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Introduction

This Ph.D. thesis considers and analyses the relevant role of Governmental and Non-Governmental intervention in shaping individual and household economic outcomes in developing countries, with particular attention on children. The first and third chapters are co-authored with my supervisors, Prof. Danilo Cavapozzi and Prof. Teresa Randazzo, while the second chapter is a single-author research.

The first chapter investigates the impact of a public school feeding program, the Indian Mid-Day Meal Scheme, on children’s health and cognitive development in the Indian State of Andhra Pradesh. Utilizing data from the Young Lives Indian Dataset, we leverage the Scheme’s design to determine if cumulative exposure to the Scheme has enhanced health and cognitive outcomes and reduced disparities between children enrolled in public and private schools. Moreover, employing a Heckman Selection model accounting for parental choice on the type of school to enrol the child, we examine whether the results obtained for the population of children attending public schools could be extended to the entire schooling population in the sample. The results of our study demonstrate that the Mid-Day Meal Scheme has successfully improved public school children’s health and cognitive outcomes and contributed to narrowing the existing gaps between children enrolled in different schools. Additionally, we observe that the policy would similarly impact children’s development regardless of the type of school that children attend, emphasising the importance of sustaining the nutritional intake of the entire Indian schooling population. We observe that these results are mainly driven by children living in disadvantaged caste, confirming that School Feeding Programs are most effective for the poorest segment of the population. Our findings also confirm the hypothesis found in the literature that the impact of School Feeding Programs is the largest among younger students, underscoring the importance of early interventions for children’s health and human capital accumulation.

The second chapter examines the economic impact of NGO support on children’s outcomes in Ethiopia, focusing on two crucial determinants of child development: food security and time-use. This study utilizes the Ethiopian Young Lives Dataset to assess how household-level NGO support influences children’s nutritional status

and allocation of time between education and labour. By exploiting the implementation timing of an NGO restrictive law introduced in the country between 2009 and 2010, I employ an instrumental variable approach to address potential endogeneity concerns related to NGO support and household preferences. I observe that children living in families receiving NGO support, although not experiencing improvements in food security measures, substitute time spent on non-income-generating activities (such as caring for other family members) with income-generating activities. Contrary to the literature analysing children’s time allocation in developing countries, I do not observe a substitution between labour activities and time on education. Improvements in food security are found when considering the most marginalised segment of the population, while increased time on education can be observed in female-headed households. Since NGO impact on economic outcomes is an understudied topic in the economic literature, these findings have important implications for understanding the channels through which NGOs contribute to children’s and household economic outcomes.

The third and conclusive chapter addresses a pervasive issue in development: the elite capture of economic programs and resources. Drawing on insights from economic and non-economic literature, this review explores the mechanisms of elite dominance and its implications for resource allocation and social equity. It also examines whether NGOs, as alternative providers of development assistance, can mitigate elite capture and enhance program effectiveness. Specifically, bridging quantitative and non-quantitative contributions in economics and social sciences, this review gathers new evidence on elite capture dynamics and highlights potential circumstances in which NGOs exhibit elitist behaviour. The comparative analysis of governmental versus NGO-led programs reveals nuanced dynamics: while NGOs may be better positioned to circumvent elite control due to their external funding and governance structures, they are not immune to local power dynamics.

These three studies aim to shed new insights into the complex interplay between institutions, power structures, culture and development outcomes. They reveal how Governmental policies, NGO interventions, and elite dynamics shape the distribution of resources and opportunities in developing countries. For policymakers and development practitioners, the findings underscore the importance of context-sensitive strategies that account for local norms, power dynamics, and the specific roles of non-state actors. To be effective, development policies must consider the interplay between central and local organizations, the importance of norms and social preferences, and engage with social and institutional frameworks within communities.

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The Effects of the Indian Mid-Day Meal Scheme on Cognitive and Health Outcomes of Children in Andhra Pradesh

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Abstract

This paper analyses the impact of the Indian Mid-Day Meal Scheme on the health and cognitive outcomes of schooling children living in the Indian State of Andhra Pradesh. We exploit the variability derived from the individual educational history of children, combined with the phased implementation of the program targeting only students in the public sector, to construct a variable measuring the monthly cumulative exposure to the Mid-Day Scheme. We provide evidence of the positive impact of the policy on children attending public schools, particularly in reducing inequalities between children enrolled in the private and public sectors. Lastly, employing a Heckman Selection model accounting for the selection issue on the type of school attended by children, we show that the impact of the policy is positive and consistent regardless of the type of school attended.

Keywords: Midday meal, School Feeding, Learning, Health, India

JEL Classification: I21, I25, O12

1.1 Introduction

Poorer children are the most vulnerable to malnutrition, a condition that can have severe impacts on their health, cognitive development, and educational outcomes. Malnutrition not only hinders children’s physical and mental growth but also exacerbates social inequalities, leaving those from poor backgrounds behind. The lack of essential nutrients during critical development periods leads to permanent deficits that limit learning opportunities and future success, perpetuating the cycle of poverty.

Evidence from the vast literature on children’s development demonstrates the importance of understanding and investigating the mechanisms that associate childhood determinants with adulthood outcomes (Cunha et al., 2010; Cunha and Heckman, 2008). Specifically, investments targeting children during the early stages of their lives have been proven to play a relevant role in determining children’s abilities. Heckman and Cunha (2007) identify that persistent gaps in abilities that emerge between children belonging to different socioeconomic groups, which later determine differences in economic outcomes during adulthood, can be mitigated by specific parental investments. In particular, considering developing countries where children might lack adequate health and education services, policy interventions at early stages of children’s lives might sustain not only the cognitive development of children but also their health development. Attanasio et al. (2020) highlight the crucial role of parental investments in promoting various aspects of child development. Factors such as household resources, the prices of essential goods, and the number of children in a family contribute to disparities in parental investment, which, in turn, exacerbate the wealth gap in children’s development. When parents are constrained by a lack of resources, programs aimed at supporting child development can be essential in mitigating these inequalities and ensuring more equitable investment in children. In particular, when parental investment in children’s development is insufficient, the role of the schooling system becomes crucial.

This research examines the impact of the Indian Mid-Day Meal Scheme (MDMS), one of the largest school feeding programs globally, on the health and cognitive outcomes of children attending public schools in Andhra Pradesh. Although specifically investigating Andhra Pradesh, our results provide supportive evidence of the positive impact of the MDMS throughout different Indian States. Andhra Pradesh is a coastal State located in the South-East of India, having a GDP per capita that has recently aligned with the Indian average (Statistical Abstract of Andhra Pradesh, 2009). Like other regions in India, Andhra Pradesh has living and schooling conditions that fall below the standards needed to ensure successful individual development. In 2001, one year before the start of our investigation, the literacy rate

for the adult population registered a level of 60.47%, which fell shortly to the Indian level of 64.84%. In the health sector, despite recent improvements, India continues to struggle with high malnutrition rates, especially among children and women (WFP, 2023; FAO, 2023). In Andhra Pradesh, the National Family Health Status 3 Survey for 2005 and 2006 recorded children’s levels of malnutrition lower than the national average (NFHS, 2007). Nonetheless, aware that differences in pre-existing characteristics at the state level and differences in implementation strategies of the MDMS might lead to different impact estimates, we expect our results to provide evidence of an overall positive impact of the policy, highlighting the critical role of school meal provision in India and other developing countries.

The MDMS delivers a daily cooked meal to primary and upper primary students in public schools to support their nutritional needs and boost enrolment and attendance. This study evaluates the Scheme’s effects on children’s outcomes since its start in Andhra Pradesh in 2003, initially targeting grades I to V, and its expansion in 2008 to include grades VI to X. Utilizing data from the Young Lives Indian Dataset, we leverage the Scheme’s design, focusing on public school students in specified grades and years, to determine if cumulative exposure to MDMS has enhanced health and cognitive outcomes and reduced disparities between children in public and private schools. Notably, although the phased implementation of the MDMS limits the mechanical positive correlation between age and exposure to the policy, aware of the relevant role of age in the children’s development, the age in months of children will be used as a control in the regression analysis to net out the effect of children growth.

As reported by ASER, one of the most important Indian independent organisations monitoring the Indian schooling system in the rural areas of the country, public schooling children perform systematically worse than their private counterparts, thus suggesting a difference in the teaching effectiveness between different types of institutions (ASER, 2023). The rise of the private school sector, its increasing presence in India’s educational landscape and its transformation to become more accessible to a larger segment of the population (low-cost private schools) have been major elements of discussion in the country. The expansion of private schooling and its use by the poor signals low performance of public schools and parents’ perception that private schools offer a better quality than public education (Kingdon, 2007). Muralidharan and Kremer (2008) show that private schools are significantly more likely to exist in villages with a high mean level of teacher absence in public schools. In such a contest with a strong inequality in access to educational opportunities and outcomes, the role of a school feeding program can be crucial.

The Mid-Day Meal Scheme is designed to enhance the nutritional intake of public school children, potentially improving their health and cognitive outcomes, thus

reducing inequalities between students in private and public schools. We hypothesise the MDMS to operate through three main channels. Firstly, by improving the overall nutritional intake of students, the scheme directly impacts children’s health, assuming no redistribution of resources within the household. Secondly, by providing a cooked meal at school, the MDMS aims to alleviate hunger during school hours, which can enhance students’ concentration and effort levels, and reduce illness-related absenteeism. Lastly, the scheme encourages social interaction among children during shared meals, potentially amplifying peer effects.

Unlike prior studies, our research focuses on studying the impact of cumulative exposure to the Mid-Day Meal Scheme, measured in months, on students attending primary, upper-primary schools and high schools. The sample of children in our analysis, consisting of students ranging from 7 to almost 16 years of age, enables us to investigate the impact of the policy for a more extended period than the one usually considered in the literature. The results of our study demonstrate that the Mid-Day Meal Scheme has successfully improved public school children’s health and cognitive outcomes and contributed to narrowing the existing gaps between children enrolled in private and public schools. Moreover, employing a Heckman Selection model accounting for parental choice on the type of school to enrol the child, we have examined whether the results obtained for the population of children attending public schools could be extended to the entire schooling population in the sample. Results display that the policy would produce a similar effect regardless of the type of school that children are attending, emphasising the importance of sustaining the nutritional intake of the entire Indian schooling population. Additionally, we investigate whether the policy impacts children’s development differently according to their caste and observe that the MDMS had the greatest impact precisely on children from disadvantaged castes, confirming the crucial role in sustaining the development of poorer children. Lastly, we analyse whether the marginal impact of the Mid-Day Meal Scheme decreases with children’s age by interacting the exposure in months to the MDMS with the age in months of children. Our findings confirm the hypothesis found in the literature that the impact of School Feeding Programs is the largest among younger students, underscoring the importance of early interventions for children’s health and human capital accumulation.

The rest of the paper is organised as follows: Section 1.2 presents the relevant literature. Section 1.3 explains the data set, including the key outcome variables, and the construction of the Mid-Day Meal Scheme exposure variable. Section 1.4 presents the empirical approach, while Section 1.5 reports the results. Section 1.6 explores the varying impact of the policy, considering the role of castes and the age of children. Concluding remarks appear in the last section.

1.2 Literature

Malnutrition and food insecurity in early childhood significantly harm children’s health and cognitive development. Studies by Humphries et al. (2015) and Aurino et al. (2019) using the Young Lives dataset from four developing countries,¹ show that children from food-insecure households have lower height-for-age and weaker cognitive abilities in vocabulary, reading, and math compared to those from food-secure families. This suggests that high-quality education alone cannot ensure good educational outcomes without addressing students’ health. In settings with limited parental investment, schools are the ideal places to implement health and nutrition support policies for children. These programs are particularly crucial in poor rural communities with limited access to health services, especially when targeting children from the most disadvantaged families (Bundy et al., 2017)

The literature examining the effects of School Feeding Programs (SFP) and Nutritional Programs on children’s health, cognitive and educational outcomes is extensive (Drake et al., 2017). Excellent reviews by Aurino and Giunti (2022), Alderman and Bundy (2012) and Jomaa et al. (2011) provide numerous examples of research from various developing countries that consistently show a positive impact of such policies on children’s outcomes. Ensuring children’s daily nutritional intake is beneficial for their overall development and is crucial for helping children from disadvantaged backgrounds catch up after experiencing early life disadvantages. Although the overall impact of School Feeding Programs is positive, the magnitude of the effect varies depending on the context of the analysis.

Ahmed (2004) studied a UN school meal program in Bangladesh, and Vermeersch and Kremer (2005) analysed a similar program in South Africa. Both found positive effects on children’s weight and body-mass index, but no significant impact on height-related health indicators. Fang and Zhu (2022) observed that children from low-socioeconomic households in rural China benefited most from a school meal program, with those exposed reporting better health in later years. Additionally, Gelli et al. (2019) noted that the impact of school meal programs on health outcomes in Ghana varied according to the gender of the children. In particular, the program’s impact on height-for-age was greater for girls and children from poorer families, while the effect on weight-for-age was more significant for boys.

Several studies have already examined the impact of the Mid-Day Meal Scheme and other School Feeding Programs on Indian children’s health and educational outcomes. On the health side, Afridi (2010) and Singh et al. (2014) described the Mid-Day Meal Scheme as a successful policy that increases children’s nutritional

¹Data from the Young Lives Dataset collecting information on children and their families in Ethiopia, India, Peru and Vietnam

intake and improves their health. Afridi (2010) found that in Madhya Pradesh, the transition from raw grain transfers to cooked meals under the scheme resulted in a 49% to 100% increase in children’s daily nutrient intake, depending on the nutrient. Additionally, the scheme acts as a safety net during natural disasters. Singh et al. (2014) show that in Andhra Pradesh, the scheme mitigated the negative health impacts of natural disasters, particularly droughts, on children entering public primary school.

Identifying the channels through which School Feeding Programs impact children’s cognitive and learning development is challenging. Unlike health conditions, where the link between policy and health status is direct, understanding educational and cognitive outcomes requires examining how these programs modify households’ incentives for school participation and how improved health status affects children’s cognitive outcomes. Improved nutritional intake can reduce hunger, enhancing pupils’ concentration during lectures (Drèze and Khera, 2017; Dreze and Goyal, 2003). Better health can also decrease illnesses, reducing the days of absenteeism from school (Mostert, 2021). Many School Feeding Programs require regular school attendance to receive meals, potentially increasing time spent with peers and teachers. This conditionality may increase students’ enrolment and participation rates by reducing the households’ opportunity cost of schooling. While most research suggests a positive effect on enrolment and attendance rates (Kaur, 2021; Alderman et al., 2012; Khera, 2006; Ahmed, 2004; Vermeersch and Kremer, 2005), some studies report no impact (McEwan, 2013; for Chile) or limited impact for specific sub-groups based on gender, religiosity or household’s wealth (Afridi, 2011; Jayaraman and Simroth, 2011).

Among the studies finding a positive effect of School Feeding Programs on cognitive outcomes, Alderman et al. (2012) in Uganda and Mostert (2021) in South Africa find that such programs reduce grade repetition rates, particularly among boys. Vermeersch and Kremer (2005) demonstrate that the implementation of a School Feeding Program in Western Kenya improved learning outcomes only when experienced teachers were present. Similar results were found in Aurino et al. (2023) in Ghana, where boys and children living below the poverty line benefited the most from a School Feeding Program and Fang and Zhu (2022) in China, particularly among children from low socioeconomic backgrounds.

The Mid-Day Meal Scheme in India has also been shown to positively impact children’s educational and cognitive outcomes. Afridi (2011) found in a randomised control trial in Madhya Pradesh that student attendance rates increased after implementing the policy, particularly for girls. This suggests that the impact of the Mid-Day Meal Scheme may vary by gender, influenced by traditional Indian norms and the higher opportunity cost parents assign to daughters attending school (King-

don, 2007; Drèze and Kingdon, 2001). Jayaraman and Simroth (2011) also described how the enrolment rate increased due to MDMS, particularly for lower-caste children and those from low-income households. Kaur (2021) highlighted that this effect is more substantial for girls, almost twice that for boys. Regarding cognitive outcomes, Afridi et al. (2013) observed increased effort levels among pupils attending public schools in Delhi, suggesting that better-nourished children concentrate better at school; notably, the effect was greater for pupils attending schools with initially higher-than-average scores. Chakraborty and Jayaraman (2019), using cross-sectional observation of children in rural Indian students enrolled in public primary schools, provided evidence of a relationship between years of exposure to the MDMS and cognitive test scores.

Our research aims to contribute to the literature on the impact of School Feeding Programs on children’s health and cognitive outcomes by analysing the effects of the Mid-Day Meal Scheme in the Indian State of Andhra Pradesh. We investigate whether the program can reduce inequality, particularly since it operates exclusively in public schools where students are generally more disadvantaged. Unlike previous studies that focused solely on public primary school students (Chakraborty and Jayaraman, 2019; Singh et al., 2014), our research considers children aged 7 to almost 16, attending primary, upper primary schools and high schools. This broad age range allows us to investigate whether the effects of the MDMS diminish as children grow older. As King and Behrman (2009) noted, when evaluating a social program, it is crucial to identify the timing and the length of exposure to evaluate a policy’s impact. Therefore, we explore if the Mid-Day Meal Scheme’s effects vary with age to optimise its implementation and maximise benefits. Following Chakraborty and Jayaraman (2019), we analyse the impact of the MDMS using a cumulative exposure measure. However, instead of relying solely on age and grade information normally available in a cross-sectional setting, we calculate the total months of MDMS exposure using each child’s educational history. We gather information on the age at which children started school, their annual school attendance, the grade they attended, and whether the school was private or public. This approach creates variability in exposure, allowing us to compare children of the same age with different educational histories. Finally, to address potential selection bias regarding the type of school attended, we use a Heckman Selection model. This methodology accounts for the parental choice of school type. Our results show that the MDMS benefits students regardless of the type of school attended, highlighting the need for nutritional support across the entire student population.

1.3 Data and Mid-Day Meal Scheme Exposure

We use data from the Indian Young Lives survey, which primarily aims to investigate children’s development from childhood to adolescence and examine how various dimensions of poverty at the household and individual levels impact this development. This dataset is particularly suitable for our research due to its rich information on household and child characteristics and its unique structure, which includes two cohorts of children born in different years in the Indian State of Andhra Pradesh. The young cohort consists of 2,000 children born in 2000/2001, while the old cohort comprises 1,000 children born in 1994/1995. Each cohort was interviewed over five rounds (2002, 2007, 2009/2010, 2013/2014 and 2016/2017).²

Spanning 15 years from 2002 to 2017, the survey is ideal for studying the short- and medium-run impact of the Mid-Day Meal Scheme on children’s health and cognitive outcomes. The MDMS timeline in Andhra Pradesh is crucial for the analysis (Figure 1.1). Following a November 2001 Indian Supreme Court order, the scheme was introduced nationally to provide cooked meals in all public and public-aided primary schools (grades I to V), with Andhra Pradesh implementing it in January 2003. The scheme was extended from grade VI to grade VIII (upper-primary schools) in 2007, with Andhra Pradesh following suit in October 2008 and further extending the benefit to grades IX and X (high schools). This phased implementation within the survey period allows for examining how varying exposure levels to the MDMS affect children’s development outcomes.

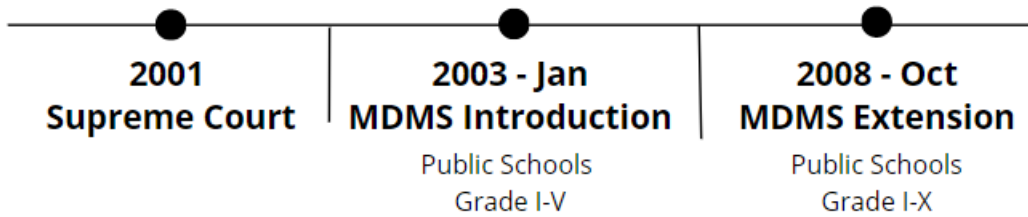
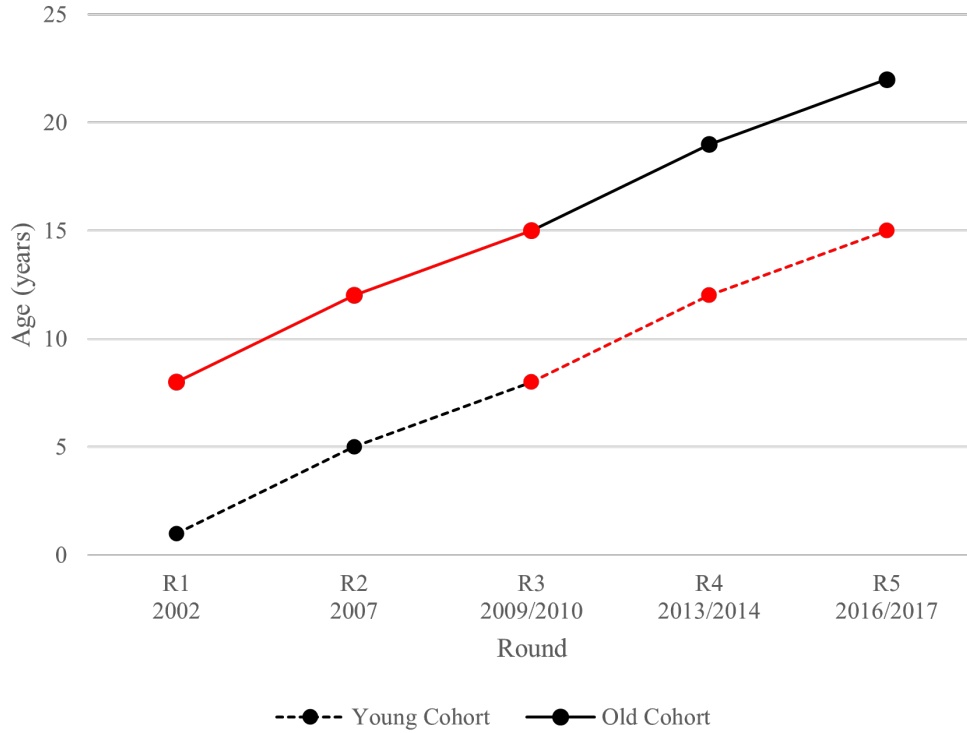


Figure 1.1 : Mid-Day Meal Scheme in Andhra Pradesh

The dataset structure, encompassing two cohorts of children with an average age difference of 7 years, interviewed in five rounds from 2002 to 2017, along with the phased implementation of the Mid-Day Meal Scheme in Andhra Pradesh, introduces variability in the exposure to the policy for children at similar ages. This heterogeneity allows us to investigate the impact of the monthly cumulative exposure to the Mid-Day Meal Scheme on the health and cognitive outcomes of children attending public primary, upper-primary and high schools. The sample for the analysis

²The survey maintained a low attrition rate, with only 3.7% for the younger cohort and 8.1% for the older cohort from the first to the last interview round (Young Lives, 2017)

includes all children enrolled in a public or private school between the ages of 7 and 16 years (in the final sample from 86 to 190 months), regardless of the cohort they belong to. For each cohort, we then selected the three interview rounds in which children fall in the specified age interval. The rounds considered are R1, R2 and R3 for the old cohort and R3, R4 and R5 for the young cohort (Figure 1.2).



In red are the selected rounds.
Own elaboration from the Indian Young Lives Survey.

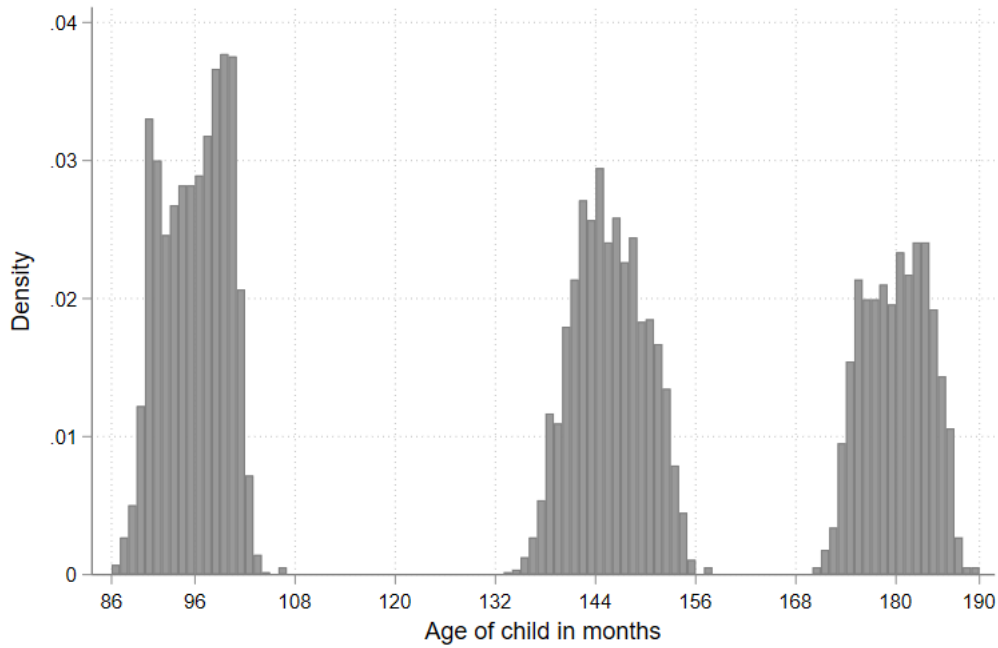
Figure 1.2 : Sample definition

The selection of these specific rounds ensures that children from different cohorts have always been interviewed at a similar age but in different periods of time, a variation that is a key characteristic we utilise in defining our main variable of interest.³ As illustrated in Figure 1.3, in the first interview round (R1 for the old cohort and R3 for the young cohort) children had an average age of 8 years (96 months), in the second round (R2 for the old cohort and R4 for the young cohort) their average age was 12 years (144 months) and in the third one it was 15 years (180 months) (R3 and R5).

From the sample of children attending public or private schools in the previously considered interview rounds, we selected only those who consistently reported attending either a public or private school across all interview rounds. While this selection reduces the variability in the measure of cumulative exposure to the Mid-Day

³Specifically, children of the same age and attending the same grade might experience different levels of exposure to the program

Meal Scheme, it offers the advantage of focusing exclusively on students committed to their educational career at a specific type of school. The students selected in the final sample are those from whom we expect both the largest between-group differences in health and cognitive outcomes and, for those attending public schools, the most significant potential impact of the policy. The total number of observations in the final sample varies depending on the outcome variable considered in the analysis. For the largest sample, we have information on 5,567 individuals ranging from 86 to 190 months of age (more than 7 and less than 16 years), of which 3,563 (64% of the total sample) attended a public school and 2,004 a private school.



Age of children in the health sample.
Own elaboration from the Indian Young Lives Survey.

Figure 1.3 : Sample definition

Our main variable of interest, the child's cumulative monthly exposure to the MDMS, is calculated for each observation using retrospective information on the individual educational history. The survey collects data on the grade and type of school each child has attended since entering the formal schooling system, allowing us to define their complete educational history.

By combining the individual educational history with the design of the Mid-Day Meal Scheme, we define the cumulative exposure to the Mid-Day Meal Scheme for a child i at the time of interview t as the total number of months they were enrolled in a public school during the implementation of the policy. The variability in monthly cumulative exposure arises from the longitudinal nature of the dataset, differences across birth cohorts, and variability within each interview round (Figure 1.4).

