.2261
	(0.2487)	(0.3202)	(0.3026)	(0.3596)
CSR group 4	-0.3753	-0.7036**	0.4807	-0.5541*
	(0.2974)	(0.3210)	(0.3918)	(0.3275)
Survey round 2	0.0116		0.1178	
	(0.3753)		(0.4646)	
Survey round 3	0.3312	-0.4269*	0.7509	0.1888
	(0.4104)	(0.2511)	(0.5114)	(0.3001)
Survey round 4	0.0730	0.4659	0.7325	0.7030**
	(0.4770)	(0.2835)	(0.5517)	(0.2958)
Constant	-2.6810	-1.2571	-5.6728***	-8.4509***
	(1.7787)	(1.8795)	(1.9195)	(2.4448)
Observations	276	225	273	223

(a) Number of school grades in the municipality per 1000 inhabitants. Clustered standard errors at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.11: Remittance reception and hours worked by children (Tobit regressions)

VARIABLES	(1) Domestic work New migrant	(3) Domestic work Return migrant	(5) Non-domestic work New migrant	(7) Non-domestic work Return migrant
Remittances	-7.1185**	-3.4345	12.6201*	-4.2643
	(3.0735)	(4.4781)	(6.6863)	(11.9406)
Child's sex (male=1)	-14.8112***	-6.7429***	24.0881***	26.0831***
	(3.5184)	(2.2727)	(6.5482)	(5.2382)
(Remit.)*(Child's sex)	6.1044	-5.5435	-3.3145	-2.3038
	(4.2401)	(7.1711)	(7.8807)	(14.8697)
Child age	1.8693***	1.8628***	3.6741***	5.0642***
	(0.3379)	(0.3717)	(0.6370)	(0.8916)
Eldest child	3.3815	2.7322	-1.8033	-4.8997
	(2.3609)	(2.5755)	(4.2124)	(6.2212)
H. Head age	0.6032	0.4702	-0.1701	1.7607
	(0.7000)	(0.6095)	(1.4973)	(1.5107)
H. Head age squared	-0.0070	-0.0038	-0.0040	-0.0179
	(0.0069)	(0.0058)	(0.0149)	(0.0139)
H. head sex (male=1)	3.9219	0.6944	-1.7530	-5.9854
	(2.9900)	(2.8972)	(5.4672)	(5.9889)
H. head married	4.8209	5.7451*	-3.2006	5.2575
	(3.0924)	(3.3439)	(5.5034)	(7.2234)
H. head literacy (literate=1)	-4.0118*	-3.7526	0.1820	1.8034
	(2.3293)	(2.8592)	(4.3646)	(6.1592)
H. dependency ratio	16.8549**	21.8941**	7.5775	32.3503
	(7.8089)	(9.9810)	(13.9097)	(22.5258)
H. uses agri. Land (yes=1)	-2.3419	-2.7475	35.0967***	2.3969
	(2.9590)	(4.4991)	(7.1427)	(10.6787)
H. wealth index score)	-1.0617*	0.0931	-2.9877***	-0.4088
	(0.6103)	(0.6641)	(1.1321)	(1.4051)
Sch. grades in municip.[(a)]	0.3896*	-0.1552	0.5209	0.1786
	(0.1978)	(0.2191)	(0.3484)	(0.4789)
Municip. Adult unemp. Rate	-55.2379	-2.9369	-58.6630	-2.9991
	(79.0442)	(84.1236)	(152.2996)	(173.0122)
CSR group 2	-3.1971	-1.2557	19.8250***	-4.6859
	(3.0494)	(3.2092)	(6.2019)	(6.6445)
CSR group 3	2.0370	-1.9067	11.8767**	-3.3506
	(2.9581)	(3.1867)	(5.8042)	(6.8768)
CSR group 4	-0.6461	-5.3382*	21.7280***	-6.4594
	(3.7892)	(3.1712)	(6.8114)	(6.6019)
Survey round 2	-5.3791		1.4351	
	(4.4245)		(7.8105)	
Survey round 3	-3.2651	-7.6658***	11.0640	3.5644
	(4.7419)	(2.7900)	(8.2798)	(6.2678)
Survey round 4	-7.9320	-2.9570	10.2477	10.3084
	(5.5370)	(2.8468)	(9.6022)	(6.4504)
Constant	-32.9839	-29.3194	-118.4617***	-158.0902***
	(20.1647)	(18.2709)	(42.2487)	(50.5807)
Observations	273	225	273	223

(a) Number of school grades in the municipality per 1000 inhabitants. Standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Appendix C-II

Interviews with key informants

A series of semi-structured qualitative interviews with key informants were carried on in El Salvador to identify the main challenges returned migrants face in their economic and social reintegration. The interviews were originally part of a larger research project to understand the impacts of a migrant's return on household welfare. The project included a survey of households with recently returned migrants. Unfortunately, the Covid-19 Pandemic made conducting the survey impossible. The qualitative interviews were intended to gain knowledge on the returnees' migration and reintegration experiences and to register the opinions of professionals working for reintegration programs about the main challenges and opportunities for migrants returning to El Salvador. The results of the interviews would help in the design of the household survey and the interpretation of the quantitative results.