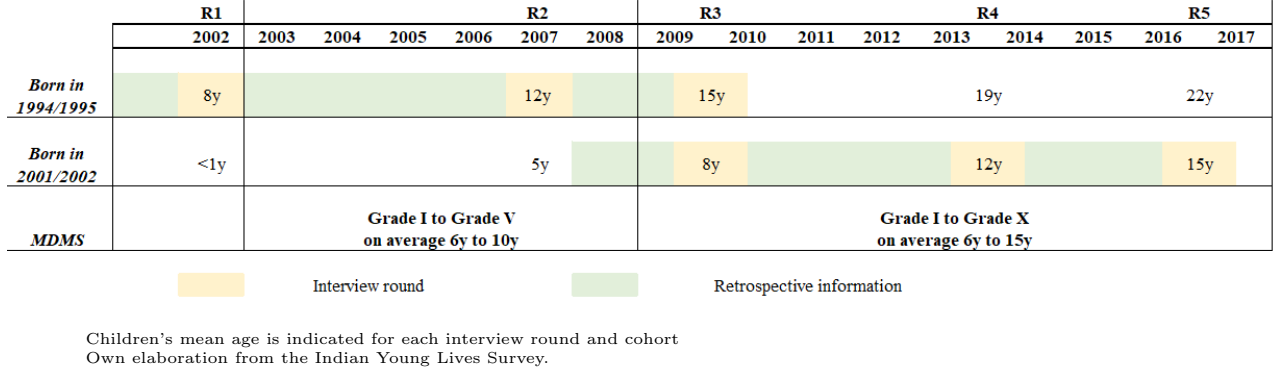
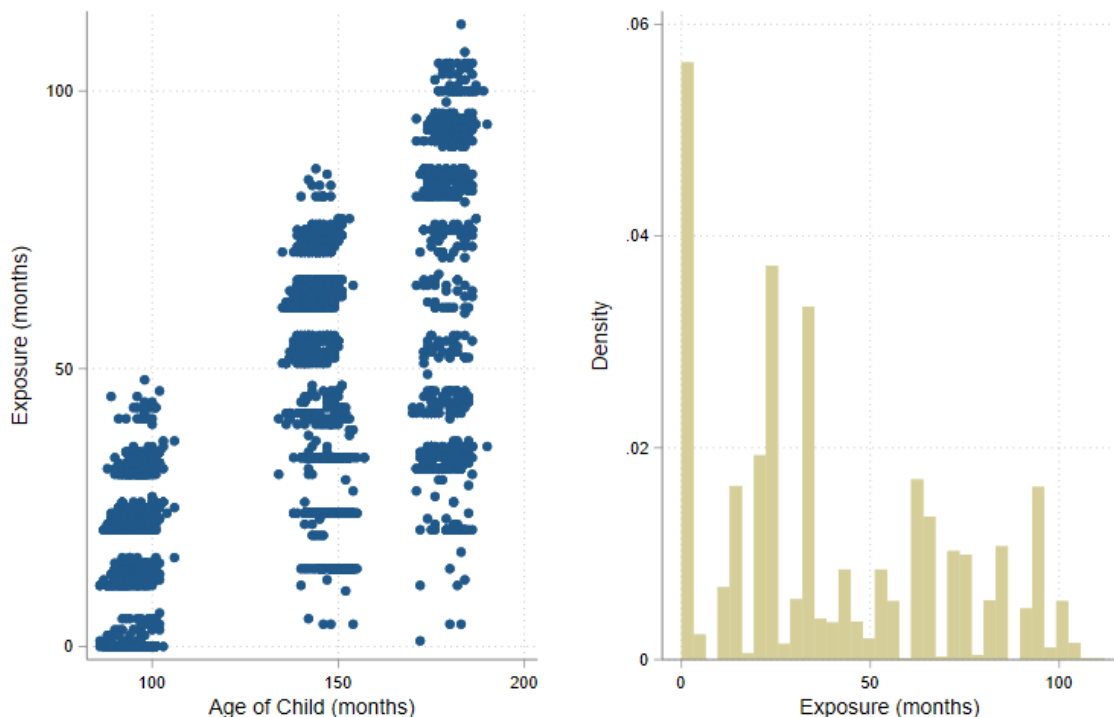


Figure 1.4 : Young Lives Dataset and Mid-Day Meal Scheme

Moreover, the different timing of the interviews, combined with the characteristics of the Mid-Day Meal Scheme, introduces additional variability in this measure. This variability creates heterogeneity in the cumulative monthly exposure to the policy, conditional on the age in months of treated children. For example, consider two 12-year-old children from different cohorts, both enrolled in public schools and attending grade VI. If they started grade I at age 6, the first child from the old cohort would be interviewed in R2 (2007) and the second from the young cohort in R4 (2013/2014). The first child's cumulative exposure to the Mid-Day Meal Scheme would include all months from the initial introduction of the MDMS in January 2003 to the last month in grade V, starting primary school before the MDMS began.⁴ The second child's exposure to the MDMS would be from the start of grade I in 2008/2009 up to the interview month (by the time of its interview the policy had already been extended up to class X). To calculate the number of months of exposure, we consistently consider the school year starting in July and ending in April.

The variability derived from the age structure of the two cohorts, combined with the phased implementation of the policy and the use of the age in months of children as a covariate in every specification, limits the potential concern that it is the age in months of the children and not the exposure to MDMS that drives the results; thus guaranteeing to effectively estimate the impact of an additional month of exposure on our set of outcome variables. In Figure 1.5, we specifically address this concern by showing that the cumulated monthly exposure to the policy does not systematically correlate with the age in months of children in the sample. The left panel shows a scatterplot illustrating the lack of association between the cumulative number of months of exposure to the policy and the age in months of children attending public schools in the sample; children of the same age might

⁴The child entered primary school at age 6 in 2001/2002, before the policy's introduction, and was targeted by the Scheme up to grade V (the extension to grade X became operational only in 2008)



Exposure to the Scheme for children attending public schools in the health sample. On the left: scatterplot of the exposure to MDMS on the age in months of children. On the right: histogram of the months of exposure to MDMS in the sample. Own elaboration from the Indian Young Lives Survey.

Figure 1.5 : Exposure to Mid-Day Meal Scheme

exhibit different levels of exposure. The histogram in the right panel depicts the distribution of the number of months of exposure to the policy. The spike in density at 0 is due to observations from the 2002 interview round (R1), conducted before the introduction of the MDMS in 2003.

Our analysis explores the effects of cumulative exposure to the MDMS on two critical dimensions of child development: health and cognitive outcomes. We examine four outcomes: weight (in kilograms) and height (in centimetres) for health, and the scores of the Peabody-Picture Vocabulary Test (PPVT) and Math Test for cognition. Due to data limitations, the two cognitive tests were not performed in the first interview round, the final sample for cognitive outcomes was reduced from 5,567 to 4,826 observations. Table 1.1 outlines the sizes and composition of the two samples based on children's gender and type of school attended. Notably, we observe gender-related inequalities in the frequency of children attending a public school, with females more likely to attend public schools, likely influenced by households' gender norms and preferences.

When considering cognitive outcomes, the optimal approach, as outlined by Cunha and Heckman (2008), would be to anchor the scores obtained by each child to

Table 1.1 : Sample definition

	<i>Health:</i>			<i>Cognitive:</i>		
	All	Male	Female	All	Male	Female
Public	3,563	1,665	1,898	2,934	1,361	1,573
Private	2,004	1,199	805	1,892	1,145	747
Conditional on gender						
Public	64.00%	58.13%	70.22%	60.80%	54.31%	67.80%
Private	36.00%	41.87%	29.78%	39.20%	45.69%	32.20%
Observations	5,567	2,864	2,703	4,826	2,506	2,320

a variable (such as earnings) in adulthood; unfortunately, this is not feasible as we do not observe children after they exit schools. Given that test scores are measured on ordinal scales and lack a natural metric, any monotonic transformation, while not entirely satisfactory, serves as a valid alternative. For each interview round, we constructed the percentile ranking for each of the four dependent variables. This transformation is employed due to the challenge of directly comparing scores from different rounds, given changes in the number of items and questions. However, comparing rank positions remains feasible due to the characteristics of the two tests (Item Response Theory) and to a set of common items preserved in all interview rounds (Leon, 2020; Das and Zajonc, 2010). To be consistent throughout the research, we extend the use of percentile rankings, computed at the cohort-interview round level for health outcomes as well. In our analysis, the percentile ranking assigns a value between 100 and 0 to each observation within the same cohort and interview round. This process establishes rankings for children interviewed at the same time and of a similar age. The rank position for each specific outcome is determined by the individual value relative to all other values in the subsample. The percentile ranking defines the percentage of observations that fall at or below a specific value. For example, a child obtaining the highest score in the PPVT in a particular cohort interview round would be assigned a value of 100; the higher the percentile ranking, the better the health or cognitive condition. As a robustness analysis, we also examine standardised outcome variables at the cohort-interview round level, with results consistent with those obtained using the percentile ranking strategy.⁵

We consider a rich set of covariates in every model specification. Table 1.2 presents individual and household characteristics by type of school for the health sample (with results valid for the cognitive sample as well). As expected, factors

⁵Results using standardised outcome variables can be found in the Appendix, Tables A.5-A.8

Table 1.2 : Descriptive statistics by type of school

	Private	Public	Difference		Private	Public	Difference
Female	0.402 (0.011)	0.533 (0.008)	-0.131*** (0.014)	Other Caste	0.403 (0.011)	0.103 (0.008)	0.302*** (0.014)
Rural	0.407 (0.011)	0.916 (0.005)	-0.509*** (0.010)	Hindu	0.821 (0.009)	0.909 (0.005)	-0.088*** (0.009)
Natural Event	0.087 (0.006)	0.219 (0.007)	-0.132*** (0.010)	Telegu	0.822 (0.009)	0.826 (0.006)	-0.004 (0.011)
Housing Quality (Quartile)	2.761 (0.024)	2.257 (0.018)	0.504*** (0.030)	Education Father	9.590 (0.107)	3.828 (0.074)	5.762*** (0.127)
Ownhouse	0.700 (0.010)	0.914 (0.005)	-0.214*** (0.010)	Education Mother	7.083 (0.110)	2.098 (0.055)	4.985*** (0.111)
Tv	0.892 (0.007)	0.484 (0.008)	0.409*** (0.012)	Household Size	5.102 (0.045)	5.207 (0.033)	-0.106* (0.056)
Bike	0.466 (0.011)	0.324 (0.008)	0.141*** (0.013)	Eldest child	0.591 (0.011)	0.417 (0.008)	0.174*** (0.013)
Fan	0.958 (0.005)	0.711 (0.008)	0.247*** (0.010)	Rayalaseema	0.276 (0.010)	0.275 (0.007)	0.002 (0.012)
Age Child (months)	135.907 (0.784)	134.419 (0.580)	1.488 (0.972)	Telangana	0.442 (0.011)	0.312 (0.008)	0.130*** (0.013)
Age Child (square)	19700.97 (213.109)	19267.67 (157.075)	433.296 (263.457)	Coastal Andhra	0.282 (0.010)	0.413 (0.008)	-0.131*** (0.013)
N. Obs	2,004	3,563			2,004	3,563	

List of covariates, group differences between children enrolled in private and public schools. Health sample.

such as being a female, residing in a rural area or experiencing relative poverty increase the probability of a child being enrolled in a public school. Conversely, being the oldest child in the family or having parents with relatively higher education is associated with an increased likelihood of attending a private school. Additionally, wealth indicators, such as asset ownership and housing quality, confirm evidence found in the literature of wealthier households being those in which children are more frequently enrolled in private schools.

Table 1.3 : Outcome variables by type of school

	<i>Health Sample:</i>				<i>Cognitive Sample</i>		
	Private	Public	Difference		Private	Public	Difference
Perc. Weight	60.325 (0.635)	44.322 (0.460)	16.003*** (0.778)	Perc. PPVT	57.717 (0.649)	43.356 (0.508)	14.361*** (0.819)
Perc. Height	59.514 (0.632)	45.015 (0.467)	14.499*** (0.783)	Perc. Math	58.124 (0.631)	40.321 (0.500)	17.803*** (0.802)
N. Obs	2,004	3,563			1,892	2,934	

Outcome variables, group differences between children enrolled in private and public schools.

Table 1.3 illustrates the mean values for our set of outcome variables for children attending different types of schools. As expected, children attending the private schooling system display systematically better outcomes in the percentile ranking of all four outcomes of interest, particularly with respect to Weight and Math scores.

1.4 Empirical Strategy

The primary goal of the Mid-Day Meal Scheme, is to support students' nutritional intake, potentially influencing their health and cognitive outcomes. By specifically targeting governmental schools, the policy enables us to examine not only whether the MDMS has improved the cognitive and health conditions of public school students, but also to measure these improvements relative to the inequalities existing between children attending public and private schools. To identify the magnitude of these inequalities in our outcome variables, we implement an Oaxaca-Blinder Decomposition strategy (Blinder, 1973; Oaxaca, 1973). This method decomposes the observed gap in outcome variables (R) into components explained by group differences in characteristics (Q) and an unexplained component representing group-related discrimination (U) (Jann, 2008).

$$R = E(Y_{pri}) - E(Y_{pub}) \quad (1.1)$$

Rearranging:

$$R = E(X_{pri})'\beta_{priv} - E(X_{pub})'\beta_{pub} \quad (1.2)$$

$$R = \underbrace{[E(X_{priv}) - E(X_{pub})]'\beta_{priv}}_{Q = \text{Explained}} + \underbrace{E(X_{pub})'(\beta_{priv} - \beta_{pub})}_{U = \text{Unexplained}}$$

We define the "Unadjusted Difference" as the raw difference in the values between the two groups (private and public schooling children) and the "Adjusted Difference" as the difference that is left unexplained after controlling for covariates. A positive Adjusted Difference indicates a higher return associated with attending private schools in terms of health and cognitive outcomes. This decomposition is intended to provide an initial descriptive analysis of the differences in outcomes variables between children enrolled in private and public schools, netting out for the impact of different individual and household characteristics. This descriptive analysis is instrumental in motivating the investigation of how the MDMS can impact children's health and cognitive outcomes and reduce the gaps in the two groups. Our analysis will then make use of the values of these Adjusted Differences to determine the additional months of exposure to the policy required for a treated child to close these gaps.

To assess the impact of the Mid-Day Meal Scheme on children's health and cognitive outcomes, we regress the percentile rankings of our dependent variables on the cumulative MDMS exposure and covariates, including year and region fixed effects. Equation (1.3) describes the regression equation. Y_{itr} denotes the percentile ranking of the dependent variable, $Exposure_{itr}$ quantifies the monthly cumulative exposure to MDMS for a child i interviewed at time t in region r , X_{itr} encompasses

the set of covariates, τ_t and θ_r represent year and region fixed effects, and the error term is denoted by u_{itr} . Standard errors in this specification are clustered at time, gender and district level, with districts being smaller geographical units than regions.

$$Y_{itr} = \alpha + \gamma Exposure_{itr} + X'_{itr}\beta + \tau_t + \theta_r + u_{itr} \quad (1.3)$$

This specification is estimated by pooled OLS under the assumptions of strict exogeneity between covariates, and no correlation, at any period of time, between covariates and unobserved individual component c_i . To enhance the robustness of the estimates, a comprehensive set of covariates related to individual and family characteristics is included, along with year and region fixed effects. This approach controls for variations due to unobserved time-specific and regional characteristics. Additionally, the child's age in months is included as a covariate to account for the impact of child development at a highly granular level and to act as a cohort fixed effect.⁶ The coefficient γ quantifies the average effect of an additional month of exposure to the MDMS on the selected dependent variable. This helps to quantify how many additional months of exposure are needed for a public school child to close the adjusted outcome gap between different school types. With the aim of exploring potential gender inequalities in the impact of the MDMS on child development, we perform the analysis both on the entire sample of public schooling children and on the subsamples of male and female public schooling students. However, it is important to note that the dataset lacks information on whether children were effectively treated by the Mid-Day Meal Scheme. Therefore, our measure of exposure is based solely on the characteristics of the MDMS and the structure of our sample. Our results should then be interpreted as an intention-to-treat (ITT) effect, as our data allow us only to identify children who are potentially eligible for the program.⁷ Nonetheless, evidence from reports and articles documents a large and almost universal adoption of the MDMS in the public schooling sector. Dréze and Goyal (2003) illustrate that, by 2003, the program achieved full implementation in Andhra Pradesh and that in later years, over 98% of government schools were serving a midday meal in schools (ASER, 2007).

This analysis focuses specifically on children attending government schools, excluding those in private schools. Consequently, the results specifically reflect the impact of the Mid-Day Meal Scheme on the health and cognitive outcomes of chil-

⁶The only interview round where both cohorts were surveyed simultaneously was in 2009/2010, with the old cohort averaging 15 years old and the young cohort 8. In this round, age in months determines the cohort, while in other rounds, time fixed effects control for cohort differences.

⁷Using different rounds of the same dataset containing information on families reporting whether children were receiving the meal provided by the policy, Singh et al. (2014) observe the almost universal provision of the service throughout its sample, thus reassuring us of the effective targeting of the sampled children.

dren in public schools. The sample selection limits the generalizability of the results to the entire schooling population. It assumes that the decision made by parents to enrol a child in a specific type of school is exogenous to the outcome of interest. This assumption rules out the influence of unobserved factors that could affect both school choice and child outcomes. For instance, in the presence of limited resources, parents might decide to enrol children with better skills and better health in private schools in order to maximise educational returns (Kingdon, 2020; James and Woodhead, 2014). Additionally, budget constraints and parents' attitudes with respect to gender might lead to higher investments in health and education for male children (Sahoo, 2017). To address this concern, a Heckman Selection model is employed to account for the potential selection bias in school choice.

1.4 .1 Heckman Model

The Heckman Selection Model is implemented in two steps. First, we model the selection equation, using a probit specification to estimate the probability of a child being enrolled in a public school, incorporating an exclusion restriction to address endogeneity. In the second stage, the outcome equation, we estimate the impact of the MDMS on the outcome variables for the selected sample of public school children, correcting for the selection bias by including the Inverse Mills Ratio from the first stage. A bootstrap method is applied to obtain robust standard errors.

Equation (1.4) describes the first stage, where a probit regression models the probability for a child to attend a public school:

$$Pr(Public_{itr} = 1) = \alpha + X'_{itr}\delta + \phi Z_{id,t-5} + \tau_t + \theta_r + u_{itr} \quad (1.4)$$

The dependent variable $Public_{itr}$ is regressed on the set of covariates X_{itr} , on the year and region fixed effects τ_t , and θ_r and on an exclusion restriction $Z_{id,t-5}$. The exclusion restriction provides a source of exogenous variation in the selection process, helping to address the endogeneity issue. This restriction should influence the likelihood of attending a public school without directly affecting the health and cognitive outcomes in the second stage. The exclusion restriction used is a pre-determined measure from administrative sources (Statistical Abstract of Andhra Pradesh) that reflects the extent of public school provision at the local level. For a child i observed at time t , this variable is defined as the proportion of children in public schools relative to the total number of children enrolled at school at time $t-5$, by gender, district d and schooling level. For example, for a male child living in West Godavari district attending in 2002 a public or private primary school, the exclusion restriction would measure the percentage of male children enrolled in primary public schools in

1997 relative to all male children in primary school in that district.⁸ This aggregate variable exploits institutional information external to Young Lives to capture, from a historical perspective, elements of the demand and supply of school services at the local level. On the one hand, it describes gender- and district-specific social norms related to (i) the choice of the type of school families decide to enrol children into and (ii) household preferences for parental investment, considering differences existing in the quality of private schools with respect to public schools. On the other hand, it captures pre-determined differences existing in the availability of different schooling systems (public and private) in the district in which children reside. The exclusion restriction captures the heterogeneity in public school availability and district-level attitudes towards alternative educational systems, affecting school enrollment likelihood at time t without directly impacting children's individual health and cognitive outcomes. The choice of using a lagged variable is inherent in the fact that this limits the possibility of temporal and geographical spillover effects among children attending schools at time $t - 5$ and t . Conditional on time and district, our exclusion restriction also varies by children's gender. The granularity of the variable is then suited to reflect the heterogeneity in parental preferences and norms existing between male and female children, accounting for their variation across different districts and years. The exposure to the Mid-Day Meal Scheme is excluded from the first stage because it depends on the parental decision to enrol and keep the child in a public school. In the second stage of the model, we use the selected sample of children attending public schools to measure the impact of the MDMS on the health and cognitive outcomes of the entire schooling population.

$$Y_{itr} = \alpha + \gamma Exposure_{itr} + X'_{itr}\beta + \omega\lambda_{itr} + \tau_t + \theta_r + \varepsilon_{itr} \quad (1.5)$$

This stage is specified as a linear regression (1.5), akin to the one utilised in the OLS model, with the Inverse Mills Ratio λ_{itr} included on the right-hand side of the equation. The Inverse Mills Ratio, estimated from the first stage, corrects the selection bias in the sample. A statistically significant coefficient for this ratio indicates the presence of selection in the types of schools in the sample. The coefficient of our main variable of interest γ , estimated through a two-stage Heckman Selection model, will then describe the policy's impact on the outcome variable Y_{itr} regardless of the type of school attended by children, accounting for the potential selection bias. The Heckman Selection model is computed following a two-step procedure to relax the assumption of joint normality of the error terms in the two stages, u_{itr} and ε_{itr} where η is an independent error.⁹

⁸For each district and each round considered, there is never a case where the number of public or public schools in the district is 0.

⁹The first stage of the Heckman model is a probit estimate based on the assumption of normality

$$\begin{aligned}
u_{itr} &\sim N(0, 1) \\
\varepsilon_{itr} &= \sigma u_{itr} + \eta
\end{aligned}
\tag{1.6}$$

The standard errors obtained through this two-step procedure are typically larger than those derived from maximum likelihood (ML) estimation. To account for this, we retrieve robust standard errors by employing a bootstrap estimation procedure, clustering at gender, district and time levels.

1.5 Results

1.5 .1 Oaxaca-Blinder Decomposition and OLS estimates

Table 1.4 and Table 1.5 present the results of the Oaxaca-Blinder decomposition for the health and cognitive outcomes in the sample. The Unadjusted Difference captures the raw group difference in the mean outcome variables between children enrolled in private and public schools. A positive value indicates that, on average, children attending private schools have higher positions in the percentile rankings for weight, height and test scores, highlighting disparities in the health and cognitive conditions between the two groups. The Adjusted Difference is defined as the difference that is left unexplained in the model after controlling for a set of covariates, including individual characteristics like the child’s age in months, household wealth indicators and parental education. Across all specifications, the Adjusted Differences remain positive and statistically significant, though their magnitude is reduced. This indicates that, even after controlling for individual and parental characteristics, significant disparities between the two groups persist, largely attributable to group affiliation. Although without any causal interpretations, the values of the Adjusted Differences will be used to measure the amount of additional exposure that public schooling children would need to close the group differences in outcome variables.

Notably, the largest Adjusted Differences are observed in the female samples for all four outcomes. Female children in public schools exhibit greater disparities compared to their male counterparts, pointing to gender inequalities in health and cognitive outcomes linked to educational choices. Overall, the Adjusted Differences account for approximately 35% to 47% of the Unadjusted Differences, leaving a substantial portion of inequalities unexplained. On average, children attending private schools are ranked 7.4 percentiles higher in weight and 5.5 percentiles higher

of the distribution of error terms. In order to relax this normality assumption, we define a linear probability model and observe consistent results concerning marginal effects of covariates and their significance with respect to the probit first stage of the Heckman model.

Table 1.4 : Oaxaca-Blinder Decomposition, Health Outcomes

	<i>Perc. Weight:</i>			<i>Perc. Height:</i>		
	All	Male	Female	All	Male	Female
Unadjusted Difference	16.003*** (1.033)	15.472*** (1.390)	17.294*** (1.323)	14.499*** (1.015)	14.017*** (1.486)	13.920*** (1.172)
Adjusted Difference	7.384*** (1.156)	6.495*** (1.870)	8.837*** (1.639)	5.498*** (1.252)	5.998*** (1.796)	5.606*** (1.463)
Region & Year FE	✓	✓	✓	✓	✓	✓
Child controls	✓	✓	✓	✓	✓	✓
Household controls	✓	✓	✓	✓	✓	✓
N. Obs	5,567	2,864	2,703	5,567	2,864	2,703

*p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

in height than students in public schools. For cognitive outcomes, the difference ranges from around 5.1 percentiles for the PPVT to around 8.3 for the Math test. We anticipate that the Mid-Day Meal Scheme has the potential to mitigate these inequalities through mechanisms such as improving daily nutrition, reducing illnesses and school hunger, better concentration and increasing time spent at school.

Table 1.5 : Oaxaca-Blinder Decomposition, Cognitive Outcomes

	<i>Perc. PPVT:</i>			<i>Perc. Math:</i>		
	All	Male	Female	All	Male	Female
Unadjusted Difference	14.361*** (1.449)	11.800*** (1.717)	16.638*** (2.102)	17.803*** (1.359)	16.143*** (1.754)	19.505*** (1.884)
Adjusted Difference	5.055*** (1.159)	4.428*** (1.359)	6.064*** (1.559)	8.318*** (1.497)	8.559*** (1.891)	8.134*** (2.179)
Region & Year FE	✓	✓	✓	✓	✓	✓
Child controls	✓	✓	✓	✓	✓	✓
Household controls	✓	✓	✓	✓	✓	✓
N. Obs	4,826	2,506	2,320	4,826	2,506	2,320

*p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

To further understand the potential of the Mid-Day Meal Scheme (MDMS) in addressing these inequalities, we turn to the results of the OLS specification, as presented in Tables 1.6 and 1.7. These results indicate the direct impact of MDMS on the health and cognitive outcomes of children attending public schools.

Table 1.6 shows that an additional month of exposure to the Mid-Day Meal

Scheme has, on average, a positive statistically significant impact on both weight and height percentile rankings. Given the average exposure to the MDMS in the health sample, equal to 39.33 months (38.88 for males and 39.73 for females), we can calculate the average impact of exposure to the policy for public school students. This translates into an increase of 7.1 percentiles for weight (7.7 for males and 7.0 for females) and 11.8 percentiles for height (9.3 for males and 13.7 for females). Notably, while the impact on weight is similar between males and females, the effect on height is more pronounced for females with the coefficient almost 50% larger than males, suggesting a potential gender-specific impact of the scheme on height.

In Appendix Table A.1, we present the full set of results. It is important to note that the findings for other covariates align with expectations. Residing in rural areas has a negative impact on children's health outcomes, particularly for females, while coming from wealthier families is associated with better health. The coefficient for a child's age in months is positive and statistically significant, reflecting the expected influence of growth on weight and height.

Table 1.6 : OLS, Health Outcomes

	<i>Perc. Weight:</i>			<i>Perc. Height:</i>		
	All	Male	Female	All	Male	Female
Exposure (months)	0.181*** (0.061)	0.197** (0.081)	0.176** (0.008)	0.299*** (0.079)	0.239** (0.093)	0.344*** (0.103)
Region & Year FE	✓	✓	✓	✓	✓	✓
Child controls	✓	✓	✓	✓	✓	✓
Household controls	✓	✓	✓	✓	✓	✓
N. Obs	3,563	1,665	1,898	3,563	1,665	1,898

*p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Similarly, Table 1.7 reveals a positive and statistically significant effect of the Mid-Day Meal Scheme on cognitive outcomes, as measured by the percentile rankings of the PPVT and Math test.¹⁰ With an average exposure of 47.77 months (47.64 for males and 47.87 for females), the policy results in a 9.6 percentile increase in PPVT (10.4 for males and 8.8 for females) and 21.6 percentile increase in Math

¹⁰As mentioned in the sample definition, when analyzing cognitive outcomes, we reduce the total number of observations due to the absence of these two particular tests in the first round of the survey (year 2002). Unfortunately, this exclusion results in the removal of the only round in the dataset where, by design, children attending public schools had no exposure to the MDMS (as the policy was introduced only in 2003). Nonetheless, the OLS model still yields statistically significant results regarding the impact of MDMS exposure on the cognitive outcomes of children attending public schools.

scores (23 for males and 20.2 for females). The consistency in these effects across genders suggests that the policy does not favour one specific gender over the other in cognitive outcomes. The full set of results is shown in Table A.2 in the Appendix; also in this case, we observe covariates to have an impact on cognitive outcomes aligning with expectations. Children from wealthier families display better results, and parental education plays a crucial role, particularly the mother’s education for daughters.

Table 1.7 : OLS, Cognitive Outcomes

	<i>Perc. PPVT:</i>			<i>Perc. Math:</i>		
	All	Male	Female	All	Male	Female
Exposure (months)	0.202*** (0.055)	0.219** (0.100)	0.184*** (0.065)	0.452*** (0.067)	0.483*** (0.107)	0.423*** (0.082)
Region & Year FE	✓	✓	✓	✓	✓	✓
Child controls	✓	✓	✓	✓	✓	✓
Household controls	✓	✓	✓	✓	✓	✓
N. Obs	2,934	1,361	1,573	2,934	1,361	1,573

*p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

We contextualise the OLS results in relation to the observed inequality derived from the Oaxaca-Blinder decomposition. Indeed, the OLS findings underscore the policy’s potential to reduce, though not completely eliminate, the disparities identified in the decomposition analysis. For instance, to close the weight gap observed in the Oaxaca-Blinder decomposition, an additional 40.8 months of exposure to the MDMS would be required for the entire sample, with specific needs of 33 months for males and 50.2 months for females.¹¹ The larger requirement for females, despite similar impacts of the policy, reflects the greater baseline disparities identified in the decomposition analysis.

For height, the required additional months are 18.4 for the entire sample, with females needing fewer months (16.3) than males (25.1), a discrepancy that can be attributed to the larger height gains observed among females in the OLS results. In cognitive outcomes, closing the gap would require 25 additional months of exposure for PPVT and 18.4 months for the Math test, with variations across genders due to

¹¹To find the number of months required, consider the coefficient in the Oaxaca-Blinder Decomposition for the Adjusted Difference and divide it by the OLS coefficient for Exposure; e.g. for perc. weight

$$7.384/0.181 = 40.79$$

the different baseline disparities. Notably, the calculation of the number of months required for the policy to close the gap in the outcome variables can not be causally interpreted, but has to be reconciled as a descriptive indication of the amount of exposure to the policy that would be needed to close the gaps in the outcome variables derived from the Adjusted Differences in the Oaxaca-Blinder decomposition between the two groups.

While these OLS results provide strong evidence of the MDMS's positive impact, it is essential to recognise potential limitations. A primary concern is endogeneity, which could bias the estimated effects. The inclusion of a comprehensive set of covariates, along with year and region fixed effects, helps mitigate this risk, lending credibility to the findings. However, the coefficient for monthly exposure may still partly capture natural growth in children, not solely the impact of the MDMS. To account for the individual growth of the child, age in months is controlled for in all specifications; for this reason, as already discussed in Section 1.3, the results of our analysis are unlikely to be driven by the growth of the children in the sample. Consequently, we are in the position of identifying the impact of the cumulative exposure to the program net of age effects due to the phased implementation of the Mid-Day Meal Scheme and the sampling design of the Young Lives survey, consisting of two birth-cohorts of children observed in different rounds (i.e. calendar years). Specifically, children of the same age in months belonging to different birth-cohorts might be differently exposed to the policy as long as they are enrolled in different educational grades at the time of the interview and to the extent that the program was available throughout their educational career up to that time. Moreover, even if interviewed in the same round of the survey, cumulative exposure to the program of children of the same age in months might differ because of the different months of the interview. This allows us to interpret the coefficient of exposure to the MDMS as the average impact of an additional month of exposure to the scheme on the outcomes.

In summary, the OLS results corroborate the positive influence of the MDMS on both health and cognitive outcomes in public school children with males, who generally benefit the most, except in the case of height percentile rankings. Height, a key indicator of long-term health capital, shows a larger impact for females, which is notable. While weight reflects short-term health, height measures cumulative health since birth. The greater effect on height for females suggests that despite possibly receiving fewer resources early in life, the scheme has helped bridge this gap, highlighting its role in improving the health of female children.

1.5 .2 Heckman Model Estimates

While the OLS results offer valuable insights, another key limitation arises from potential selection bias, as the OLS analysis only captures children attending public schools. Children enrolled in public schools may be systematically different from those in private schools based on unobserved factors influencing both school choice and the outcomes of interest. To address this concern and ensure that the observed effects of the MDMS are not driven by selection into public school choice, we turn to the Heckman Selection model. This model accounts for selection bias by accounting for unobserved characteristics that influence both school enrollment and children’s health and cognitive development, providing a more comprehensive view of the policy’s impact across the school population.

The first stage of the Heckman model focuses on the exclusion restriction, which leverages district-level variation provision five years before the interview to predict the likelihood of a child being enrolled in a public school. Additionally, the exclusion restriction is also broken down by gender. This helps ensure the model considers possible differences in school enrollment between genders, accounting for potential disparities in educational access and participation across this individual characteristic. The exclusion restriction proves to be a strong and statistically significant predictor of school choice in all specifications, confirming its validity in addressing selection bias.

Tables 1.8 and 1.9, which present the Heckman estimates for the health and cognitive sample, show that a 1 percentage point increase in the exclusion restriction raises the likelihood of public school enrollment by up to 1 percentage points for males and 0.79 percentage points for females. In the second stage, we assess the effect of cumulative exposure to the MDMS on the percentile rankings of health and cognitive outcomes, now controlling for the selection process. Crucially, the Inverse Mills Ratio, which accounts for selection bias, is not statistically significant in most cases, suggesting that selection into public or private schools does not drive the observed outcomes. This reinforces the validity of the OLS findings, as the Heckman model yields similar estimates of MDMS’s impact on weight and height for both male and female students, as well as on cognitive outcomes like the PPVT and Math test.

These results indicate that the positive effects of the MDMS observed in the OLS analysis are not confined to public school children but extend across the broader schooling population. The consistency between the Heckman and OLS findings highlights the MDMS’s capacity to improve health and cognitive outcomes irrespective

Table 1.8 : Heckman Model, Health Outcomes

	<i>Perc. Weight:</i>			<i>Perc. Height:</i>		
	All	Male	Female	All	Male	Female
<i>Second Stage</i>						
Exposure (months)	0.179*** (0.060)	0.194** (0.087)	0.176** (0.087)	0.297*** (0.079)	0.238** (0.100)	0.343*** (0.107)
Mills Ratio	-3.568 (4.014)	-5.594 (5.387)	-0.913 (5.211)	-3.441 (3.628)	-1.769 (4.928)	-2.373 (4.197)
<i>First Stage</i>						
Exclusion Restriction	0.933*** (0.207)	1.014*** (0.343)	0.786*** (0.286)	0.933*** (0.207)	1.014*** (0.343)	0.786*** (0.286)
Region & Year FE	✓	✓	✓	✓	✓	✓
Child controls	✓	✓	✓	✓	✓	✓
Household controls	✓	✓	✓	✓	✓	✓
N. Obs	5,567	2,864	2,703	5,567	2,864	2,703
Selected	3,563	1,665	1,898	3,563	1,665	1,898

*p<0.1; **p<0.05; ***p<0.01
 Heckman two-step procedure; bootstrap standard errors (1500 replications) are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

of the type of school children attend.^{12,13}

The Heckman Selection model confirms that the MDMS plays a critical role in enhancing children's development, addressing disparities not only between public and private school students but also within gender groups. The program's ability to improve both health and cognition across diverse schooling environments emphasizes the potential of school feeding programs to reduce inequalities in India as well as in other developing countries.

1.6 Heterogeneity Analyses

All the specifications examined so far identify the average impact of the Mid-Day Meal Scheme on children's health and cognitive outcomes. However, it is important to recognise that the impact of the policy might be different for families with different characteristics. Important characteristics typical of the study context, that of India and a developing country, such as familiar caste and parental education, might thus

¹²Table A.3 and A.4 in the Appendix describe the results for the complete set of covariates used in the model.

¹³We find consistency between OLS estimates and Heckman ones also using standardised outcome variables; results can be found in the Appendix, Tables A.5 and A.6 for OLS and Tables A.7 and A.8 for Heckman model.

Table 1.9 : Heckman Model, Cognitive Outcomes

	<i>Perc. PPVT:</i>			<i>Perc. Math:</i>		
	All	Male	Female	All	Male	Female
<i>Second Stage</i>						
Exposure (months)	0.204*** (0.056)	0.220** (0.100)	0.189*** (0.068)	0.450*** (0.066)	0.479*** (0.105)	0.425*** (0.085)
Mills Ratio	3.993 (4.105)	2.216 (7.413)	9.656** (4.496)	−2.664 (4.372)	−5.796 (6.787)	3.705 (4.867)
<i>First Stage</i>						
Exclusion Restriction	0.892*** (0.225)	1.022*** (0.393)	0.754*** (0.285)	0.892*** (0.225)	1.022*** (0.393)	0.754*** (0.285)
Region & Year FE	✓	✓	✓	✓	✓	✓
Child controls	✓	✓	✓	✓	✓	✓
Household controls	✓	✓	✓	✓	✓	✓
N. Obs	4,826	2,506	2,320	4,826	2,506	2,320
Selected	2,934	1,361	1,573	2,934	1,361	1,573

*p<0.1; **p<0.05; ***p<0.01

Heckman two-step procedure; bootstrap standard errors (1500 replications) are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

be crucial in understanding which families benefit the most from the introduction of the MDMS. In the following section, we specifically address the role of caste, while providing the results and tables on parental education in the Appendix.¹⁴

1.6 .1 Caste Heterogeneity

The caste system can be considered one of the main determinants of the Indian religious and social structure, playing a fundamental role in shaping individuals' and families' lives and future opportunities in terms of economic and labour outcomes (Munshi, 2019). A recent literature has already investigated the role of caste in determining children's educational and cognitive outcomes, highlighting how children from disadvantaged castes perform worse on cognitive tests due to discrimination and lack of educational opportunities, particularly in higher-caste dominated villages (Bailwal and Paul, 2024). We hypothesise the MDMS to play a role in reduc-

¹⁴To identify the impact of the policy depending on parental education, we consider the highest education level of parents and split the sample according to the median value of this variable in the sample. We do not observe substantial differences in the impact of MDMS in the two groups, children from families with parental education below the median value benefit from the policy in the same way as children from families with high parental education in all outcomes considered. Tables A.9 to A.12 in Appendix report the results.

ing educational, cognitive and health disparities between children from upper and lower castes, sustaining nutritional intakes of economically disadvantaged families and incentivising education enrolment rate and attendance. Table 1.10 depicts the distribution of castes in the sample.

Table 1.10 : Caste - Health Sample

Caste	Number of Observations	Frequency
Scheduled Caste	998	17.93%
Scheduled Tribes	790	14.19%
Backward Caste	2,603	46.76%
Other Caste	1,176	21.12%
Observations	5,567	

Caste structure in the health sample

It is possible to observe that because Young Lives focuses primarily on disadvantaged families and the multidimensionality of poverty, the majority of families in the sample belong to lower castes such as the Scheduled Caste, Scheduled Tribes and Backward Caste. For the sake of analysis, to ease the understanding of caste dynamics and have a sufficiently large sample size, we consider Other Caste as the main dummy variable identifying non-disadvantaged castes, thus aggregating Scheduled Caste, Scheduled Tribes, and Backward Caste into a single category. This categorisation allows us to compare the impact of the MDMS between castes having different societal roles and relevance. We expect the policy to have a larger impact on families belonging to disadvantaged castes, those who usually have a lower standard of living, which is reflected in lower income and poorer health.

To compare the MDMS's impact on families of different castes, we replicated the analysis presented in the main section, considering families belonging to disadvantaged castes and other castes. First, we provide the OLS results of the impact of an additional month of exposure to the Mid-Day Meal Scheme on health and cognitive outcomes in the two groups. Second, we replicate the same analyses employing a Heckman strategy to account for potential selection into the type of school by introducing as exclusion restriction the ratio of the number of children attending public schools by schooling level, gender and district five years before the year of interviews. Unfortunately, it is not possible to derive the exclusion restriction considering the number of children attending public schools from the caste subgroups used in the heterogeneity analysis.

Table 1.11 : OLS, Health Outcomes - Caste

	<i>Perc. Weight:</i>			<i>Perc. Height:</i>		
	All	Disadvantaged Caste	Other Caste	All	Disadvantaged Caste	Other Caste
Exposure (months)	0.181*** (0.061)	0.186*** (0.061)	-0.085 (0.199)	0.299*** (0.079)	0.305*** (0.081)	0.031 (0.168)
Region & Year FE	✓	✓	✓	✓	✓	✓
Child controls	✓	✓	✓	✓	✓	✓
Household controls	✓	✓	✓	✓	✓	✓
N. Obs	3,563	3,195	368	3,563	3,195	368

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Tables 1.11 and 1.12 illustrate how the MDMS's impact on children's health outcomes is positive and statistically significant only for children of disadvantaged castes. In contrast, the result is not significant for children belonging to upper castes. The point estimates are close to those observed in the main analyses, indicating that the impact of the policy is derived mainly from children of this group. It is worth noting that the number of children from other caste attending public schools is significantly smaller than children from disadvantaged caste, which might be a factor for not significant results. Nonetheless, the significance of the exclusion restriction in the Heckman model (Table 1.12) in all the specifications highlights the relevance of the variable in being a determinant for public school enrolment for children from disadvantaged caste and children from other caste.

Table 1.12 : Heckman Model, Health Outcomes - Caste

	<i>Perc. Weight:</i>			<i>Perc. Height:</i>		
	All	Disadvantaged Caste	Other Caste	All	Disadvantaged Caste	Other Caste
Second Stage						
Exposure (months)	0.179*** (0.060)	0.187*** (0.062)	-0.092 (0.199)	0.297*** (0.079)	0.306*** (0.082)	0.028 (0.174)
Mills Ratio	-3.568 (4.014)	3.237 (5.035)	-9.275 (6.562)	-3.441 (3.628)	2.756 (4.901)	-4.584 (8.433)
First Stage						
Exclusion Restriction	0.933*** (0.207)	0.683*** (0.253)	1.566*** (0.362)	0.933*** (0.207)	0.683*** (0.253)	1.566*** (0.362)
Region & Year FE	✓	✓	✓	✓	✓	✓
Child controls	✓	✓	✓	✓	✓	✓
Household controls	✓	✓	✓	✓	✓	✓
N. Obs	5,567	4,391	1,176	5,567	4,391	1,176
Selected	3,563	3,195	368	3,563	3,195	368

*p<0.1; **p<0.05; ***p<0.01

Heckman two-step procedure; bootstrap standard errors (1500 replications) are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Table 1.13 : OLS, Cognitive Outcomes - Caste

	<i>Perc. PPVT:</i>			<i>Perc. Math:</i>		
	All	Disadvantaged Caste	Other Caste	All	Disadvantaged Caste	Other Caste
Exposure (months)	0.202*** (0.055)	0.211*** (0.062)	0.074 (0.196)	0.452*** (0.067)	0.478*** (0.073)	0.113 (0.197)
Region & Year FE	✓	✓	✓	✓	✓	✓
Child controls	✓	✓	✓	✓	✓	✓
Household controls	✓	✓	✓	✓	✓	✓
N. Obs	2,934	2,657	277	2,934	2,657	277

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Table 1.14 : Heckman Model, Cognitive Outcomes - Caste

	<i>Perc. PPVT:</i>			<i>Perc. Math:</i>		
	All	Disadvantaged Caste	Other Caste	All	Disadvantaged Caste	Other Caste
Second Stage						
Exposure (months)	0.204*** (0.056)	0.212*** (0.063)	0.092 (0.206)	0.450*** (0.066)	0.478*** (0.072)	0.155 (0.202)
Mills Ratio	3.993 (4.105)	4.241 (4.257)	9.440 (8.302)	-2.664 (4.372)	-3.010 (4.124)	0.741 (8.794)
First Stage						
Exclusion Restriction	0.892*** (0.225)	0.506** (0.255)	1.838*** (0.378)	0.892*** (0.225)	0.506** (0.255)	1.838*** (0.378)
Region & Year FE	✓	✓	✓	✓	✓	✓
Child controls	✓	✓	✓	✓	✓	✓
Household controls	✓	✓	✓	✓	✓	✓
N. Obs	4,826	3,788	1,038	4,826	3,788	1,038
Selected	2,934	2,657	277	2,934	2,657	277

*p<0.1; **p<0.05; ***p<0.01

Heckman two-step procedure; bootstrap standard errors (1500 replications) are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Tables 1.13 and 1.14 complement the analysis of the impact of the policy on the two groups, focusing on the impact of the MDMS on cognitive outcomes. Similarly to previous results, an additional month of exposure to the policy significantly impacts the cognitive outcomes only for disadvantaged caste children, with an impact close to those observed in the main sample. Also for the cognitive analyses, the exclusion restriction used in the first stage of the Heckman model significantly affects the probability of a family enrolling a child in a public school. Notably, the Inverse Mills Ratio is never statistically significant in the health and cognitive analyses, supporting the lack of selection into different types of schools in the sample.

As expected, the Mid-Day Meal Scheme has a larger impact on poorer families, exemplified, in this case, by those belonging to lower castes, and plays a crucial role

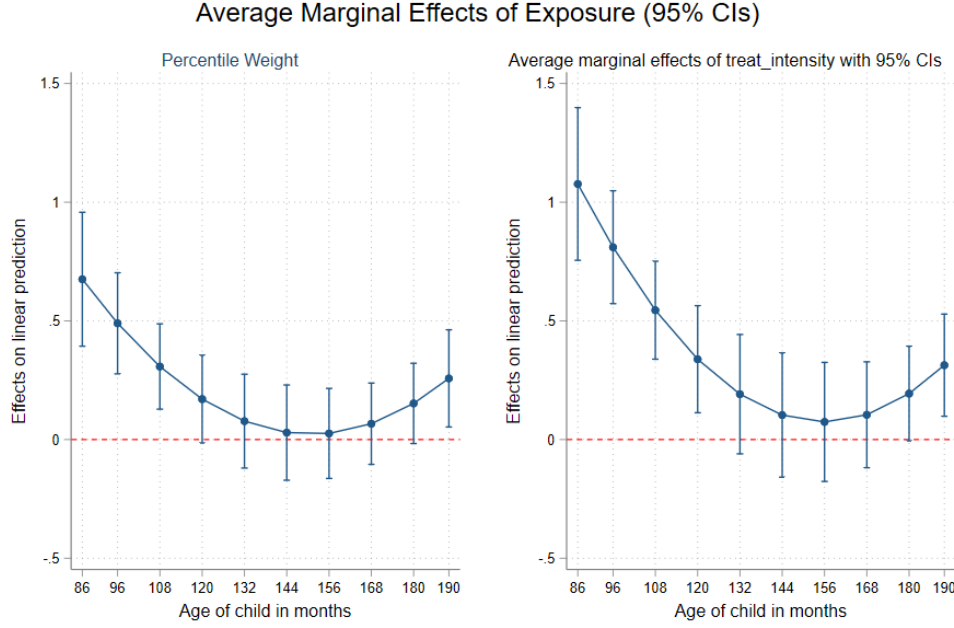
in supporting children’s cognitive and health development when parental resources are most likely lacking.

1.6 .2 Age Heterogeneity

The main analyses presented in this research identify the average impact of the Mid-Day Meal Scheme on the health and cognitive outcomes of children, regardless of the age at which they receive support from the policy. However, children in our sample range are between 7 and nearly 16 years of age, and we may expect potential variability in the magnitude of the scheme’s impact depending on their age at the time of the interview. Children in the initial years of formal schooling might derive larger benefits from the program compared to those in higher grades. The literature provides evidence that School Feeding Programs and, in general, programs aimed at supporting children’s development tend to produce larger improvements when children are in the early stages of their lives (Cunha and Heckman, 2008; Cascio and Staiger, 2012; Attanasio et al., 2020). To account for this potential heterogeneity, we incorporate an interaction term in the second stage of the Heckman Selection model by multiplying the monthly cumulative exposure to the Mid-Day Meal Scheme with the child’s age in months and its squared term. These interactions allow us to identify the non-linear impact of an additional month of exposure to the MDMS and describe the marginal impact of the policy based on the children’s age. Our examination spans the entire age range in the sample, from 86 months (7 years and 2 months) to 190 months (15 years and 10 months). However, due to limited observations at the extremes of this interval, we focus primarily on assessing the impact on children aged 8 to 15 years.

Figure 1.6 illustrates the variation in the average impact of an additional month of exposure to the Mid-Day Meal Scheme on the percentile rankings of weight and height across different age groups. The graphs reveal a U-shaped pattern, with the most substantial effect observed among children entering the schooling system and diminishing as age increases. Notably, the coefficient loses statistical significance, approaching zero impact for children older than 10 and younger than 16 years of age. Interestingly, the effect regains statistical significance for the few children in the sample who are the oldest, nearing 16 years of age.

Similarly, Figure 1.7 shows the average marginal effect of the exposure to the policy across various age groups in the cognitive sample. Here, too, the marginal impact diminishes with age, but the effect remains statistically significant for a longer period of growth, from about 7 to almost 12 years of age. Notably, for the math test, the effect remains positive and statistically significant at any age despite decreasing



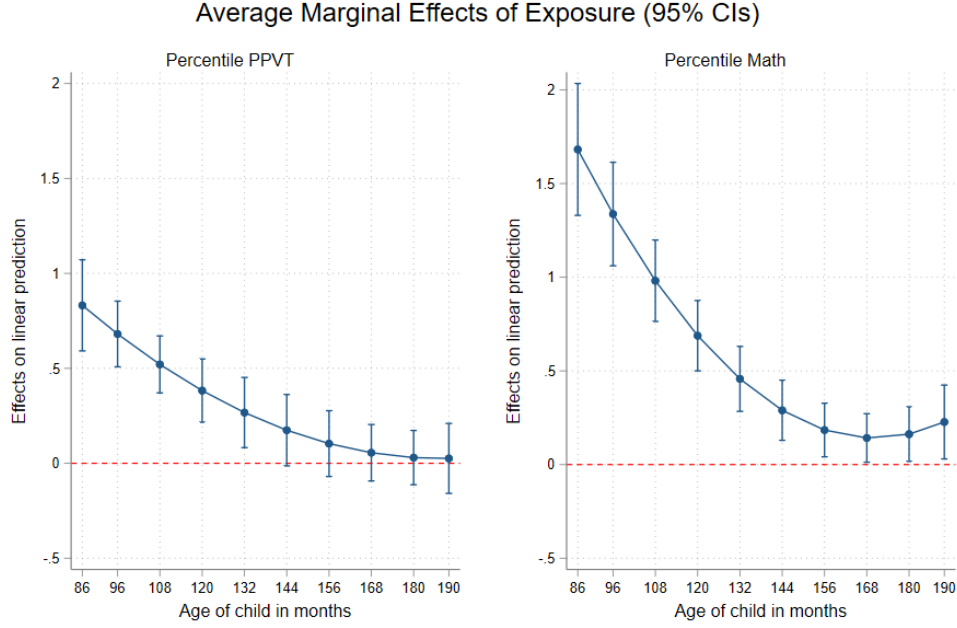
Heckman two-step procedure; bootstrap standard errors (1500 replications) are clustered at district, gender and time levels.
Average treatment effect of exposure to Mid-Day Meal Scheme at different ages on health outcomes. Range from 86 (min) to 190 (max) months, any additional tick represents a year.

Figure 1.6 : Age Heterogeneity, Health Outcomes

point estimates.¹⁵

This heterogeneity analysis confirms that the youngest age groups, primarily children in primary school, benefit most from the Mid-Day Meal Scheme. Unfortunately, our dataset lacks information to assess whether a redistribution mechanism within the household, as suggested by Jacoby (2002), could limit the effectiveness of the transfer received by the child. However, the results suggest that if such a mechanism exists, it is unlikely to affect very young children. Additionally, we are unable to investigate whether the absence of an effect for older children could be due to an insufficient amount of daily calories provided by the school meal program. This could become an issue if the calories provided by the school meal are not enough to meet the increasing needs of older children. A combination of the two effects is also possible. Over time, households may adjust the total daily food they provide during other meals in response to the food transfer received by the child at school. If the MDMS does not adequately address the growing calorie needs of children, and households fail to compensate for the shortfall, the policy's impact could become negligible. Notably, the effect of the policy on cognitive outcomes seems to persist for a longer period, potentially due to increased time spent at school or a reduction in days missed due to illness.

¹⁵Figure A.1 and A.2 in the Appendix reproduce the same analysis by gender



Heckman two-step procedure; bootstrap standard errors (1500 replications) are clustered at district, gender and time levels.
Average treatment effect of exposure to Mid-Day Meal Scheme at different ages on cognitive outcomes. Range from 86 (min) to 190 (max) months, any additional tick represents a year.

Figure 1.7 : Age Heterogeneity, Cognitive Outcomes

Overall, the results confirm the evidence described in the large economic and non-economic literature on children's development, assessing that the largest and most significant impacts on the health and cognitive development of children are found when investments are directed to children's early stages of life (Cunha et al., 2010). Additionally, results also confirm that educational gaps between children can be at least mitigated if remediation is attempted at early stages (Cunha and Heckman, 2007).

1.7 Conclusion

In our research, we examine the impact of the Indian Mid-Day Meal Scheme, one of the world's largest School Feeding Programs, on a set of outcomes describing the health and cognitive development of schoolchildren aged 7 to 16 years old living in the Indian State of Andhra Pradesh. Specifically, we analyse the impact of the policy with respect to the weight and height of children and their performance on two cognitive tests, the PPVT and the Math Test. The policy, discriminating between children enrolled in different types of schools, has the potential not just to enhance the development of students attending public schools but also to reduce inequalities that exist between children enrolled in the private and public sectors.

Indeed, through an Oaxaca-Blinder Decomposition, we find that disparities in the two dimensions between children enrolled in different types of schools, private and public, persist even after accounting for a comprehensive set of individual and family characteristics. Notably, these differences are most pronounced among female children. To analyse the extent to which the MDMS can reduce these inequalities, we leverage the design of the Indian Young Lives Survey and the phased implementation of the MDMS, targeting only children attending public schools at specific grades in specific years, to construct a variable describing the individual monthly cumulative exposure to the policy at each interview round, utilizing the complete educational history of each child. Initially, we perform an OLS analysis on the sample of children attending public school to measure the impact that an additional month of exposure to the policy has on the health and cognitive outcomes considered. The results reveal a positive and statistically significant impact of the MDMS on both health and cognitive outcomes, underscoring the program’s significance in supporting the development of public school students and also allowing the calculation of the number of additional months of exposure that would be needed to close the observed gaps identified in the Oaxaca-Blinder Decomposition.