The study received ethical clearance from the Research Ethics Committee of the Center for Development Research (ZEF), University of Bonn.

The interviews took place between October 2019 and March 2020. The first step for recruiting participants was identifying governmental and non-governmental organizations implementing reintegration programs for former migrants. Once the organizations were listed, the second step was requesting an interview with staff directly involved with the reintegration program. At least one representative of the following organizations was interviewed: the International Organization for Migration, the United Nations Development Program, the World Food Program, the Salvadoran Ministry of Economic Affairs, the Salvadoran General Directorate of Migration and Foreigners, the Salvadoran Institute for Migrants, and the Center for the Integration of Migrants and Workers.

Requests to interview a sample of the programs' beneficiaries were also made. However, interviews of beneficiaries were only possible in the case of the programs implemented by the World Food Program and the Salvadoran Institute for Migrants. A total of eight program participants were interviewed. Program participants were given a cash stipend worth 10 USD to cover transportation costs.

The interviews with personnel of the programs were conducted face-to-face by the principal author of this dissertation. The main author and three research assistants conducted face-to-face interviews with beneficiaries. One of the research assistants was trained as a phycologist, and the other two were trained as social workers. The research assistants attended a half-day training session to familiarize themselves with the interview protocol and the guide developed by the principal author.

All interviews started by explaining the main objectives of the research and the intended use of the information to be collected. Interviewees were asked to express their consent to participate in the study. The program's staff were asked to communicate their consent orally, while the beneficiaries signed a written consent form. Interviews were conducted in private rooms or a secluded location outdoors and were audio-recorded (previous consent of the interviewee). A translation of the interview guides can be found below.

Interview guide for reintegration program personnel

- In your opinion, how does the forced return affect the well-being of migrants and their families in aspects such as…
    - Financial position of the household (income and debts)?
    - Mental health of migrants and satisfaction with their own life?
- In your opinion, what are the main challenges faced by migrants upon their return to El Salvador to reintegrate into working life?
- In what activities are returned migrants mainly employed?
- What programs are currently being executed to facilitate the return to work of migrants forced to return to El Salvador? Could you tell me the name and objectives of the programs?
- How many returnees use the program(s)?
- Is the amount considered high or low? If it is low, what do you think could be done to increase the number of beneficiaries?
- In your opinion, what determines the returnee's intention to migrate again?

Interview guide for reintegration program beneficiaries

Situation before migration

- What are the main reasons why you decided to emigrate?
- Did you study or work before leaving?
- Did you suffer any threat/violence that motivated you to leave?
- Besides emigrating, did you have other opportunities to improve your quality of life in El Salvador?

Travel experience

- How did you leave?
- Whom did you go with?
- Did you have an adequate diet during your trip?
    - Why do you consider your diet (in)adequate:
- Were you exposed to any type of danger during the journey?
- How many times have you tried to emigrate?
    - Why did you have to emigrate more than once?

Residency experience in the United States

- How was your life in the US?
- How long did you live in the US?
- When you were in the US, did you miss life in El Salvador?
    - Can you elaborate on what did you miss?
- Who did you live within the US?
- Did you study or work in the US?
- Who made up your social circle abroad?
- Did you send remittances to your relatives in El Salvador?

Detention and deportation experience.

- How was the process of your detention?
- What feelings did you experience during your detention?
- In what period did it occur?
- How long were you detained?
- Did you suffer discrimination while in the detention center or shelter?
- Did you have a healthy diet in the detention center or shelter?
- Did the detention center or shelter have optimal conditions for you and the other detained immigrants?

Current life

- How did you get back to El Salvador?
- Did you have a place to go when you returned to El Salvador?
- What were the most significant difficulties you have encountered since your return?

- What has been the area of your life that has been most affected?
- Have you been the victim of any violence or threat after your return?
- Currently, who makes up your social circle?
- When you were back in El Salvador, did you feel emotionally affected?
- How has your household been affected economically due to your return?
- Who is your home made up of?
- Have you had any difficulty reintegrating into working life?
- Have you experienced any episode of discrimination after your return to the country?

Reintegration Program

- How has the reintegration program helped you?
- At the end of the program, what do you think your job opportunities and salary will be?
- Would you change anything within the program?
- Of what you learned in the program, what is going to serve you the most in your work and personal life, and what do you think is not?

Expectations

- Have you thought about resuming your academic studies?
    - Why or why not?
- Is it in your plans to emigrate once again?
    - Why or why not?