The interpretation of the OLS results, however, is limited to the population of students in public schools and cannot provide answers to the broader question of how the policy would affect the entire school population. The OLS results can only be generalised to the overall student population if the decision to attend a particular type of school is exogenous. This assumption excludes the existence of unobserved characteristics that could affect both the outcomes of interest and the school choice, which determines the exposure to the MDMS. To address this potential selection issue, we employ a two-step Heckman Selection model, which accounts for parental decisions in school choice. The results indicate that the impact of the MDMS on students in our sample would be positive and statistically significant, regardless of the type of school attended. Overall, we estimate that the number of months of exposure to the policy required to close the gaps observed in the outcome variables between children attending private and public schools is equal to 40.8 months for percentile ranking of weight and 18.4 for height, while for percentile ranking of PPVT and Math this value is equal to 25 and 18.4 months. Having calculated the number of months needed to close gaps in children’s development outcomes between children attending private and public schools, it is possible to exploit information on individual meal cost to have a sense of the total cost of this exposure for the public schooling population. For this back-of-the-envelope calculation, we consider the number of months needed to close the gap in the percentile ranking of weight, being the largest among the four outcomes considered. Because the unitary cost varies in different years, we consider 2011 as the reference year for this calculation. Follow-

ing administrative sources of the Department of Education of Andhra Pradesh, we derived a unitary cost of 3.84 Rs for primary schools and 4.40 Rs for upper primary schools (Government of Andhra Pradesh, 2011). The total number of children enrolled in primary public schools was 4,599,701; in upper primary public schools, it was 1,111,830 (Statistical Abstract of Andhra Pradesh, 2012). Multiplying the unitary cost for a meal in primary and upper primary school by the number of months of exposure required to close the gap in the percentile ranking of weight between groups, it is possible to have an idea of the total (tentative) cost paid by India and -in quota parte- Andhra Pradesh. The total cost of 40.8 months of exposure for public primary school children was equal to 21.431 billion Indian rupees, while for upper primary children, it was 5.987 billion rupees. If we sum up the two quantities and compare the result with the GDP of Andhra Pradesh in 2011, we observe that the total expenditure for guaranteeing 40.8 months of exposure to the public primary and upper-primary school population would be equal to around 0.7% of the State GDP.

Finally, we consider important characteristics at the individual and household level to understand how the MDMS's impact varies between children living in different families and having different ages. When considering children coming from different castes, specifically disadvantaged castes compared to other castes, we observe how the results obtained in the main analyses are predominantly driven by children coming from the first group, thus representing a safety net with respect to the Indian societal structure and caste discrimination. Similarly, we observe that the child's age represents an important factor in determining the policy impact. Conducting a heterogeneity exercise by interacting the monthly exposure to the MDMS with the child's age in months, we highlight that the groups of children benefiting the most from the School Feeding Program are, as expected from the literature, the youngest, particularly with respect to health outcomes.

Our analysis underscores the importance of School Feeding Programs, such as the Indian Mid-Day Meal, in supporting children's development and reducing early-life inequalities. In all the specifications considered, males seem to benefit slightly more with respect than females in most outcomes, except for height, where females show stronger gain, highlighting the crucial role the policy plays in supporting health capital accumulation, especially among girls. While our findings provide insights into the effects of the MDMS on students in Andhra Pradesh, they also offer valuable guidance for policymakers, emphasising the diminishing impact of nutrition programs as children age and the crucial role these programs play in female health capital accumulation. In the Indian context, where the private sector is expanding to children coming from lower socioeconomic groups, extending the Mid-Day Meal Scheme to students attending private schools would be beneficial for the overall

development of the entire schooling population.

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Bibliography

- Afridi, F. (2010). Child welfare programs and child nutrition: Evidence from a mandated school meal program in india. *Journal of development Economics*, 92(2):152–165.
- Afridi, F. (2011). The impact of school meals on school participation: evidence from rural india. *Journal of Development Studies*, 47(11):1636–1656.
- Afridi, F., Barooah, B., and Somanathan, R. (2013). School meals and classroom effort: Evidence from india. *International Growth Centre*.
- Ahmed, A. U. (2004). Impact of feeding children in school: Evidence from bangladesh. *Washington, DC: International Food Policy Research Institute*.
- Alderman, H. and Bundy, D. (2012). School feeding programs and development: are we framing the question correctly? *The World Bank Research Observer*, 27(2):204–221.
- Alderman, H., Gilligan, D. O., and Lehrer, K. (2012). The impact of food for education programs on school participation in northern uganda. *Economic Development and Cultural Change*, 61(1):187–218.
- ASER (2007). India National Picture. https://img.asercentre.org/docs/Publications/ASER%20Reports/ASER_2007/Aser2007Report.pdf#page=123.00.
- ASER (2023). Aser evidence for action. <https://asercentre.org/>.
- Attanasio, O., Meghir, C., and Nix, E. (2020). Human capital development and parental investment in india. *The Review of Economic Studies*, 87(6):2511–2541.
- Aurino, E., Fledderjohann, J., and Vellakkal, S. (2019). Inequalities in adolescent learning: Does the timing and persistence of food insecurity at home matter? *Economics of Education Review*, 70:94–108.
- Aurino, E., Gelli, A., Adamba, C., Osei-Akoto, I., and Alderman, H. (2023). Food for thought? experimental evidence on the learning impacts of a large-scale school feeding program. *Journal of Human Resources*, 58(1):74–111.
- Aurino, E. and Giunti, S. (2022). Social protection for child development in crisis: A review of evidence and knowledge gaps. *The World Bank Research Observer*, 37(2):229–263.

- Bailwal, N. and Paul, S. B. (2024). Village dominance and learning gaps in rural india. *Journal of Economic Behavior & Organization*, 219:52–73.
- Blinder, A. S. (1973). Wage discrimination: reduced form and structural estimates. *Journal of Human resources*, pages 436–455.
- Bundy, D. A., Schultz, L., Sarr, B., Banham, L., Colenso, P., and Drake, L. (2017). The school as a platform for addressing health in middle childhood and adolescence.
- Cascio, E. U. and Staiger, D. O. (2012). Knowledge, tests, and fadeout in educational interventions. Technical report, National Bureau of Economic Research.
- Chakraborty, T. and Jayaraman, R. (2019). School feeding and learning achievement: evidence from india’s midday meal program. *Journal of Development Economics*, 139:249–265.
- Cunha, F. and Heckman, J. (2007). The technology of skill formation. *American economic review*, 97(2):31–47.
- Cunha, F. and Heckman, J. J. (2008). Formulating, identifying and estimating the technology of cognitive and noncognitive skill formation. *Journal of human resources*, 43(4):738–782.
- Cunha, F., Heckman, J. J., and Schennach, S. M. (2010). Estimating the technology of cognitive and noncognitive skill formation. *Econometrica*, 78(3):883–931.
- Das, J. and Zajonc, T. (2010). India shining and bharat drowning: Comparing two indian states to the worldwide distribution in mathematics achievement. *Journal of Development Economics*, 92(2):175–187.
- Drake, L., Fernandes, M., Aurino, E., Kiamba, J., Giyose, B., Burbano, C., Alderman, H., Mai, L., Mitchell, A., Gelli, A., et al. (2017). School feeding programs in middle childhood and adolescence. *Disease control priorities, Vol. 8: Child and adolescent health and development*, pages 147–64.
- Dreze, J. and Goyal, A. (2003). Future of mid-day meals. *Economic and political weekly*, pages 4673–4683.
- Drèze, J. and Khera, R. (2017). Recent social security initiatives in india. *World Development*, 98:555–572.
- Drèze, J. and Kingdon, G. G. (2001). School participation in rural india. *Review of Development Economics*, 5(1):1–24.

- Fang, G. and Zhu, Y. (2022). Long-term impacts of school nutrition: Evidence from china’s school meal reform. *World Development*, 153:105854.
- FAO (2023). Faostat. <https://www.fao.org/faostat/en/#country/100>.
- Gelli, A., Aurino, E., Folsom, G., Arhinful, D., Adamba, C., Osei-Akoto, I., Masset, E., Watkins, K., Fernandes, M., Drake, L., et al. (2019). A school meals program implemented at scale in ghana increases height-for-age during midchildhood in girls and in children from poor households: a cluster randomized trial. *The Journal of nutrition*, 149(8):1434–1442.
- Government of Andhra Pradesh (2011). Department of Education. <https://utfundrajavaram.yolasite.com/resources/MDM%20REVISED%20RATES.%20GO%20420.%20Dt.17.5.11.pdf>.
- Humphries, D. L., Dearden, K. A., Crookston, B. T., Fernald, L. C., Stein, A. D., Woldehanna, T., Penny, M. E., and Behrman, J. R. (2015). Cross-sectional and longitudinal associations between household food security and child anthropometry at ages 5 and 8 years in ethiopia, india, peru, and vietnam. *The Journal of nutrition*, 145(8):1924–1933.
- Jacoby, H. G. (2002). Is there an intrahousehold ‘flypaper effect’? evidence from a school feeding programme. *The Economic Journal*, 112(476):196–221.
- James, Z. and Woodhead, M. (2014). Choosing and changing schools in india’s private and government sectors: Young lives evidence from andhra pradesh. *Oxford Review of Education*, 40(1):73–90.
- Jann, B. (2008). The blinder–oaxaca decomposition for linear regression models. *The Stata Journal*, 8(4):453–479.
- Jayaraman, R. and Simroth, D. (2011). The impact of school lunches on primary school enrollment: Evidence from india’s midday meal scheme.
- Jomaa, L. H., McDonnell, E., and Probart, C. (2011). School feeding programs in developing countries: impacts on children’s health and educational outcomes. *Nutrition reviews*, 69(2):83–98.
- Kaur, R. (2021). Estimating the impact of school feeding programs: Evidence from mid day meal scheme of india. *Economics of Education Review*, 84:102171.
- Khera, R. (2006). Mid-day meals in primary schools: Achievements and challenges. *Economic and political weekly*, pages 4742–4750.

- King, E. M. and Behrman, J. R. (2009). Timing and duration of exposure in evaluations of social programs. *The World Bank Research Observer*, 24(1):55–82.
- Kingdon, G. G. (2007). The progress of school education in india. *Oxford Review of Economic Policy*, 23(2):168–195.
- Kingdon, G. G. (2020). The private schooling phenomenon in india: A review. *The Journal of Development Studies*, 56(10):1795–1817.
- Leon, J. (2020). Young lives techincal note 51. Technical report, Young Lives.
- McEwan, P. J. (2013). The impact of chile’s school feeding program on education outcomes. *Economics of Education Review*, 32:122–139.
- Mostert, C. M. (2021). The impact of the school feeding programme on the education and health outcomes of south african children. *Children and Youth Services Review*, 126:106029.
- Munshi, K. (2019). Caste and the indian economy. *Journal of Economic Literature*, 57(4):781–834.
- Muralidharan, K. and Kremer, M. (2008). Public-private schools in rural india.
- National Health Family Survey (2007). International Institute for Population Science.
- Oaxaca, R. (1973). Male-female wage differentials in urban labor markets. *International economic review*, pages 693–709.
- Sahoo, S. (2017). Intra-household gender disparity in school choice: Evidence from private schooling in india. *The Journal of Development Studies*, 53(10):1714–1730.
- Singh, A., Park, A., and Dercon, S. (2014). School meals as a safety net: an evaluation of the midday meal scheme in india. *Economic Development and Cultural Change*, 62(2):275–306.
- Statistical Abstract (1998). Directorate of Economics Statistics Government of Andhra Pradesh.
- Statistical Abstract (2003). Directorate of Economics Statistics Government of Andhra Pradesh.
- Statistical Abstract (2006). Directorate of Economics Statistics Government of Andhra Pradesh.

Statistical Abstract (2009). Directorate of Economics Statistics Government of Andhra Pradesh.

Statistical Abstract (2012). Directorate of Economics Statistics Government of Andhra Pradesh.

Vermeersch, C. and Kremer, M. (2005). *School meals, educational achievement, and school competition: evidence from a randomized evaluation*, volume 3523. World Bank Publications.

World Food Programme (2023). India country brief.
<https://www.wfp.org/countries/india>.

Young Lives (2017). Young lives survey design and sampling (round 5): United andhra pradesh. Technical report, Young Lives.

1.8 Appendix

Table A.1: OLS, Health Outcomes

	<i>Perc. Weight:</i>			<i>Perc. Height:</i>		
	All	Male	Female	All	Male	Female
Exposure (months)	0.181*** (0.061)	0.197** (0.081)	0.176** (0.084)	0.299*** (0.079)	0.239** (0.093)	0.344*** (0.103)
Gender	1.064 (1.444)			−4.372** (1.788)		
Rural	−6.389** (2.498)	−5.922 (4.096)	−6.325** (3.008)	−1.407 (2.550)	3.522 (3.162)	−5.870* (3.184)
Housing Quality 2nd quartile	0.147 (1.035)	0.730 (1.573)	−0.136 (1.483)	1.823 (1.165)	3.285** (1.626)	0.104 (1.768)
Housing Quality 3rd quartile	0.180 (1.156)	1.494 (2.093)	−1.569 (1.483)	2.204 (1.425)	2.618 (1.792)	0.801 (2.221)
Housing Quality 4th quartile	0.792 (1.350)	0.009 (1.895)	1.707 (1.784)	1.905 (1.622)	0.828 (2.766)	3.063* (1.520)
Ownhouse	−3.178* (1.834)	−4.974** (2.443)	−1.596 (2.760)	−5.586*** (1.815)	−8.770*** (1.778)	−2.157 (2.773)
TV	3.309** (1.309)	2.002 (1.519)	4.008* (2.208)	4.225*** (1.182)	3.593** (1.427)	4.837** (1.876)
Bike	1.786* (1.032)	0.756 (1.155)	2.354 (1.460)	2.767** (1.051)	0.839 (1.465)	2.690** (1.251)
Fan	1.592 (1.202)	3.873** (1.473)	−0.338 (1.676)	1.985 (1.293)	3.708** (1.774)	1.025 (1.877)
Natural Event	−0.700 (1.256)	0.358 (1.476)	−1.682 (1.753)	0.206 (1.568)	0.586 (1.616)	−0.315 (1.864)
Age Child (months)	1.669*** (0.604)	0.694 (0.878)	2.551*** (0.735)	1.918*** (0.593)	0.985 (0.947)	2.733*** (0.690)
Age Child squared	−0.006*** (0.002)	−0.003 (0.003)	−0.009*** (0.003)	−0.007*** (0.002)	−0.003 (0.003)	−0.011*** (0.002)
Other Caste	−0.035 (1.591)	0.384 (3.055)	−0.104 (1.514)	1.719 (1.870)	4.730 (3.031)	−0.139 (1.963)
Hindu	4.100*** (1.507)	5.376*** (1.897)	3.470 (2.474)	2.312 (1.857)	3.804** (1.801)	0.649 (2.972)
Telegu	−2.359** (1.111)	0.351 (1.157)	−4.889*** (1.645)	−0.552 (1.372)	−1.396 (1.963)	−2.553 (1.568)
Education Father	0.132 (0.132)	−0.400** (0.152)	0.535*** (0.150)	0.041 (0.130)	−0.365* (0.189)	0.329** (0.128)
Education Mother	0.109 (0.143)	0.299 (0.233)	−0.018 (0.188)	0.252 (0.172)	0.260 (0.245)	0.173 (0.283)
Household Size	−0.470** (0.229)	−0.387 (0.339)	−0.541* (0.281)	−0.296 (0.233)	−0.379 (0.357)	−0.173 (0.283)
First Child	1.894 (1.291)	2.292 (1.792)	1.891 (1.832)	2.256** (0.938)	2.433* (1.334)	2.655** (1.305)
Region & Year FE	✓	✓	✓	✓	✓	✓
N. Obs	3,563	1,665	1,898	3,563	1,665	1,898
R-squared	0.056	0.078	0.093	0.059	0.107	0.118
F	14.50	36.23	122.34	13.86	25.50	107.24

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Table A.2: OLS, Cognitive Outcomes

	<i>Perc. PPVT:</i>			<i>Perc. Math:</i>		
	All	Male	Female	All	Male	Female
Exposure (months)	0.202*** (0.055)	0.219** (0.100)	0.184*** (0.068)	0.452*** (0.066)	0.483*** (0.107)	0.423*** (0.082)
Gender	-5.941*** (1.641)			-4.127*** (1.407)		
Rural	-5.665** (2.496)	0.570 (4.286)	-11.068*** (2.772)	3.958** (1.878)	7.282*** (2.431)	1.395 (2.558)
Housing Quality 2nd quartile	-2.000 (1.376)	-0.469 (2.110)	-3.081* (1.700)	-0.352 (1.062)	0.101 (1.422)	-0.364 (1.578)
Housing Quality 3rd quartile	-3.150* (1.689)	-1.615 (1.998)	-4.801* (2.562)	-0.186 (1.417)	1.615 (2.005)	-1.954 (1.724)
Housing Quality 4th quartile	-4.048*** (1.503)	-2.771 (1.888)	-4.785** (2.227)	-0.995 (2.147)	0.795 (3.314)	-2.055 (2.853)
Ownhouse	0.928 (1.794)	-3.549 (2.682)	3.825 (2.353)	2.765 (1.687)	-1.988 (2.350)	6.445*** (1.974)
TV	3.337*** (1.053)	2.751* (1.554)	3.622** (1.569)	0.348 (0.998)	-0.709 (1.459)	0.835 (1.328)
Bike	1.923 (1.400)	1.760 (1.528)	1.976 (2.121)	0.302 (1.580)	-2.346 (2.423)	2.467 (1.691)
Fan	3.443** (1.520)	3.832* (1.937)	2.830 (2.316)	6.779*** (1.587)	8.076*** (2.553)	5.724*** (1.945)
Natural Event	-0.458 (1.974)	1.999 (2.529)	-2.361 (2.803)	0.512 (1.405)	2.760 (2.347)	-1.519 (1.581)
Age Child (months)	0.438 (0.491)	-0.211 (0.632)	0.901 (0.666)	0.665 (0.494)	1.211* (0.659)	0.095 (0.633)
Age Child squared	-0.002 (0.002)	0.001 (0.002)	-0.004 (0.002)	-0.003 (0.002)	-0.004* (0.002)	-0.001 (0.002)
Other Caste	1.805 (2.071)	-0.508 (3.112)	3.520 (2.406)	3.982** (1.731)	1.359 (2.202)	6.449*** (2.360)
Hindu	1.490 (1.565)	4.570* (2.677)	-1.186 (2.010)	6.921*** (1.478)	8.857*** (2.101)	4.889** (1.971)
Telegu	0.451 (1.454)	0.994 (2.336)	0.391 (1.857)	1.550 (1.364)	0.880 (2.055)	2.750 (1.830)
Education Father	0.446*** (0.133)	0.520*** (0.177)	0.429** (0.189)	0.430*** (0.133)	0.230 (0.234)	0.565*** (0.176)
Education Mother	0.816*** (0.159)	0.631** (0.243)	0.821*** (0.213)	0.953*** (0.196)	0.872** (0.325)	0.912*** (0.259)
Household Size	-0.306 (0.208)	-0.669** (0.289)	0.097 (0.289)	0.423 (0.243)	0.066 (0.284)	0.793** (0.306)
First Child	2.672** (1.018)	2.943** (1.341)	2.494* (1.440)	3.081*** (0.991)	3.162 (1.974)	3.326*** (0.864)
Region & Year FE	✓	✓	✓	✓	✓	✓
N. Obs	2,934	1,361	1,573	2,934	1,361	1,573
R-squared	0.129	0.140	0.133	0.161	0.164	0.189
F	29.66	73.60	122.04	25.77	85.90	399.94

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Table A.3: Heckman Model, Health Outcomes

	<i>Perc. Weight:</i>			<i>Perc. Height:</i>		
	All	Male	Female	All	Male	Female
<i>Second Stage</i>						
Exposure (months)	0.179*** (0.060)	0.194** (0.087)	0.176** (0.087)	0.297*** (0.079)	0.238** (0.100)	0.343*** (0.107)
Mills Ratio	−3.568 (4.014)	−5.594 (5.387)	−0.913 (5.211)	−3.441 (3.628)	−1.769 (4.928)	−2.373 (4.197)
Gender	0.556 (1.719)			−4.862** (2.083)		
Rural	−8.430** (3.850)	−9.034* (5.311)	−6.864 (5.143)	−3.375 (3.575)	2.537 (4.135)	−7.271 (5.001)
Housing Quality 2nd quartile	0.276 (1.044)	0.935 (1.618)	−0.110 (1.545)	1.948 (1.195)	3.350** (1.688)	0.173 (1.822)
Housing Quality 3rd quartile	0.553 (1.193)	2.243 (2.216)	−1.500 (1.434)	2.563* (1.514)	2.855 (1.971)	0.982 (2.321)
Housing Quality 4th quartile	1.106 (1.619)	0.332 (2.437)	1.852 (2.069)	2.517 (1.886)	1.175 (3.386)	3.437* (1.825)
Ownhouse	−3.334* (1.830)	−4.957** (2.441)	−1.665 (2.868)	−5.737*** (1.829)	−8.765*** (1.939)	−2.338 (2.882)
TV	3.823*** (1.302)	2.926* (1.747)	4.127** (2.063)	4.721*** (1.201)	3.885** (1.819)	5.145*** (1.767)
Bike	1.765* (1.057)	0.814 (1.201)	2.331 (1.527)	2.747*** (1.063)	0.857 (1.501)	2.630** (1.295)
Fan	1.667 (1.225)	3.909** (1.504)	−0.310 (1.659)	2.057 (1.301)	3.720** (1.753)	1.097 (1.956)
Natural Event	−0.822 (1.290)	0.183 (1.663)	−1.711 (1.820)	0.088 (1.516)	0.531 (1.705)	−0.389 (1.930)
Age Child (months)	1.622*** (0.620)	0.602 (0.970)	2.542*** (0.770)	1.873*** (0.592)	0.956 (1.018)	2.709*** (0.732)
Age Child squared	−0.006*** (0.002)	−0.002 (0.004)	−0.009*** (0.003)	−0.007*** (0.002)	−0.003 (0.004)	−0.010*** (0.003)
Other Caste	0.825 (1.878)	1.719 (3.351)	0.109 (2.145)	2.549 (2.060)	5.152 (3.435)	0.414 (2.366)
Hindu	4.295*** (1.590)	5.639*** (2.098)	3.523 (2.605)	2.320 (1.895)	3.888* (1.906)	0.786 (3.238)
Telegu	−2.102* (1.191)	0.730 (1.236)	−4.824*** (1.712)	−1.235 (1.357)	−0.432 (2.063)	−2.385 (1.618)
Education Father	0.211 (0.167)	−0.223 (0.215)	0.549*** (0.193)	0.117 (0.167)	−0.309 (0.248)	0.365** (0.150)
Education Mother	0.194 (0.165)	0.437 (0.311)	0.003 (0.211)	0.334* (0.189)	0.303 (0.295)	0.229 (0.257)
Household Size	−0.475** (0.235)	−0.543* (0.358)	−0.540* (0.293)	−0.301 (0.236)	−0.379 (0.369)	−0.179 (0.301)
First Child	2.179* (1.300)	2.709 (1.995)	1.958 (1.654)	2.530*** (0.942)	2.815* (1.500)	2.830** (1.156)
Region & Year FE	✓	✓	✓	✓	✓	✓
<i>First Stage</i>						
Exclusion Restriction	0.933*** (0.207)	1.014*** (0.343)	0.786*** (0.277)	0.933*** (0.286)	1.014*** (0.343)	0.786*** (0.286)
N. Obs	5,567	2,864	2,703	5,567	2,864	2,703
Selected	3,563	1,665	1,898	3,563	1,665	1,898

* p<0.1; ** p<0.05; *** p<0.01

Heckman two-step procedure; bootstrap standard errors (1500 replications) are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Table A.4: Heckman Model, Cognitive Outcomes

	<i>Perc. PPVT:</i>			<i>Perc. Math:</i>		
	All	Male	Female	All	Male	Female
<i>Second Stage</i>						
Exposure (months)	0.204*** (0.056)	0.220** (0.100)	0.189*** (0.068)	0.450*** (0.066)	0.479*** (0.105)	0.425*** (0.085)
Mills Ratio	3.993 (4.105)	2.216 (7.413)	9.656** (4.496)	-2.664 (4.372)	-5.796 (6.787)	3.705 (4.867)
Gender	-5.263** (2.185)			-4.579** (1.823)		
Rural	-3.401 (3.818)	1.744 (6.340)	-4.649 (4.334)	2.449 (3.382)	4.209 (5.010)	3.619 (4.451)
Housing Quality 2nd quartile	-2.183 (1.417)	-0.600 (2.363)	-3.328* (1.832)	-0.229 (1.098)	0.444 (1.605)	-0.458 (1.611)
Housing Quality 3rd quartile	-3.609* (1.874)	-1.967 (2.774)	-5.514** (2.659)	0.120 (1.594)	2.534 (2.322)	-2.228 (1.921)
Housing Quality 4th quartile	-4.910** (1.948)	-3.296 (2.699)	-6.626** (2.777)	-0.420 (2.500)	2.169 (4.161)	-2.761 (3.171)
Ownhouse	1.176 (1.854)	-3.534 (2.710)	4.809* (2.484)	2.599 (1.809)	-2.027 (2.585)	6.822*** (2.178)
TV	2.782** (1.236)	2.399 (2.273)	2.430 (1.746)	0.718 (1.158)	0.213 (1.866)	0.378 (1.521)
Bike	1.929 (1.366)	1.747 (1.612)	2.087 (2.059)	0.298 (1.561)	-2.311 (2.467)	2.509 (1.550)
Fan	3.413** (1.530)	3.854* (2.108)	2.612 (2.386)	6.800*** (1.594)	8.017*** (2.523)	5.640*** (2.074)
Natural Event	-0.398 (1.993)	2.040 (2.595)	-2.288 (2.884)	0.472 (1.403)	2.653 (2.395)	-1.491 (1.583)
Age Child (months)	0.505 (0.536)	-0.178 (0.739)	1.065 (0.761)	0.620 (0.523)	1.124 (0.735)	0.158 (0.738)
Age Child squared	-0.002 (0.002)	0.001 (0.003)	-0.004 (0.003)	-0.004 (0.002)	-0.004 (0.003)	-0.001 (0.003)
Other Caste	0.667 (2.587)	-1.194 (4.362)	1.010 (3.130)	4.742** (2.215)	3.153 (2.438)	5.486* (3.171)
Hindu	1.203 (1.598)	4.413* (2.658)	-1.762 (2.005)	7.112*** (1.563)	9.267*** (2.383)	4.668** (2.056)
Telegu	0.105 (1.428)	0.814 (2.445)	-0.430 (1.874)	1.781 (1.370)	1.351 (2.163)	2.435 (1.773)
Education Father	0.352** (0.159)	0.448 (0.300)	0.266 (0.204)	0.493*** (0.167)	0.418 (0.324)	0.824*** (0.300)
Education Mother	0.712*** (0.195)	0.591** (0.299)	0.628** (0.262)	1.023*** (0.245)	1.037** (0.420)	0.824*** (0.300)
Household Size	-0.314 (0.222)	-0.677** (0.318)	0.093 (0.310)	0.428* (0.249)	0.086 (0.343)	0.792** (0.336)
First Child	2.307** (1.140)	2.735 (1.587)	1.733 (1.588)	3.324*** (1.022)	3.706* (2.058)	3.034*** (0.888)
Region & Year FE	✓	✓	✓	✓	✓	✓
<i>First Stage</i>						
Exclusion Restriction	0.892*** (0.225)	1.022*** (0.393)	0.754*** (0.285)	0.892*** (0.225)	1.022*** (0.393)	0.754*** (0.285)
N. Obs	4,826	2,506	2,320	4,826	2,506	2,320
Selected	2,934	1,361	1,573	2,934	1,361	1,573

*p<0.1; **p<0.05; ***p<0.01

Heckman two-step procedure; bootstrap standard errors (1500 replications) are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Table A.5: OLS, Health Outcomes - Standardised Scores

	<i>Std. Weight:</i>			<i>Std. Height:</i>		
	All	Male	Female	All	Male	Female
Exposure (months)	0.005** (0.002)	0.006** (0.003)	0.005* (0.003)	0.010*** (0.003)	0.008** (0.004)	0.012*** (0.004)
Gender	0.024 (0.044)			-0.165*** (0.059)		
Rural	-0.248*** (0.088)	-0.240 (0.148)	-0.238** (0.105)	-0.056 (0.087)	0.130 (0.105)	-0.217* (0.110)
Housing Quality 2nd quartile	0.009 (0.032)	0.035 (0.053)	-0.001 (0.044)	0.063 (0.039)	0.111** (0.055)	0.007 (0.059)
Housing Quality 3rd quartile	0.001 (0.037)	0.041 (0.065)	-0.049 (0.046)	0.068 (0.047)	0.082 (0.059)	0.022 (0.073)
Housing Quality 4th quartile	0.031 (0.042)	0.014 (0.068)	0.055 (0.050)	0.069 (0.054)	0.033 (0.090)	0.104* (0.053)
Ownhouse	-0.090 (0.062)	-0.131* (0.075)	-0.061 (0.101)	-0.182*** (0.058)	-0.298*** (0.056)	-0.067 (0.087)
TV	0.093** (0.038)	0.033 (0.047)	0.127* (0.065)	0.151*** (0.040)	0.130** (0.051)	0.167** (0.062)
Bike	0.053 (0.033)	0.003 (0.036)	0.093** (0.046)	0.094** (0.036)	0.031 (0.048)	0.091** (0.044)
Fan	0.035 (0.037)	0.128*** (0.047)	-0.043 (0.052)	0.067 (0.042)	0.132** (0.058)	0.029 (0.061)
Natural Event	-0.027 (0.042)	-0.0010 (0.053)	-0.041 (0.057)	-0.007 (0.050)	0.011 (0.052)	-0.032 (0.062)
Age Child (months)	0.053*** (0.018)	0.025 (0.028)	0.079*** (0.020)	0.066*** (0.021)	0.0310 (0.032)	0.096*** (0.023)
Age Child squared	-0.0002*** (0.0001)	-0.0001 (0.0001)	-0.0003*** (0.0001)	-0.0002*** (0.0001)	-0.000 (0.0001)	-0.0004*** (0.0001)
Other Caste	0.021 (0.046)	0.009 (0.084)	0.040 (0.051)	0.059 (0.064)	0.172 (0.112)	-0.005 (0.062)
Hindu	0.131*** (0.048)	0.177*** (0.057)	0.106 (0.079)	0.064 (0.061)	0.131** (0.062)	0.009 (0.096)
Telegu	-0.055* (0.033)	0.034 (0.033)	-0.137*** (0.050)	-0.060 (0.045)	-0.032 (0.067)	-0.091*** (0.052)
Education Father	0.005 (0.004)	-0.012** (0.005)	0.017*** (0.005)	0.002 (0.004)	-0.012** (0.006)	0.012*** (0.004)
Education Mother	0.004 (0.005)	0.008 (0.008)	0.002 (0.006)	0.008 (0.006)	0.004 (0.009)	0.007 (0.009)
Household Size	-0.014** (0.007)	-0.011 (0.009)	-0.019* (0.009)	-0.010 (0.008)	-0.012 (0.011)	-0.008 (0.010)
First Child	0.059 (0.036)	0.068 (0.053)	0.065 (0.049)	0.070** (0.032)	0.101** (0.045)	0.074* (0.043)
Region & Year FE	✓	✓	✓	✓	✓	✓
N. Obs	3,563	1,665	1,898	3,563	1,665	1,898
R-squared	0.054	0.071	0.089	0.060	0.100	0.119
F	13.63	38.57	98.34	13.52	27.55	112.93

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Table A.6: OLS, Cognitive Outcomes - Standardised Scores

	<i>Std. PPVT:</i>			<i>Std. Math:</i>		
	All	Male	Female	All	Male	Female
Exposure (months)	0.005** (0.002)	0.007* (0.004)	0.004 (0.003)	0.015*** (0.002)	0.017*** (0.004)	0.014*** (0.003)
Gender	-0.220*** (0.059)			-0.149*** (0.051)		
Rural	-0.181** (0.075)	0.003 (0.139)	-0.327*** (0.080)	0.149*** (0.051)	0.267*** (0.082)	0.074 (0.097)
Housing Quality 2nd quartile	-0.031 (0.048)	0.009 (0.074)	-0.058 (0.056)	-0.022 (0.036)	0.004 (0.047)	-0.032 (0.056)
Housing Quality 3rd quartile	-0.099* (0.057)	-0.032 (0.067)	-0.170** (0.083)	-0.018 (0.049)	0.049 (0.067)	-0.080 (0.063)
Housing Quality 4th quartile	-0.078 (0.054)	-0.013 (0.064)	-0.122 (0.078)	-0.020 (0.073)	0.046 (0.114)	-0.062 (0.097)
Ownhouse	0.081 (0.062)	-0.072 (0.089)	0.188** (0.083)	0.100* (0.058)	-0.044 (0.086)	0.212*** (0.066)
TV	0.102** (0.040)	0.064 (0.063)	0.120** (0.057)	0.014 (0.034)	-0.029 (0.053)	0.033 (0.043)
Bike	0.077 (0.051)	0.069 (0.053)	0.074 (0.078)	0.011 (0.056)	-0.070 (0.089)	0.073 (0.056)
Fan	0.163*** (0.058)	0.194** (0.081)	0.129 (0.083)	0.246*** (0.056)	0.286*** (0.092)	0.214*** (0.066)
Natural Event	0.005 (0.071)	0.084 (0.101)	-0.059 (0.095)	0.032 (0.052)	0.112 (0.085)	-0.044 (0.058)
Age Child (months)	0.008 (0.016)	-0.009 (0.023)	0.020 (0.019)	0.025 (0.017)	0.046** (0.021)	0.004 (0.020)
Age Child squared	-0.000 (0.0001)	0.000 (0.0001)	-0.0001 (0.0001)	-0.0001* (0.0000)	-0.0001** (0.0000)	-0.000 (0.00001)
Other Caste	0.071 (0.066)	-0.031 (0.095)	0.152* (0.078)	0.129** (0.063)	0.030 (0.079)	0.226** (0.086)
Hindu	0.003 (0.058)	0.128 (0.097)	-0.113 (0.073)	0.231*** (0.053)	0.310*** (0.076)	0.150** (0.072)
Telegu	0.033 (0.060)	0.045 (0.093)	0.042 (0.0758)	0.047 (0.045)	0.016 (0.070)	0.098* (0.057)
Education Father	0.019*** (0.005)	0.018*** (0.006)	0.020*** (0.007)	0.015*** (0.005)	0.008 (0.008)	0.020*** (0.006)
Education Mother	0.023*** (0.006)	0.022** (0.009)	0.019** (0.008)	0.033*** (0.007)	0.034*** (0.012)	0.029** (0.008)
Household Size	-0.013 (0.009)	-0.028** (0.011)	0.004 (0.012)	0.016* (0.009)	0.002 (0.009)	0.031** (0.013)
First Child	0.103*** (0.037)	0.118** (0.052)	0.094* (0.051)	0.120*** (0.036)	0.136* (0.069)	0.115*** (0.043)
Region & Year FE	✓	✓	✓	✓	✓	✓
N. Obs	2,934	1,361	1,573	2,934	1,361	1,573
R-squared	0.116	0.128	0.117	0.156	0.163	0.177
F	31.18	123.43	172.36	36.97	66.74	257.15

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Table A.7: Heckman Model, Health Outcomes - Standardised Scores

	<i>Std. Weight:</i>			<i>Std. Height:</i>		
	All	Male	Female	All	Male	Female
Second Stage						
Exposure (months)	0.005** (0.002)	0.006** (0.003)	0.005* (0.003)	0.010*** (0.003)	0.008** (0.004)	0.012*** (0.004)
Mills Ratio	-0.113 (0.137)	-0.175 (0.187)	-0.002 (0.189)	-0.129 (0.127)	-0.107 (0.166)	-0.059 (0.151)
Gender	0.007 (0.056)			-0.183*** (0.069)		
Rural	-0.313** (0.137)	-0.337* (0.199)	-0.239 (0.181)	-0.129 (0.122)	0.070 (0.140)	-0.252 (0.174)
Housing Quality 2nd quartile	0.014 (0.033)	0.041 (0.055)	-0.001 (0.047)	0.068* (0.040)	0.115** (0.057)	0.009 (0.061)
Housing Quality 3rd quartile	0.013 (0.040)	0.065 (0.071)	-0.048 (0.049)	0.082 (0.051)	0.096 (0.067)	0.027 (0.077)
Housing Quality 4th quartile	0.052 (0.052)	0.048 (0.087)	0.055 (0.062)	0.092 (0.064)	0.054 (0.110)	0.114* (0.064)
Ownhouse	-0.095 (0.062)	-0.130* (0.107)	-0.062 (0.103)	-0.187*** (0.058)	-0.297*** (0.061)	-0.072 (0.092)
TV	0.109*** (0.039)	0.062 (0.051)	0.127* (0.064)	0.170*** (0.042)	0.148** (0.063)	0.175*** (0.061)
Bike	0.053 (0.034)	0.004 (0.038)	0.093* (0.048)	0.093*** (0.036)	0.032 (0.050)	0.090** (0.045)
Fan	0.038 (0.038)	0.129*** (0.048)	-0.043 (0.050)	0.069 (0.044)	0.133** (0.057)	0.031 (0.064)
Natural Event	-0.031 (0.043)	-0.015 (0.060)	-0.041 (0.059)	-0.011 (0.049)	0.008 (0.0554)	-0.034 (0.065)
Age Child (months)	0.052*** (0.019)	0.022 (0.032)	0.064*** (0.022)	0.066*** (0.020)	0.028 (0.035)	0.096*** (0.025)
Age Child squared	-0.0002*** (0.0001)	-0.0001 (0.0001)	-0.0003*** (0.00001)	-0.0002*** (0.0001)	-0.0001 (0.0001)	-0.0004*** (0.0001)
Other Caste	0.049 (0.058)	0.051 (0.097)	0.040 (0.072)	0.090 (0.071)	0.197 (0.123)	0.009 (0.077)
Hindu	0.137*** (0.050)	0.186*** (0.065)	0.106 (0.084)	0.071 (0.063)	0.136** (0.066)	0.012 (0.105)
Telegu	-0.047 (0.036)	0.046 (0.035)	-0.137*** (0.052)	-0.051 (0.045)	-0.025 (0.070)	-0.086 (0.053)
Education Father	0.007 (0.005)	-0.006 (0.007)	0.017*** (0.006)	0.046 (0.005)	-0.009 (0.008)	0.013*** (0.005)
Education Mother	0.008 (0.005)	0.012 (0.019)	0.002 (0.007)	0.011 (0.007)	0.007 (0.011)	0.009 (0.009)
Household Size	-0.014** (0.007)	-0.011 (0.010)	-0.019* (0.010)	-0.010 (0.008)	-0.012 (0.012)	-0.008 (0.011)
First Child	0.068* (0.036)	0.081 (0.062)	0.065 (0.044)	0.870** (0.032)	0.109** (0.051)	0.078** (0.037)
Region & Year FE	✓	✓	✓	✓	✓	✓
First Stage						
Exclusion Restriction	0.933*** (0.207)	1.014*** (0.343)	0.786*** (0.286)	0.933*** (0.207)	1.014*** (0.343)	0.786*** (0.286)
N. Obs	5,567	2,864	2,703	5,567	2,864	2,703
Selected	3,563	1,665	1,898	3,563	1,665	1,898

* p<0.1; ** p<0.05; *** p<0.01

Heckman two-step procedure; bootstrap standard errors (1500 replications) are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Table A.8: Heckman Model, Cognitive Outcomes - Standardised Scores

	<i>Std. PPVT:</i>			<i>Std. Math:</i>		
	All	Male	Female	All	Male	Female
<i>Second Stage</i>						
Exposure (months)	0.005** (0.002)	0.006* (0.003)	0.004 (0.003)	0.015*** (0.002)	0.017*** (0.004)	0.014*** (0.003)
Mills Ratio	0.135 (0.146)	0.076 (0.256)	0.317* (0.176)	-0.065 (0.157)	-0.204 (0.243)	0.167 (0.169)
Gender	-0.197** (0.077)			-0.160** (0.066)		
Rural	-0.104 (0.120)	0.043 (0.201)	-0.137 (0.136)	0.125 (0.123)	0.159 (0.177)	0.174 (0.164)
Housing Quality 2nd quartile	-0.037 (0.049)	0.005 (0.085)	-0.066 (0.061)	-0.019 (0.039)	0.016 (0.055)	-0.036 (0.058)
Housing Quality 3rd quartile	-0.115* (0.065)	-0.044 (0.091)	-0.194** (0.092)	-0.011 (0.057)	0.081 (0.082)	-0.092 (0.071)
Housing Quality 4th quartile	-0.107 (0.069)	-0.031 (0.091)	-0.182* (0.099)	-0.006 (0.089)	0.094 (0.146)	-0.093 (0.113)
Ownhouse	0.089 (0.063)	-0.072 (0.091)	0.220** (0.090)	0.096 (0.062)	-0.045 (0.093)	0.230*** (0.073)
TV	0.083* (0.047)	0.052 (0.088)	0.081 (0.064)	0.023 (0.039)	0.003 (0.065)	0.012 (0.050)
Bike	0.077 (0.050)	0.069 (0.055)	0.077 (0.077)	0.010 (0.055)	-0.069 (0.090)	0.075 (0.052)
Fan	0.162*** (0.058)	0.195** (0.087)	0.122 (0.087)	0.247*** (0.056)	0.284*** (0.090)	0.210*** (0.071)
Natural Event	0.007 (0.072)	0.085 (0.103)	-0.057 (0.098)	0.031 (0.052)	0.108 (0.086)	-0.042 (0.057)
Age Child (months)	0.011 (0.071)	-0.008 (0.027)	0.026 (0.024)	0.024 (0.018)	0.043* (0.024)	0.006 (0.024)
Age Child squared	-0.0000 (0.00001)	0.0000 (0.0001)	-0.0001 (0.0001)	-0.0002* (0.001)	-0.0001 (0.00001)	-0.000 (0.0001)
Other Caste	0.032 (0.089)	-0.054 (0.142)	0.070 (0.105)	0.147* (0.083)	0.093 (0.089)	0.182* (0.105)
Hindu	-0.007 (0.062)	0.122 (0.098)	-0.132* (0.076)	0.236*** (0.057)	0.324*** (0.084)	0.140* (0.077)
Telegu	0.021 (0.060)	0.039 (0.100)	0.015 (0.074)	0.053 (0.046)	0.032 (0.076)	0.084 (0.056)
Education Father	0.016*** (0.006)	0.015 (0.010)	0.015** (0.007)	0.016*** (0.006)	0.014 (0.012)	0.017*** (0.006)
Education Mother	0.019*** (0.007)	0.019* (0.011)	0.012 (0.010)	0.035*** (0.008)	0.040*** (0.014)	0.025*** (0.009)
Household Size	-0.014 (0.009)	-0.029** (0.013)	0.004 (0.013)	0.016* (0.009)	0.003 (0.011)	0.031** (0.014)
First Child	0.009** (0.042)	0.110* (0.065)	0.069 (0.060)	0.126*** (0.038)	0.155** (0.072)	0.102*** (0.035)
Region & Year FE	✓	✓	✓	✓	✓	✓
<i>First Stage</i>						
Exclusion Restriction	0.892*** (0.225)	1.022*** (0.393)	0.754*** (0.285)	0.892*** (0.225)	1.022*** (0.393)	0.754*** (0.285)
N. Obs	4,826	2,506	2,320	4,826	2,506	2,320
Selected	2,934	1,361	1,573	2,934	1,361	1,573

*p<0.1; **p<0.05; ***p<0.01

Heckman two-step procedure; bootstrap standard errors (1500 replications) are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Table A.9: OLS, Cognitive Outcomes - Parental Education

	<i>Perc. PPVT:</i>			<i>Perc. Math:</i>		
	All	Below Med.	Above Med.	All	Below Med.	Above Med.
Exposure (months)	0.202*** (0.055)	0.208*** (0.070)	0.205** (0.096)	0.452*** (0.067)	0.466*** (0.073)	0.457*** (0.110)
Region & Year FE	✓	✓	✓	✓	✓	✓
Child controls	✓	✓	✓	✓	✓	✓
Household controls	✓	✓	✓	✓	✓	✓
N. Obs	2,934	2,064	870	2,934	2,064	870

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Table A.10: Heckman Model, Cognitive Outcomes - Parental Education

	<i>Perc. PPVT:</i>			<i>Perc. Math:</i>		
	All	Below Med.	Above Med.	All	Below Med.	Above Med.
<i>Second Stage</i>						
Exposure (months)	0.204*** (0.056)	0.206*** (0.071)	0.202** (0.098)	0.450*** (0.066)	0.466*** (0.073)	0.453*** (0.114)
Mills Ratio	3.993 (4.105)	-5.315 (9.999)	-2.549 (6.990)	-2.664 (4.372)	-15.930 (10.190)	-3.439 (6.854)
<i>First Stage</i>						
Exclusion Restriction	0.892*** (0.225)	0.785*** (0.294)	1.107*** (0.236)	0.892*** (0.225)	0.785*** (0.294)	1.107*** (0.236)
Region & Year FE	✓	✓	✓	✓	✓	✓
Child controls	✓	✓	✓	✓	✓	✓
Household controls	✓	✓	✓	✓	✓	✓
N. Obs	4,826	2,477	2,320	4,826	2,477	2,320
Selected	2,934	2,064	1,573	2,934	2,064	1,573

*p<0.1; **p<0.05; ***p<0.01

Heckman two-step procedure; bootstrap standard errors (1500 replications) are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Table A.11: OLS, Health Outcomes - Parental Education

	<i>Perc. Weight:</i>			<i>Perc. Height:</i>		
	All	Below Med.	Above Med.	All	Below Med.	Above Med.
Exposure (months)	0.181*** (0.061)	0.176*** (0.065)	0.191** (0.092)	0.299*** (0.079)	0.312*** (0.074)	0.235** (0.117)
Region & Year FE	✓	✓	✓	✓	✓	✓
Child controls	✓	✓	✓	✓	✓	✓
Household controls	✓	✓	✓	✓	✓	✓
N. Obs	3,563	2,466	1,097	3,563	2,466	1,097

*p<0.1; **p<0.05; ***p<0.01

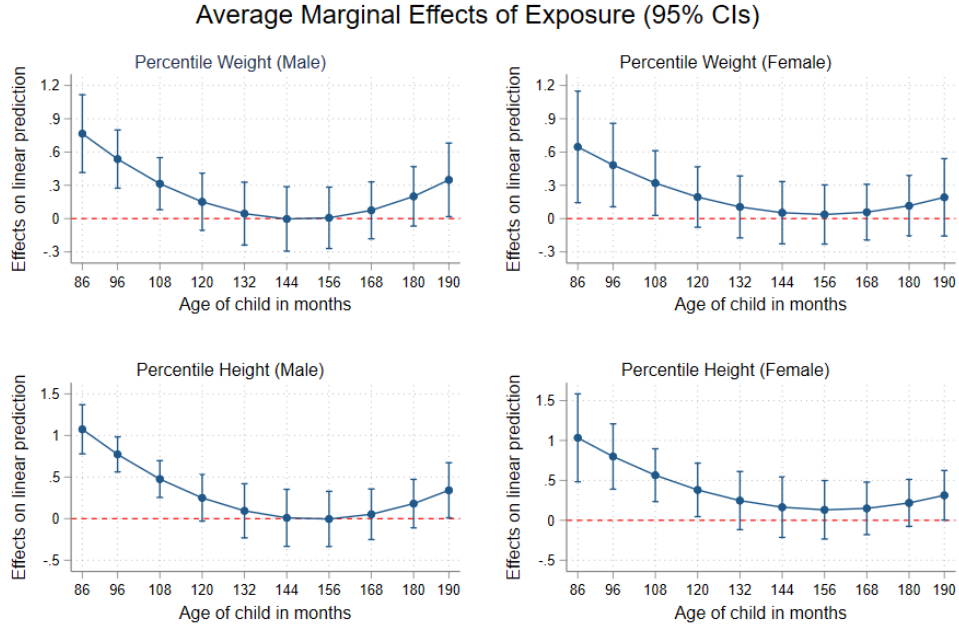
Standard errors are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.

Table A.12: Heckman Model, Health Outcomes - Parental Education

	<i>Perc. Weight:</i>			<i>Perc. Height:</i>		
	All	Below Med.	Above Med.	All	Below Med.	Above Med.
<i>Second Stage</i>						
Exposure (months)	0.179*** (0.060)	0.175*** (0.066)	0.188** (0.093)	0.297*** (0.079)	0.305*** (0.076)	0.233* (0.119)
Mills Ratio	-3.568 (4.014)	-1.004 (6.421)	-7.202 (5.420)	-3.441 (3.628)	-11.100 (7.110)	-5.982 (5.888)
<i>First Stage</i>						
Exclusion Restriction	0.933*** (0.207)	0.809*** (0.290)	1.062*** (0.221)	0.933*** (0.207)	0.809*** (0.290)	1.062*** (0.221)
Region & Year FE	✓	✓	✓	✓	✓	✓
Child controls	✓	✓	✓	✓	✓	✓
Household controls	✓	✓	✓	✓	✓	✓
N. Obs	5,567	2,877	2,690	5,567	2,877	2,690
Selected	3,563	2,466	1,097	3,563	2,466	1,097

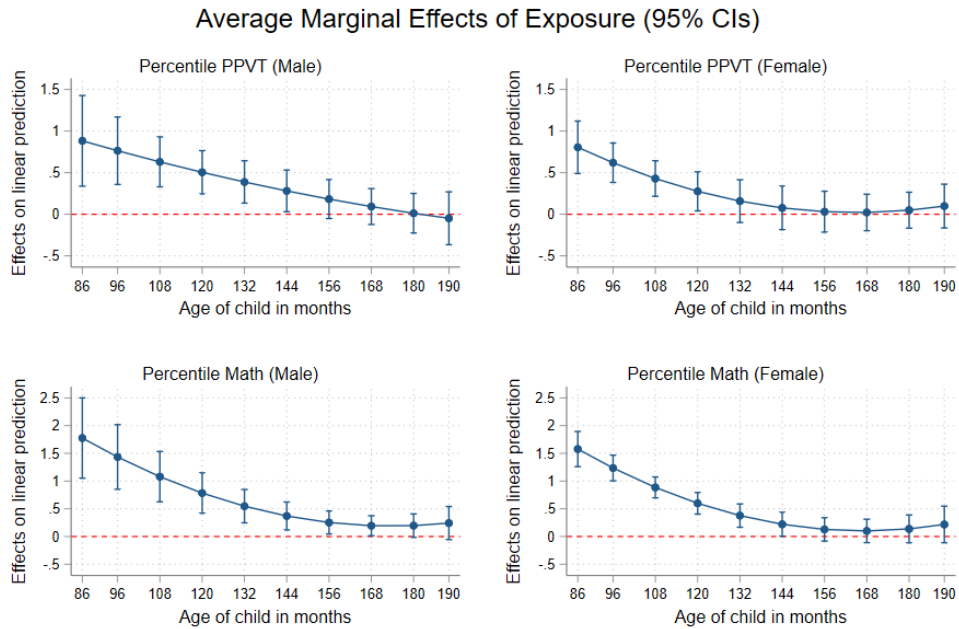
*p<0.1; **p<0.05; ***p<0.01

Heckman two-step procedure; bootstrap standard errors (1500 replications) are clustered at district, gender and time levels. Child controls: gender, age (months), being the oldest child, ethnicity, religion and language. Household controls: wealth, parental education, household size.



Heckman two-step procedure; bootstrap standard errors (1500 replications) are clustered at district, gender and time levels.
Average treatment effect of exposure to Mid-Day Meal Scheme at different ages on health outcomes. Range from 86 (min) to 190 (max) months, any additional tick represents a year.

Figure A.1: Age Heterogeneity by Gender, Health Outcomes



Heckman two-step procedure; bootstrap standard errors (1500 replications) are clustered at district, gender and time levels.
Average treatment effect of exposure to Mid-Day Meal Scheme at different ages on health outcomes. Range from 86 (min) to 190 (max) months, any additional tick represents a year.

Figure A.2: Age Heterogeneity by Gender, Cognitive Outcomes

The Impact of Non-Governmental Organisations on Children's Wellbeing: Evidence from Ethiopia

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Abstract

This research studies the role of the Non-Governmental Sector on household economic outcomes by analysing the impact of receiving support from Non-Governmental Organisations (NGOs) on children's food security and time-use in Ethiopia. I exploit the implementation timing of a restrictive NGO law to solve the potential endogeneity concerns by defining a two-stage model. I find evidence that receiving NGO support increases children's time spent on income-generating activities, reducing the number of hours dedicated to household chores. These effects are mainly due to children who live in the poorest households, in rural communities, or in a family in which the primary occupation of the household head is agriculture and when NGOs provide income support. Notably, receiving support from an NGO increases the time children spend in education only for female-headed households.

Keywords: Non-Governmental Organisation, Children, Food Security, Time Use, Ethiopia

JEL Classification: I25, I31, J13, J24, L31, O12

2.1 Introduction

Since the introduction of the “Non-Governmental Organisation” term in the UN Charter of 1945 -article 71- in which the role of the Non-Governmental Organisation (NGO) sector was for the first time established and recognised in an international context, its size and relevance in the development literature have rapidly increased. Aldashev and Navarra (2018), in an excellent review describing both the evolution of the NGO sector from the Second World War to the present day and the main related topics discussed in the literature, provide evidence of the expansion of the NGO sector, not just in terms of number of organisations but mainly of its economic relevance. As one of the main actors in the development arena, NGOs implement various development programs, from natural conservation to income schemes and training programs. It is assumed that these organisations act with the primary objective of pursuing the improvement of the living conditions of the families they support and the villages in which they operate, independent of political pressures and bureaucracy, but having to be able to attract resources from donors. Indeed, NGOs receive funds not only from private entities but also from Western governments and international agencies (e.g., UN, USAID, and OECD); notably, the increasing flow of resources channelled through the NGO sector can be explained explicitly by their being considered crucial in connecting governments and international agencies with villages and communities (OECD, 2022).

Despite the growth in the economic relevance of NGOs in the development context, the analysis of the economic impact of the support provided by such organisations on household and individual economic outcomes is still an understudied topic in the economic literature. Specifically, research has mainly assessed the economic impact of specific programs and NGOs but lacks a general overview of the consequences of receiving support from these organisations.¹⁶ This research aims to partly fill this gap by considering Ethiopia’s case, utilising the Ethiopian Young Lives Dataset to evaluate the economic impact of NGO support at the household level on children’s outcomes. I consider two important determinants of children’s development, food security and daily time-use, both having a crucial role in children’s health and human capital accumulation. This research contributes to the literature that investigates the effects of Non-Governmental Organisations on individual outcomes and to the literature that analyses the determinants of children’s time allocation and food security in developing countries. To the best of my knowledge, this is the first work that considers the NGO sector in Ethiopia using a survey dataset, and

¹⁶Few exceptions are related to analyses on the role of NGO identity in technology and product adoption rates (Bandiera et al., 2023; Usmani et al., 2022; Fischer et al. 2019) and analyses on service provision and its crowding out effect of similar public services in villages (Deserrano et al., 2024)

it is the first to investigate the relationship between NGO support and children’s time allocation. This research will estimate a well-being equation relying on survey data, exposing the analysis to potential endogeneity concerns in the relationship between NGO support and children’s outcomes. An example is parental preferences, which might simultaneously affect the probability of receiving NGO support and the set of outcome variables.¹⁷ For this reason, an instrumental variable approach would be employed to solve this specific issue, instrumenting being in contact with at least one NGO at the household level by exploiting the implementation timing of a restrictive NGO law, the Ethiopian Charities and Societies Proclamation. Unlike previous research, I do not analyse the impact of specific programs or organisations but consider the average effect of receiving support from different NGOs operating in different Ethiopian regions, thus aiming to provide complementary evidence on the economic role of NGOs focusing on household and individual characteristics. This choice is motivated by the awareness that the NGO sector in any country consists of a set of non-homogeneous organisations which differ on many observable and non-observable characteristics such as nationality, type of support, religion and norms; successful programs implemented by specific NGOs in specific contexts (e.g. location and sample) can not be easily replicated by different organisations in different countries and communities.

Ethiopia represents an ideal candidate for such analysis for the relevance of investigating children’s development outcomes in the country, for the availability of data describing the relationship between NGOs and households and for its legislative framework. Located in the Horn of Africa, Ethiopia is one of the continent’s most important countries, having the second-largest population and a high, although declining, fertility rate of around four children per woman (World Bank, 2024a). A direct consequence of this high fertility rate is represented by the large share of the young population in the country, as it is possible to evince from the median age in the population of only 18.8 years. With almost 40% of the population under 14 years of age (World Bank, 2024b), researchers, the government, and other actors have started to investigate how to support children and young people’s development, for which food security and time-use represent crucial determinants. Although during the last decades, the number of food insecure families has been reducing worldwide, in recent years, international organisations and agencies have been witnessing a reversal of this trend due to different shocks such as the COVID-19 outbreak, the emergence of new regional and global conflicts and the growing impact of climate change (European Commission, 2024). FAO (2024) registers that in the last decade, the prevalence of moderate and severe food insecurity in the Ethiopian population

¹⁷Evidence highlights how families and agents interact differently with different support providers according to their characteristics, such as their social position and gender (Kruks-Wisner, 2011).

has been constant and slightly higher than 50%, while the prevalence of undernourishment has been oscillating around the 20% threshold, declining from more than 40% in 2000-2001. Food insecurity has a detrimental impact on children; the same report identifies that in the last decade, around 40% of the children's population has been stunted, and UNICEF (2024) describes that 28% of child deaths in the country are still associated with undernutrition. The second set of outcomes considered in the analysis describes children's activities carried out on a typical day. Children's time-use represents the cornerstone for their individual development, defining the amount of time dedicated, for example, to educational activities such as attending schools or studying at home or to working activities, whether income generating (e.g. family business) or not (e.g. household chores). Analysing the time allocation decisions of children living in developing countries is complex; unlike in developed countries, the decision process is usually associated with a family's survival strategy decision. Children's time allocation is predominantly determined by household preferences, depending on cultural norms and parents' incentives. Considering, for example, the trade-off between education and labour, a family has to decide and weigh the opportunity cost related to a potential loss of income today if children are spending a large number of hours on education, with a potentially higher income tomorrow derived from better education of children. ILO (2017) indicates that a fifth of African children are involved in some form of child labour, with 9% in hazardous work. The agricultural sector, where most of the population is employed, registers the largest share of child labour. Specifically, children working in agriculture are mainly involved in family subsistence activities, farm products trade and herding. UNICEF (2020) describes that in Ethiopia, the coexistence between education and labour is likely to happen only for children aged up to 11; for older children, increasing time spent in labour corresponds to decreasing time in education. The same report highlights that the prevalence of child labour in Ethiopia is around 42% of the children population; such extensive use of child labour can thus have a substantial impact on children's human capital accumulation if it translates into less time invested in education. The World Bank's (2020) Human Capital Index, measuring the total amount of human capital that a child born in a particular year can expect to attain at age 18, highlights that a child born in Ethiopia in 2020 would be only 38% as productive as she could be if she enjoyed complete education and full health. The trade-off between labour and education and a poor educational system also impact children's academic achievements. Learning poverty, described as the percentage of children who cannot read and understand a text by age 10, is widespread in the country, affecting around 90% of children (UNESCO, 2024). Lastly, the high prevalence of child labour is also considered to be responsible for a low transition rate from primary to secondary schools (UNICEF, 2017).

This research aims to provide evidence on NGOs’ role in shaping children’s development determinants. Although it is not possible to have precise information on the number of organisations operating in Ethiopia and their programs, evidence from international agencies describes a country heavily supported by international aid. Ariti et al. (2018), using official documents from the Government of Ethiopia, describe how, in 2016, more than 3,100 NGOs were operating in the country, covering a variety of programs from environmental issues to food aid and credit. An example is Save the Children Ethiopia, which provides multifaceted support such as drought response, ensuring support to people in need and improving access to water, sanitation and health services (Save The Children, 2022). Because of this multifaceted support and the variety of different programs NGOs implement in the country, the main analyses of this research investigate the NGO support’s impact on children’s food security and time-use in Ethiopia without focusing on specific programs. Moreover, considering the evolution of the NGO sector from adopting a welfarist approach to poverty to the so-called Right Based Approach (RBA), this research would also represent a first step in better understanding through which channels NGOs can impact children’s outcomes. While the welfarist approach focused mainly on providing goods and services in areas suffering from exogenous shocks such as natural events or conflicts, the RBA combines goods and services provision with a focus on human, children and gender rights. Adopting this strategy has recently led NGOs to recognise rights as essential for communities and households to overcome poverty and improve their living conditions (Cornwall and Nyamu-Musebi, 2004; Uvin, 2007). When evaluating the economic impact of NGO support, economists should then consider two potential channels: the wealth channel through the provision of goods and services and what I would define as the “rights” channels, the possible impact these organisations might have on parental preferences on children and gender rights.

To better understand the mechanisms through which NGOs impact children’s outcomes, two different heterogeneity analyses will investigate how the impact varies, considering different kinds of support and different household characteristics. Firstly, I will study whether the results observed in the main sample are driven by NGOs’ income or education support, providing preliminary evidence on the most relevant type of support for children’s outcomes. Secondly, aware that NGOs might support families with different characteristics differently, I will propose a heterogeneity analysis to understand if and how the impact of NGO support changes according to observable characteristics at the household level, such as the area in which the family lives, its wealth, the main occupation and the gender of the household head.

The rest of the paper is organised as follows. Section 2.2 presents the relevant literature on food security and children’s time use. Section 2.3 introduces the model

and describes the policy that will be used in the identification strategy. Section 2.4 presents the data and the main variables of interest. Section 2.5 discusses the identification strategy and the instrumental variable approach, while Section 2.6 presents the main results and the heterogeneity analyses. Concluding remarks appear in the last section.

2.2 Literature

This research aims to analyse the potential impact of NGO support on children’s food security and daily time allocation in Ethiopia without limiting the analysis to specific NGOs or programs. For this reason, when analysing the potential channels through which NGOs impact the outcome variables of interest, it will be necessary to consider a variety of possible mechanisms to guide the interpretation of the results obtained by the econometric exercise. To the best of my knowledge, this research appears to be the first following a similar approach; for this reason, to understand and evaluate the possible channels and mechanisms of the impact, I will refer to the broader economic literature that investigates the main determinants of food security and child time-use in developing countries.

Ensuring food security is crucial and indispensable for children’s individual development. In the last decades, many national and international programs have been implemented in different developing countries to guarantee adequate food security for the most disadvantaged population groups. It is undisputed that providing children with a sufficient amount and variety of food positively impacts their health and human capital accumulation (Alderman et al., 2006). Among the different types of programs that focus on supporting children’s food security, School Feeding Programs have proven to be efficient schemes for improving students’ health and cognitive development (Aurino et al., 2023; Poppe et al., 2019; Humphries et al., 2015; Hannum et al., 2014). Such programs ease the economic burden for families to provide food for their children, incentivise school attendance, and have been found to act as a safety net for health development, particularly for children living in disadvantaged families and families that have suffered from climate shocks (Singh et al., 2014). More recently, an emerging literature has also focused on the impact of food security at the household level on children’s cognitive development. Aurino et al. (2019) clearly state that, when analysing the effects of food security on children’s development, it is crucial to consider and examine its trajectory and the transition of families from food insecurity to food security and vice versa. The authors find that children having experienced episodes of food insecurity during early childhood or who are living in food-insecure families perform lower on cognitive tests and have lower psychosocial abilities. A reason for these transitions can be found in the

precariousness and irregularity of income sources, often dependent on exogenous shocks.

In most developing countries, own production is a primary component of food security, with agriculture activities thus being crucial for families' food security. For these households, climate shocks are prominent causes of food insecurity episodes; floods, droughts, crop infestations and other shocks targeting agriculture production can be detrimental both to household survival and to children's health and education, particularly for girls (Björkman-Nyqvist, 2013). NGO support can be considered a potential mechanism for families to mitigate the frequency of food insecurity episodes and reduce their consequences. Given the importance of being a food-secure family, the literature has already analysed which economic determinants guarantee and can sustain this condition over time. Depending on the different types of organisations, the NGO sector can provide support both directly, in terms of agricultural aid or providing new technologies and productive assets, and indirectly through income schemes and credit, potentially impacting the productivity of the household economic activities. The literature has already investigated different economic and household determinants of food security; even though it is not always possible to identify single specific factors, it is usually the combination of them that makes food security at the household level more likely. While it is intuitive to argue that families with higher disposable income suffer less from food insecure episodes, evidence suggests that differences exist when considering the source of the income (Wichern et al., 2017; Frelat et al., 2016). Specifically, off-farm income, a source of income unrelated to agriculture, has usually been considered an essential determinant of food security in situations where agriculture shocks disrupt household self-production. Babatunde and Qaim (2010) in Nigeria and Dzanku (2019) in rural Sub-Saharan countries find a positive impact of off-farm income on household food security, with the former highlighting a more significant effect for the poorest and an increase in the health outcomes of children, and the latter finding a positive impact, particularly for female-headed households. Overall, non-farm income has been observed to increase not just current food security but, as described by Zereyesus et al. (2017), also expected future food consumption. Among the different policies analysed in the literature, income schemes and cash transfers are types of support which can resemble those used by NGOs to sustain targeted households. Bhalla et al. (2018) investigated the determinants and the impact of a cash transfer program on food security in Zimbabwe, finding that the policy had a positive impact on food security, allowing for a greater diet diversity offsetting other household characteristics associated with food insecurity as the high dependency ratio in the sample (number of family working members per non-working members). The impact of cash transfer programs on food security is particularly effective in the case of reg-

ular and generous transfers, alleviating household credit constraints and enabling investments; Tiwari et al. (2016) describe this specific case considering the impact of such programs in a set of Sub-Saharan countries. Other determinants of food security can be found in household characteristics (Maziya et al., 2017; Mutisya et al., 2016; Mango et al., 2014; Christiaensen and Alderman, 2004). Those most commonly positively associated with food security are related to the education level of the family head, a diversification of the source of income, and the ownership of land and livestock. Living in a large family or having an old household head are instead predictors of food insecurity episodes. It has also been observed the existence of a gendered component in food security at the household level; in the case of female-headed households, the likelihood of being food insecure increases due to difficulties in accessing assets mainly related to farm production and markets (Tibesigwa and Visser, 2016; Mason et al., 2015; Kassie et al., 2014). Of the various methods used in the literature to identify whether a family is food insecure, many are unable to analyse whether this condition is also passed on to the children or whether there exist buffering mechanisms that can ensure an adequate amount and variety of food for the children even if they live in food insecure households. Hadley et al. (2008) investigate this particular circumstance, demonstrating the existence of a gender bias in the buffering mechanism that Ethiopian families adopt. Although sons and daughters in its sample were equally likely to live in food-insecure families and less likely to be food insecure compared to parents, the second were more likely to report food insecurity than the first, highlighting the role of gender in determining the nutrition condition of children inside the households.

Focusing on the NGOs' role in children's development, it is also relevant to consider these organisations' impact in addressing human and children's rights issues, such as the right to education and not be exploited in child labour. NGOs can potentially impact children's time allocation in two ways: by providing goods and services (wealth channel) and by defending human and children's rights (rights channel). On the one hand, we might expect NGOs to persuade and incentivise families to respect children's rights, diminishing the time spent on labour activities and increasing the time spent on education; on the other hand, we might expect the provision of income support and new technology to also play a crucial role in the determination of children's time allocation. Children's daily time-use has been commonly considered a cornerstone of individual development, particularly in developing countries where it depends on both parental preferences and household economic conditions. Many studies have already analysed the role of time spent on different activities on children's health and human capital accumulation, highlighting the potential trade-off between investing time in education and labour. It is worth noting that, being culturally accepted in many LMICs, child labour might not only represent a crucial

means for household sustainment but an accepted norm in the community, thus complicating the analysis of its role in the family. Literature on health and economics does not provide clear evidence of the impact of child labour on mental and physical health outcomes. Trinh (2020) being one of the first to analyse the impact of child labour on a set of mental health outcomes in India and Vietnam, highlights that while child labour generally increases peer relationship problems and reduces prosocial behaviour, household chores in Vietnam, where such activities are considered accepted norms, are associated with better mental health condition. Less ambiguous is the evidence related to physical health, review as the one proposed by Batomen Kuimi (2018) suggests a negative association of child labour with nutritional status and an increased prevalence of injuries. Other research, such as that of Kana et al. (2010) for rural Cambodia, shows that the impact on health depends on the type and intensity of the labour activities undertaken by children. Household chores, usually considered light work, might not necessarily represent a risk to children's health. Overall, child labour appears detrimental in the case of excessive workload in terms of hours and tasks. The economic literature instead consistently provides evidence supporting the thesis that whenever child labour reduces the number of hours spent on education, then child labour becomes detrimental to children's cognitive development. Using the Young Lives Dataset on four developing countries, Chang (2022) and Borga (2019) analysed how daily time allocation decisions on different activities -ranging from child labour, education, and sleep- affect children's non-cognitive and cognitive development. The former finds that, although the magnitude and significance of activities related to child labour are country-dependent, work activities that reduce time on education have a negative impact on children's self-efficacy, while this is not the case when leisure time is substituted. The latter research displays the magnitude of the impact on cognitive outcomes measured as results of cognitive tests, indicating that additional time dedicated to family business instead of school significantly reduces the overall test performance. Similar results are also found by Keane et al. (2022) using the same dataset but an alternative econometric model, thus providing supporting evidence of the existence of a trade-off between labour and education. Akabayashi and Psacharopoulos (1999) were among the first to analyse the existence of the trade-off in the Tanzanian context, highlighting the complexity of analysing this issue and the importance of social and household characteristics. As noted by Haile and Haile (2012), the need for a family to hire children in their business activities is usually related to the need to sustain the existence of the household itself and to the quality and characteristics of the education system. Many authors have also studied which economic characteristics at the household level are determinants of child labour to understand the familiar mechanisms behind this decision. Basu and Van (1998) were among the

first to provide a theoretical model to prove the existence of household economic equilibria in which it is optimal to have children working, particularly considering household survival strategies. Income shocks are examples of survival risks for the household. Beegle et al. (2006) describe that families, particularly the poorest, can use child labour to reduce shocks' impact on household economic outcomes at the cost of reducing the time spent on education. Nonetheless, recent empirical studies have shown that low-income families are not the only ones where children are likely to work. The so-called "wealth paradox" illustrates that land-rich and asset-rich households are also likely to adopt child labour to sustain their economic activities. Bhalotra and Heady (2003), in Ghana and Pakistan, provide evidence that children in land-rich households are more likely to work and less likely to attend school than those in land-poor households, also hinting at a gender effect for which girls are less likely than boys to attend school and spend on average fewer hours on education conditional on school attendance. A reason for this paradox can be found in labour market failures and imperfections that limit the possibility for these families to hire workers outside the household context. The implications arising from the wealth paradox acquire importance when associated with programs aiming to alleviate poverty through asset accumulation policies; households receiving this type of support might respond to it by using child labour to take advantage of the increased returns that can be derived from their business activities thus reducing children's time spent in education. Cockburn and Dostie (2007) for Ethiopia clearly describe the previously mentioned scenario, stressing the importance of productive assets in household decisions regarding children's time allocation; new technology might increase the demand for labour that, in the case of labour market failures, might encourage child labour, particularly in the case in which returns from child labour becomes larger than returns from education. Dammert et al. (2018), reviewing different policies implemented in developing countries, have shown that programs aiming to increase adults' participation in the labour market can also increase the demand for adolescent and child labour. Similar results are found by De Hoop et al. (2020), who analysed the impact of cash transfer programs in Malawi and Zambia. Economic characteristics are not the only determinant of children's time allocation decisions; child- and household-specific characteristics also play a role in the decision process. In many developing countries, labour activities are strictly related to gender and cultural norms. It is then expected to observe a division of tasks between sons and daughters, with the former more involved in business and farm activities while the latter in household chores and caring for other family members (Khanna and Thomas, 2024). Another critical element is represented by the family and sibling composition, with different household members carrying out activities according to their gender and age (Alvi and Dendir, 2011). The NGO sector, aiming

to defend and support human and children’s rights, might also have an impact on gender norms, thus incentivising parents to treat equally male and female children. Nonetheless, by providing support that potentially enhances family business, which might lead to an increase in child labour, it is not possible to hypothesise ex-ante what the impact would be on the time allocation decision process. On the one hand, an increase in the number of hours dedicated to work would indicate that income support and the provision of productive assets that households can use in their income-generating activities is the primary channel through which NGOs impact children’s time-use. On the other hand, an increase in total time spent on education would underpin the human and children’s rights narrative for which NGOs are effective in reducing child labour and sustaining children’s rights.

2.3 Model

Ethiopia represents an ideal country to investigate this research question, not just because of the relevance of studying children’s development determinants in this context but also because it allows overcoming several econometric issues related to studying NGO impact on economic outcomes when using secondary data. The first is represented by the availability of survey data describing NGOs’ presence in developing countries; unlike relying on primary data, few datasets gather information on the relationship between these organisations, households, and individuals. The Ethiopian sample of the Young Lives Dataset solves this issue; in fact, it collects information on the relationship between families and NGOs in different Ethiopian regions, thus allowing for investigating NGO impacts on children’s outcome variables. Relying on survey data, eliciting this causal effect is also complicated by the potential endogeneity of receiving NGO support with respect to children’s development outcomes, in particular considering omitted variables and reverse causality concerns. For example, parental preferences related to cultural norms can simultaneously affect the probability for a family to receive support from NGOs and play a role in defining children’s time allocation through labour and gender norms. In such a situation, it is possible to expect that families in which social and traditional norms are more pronounced may, at the same time, be more reluctant to accept support from NGOs and have preferences towards children’s time allocation, also considering their gender. Similarly, households in need, knowing that an NGO has entered the community in which they reside, might be those looking for support rather than being the ones targeted by the organisation. For example, food-insecure families might be those looking for external support before NGOs select them as potential beneficiaries of food aid. Ethiopia’s legislative framework enables dealing

with these endogeneity concerns, allowing the implementation of an instrumental variable approach leveraging the heterogeneity in the survey fieldwork and the introduction in the country -between 2009 and 2010- of a restrictive NGO law, the “Charities and Societies Proclamation, N.621/2009”.

2.3 .1 Charities and Societies Proclamation

The Charities and Societies Proclamation (CSP) is an Ethiopian NGO restrictive law introduced in the country aiming to strongly limit the effectiveness of NGO programs, primarily targeting organisations receiving funds from foreign sources and those operating on human and children’s rights. The contents of the Proclamation completely reshaped the environment in which NGOs were used to operate in Ethiopia; for the purpose of this research, only specific articles and norms will be analysed, namely how the CSP caused the complete re-organisation of the NGO sector and the impact that the financial norms introduced by the law had on NGOs operations.

The CSP was one of the many and, at the time of its introduction, one of the strictest laws introduced worldwide in recent decades, severely limiting NGOs’ funding and operations. Between 1993 and 2012, over a quarter of the world’s LMICs implemented similar regulations (Cheeseman and Dodsworth, 2023; Musila, 2019; Dupuy et al., 2016).¹⁸ The governments of these countries considered NGOs, particularly those funded and run by foreign organisations, as potential threats to the country’s political status quo and cultural heritage. Western values brought by foreign organisations, which were not part of the traditional set of values, were seen as the leading potential cause for the loss of national identity. Foreign-funded organisations were then usually deemed by governments as foreign agents and, for this reason, strongly controlled by governmental agencies. The Ethiopian CSP has been considered by international organisations and agencies, such as Save the Children (Meskerem, 2009), Amnesty International (2012) and USAID (2010), as having had a devastating impact on the NGO space and civil sector in the country. The CSP was divided into three main parts: the first defined the type of activities an NGO could promote according to the source of its funding and the nationality of the board members. The second defined how these organisations were allowed to use their resources, classifying activities according to their nature (administrative versus operational). The last focused on increasing the financial control exerted by the Ethiopian government in terms of bureaucratic obligations and the number of

¹⁸Following Musila (2019) a substantial number of countries implemented similar laws: Algeria (2012), Burundi (2017), Egypt (2017), Rwanda (2008, 2012, 2016), Sierra Leone (2009, 2017), South Sudan (2016), Sudan (2006), Tanzania (2018), Tunisia (2018), Uganda (2016, 2017) and Zambia (2009)

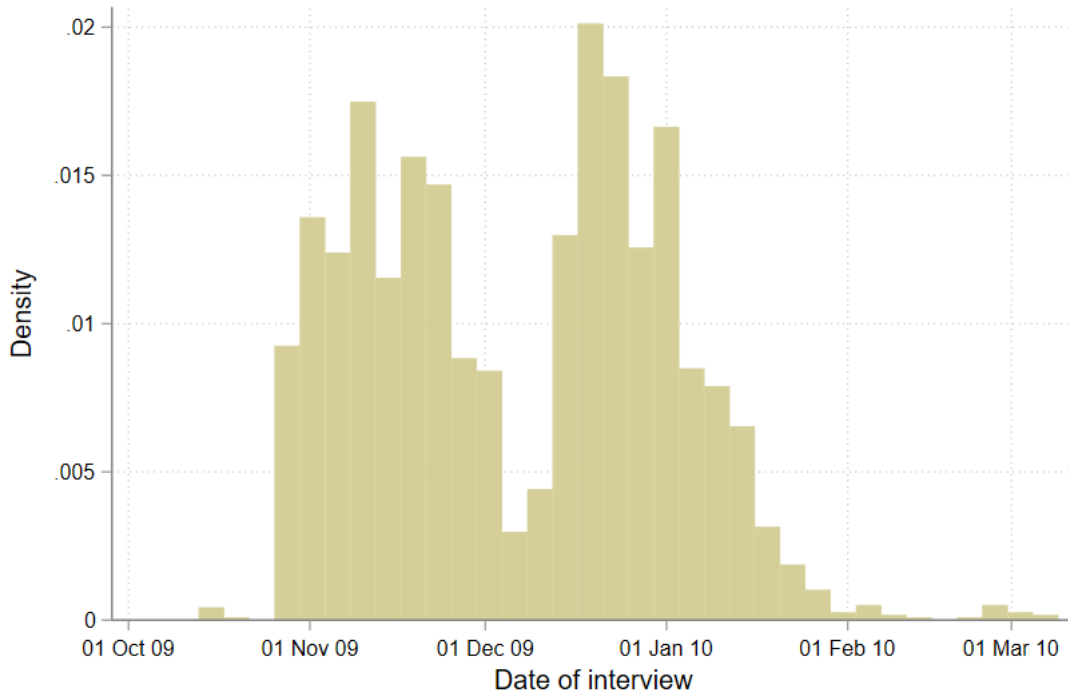
financial reports these organisations had to periodically submit to a newly established Agency. An NGO was allowed to work on the advancement of human and democratic rights, the equality of nations, genders and religions, the promotion of children’s rights and the efficiency of the justice and law enforcement services only if the organisation was collecting more than 90% of their funds from Ethiopian sources and was entirely controlled by Ethiopian members. This norm particularly impacted the NGO sector as it is highly complicated for an NGO to be almost entirely independent from foreign support, specifically when operating in LMICs. This limitation forced many advocacy organisations to stop their activities or to rebrand, changing their mission from the defence of rights to aid provision (Dupuy et al., 2015). The norm also affected organisations that were not solely focused on promoting human rights, as most NGOs were primarily involved in service or goods provision, adopting a Right-Based Approach. Nonetheless, Dupuy et al. (2015) described that these organisations did not change their mission. Still, they re-framed how they proposed it, avoiding using words that could be referring to human and children’s rights even though the approach remained unchanged operationally. Most relevant for this research is the part of the CSP describing how NGOs had to use their resources and the quantity and quality of financial reports that had to be submitted to the new Agency having the legislative power to dismantle non-compliant organisations. NGOs had to start producing detailed documents describing the amount of resources devoted to each activity and were forced to use 70% of their resources for operations (e.g. development projects) while the remaining 30% for administration. Nonetheless, the CSP was unclear in defining which costs were considered administrative or operational (e.g. training and travel costs were considered administrative), thus creating ambiguity, particularly in the period immediately after the implementation of the policy. Additionally, NGOs had to start recording day-to-day transactions and annually (or upon request) notify all their bank accounts to the Agency. NGOs also had to undergo an annual examination of their accounts by a certified auditor, thus increasing not only the costs of this increased bureaucracy but also the time volunteers and employees had to spend on such activities rather than the projects. Evidence from the literature on human rights, non-profit organisations and democratisation issues has already demonstrated that the CSP had a disruptive impact on the NGO sector in the country, affecting how NGOs collected funds, the number of organisations operating in the country and their activities (Balcha, 2014; Dupuy et al., 2015; Birru and Wolf, 2019; Musila, 2019). Backed on previous evidence, I hypothesise that the implementation of the policy, its strict regulations and the limitations on the use of funds had as a primary consequence a decrease in the total amount of resources that NGOs could dedicate to projects, translating into a decline in the number of households supported. The implementation timing

of the CSP (which happened in different phases) will be crucial in designing the econometric exercise of the research.

The Ethiopian parliament approved the CSP on the 9th of January 2009 and published it in the Gazette on the 13th of February of the same year, guaranteeing the organisations a transition period of one year to re-register under the new regulation. In this research, I will be making use of a significant threshold that was implicitly settled in the regulation, which would be defined in the model as the financial threshold. NGOs had to periodically submit accounting records to be able to continue operating in the country, particularly an annual revised audit, following a specific fiscal regime that was defined in the Proclamation. The CSP described as “budget year” the period going from the Hamle 1 to Sene 30 (Ethiopian Calendar) or from the 1st of January to the 31st of December, as the starting and ending day of the two possible fiscal regimes. Specifically, these dates represented the starting date from which an NGO had to comply with the financial obligations defined in the law. Considering the need for annual examinations of NGO accounts, according to the fiscal regime chosen to be the Ethiopian or the international one, NGOs had to change the management and use of their resources starting from the first day of the selected regime to comply with the regulation even before the effective implementation of the CSP in February 2010. Note that Hamle 1 represents the start of the financial year in Ethiopia (around July 8), while the 1st of January is the starting date of the fiscal regime for most Western (donor) countries. The use of these thresholds -and specifically the 1st of January- will be crucial for the econometric exercise in relation to the characteristics of the dataset that will be used in the analysis. In fact, unfortunately, the available data does not allow me to know and leverage the exact date on which different organisations re-registered under the new regulation or have information on the chosen regime. Nonetheless, the survey design of the dataset, consisting of households interviewed in the proximity to the 1st of January 2010 (the threshold in the model), specifically from October 2009 to March 2010 (with less than 1% of the observations in the sample which have been interviewed after the 13th of February 2010), would allow me to exploit this particular threshold to define a two-stage strategy. In the following sections, I provide evidence of the validity of the threshold decision by also using counterfactual analyses to explain that the decrease in the number of families supported by NGOs after the 1st of January 2010 is not observed when considering the same date on different years.

2.4 Data

The data used in this research are derived from the Ethiopian sample of the Young Lives Dataset. The advantages of using this dataset come from its richness in detailed information on Young Lives children (YL) and their families, as well as from containing precise information on the existing relationship between NGOs and interviewed households. The Young Lives Dataset collects interviews through multiple rounds, from 2002 to 2017 in four developing countries (Ethiopia, India, Peru and Vietnam), but only in the African country, it also collects information on NGOs' location and interaction with the families. For reasons which are related to the econometric model, only Round 3 of the Ethiopian sample will be used in the analysis, consisting of almost 2,800 observations of families and children interviewed from October 2009 to March 2010, as illustrated in Figure 2.1, located in five different Ethiopian regions (Addis Ababa, Amhara, Oromia, SNNP and Tigray).



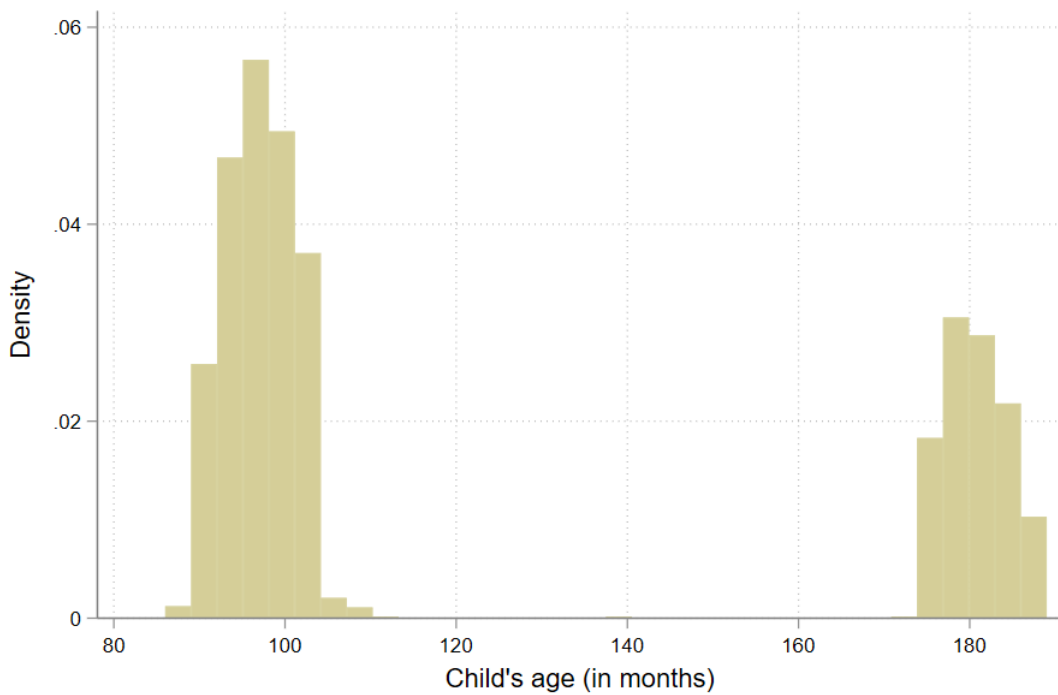
Own elaboration from the Ethiopian Young Lives Sample.

Figure 2.1 : Date of interview

The distribution timing of the interviews guarantees that potential seasonality components that might affect the analysis are limited in time. For example, assume that the involvement of children in agriculture depends on the seasonality of the cultivated crops; in this case, the time allocated to working might drastically change in months far apart from one another. This concern is limited in my analysis thanks

to the concentration of interviews in a few months, having more than 90% of families interviewed between the 1st of November 2009 and the end of January 2010. In fact, as illustrated in Figure 2.1, only 461 observations, equal to 16.92% of the entire sample, have been interviewed after the 1st of January 2010, with the majority being interviewed close to the threshold date.

Figure 2.2 depicts the age distribution of children in the sample in months; the graph clearly describes the structure of the Young Lives Dataset, which consists of two cohorts of children born approximately seven years apart. The mean age value in the sample is 8.12 years for children in the young cohort and 15.03 years for those in the old cohort.



Own elaboration from the Ethiopian Young Lives Sample.

Figure 2.2 : Age distribution in the sample

2.4 .1 Main Variables

This research considers two sets of outcome variables describing food security at the household and child level and the child's time allocation. The variables considered in the food security analysis are a dummy variable describing food insecurity constructed using the Household Food Insecurity Access Scale (HFIAS) index and the number of meals the YL children had in the last 24 hours. The HFIAS is a validated measure of food access in LMICs, which combines the occurrence of food insecurity episodes with their frequency in the previous 12 months (Coates et al.,

2007). Following Aurino et al. (2019) and Humphries et al. (2015) I defined a food insecurity dummy variable equal to one if the family was classified as moderately or severely food insecure by the HFIAS classification. While the HFIAS depicts the food security condition at the household level for quite an extended period, the second variable, describing the number of meals the YL child had in the last 24 hours, will track the food security condition of YL children in the short run.

Table 2.1 : Group differences in the Outcome Variables

	NGO Support	No Support	Difference
Food Insecurity	0.748 (0.432)	0.755 (0.431)	-0.007
Number of Meals	3.908 (0.682)	3.815 (0.706)	0.093***
Hours Housework	2.668 (2.033)	2.778 (1.994)	-0.110
Hours WorkAll	1.798 (2.464)	1.522 (2.249)	0.276***
Hours Education	6.645 (2.999)	6.316 (3.104)	0.329**
Observations	813 29.83%	1,912 70.17%	2,725

Housework = hours care + hours chores; WorkAll = hours task (household) + hours paid (outside); Education = hours school + hours study. t-statistics significance levels *p<0.1; **p<0.05; ***p<0.01

An important feature of the YL Dataset is represented by the collection of precise information on the time-use of children; specifically, the number of hours children spend on different activities on a typical day (i.e. excluding holidays and weekends). These activities are sleeping, taking care of other family members, doing household chores, working for the family business, working for money outside the household, attending school, studying outside school, and spending time playing or for leisure. To ease the analysis, I aggregate six of the eight categories into three groups gathering together similar activities, namely non-income-generating activities or *Housework*, income-generating activities or *WorkAll*, and time invested in *Education*. The first category is calculated by summing the hours children spend taking care of other family members and doing household chores, the second by summing the hours spent working for the family business or paid outside the household, and the last is obtained by summing the hours in school and outside the school studying. Notably, the hours devoted to the different activities are recorded considering a typical

day, thus not referring to specific days or weeks, and therefore potentially disconnected from the temporal context of the interview itself, hence defining a child's average time use. This particular aspect, combined with the short period in which the households were interviewed, helps mitigate any potential seasonal component related to children's time allocation. As previously described, I hypothesise that NGO support can change households' incentives for children's time allocation decisions by providing goods and services, as well as norms and values regarding human and children's rights. According to the dominant channel, we might expect different time-use impacts when receiving NGO support.

Lastly, a family is considered to be a recipient of NGO support (dummy variable equal to one) only when the respondent to the questionnaire answers that the NGO support is still ongoing at the time of the interview. Table 2.1 outlines the sample size and the mean of the outcome variables in the two groups of households receiving and not receiving NGO support at the time of the interview. The percentage of households receiving NGO support is equal to 29.83%. Food insecurity is a prevalent condition in the sample; around 75% of households, independently from receiving NGO support, are classified as food insecure. YL children living in families receiving NGO support display a positive statistically significant but small difference in the total number of meals children had in the last 24 hours and, similarly, a larger amount of time spent by children in income-generating activities and education.

Table 2.2 : Group differences in the Control Variables

	NGO Support	No Support	Difference		NGO Support	No Support	Difference
Rural	0.631 (0.483)	0.657 (0.475)	-0.026	Orthodox	0.745 (0.436)	0.692 (0.462)	0.052***
Sex Child	0.476 (0.500)	0.476 (0.500)	0.000	Amhara (ethnicity)	0.276 (0.447)	0.287 (0.453)	-0.011
Age Child (months)	127.315 (39.920)	124.043 (38.899)	3.272**	Gurage (ethnicity)	0.039 (0.195)	0.095 (0.293)	-0.056***
Natural Event	0.499 (0.500)	0.402 (0.490)	0.097***	Oromo (ethnicity)	0.209 (0.407)	0.202 (0.402)	0.007
Head Female	0.214 (0.410)	0.205 (0.404)	0.009	Tigrian (ethnicity)	0.280 (0.449)	0.202 (0.402)	0.078***
Head Age	45.956 (11.041)	45.601 (10.976)	0.345	Wolavta (ethnicity)	0.048 (0.214)	0.071 (0.257)	-0.023*
Head No Education	0.328 (0.470)	0.361 (0.480)	-0.033	Addis Ababa (region)	0.159 (0.366)	0.134 (0.341)	0.025*
Head Higher Education	0.262 (0.440)	0.269 (0.444)	-0.007	SNNP (region)	0.208 (0.406)	0.269 (0.443)	-0.061***
Household Size	6.407 (2.028)	6.252 (1.974)	0.155*	Amhara (region)	0.181 (0.385)	0.206 (0.405)	-0.025
Household Share Female	0.522 (0.200)	0.533 (0.203)	-0.011	Oromia (region)	0.197 (0.398)	0.207 (0.405)	-0.010
Muslim	0.134 (0.341)	0.176 (0.381)	-0.042***	Tigray (region)	0.256 (0.437)	0.185 (0.388)	0.071***
Observations	813 29.83%	1,912 70.17%			813 29.83%	1,912 70.17%	

List of covariates, group differences between families receiving or not receiving NGO support.
t-statistics significance levels for the test on the difference in the two groups *p<0.1; **p<0.05; ***p<0.01

Similarly, Table 2.2 presents the set of covariates, containing individual and household characteristics, that will be used throughout the analysis. Differences in the variables' means can be observed for a subset of the controls, particularly with respect to the frequency of being hit by a natural event and other variables related to religion, ethnicity and region where households live.

2.5 Identification

Equation (2.1) represents the ideal specification used to analyse the impact of NGO support on children's food security and time-use.

$$Y_{ir} = \alpha + \gamma NGO\ Support_{ir} + X'_{ir}\beta + \theta_r + u_{ir} \quad (2.1)$$

Y_{ir} identifies the outcome variable as either a food insecurity measure or a time-use category for child i living in the region r . $NGO\ Support_{ir}$ is a dummy variable equal to 1 for families receiving support from at least one NGO at the time of the interview. X'_{ir} is a vector of household and individual characteristics, mostly time-invariant, describing household head characteristics (age, education and gender), household composition (share of females, size, etc.) and children characteristics (religion, ethnicity, age in months and gender). θ_r are region-fixed effects; I do not control for time-fixed effects, but variables describing the distance between the interview date and the threshold date of the 1st of January will be used as covariates in all models.

As long as the error term is uncorrelated with NGO support, the causal impact of interest can be consistently estimated by OLS by directly considering the equation (2.1). Endogeneity concerns, discussed in the previous section and related to omitted variables and reverse causality, suggest that an instrumental variable approach should be used to produce consistent estimates. In the first stage (2.2), the dummy variable $NGO\ Support_{ir}$ would be used as the outcome variable in the equation and regressed on the previously described set of covariates and the instrument Z_{ir} . In the second stage (2.3), the estimates for NGO support derived from the first stage would then be used to identify the causal impact on the outcome variable of interest.

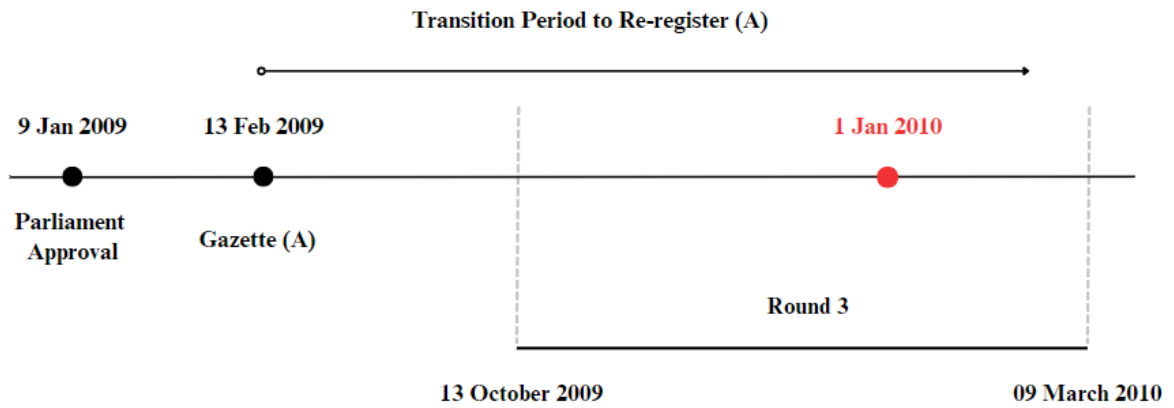
$$Y_{ir} = \alpha_1 + \gamma NGO\ Support_{ir} + X'_{ir}\beta + \theta_r + u_{ir} \quad (2.2)$$

$$NGO\ Support_{ir} = \alpha_2 + \delta Z_{ir} + X'_{ir}\beta + \theta_r + \varepsilon_{ir} \quad (2.3)$$

The implementation timing of the Charities and Societies Proclamation, combined with the time horizon of interviews collected in Round 3 of the Young Lives Dataset, will be used to define the instrument Z_{ir} as a dummy variable equal to 1 if a household has been interviewed after the 1st of January 2010, and 0 otherwise. Figure 2.3 describes graphically the interaction between the policy and the data. As illustrated in previous sections, the CSP has been approved by the Ethiopian Parliament on the 9th of January 2009 and published in the national Gazette on the 13th of February of the same year. The law established a transition period of one year for NGOs to re-register and forced NGOs to start producing financial and accounting documents to continue operating in the country. NGOs had to decide whether to follow the Ethiopian fiscal regime starting from mid-July or the “international” one from the 1st of January. The data used in the research collect interviews from October 2009, after the start of the Ethiopian fiscal regime but before the first day of the international one, to March 2010, after the threshold of the 1st of January. The assumption exploited in this research is that in the period considered in the study, only one of the three situations had to happen: either an NGO stopped operating because of the limitations imposed by the CSP, or an NGO chose to start complying with the financial regulation starting from mid-July or from January. In the first case, disposable data does not indicate when and why an NGO ceased to operate. In the second scenario, the change in NGO behaviour (use of resources and administration) happened before the start of the survey fieldwork, and thus no change in NGO behaviour happened during the timeframe of Round 3. In contrast, in the last case, this change occurred during the period taken into consideration in the sample, thus creating a source of variation in the way NGOs -that decided to follow the “international” fiscal regime- operated. The “financial” implementation of the CSP on the 1st of January 2010 identifies an exogenous threshold for the set of variables. I define the instrument Z_{ir} -**After T**_{ir}- as a dummy variable taking on value 1 if a family has been interviewed after the threshold set on the 1st of January 2010 and 0 otherwise. Due to the limitation in the use of resources needed to continue operating and the obligation to produce the accounting documents required by the regulation (e.g. the annual audit), I hypothesise that the probability of a household receiving support from an NGO decreased if the household was interviewed after this specific date.¹⁹

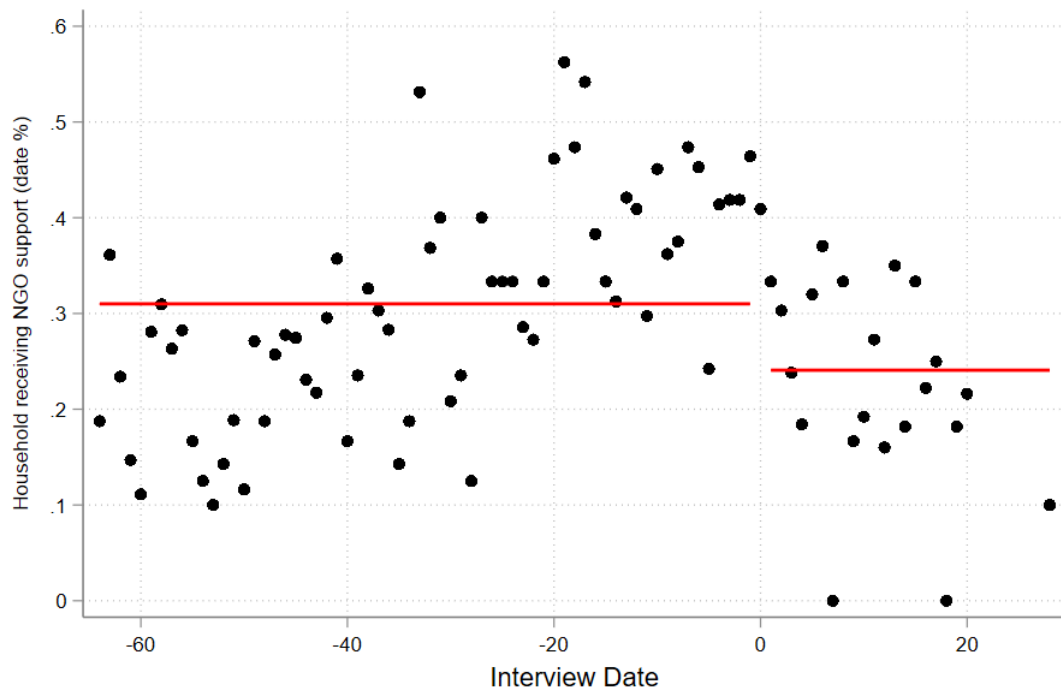
Figure 2.4 describes the percentage of families receiving NGO support at each interview date in the sample. The scatterplot illustrates, using two lines representing the mean value of $NGO\ Support_{ir}$ before and after the threshold, the difference in

¹⁹Notbaly, after the 1st of January 2010, the number of families receiving NGO support in the sample decreased. Still, there are no regions where no family receives support after the 1st of January 2010, indicating that the supply of NGO support did not completely cease in these territories.



Timeline of the implementation phases of the CSP and interviews in R3 of the Ethiopian Young Lives Dataset

Figure 2.3 : Timeline



The interview date at 0 corresponds to the 1st of January 2010. Own elaboration from the Ethiopian Young Lives Sample

Figure 2.4 : Household receiving NGO support by date

the prevalence of the support in the two periods: 0.31 before the 1st of January 2010 and 0.24 after. Of the considered sample, 16.92% of observations -or 461- were interviewed after the threshold, the majority of them in January (see Figure 2.1 for details). The two-stage model produces consistent and unbiased estimates only in the case of an exogenous and relevant instrument, having as the only channel for impacting outcome variables the one defined through the first stage.

A critical assumption for the identification strategy of the analysis is that the chosen threshold is uniquely dependent on the policy (CSP) implementation phase and that its potential impact on NGO support provision does not depend on the potential seasonality of the aid. I define a placebo strategy to demonstrate that the chosen threshold -1st of January- is effectively relevant for NGO support only for the specific years chosen in the analysis and thus depends uniquely on the CSP timing. I consider Round 2 and Round 4 of the Young Lives Dataset, the former conducted from October 2006 to May 2007 and the latter from October 2013 to April 2014, to simulate the first stage of an IV strategy. I construct a dummy variable **After T** equal to one if a family has been interviewed after the 1st of January 2007 in Round 2 and after the 1st of January 2014 in Round 4, simulating the same implementation timing of the CSP that was used for Round 3 but for interviews which happened either 3 years before the policy or 3 years after.

Table 2.3 : OLS - Placebo First Stage

	Round 2 (06/07)		Round 3 (09/10)		Round 4 (13/14)	
	NGO(I)	NGO(II)	NGO(I)	NGO(II)	NGO(I)	NGO(II)
After T	0.106 (0.074)	0.076 (0.061)	-0.291*** (0.037)	-0.192*** (0.030)	-0.001 (0.038)	-0.053 (0.034)
Distance from T	-0.000 (0.001)		0.004*** (0.001)		-0.000 (0.001)	
Distance up to T		0.001 (0.001)		0.004*** (0.001)		0.001 (0.001)
Region FE	✓	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓	✓
Ethnicity FE	✓	✓	✓	✓	✓	✓
Household Char.	✓	✓	✓	✓	✓	✓
Observations	2,823	2,823	2,725	2,725	2,446	2,446
R-squared	0.248	0.248	0.057	0.062	0.189	0.191

*p<0.1; **p<0.05; ***p<0.01

Distance from T measures the distance in days between the interview and the threshold, taking on negative and positive values. *Distance up to T* measures the distance but contains only negative values if the family has been interviewed before the threshold and 0 otherwise. Standard errors are clustered at the community/village level. Simulated first stage for an identical policy happening on the 1st of January of 2007 (Round 2) and 2014 (Round 4).

For all the specifications considered in Table 2.3 and for both Round 2 and Round 4, being interviewed after the 1st of January of the corresponding year does

not have an impact on receiving NGO support at the household level. Round 3 is the only round where the dummy variable **After T**, which describes households interviewed after the 1st of January 2010, is negative and statistically significant. Notably, in Round 2, the coefficient for After T -although not statistically significant- is positive, representing the expansion of the NGO sector in the country before the implementation of the CSP. In Round 4, the coefficient is negative, as in Round 3, but not statistically significant. These results support the assumption that a potential seasonal component does not drive the results obtained in the main analysis concerning NGO provision, reassuring us on the validity of the estimation strategy.²⁰

The relevance of the chosen instrument will be assessed considering the value of the F statistic generated from first-stage estimates. Depending on the specification considered, the F statistic will consistently exhibit values above the rule of thumb value of 10 but always below the value of 104, which would ensure a strong instrument, according to Lee et al. (2022). To control for the potential weak instrument in the model, in the Appendix I replicate all the analyses of this research using the methodology proposed by Lee et al. (2023), called **VtF**, for weak-instrument-robust inference to strengthen the validity of all the results obtained in the study.

2.6 Results

Tables 2.4 and 2.5 report the results in the OLS case, which are consistent only in the case of no endogeneity in the model. For each outcome variable, I define two different specifications. In the first, the variable *Distance from T* is introduced as a covariate, describing the distance in days between the policy threshold and the interview date, taking on negative or positive values depending on whether the observation has been interviewed before or after the threshold. In the second, *Distance up to T* is instead used, being similar to the previous one but containing negative values if the household has been interviewed before the threshold and 0 otherwise.²¹ The different specifications enable us to control for the time trend in the sample, considering that the instrument used in the first stage of the IV model is a dummy variable that also depends on time.

OLS model identifies no impact of NGO support on food insecurity measure and a positive, although minimal, impact on the YL number of meals per day. Similarly, we observe no effect on children's time-use, with only a marginal statistically signif-

²⁰The potential concern related to the possibility for NGOs to target households differently before and after the threshold date, depending on their observable and unobservable characteristics, is addressed in Table C.1 in Appendix C.

²¹Consider a family interviewed on December 10, both variables would have a value of -22. A family interviewed on January 10 would have a value of 9 for *Distance from T* and of 0 for *Distance up to T*

Table 2.4 : OLS - Food Security

	Food Insecurity		Number Meals	
	OLS(I)	OLS(II)	OLS(I)	OLS(II)
NGO Support	0.009 (0.023)	0.010 (0.023)	0.073** (0.030)	0.075** (0.030)
Distance from T	-0.001 (0.001)		-0.002 (0.001)	
Distance up to T		-0.001 (0.001)		-0.002 (0.002)
Rural	0.050 (0.050)	0.052 (0.050)	-0.012 (0.100)	-0.009 (0.099)
Sex Child	0.001 (0.020)	0.001 (0.020)	0.017 (0.024)	0.016 (0.024)
Region FE	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓
Ethnicity FE	✓	✓	✓	✓
Household Char.	✓	✓	✓	✓
Observations	2,725	2,725	2,725	2,725
Sample Mean	0.75	0.75	3.84	3.84

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at the community/village level. Distance from T is the difference in days between the threshold and the interview date (dint - T); Distance up to T is the difference in days between the threshold and the interview date if interviewed before T and 0 otherwise.

Table 2.5 : OLS - Children's Time Use

	Housework		WorkAll		Education	
	OLS(I)	OLS(II)	OLS(I)	OLS(II)	OLS(I)	OLS(II)
NGO Support	-0.028 (0.074)	-0.026 (0.075)	0.247* (0.148)	0.256* (0.148)	0.097 (0.118)	0.090 (0.116)
Distance from T	-0.001 (0.002)		-0.004 (0.003)		0.002 (0.004)	
Distance up to T		-0.001 (0.002)		-0.005 (0.004)		0.003 (0.005)
Rural	0.589*** (0.123)	0.591*** (0.125)	1.449*** (0.192)	1.459*** (0.184)	-1.472*** (0.201)	-1.478*** (0.202)
Sex Child	1.521*** (0.130)	1.521*** (0.131)	-1.510*** (0.223)	-1.512*** (0.223)	0.139 (0.144)	0.140 (0.145)
Region FE	✓	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓	✓
Ethnicity FE	✓	✓	✓	✓	✓	✓
Household Char.	✓	✓	✓	✓	✓	✓
Observations	2,725	2,725	2,725	2,725	2,725	2,725
Sample Mean	2.75	2.75	1.60	1.60	6.41	6.41

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at the community/village level. Distance from T is the difference in days between the threshold and the interview date (dint - T); Distance up to T is the difference in days between the threshold and the interview date if interviewed before T and 0 otherwise.

icant positive impact on the number of hours children spend in income-generating activities. Overall, the OLS results appear inconclusive, describing tiny or non-significant results.²² These results are consistent only in the case of no endogeneity in the specification, for which there exist reasons to believe that it is not the case of the analysis. To solve this concern, a two-stage approach is provided where receiving NGO support is instrumented by using a dummy variable equal to 1 if a family has been interviewed after the 1st of January 2010 and 0 otherwise.

Table 2.6 illustrates the results for the first stage of the IV model. For both specifications, it is possible to observe a negative and strong statistically significant impact of being interviewed after the 1st of January 2010 on receiving NGO support. In addition, since the threshold was known to the NGOs months in advance, it is possible to assume that the NGOs themselves could have adjusted their behaviour accordingly before the 1st of January 2010. Under this assumption, our estimates would be biased towards zero and against significant results. Although conservative, this result indicates the CSP's impact on the Ethiopian NGO environment and aligns with the hypothesis of NGOs reducing the number of families supported following the financial implementation of the CSP.

Table 2.6 : IV - First Stage

	NGO Support	NGO Support
After T	−0.219*** (0.037)	−0.192*** (0.030)
Distance from T	0.004*** (0.001)	
Distance up to T		0.004*** (0.001)
Rural	−0.055 (0.050)	−0.062 (0.051)
Sex Child	−0.001 (0.023)	0.001 (0.023)
Region FE	✓	✓
Religion FE	✓	✓
Ethnicity FE	✓	✓
Household Char.	✓	✓
Observations	2,725	2,725
R-squared	0.057	0.062

*p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the community/village level. Distance from T is the difference in days between the threshold and the interview date (dint - T); Distance up to T is the difference in days between the threshold and the interview date if interviewed before T and 0 otherwise.

²²In Appendix: Tables B.1 and B.2 provide the complete set of results for the OLS model.

Table 2.7 : IV - Food Security

	Food Insecurity		Number Meals	
	IV(I)	IV(II)	IV(I)	IV(II)
NGO Support	−0.049 (0.149)	−0.018 (0.145)	0.364 (0.280)	0.471* (0.275)
Distance from T	−0.000 (0.001)		−0.002** (0.001)	
Distance up to T		−0.001 (0.001)		−0.003** (0.001)
Rural	0.048 (0.051)	0.050 (0.050)	0.001 (0.090)	0.010 (0.085)
Sex Child	0.001 (0.021)	0.001 (0.020)	0.016 (0.025)	0.015 (0.026)
Region FE	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓
Ethnicity FE	✓	✓	✓	✓
Household Char.	✓	✓	✓	✓
Kleibergen-Paap F	34.49	40.63	34.49	40.63
Observations	2,725	2,725	2,725	2,725
Sample Mean	0.75	0.75	3.84	3.84

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at the community/village level. Distance from T is the difference in days between the threshold and the interview date (dint - T); Distance up to T is the difference in days between the threshold and the interview date if interviewed before T and 0 otherwise.

Tables 2.7 and 2.8 describe the results of the structural equation when I use estimates for receiving NGO support retrieved from the first stage. Receiving NGO support does not improve children's food security. With respect to OLS estimates, we observe a larger coefficient of receiving NGO support on the number of meals, although only marginally statistically significant for specification II. Differently from OLS results, IV estimates find that children's time use is impacted by receiving NGO support at the household level.²³ Specifically, it is possible to observe a decrease in the time spent on non-income-generating activities and an increase in the number of hours in income-generating activities. The F-statistics are always greater than 10 (rule of thumb) and greater than Stock and Yogo (2005) thresholds, confirming the relevance of the instrument.²⁴ These results suggest that families receiving NGO support substitute different types of child labour, preserving the time invested in education for which NGO support produces a positive but not statistically significant impact. These results appear to be in line with the literature on the wealth paradox:

²³In Appendix: Table B.3 provides the complete set of results for the first stage of the IV estimation; Tables B.4 and B.5 for the IV second stage.

²⁴In Appendix: Tables A.1 and A.2 using the VtF methodology confirm the results.

Table 2.8 : IV - Children's Time Use

	Housework		WorkAll		Education	
	IV(I)	IV(II)	IV(I)	IV(II)	IV(I)	IV(II)
NGO Support	−0.800** (0.399)	−0.758* (0.434)	1.762** (0.877)	1.739* (0.891)	0.223 (0.776)	0.213 (0.794)
Distance from T	0.001 (0.002)		−0.006** (0.003)		0.002 (0.003)	
Distance up to T		0.001 (0.002)		−0.009** (0.003)		0.003 (0.004)
Rural	0.555*** (0.117)	0.555*** (0.118)	1.516*** (0.167)	1.532*** (0.159)	−1.466*** (0.201)	−1.472*** (0.204)
Sex Child	1.522*** (0.127)	1.523*** (0.128)	−1.513*** (0.212)	−1.516*** (0.211)	0.139 (0.143)	0.140 (0.144)
Region FE	✓	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓	✓
Ethnicity FE	✓	✓	✓	✓	✓	✓
Household	✓	✓	✓	✓	✓	✓
Kleibergen-Paap F	34.49	40.63	34.49	40.63	34.49	40.63
Observations	2,725	2,725	2,725	2,725	2,725	2,725
Sample Mean	2.75	2.75	1.60	1.60	6.41	6.41

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at the community/village level. Distance from T is the difference in days between the threshold and the interview date (dint - T); Distance up to T is the difference in days between the threshold and the interview date if interviewed before T and 0 otherwise.

families trying to maximise the return from NGO support by expanding their family business, thus employing, at least in the short run, child labour as a substitute for external workers that might be difficult to hire and trust. Nonetheless, in this research, I do not observe the trade-off between child labour and education described in the literature; but a substitution between different types of labour. Receiving NGO support decreases by 0.8 hours the time children spend daily on non-income-generating activities, increasing the time spent on income-generating activities by 1.7 hours. The magnitude of these coefficients is economically relevant if we consider that children in the sample are, on average, 10.42 years old. The relative impact is also economically not negligible; NGO support decreases the time children spend on non-income-generating activities by around 30% and increases by around 105% the one in income-generating activities. These results are surprisingly large, particularly the one referred to *WorkAll* variable. A reason for this sizeable relative impact might be explained by recognising that the sample means for time-use variables both refer to children who are already involved in such activities (having at least one hour spent per day) and children who are not, thus with 0 hours spent. Given the large impact of receiving NGO support and considering that in the overall sample, there

are also children who are not spending time on these specific activities, the following question is to investigate whether NGO support changes the incentive for children to start investing time in such activities (extensive margin) or it changes the number of hours spent for children that were already involved in these activities (intensive margin).

To answer the first question, the analysis of the extensive margin, I define a dummy variable for each time-use outcome variable equal to 1 if a child is involved in such activities and 0 otherwise, and proceed by replicating the same two-stage strategy using these dummy variables as outcomes. Table 2.9 illustrates the results; NGO support keeps children's and households' incentives to start doing such activities unchanged. All coefficients are not statistically significant, suggesting that children who did not allocate their time to these activities do not change their decision depending on NGO support. In light of these results, I hypothesise that intensive margins drive the results observed in the main analysis. To test this hypothesis, for each specific time-use outcome variable, I condition the sample only on children spending at least one hour on that particular activity (thus having a total number of observations varying according to the selected outcome).

Table 2.9 : IV - Extensive Margin Children's Time Use

	<u>Housework (dummy)</u>		<u>WorkAll (dummy)</u>		<u>Education (dummy)</u>	
	IV(I)	IV(II)	IV(I)	IV(II)	IV(I)	IV(II)
NGO Support	-0.063 (0.105)	-0.008 (0.115)	0.268 (0.215)	0.275 (0.213)	0.040 (0.122)	0.080 (0.121)
Distance from T	-0.001 (0.000)		-0.001 (0.001)		-0.001 (0.000)	
Distance up to T		-0.001 (0.001)		-0.001 (0.001)		-0.001 (0.000)
Region FE	✓	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓	✓
Ethnicity FE	✓	✓	✓	✓	✓	✓
Household Char.	✓	✓	✓	✓	✓	✓
Kleibergen-Paap F	34.49	40.63	34.49	40.63	34.49	40.63
Observations	2,725	2,725	2,725	2,725	2,725	2,725
Sample Mean	0.87	0.87	0.44	0.44	0.86	0.86

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at the community/village level. Distance from T is the difference in days between the threshold and the interview date (dint - T); Distance up to T is the difference in days between the threshold and the interview date if interviewed before T and 0 otherwise.

As illustrated in Table 2.10, the results obtained in the main sample, specifically those regarding the trade-off between non-income-generating and income-generating activities, are confirmed with similar magnitude when analysing the intensive mar-

Table 2.10 : IV - Intensive Margin Children's Time Use

	Housework		WorkAll		Education	
	IV(I)	IV(II)	IV(I)	IV(II)	IV(I)	IV(II)
NGO Support	-0.838* (0.437)	-0.942** (0.436)	1.675** (0.664)	1.626** (0.693)	-0.372 (0.736)	-0.809 (0.806)
Distance from T	0.002 (0.002)		-0.004 (0.005)		0.007*** (0.002)	
Distance up to T		0.003 (0.002)		-0.006 (0.006)		0.009*** (0.003)
Region FE	✓	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓	✓
Ethnicity FE	✓	✓	✓	✓	✓	✓
Household Char.	✓	✓	✓	✓	✓	✓
Kleibergen-Paap F	33.14	41.23	37.99	39.96	21.87	24.78
Observations	2,375	2,375	1,191	1,191	2,337	2,337
Sample Mean	3.15	3.15	3.67	3.67	7.48	7.48

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at the community/village level. Distance from T is the difference in days between the threshold and the interview date (dint - T); Distance up to T is the difference in days between the threshold and the interview date if interviewed before T and 0 otherwise.

gins. Receiving NGO support impacts children's time allocation, but only if children were already involved in the activity considered (number of hours equal to or larger than 1). Differently from the main analysis, in this case, the mean values are larger by construction (not including children with 0 hours spent on the activity considered), thus leading to smaller relative impacts. Receiving NGO support at the household level decreases time dedicated to non-income-generating activities for involved children by around 27% and increases the time spent in income-generating activities by around 45%. Note that the F-statistic values decrease compared to those retrieved in the main analysis although remaining larger than 20 in all specifications; nonetheless, the confidence intervals retrieved using Lee et al. (2023) proposed methodology confirm the obtained results, eventually improving the statistical significance level for specific regressions.²⁵

All the results obtained so far have to be analysed considering the time horizon of the dataset of almost six months, thus describing the immediate impact of receiving NGO support on children's outcomes for a family switching from not receiving support to receiving it. These assumptions underline that children's time allocation

²⁵In Appendix: Tables A.3 and A.4 report the results of the extensive and intensive analysis using the VtF methodology.

is, in the short run, sensitive to receiving NGO support.

Moreover, the interpretation of these results has also to be reconciled with the recent literature on heterogeneous treatment impact when implementing a two-stage methodology. Results obtained in this analysis have to be considered as Local Average Treatment Effect (LATE) and then be attributed only to the group of compliers. In this framework, the group of compliers is defined as those families who move from a condition in which they did not receive NGO support to one in which they receive it in the presence of the policy.

Angrist and Pischke (2009) define a strategy to identify the characteristics most likely found in the compliers subpopulation. Suppose we are interested in investigating whether compliers are most likely to live in rural areas. The relative likelihood a complier is living in rural areas is given by the ratio of the first stage estimate for the variable describing NGO support for the rural sample over the first stage estimate of the same variable in the overall population. A ratio that is smaller than 1 indicates a lower probability for compliers living in rural areas, while a ratio that is larger than 1 indicates the opposite. For this calculation, in the first stages I control for a set of covariates describing region fixed effects, household religion, ethnicity and interview timing. Table 2.11 illustrates that compliers are most likely to live in urban areas (presumably closer to NGO headquarters), to have been hit by a natural event, to have a female and a relatively educated household head and a large number of household members, particularly with a larger share of females.

Table 2.11 : Complier-characteristics ratios

	(1) $E[D_i Z_i = 1, x_{1i} = 1] - E[D_i Z_i = 0, x_{1i} = 1]$	(2) $E[D_i Z_i = 1] - E[D_i Z_i = 0]$	(3) $(1)/(2)$
Rural	-0.2074	-0.2214	0.9368
Sex Child	-0.2298	-0.2214	1.0379
Age Child (m.)	-0.2722	-0.2214	1.2294
Natural Event	-0.3135	-0.2214	1.4160
Head Female	-0.2486	-0.2214	1.1299
Head Age (m.)	-0.2605	-0.2214	1.1766
Head No Education	-0.2008	-0.2214	0.9070
Head Higher Education	-0.2723	-0.2214	1.2299
Household Size (m.)	-0.3139	-0.2214	1.4178
Household Share Female (m.)	-0.2432	-0.2214	1.0985

The covariates used in the first stages as controls are the timing of interview, religion and ethnicity dummies and regions. Variables having (m.) are dummies equal to 1 if the value for the specific variable is greater than the median value.

2.6 .1 Type of Support

The main analyses do not consider the type of support NGOs provide to families. The reason for not specifying the kind of support families receive relies on NGOs' multifaceted aid and the adoption of the Right-Based Approach (RBA), meaning that NGOs providing goods and services might also promote non-material support focusing on human rights or advocacy. Consequently, it is difficult to determine precise channels through which this support affects economic outcomes such as, in our case, children's outcomes. However, it is still possible to exploit information in the Ethiopian Young Lives dataset to determine which type of NGO support is the most relevant, thus trying to better characterise the results obtained in the main analyses. The Ethiopian Young Lives Dataset contains detailed information on the type of support families receive, with answers ranging from income support and children's education to agricultural extension. Due to this multitude of types of support, to ease the analysis on investigating which type of support is the most relevant for children's outcomes, I created two dummy variables aiming to aggregate the different kinds of support into two main categories having the scope to mimic the two channels through which we might expect NGOs to play a role on children outcomes: income support and education support. Being ad-hoc variables, the choice on which kind of support to fall on income or education was arbitrary and different researchers might make different educated decisions.²⁶ Notably, because households might receive support from different NGOs simultaneously, there are families in the sample that receive both income and education support. In a similar scenario, a family receiving income and education support would have a value equal to 1 for both dummy variables.

Table 2.12 illustrates that most of the supported families in the sample received income support rather than education support. In contrast, a minority of households (44 observations or 1.61% of the total observations in the sample) simultaneously received income and education support. Unfortunately, due to the size of the sub-groups, it is unfeasible to analyse and compare families receiving only income or education support, families receiving no support and families receiving income and education support separately. Consequently, a decision had to be made on which sample of observations to consider when investigating the impact of a specific type of support. Two alternative strategies can be implemented; as an example, consider the analysis of the impact of income support on the set of outcome variables. The first would utilise the subsample of observations of families not receiving NGO sup-

²⁶Income support: productive asset provision, income scheme, unconditional transfers, credit, agricultural extension and training, health support, food aid, food-for-work, cash-for-work, training programs. Education support: children's education, children's protection schemes, school feeding programs.

Table 2.12 : Type of NGO support

	Education Support		Total
	No	Yes	
Income Support			
No	1,912	146	2,058
Yes	623	44	667
Total	2,535	190	2,725

Type of support provided by NGOs.

port (1,912) and receiving income support (623) and estimate the impact of this type of support on the set of outcome variables following the IV strategy previously presented in the research. The second strategy would use the entire sample of 2,725 observations and consider receiving NGO income support as the main variable of interest, thus analysing the impact with respect to families not receiving NGO support and families receiving only education support. Due to the sample size, the second option has been followed, aware of the limitations in interpreting results and the conservative estimates that will be obtained since when analysing income (education) support, in the group of families not receiving this type of support there are families supported by NGOs but receiving education (income) support that could hamper the estimates and the significance of results.²⁷ Tables 2.13 and 2.14 illustrate the results for the type of support. I do not report the first stage of the IV estimates being computed on the same sample of the main analysis, thus having the same results.

The results provide supportive evidence that the channel through which NGOs play a role in defining children's time use is the income and not the right channel. Families react to income support by changing their preferences on the time use of children, trying to maximise the returns of the monetary equivalent support, and eventually substituting time children invested in non-income generating activities with income-generating activities such as working in the family business. Interestingly, even in the case of education support, children are not increasing their time spent at school or studying at home. We also observe that the F-statistic for the income support is above the rule of thumb of 10 and above the Stock and Yogo thresholds for the model. At the same time, this is not the case for education

²⁷The first strategy, which is not reported in the paper, confirms the results obtained in Tables 2.13 and 2.14.

Table 2.13 : IV - Income Support

	Income Support				
	Food Ins.	N. Meals	Housework	WorkAll	Education
NGO Support	−0.060 (0.184)	0.451 (0.339)	−0.991* (0.523)	2.183** (1.007)	0.276 (0.971)
Distance from T	−0.000 (0.001)	−0.002** (0.001)	0.001 (0.002)	−0.006*** (0.003)	0.002 (0.004)
Region FE	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓
Ethnicity FE	✓	✓	✓	✓	✓
Household Char.	✓	✓	✓	✓	✓
Observations	2,725	2,725	2,725	2,725	2,725
Kleibergen-Paap F	28.98	28.98	28.98	28.98	28.98

*p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the community/village level. Distance from T is the difference in days between the threshold and the interview date (dint - T); Distance up to T is the difference in days between the threshold and the interview date if interviewed before T and 0 otherwise.

Table 2.14 : IV - Education Support

	Education Support				
	Food Ins.	N. Meals	Housework	WorkAll	Education
NGO Support	−0.146 (0.462)	1.091 (1.058)	−2.394 (1.512)	5.275 (4.042)	0.667 (2.292)
Distance from T	−0.001 (0.001)	−0.002 (0.001)	−0.000 (0.002)	−0.004 (0.003)	0.002 (0.004)
Region FE	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓
Ethnicity FE	✓	✓	✓	✓	✓
Household Char.	✓	✓	✓	✓	✓
Observations	2,725	2,725	2,725	2,725	2,725
Kleibergen-Paap F	5.361	5.361	5.361	5.361	5.361

*p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the community/village level. Distance from T is the difference in days between the threshold and the interview date (dint - T); Distance up to T is the difference in days between the threshold and the interview date if interviewed before T and 0 otherwise.

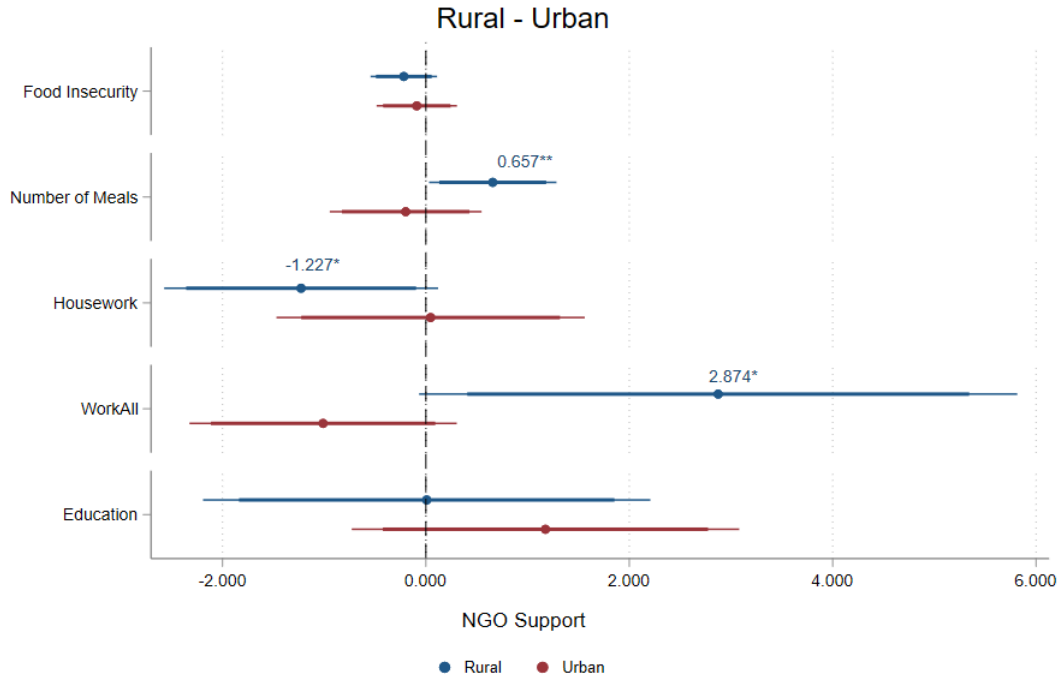
support. However, it is not possible to say this is due to sample size or the low explanatory power of the chosen policy threshold in determining education NGO support.

2.6 .2 Heterogeneity Analysis

The results previously described identify the impact of receiving NGO support in the sample without considering that households and individuals with different characteristics might be differently affected by their relationship with these organisations. As economists, we might be interested in investigating how NGO support impacts change according to important household-level characteristics that have already been demonstrated to play a crucial role in the economic literature. A heterogeneous analysis is proposed to investigate this question, considering four relevant dimensions. For each dimension, I graphically report the results of the two-stage estimation by using the preferred specification, specification I, in which the variable *Distance from T_{ir}* is used as a covariate.

The first analysis considers household location characteristics, specifically whether households lived in rural or urban communities. Figure 2.5 graphically illustrates the results of the IV estimation in which I sequentially conditioned the sample to contain only households residing in rural or urban communities. On the vertical axis are listed the five outcome variables considered in the research, and on the horizontal axis, the point estimates with 90% and 95% confidence intervals. Differently from the main estimation, we observe that NGO support has a positive statistically significant impact on the daily number of meals for children living in rural areas, thus suggesting an improvement in food security for children in this group. When dividing the sample by location characteristics, the impact on children’s time-use weakens with only children living in rural communities experiencing the substitution between non-income-generating activities and income-generating activities, having large, although only marginally, statistically significant coefficients.

Similarly, Figure 2.6 describes the results of receiving NGO support on the set of outcome variables by terciles of wealth. The wealth index, a continuous variable taking values in the interval $[0,1]$ already calculated in the dataset, has been used to construct a household wealth indicator describing the poorest households in the sample for the first tercile and, in the third, the wealthiest. Note that the wealth index variable was not used as a control in the model for endogeneity concerns. Results illustrated in Figure 2.6 confirm that children living in the most disadvantaged households are the ones who are the most affected by receiving NGO support. Whether living in rural communities or disadvantaged families, receiving NGO support translates into an increase in the number of meals per day and the number

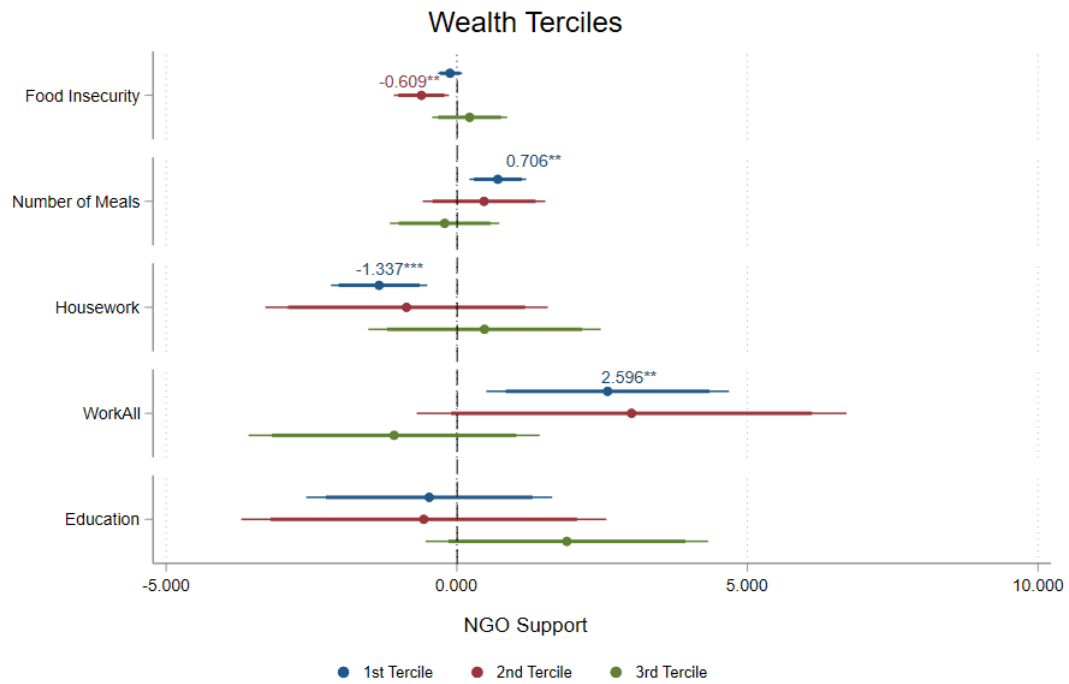


Standard errors are clustered at the community/village level. 95 percent and 99 percent confidence intervals are indicated for each coefficient.

Figure 2.5 : IV - Household Location

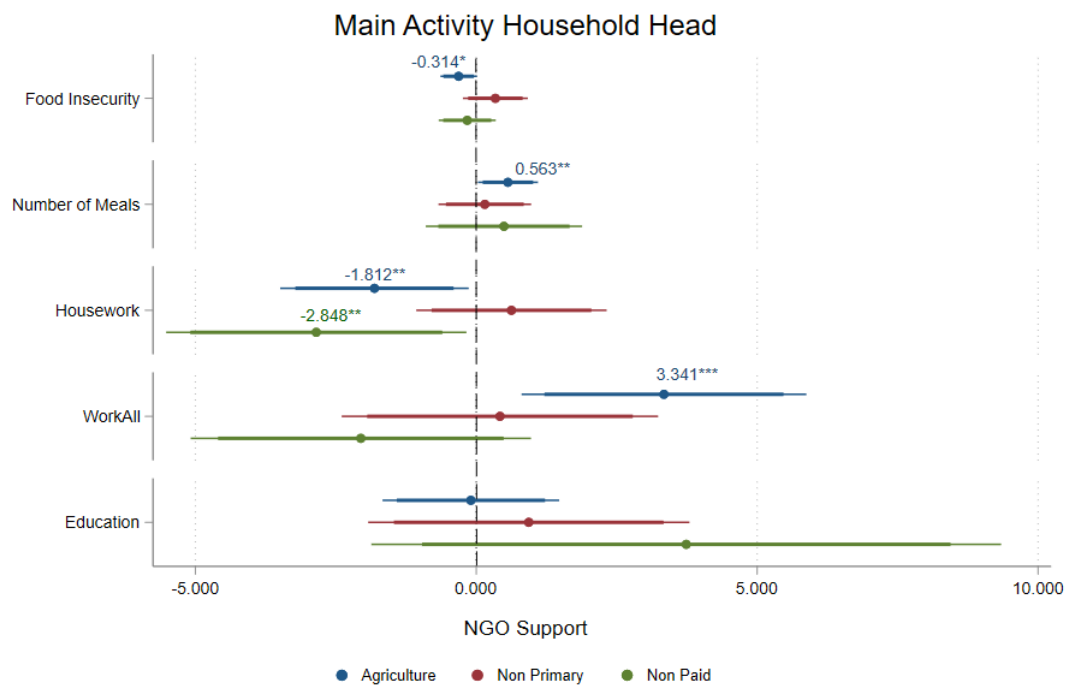
of hours spent working. For the poorest terciles, coefficients are larger than those obtained in the main sample, highlighting the saliency of the support provided by NGOs. Notably, the food insecurity measure decreases for families receiving NGO support only for those in the second wealth tercile.

An additional dimension that can potentially be relevant to the research question and has been proven to be a determinant of food security and children's time-use is represented by the main occupation of the household head. Figure 2.7 describes the case in which I condition the sample according to three categories constructed to represent the three main occupations of the household head: agriculture, non-primary and non-paid activities (e.g. unemployed). As expected, families heavily reliant on agriculture as a source of sustenance, thus having the household head involved in the primary sector, are those displaying a positive impact of receiving NGO support on food security measures. For the households in this group, receiving NGO support decreases food insecurity and increases the daily number of meals for YL children. Although I cannot provide additional evidence on the mechanisms, I hypothesise these results are driven by the provision of technology, productive assets, food aid, and income support that might improve self-production and alleviate economic constraints in the family. Similarly to previous analyses, children living in families where the household head is mainly involved in the primary sector are



Standard errors are clustered at the community/village level. 95 percent and 99 percent confidence intervals are indicated for each coefficient.

Figure 2.6 : IV - Wealth Terciles

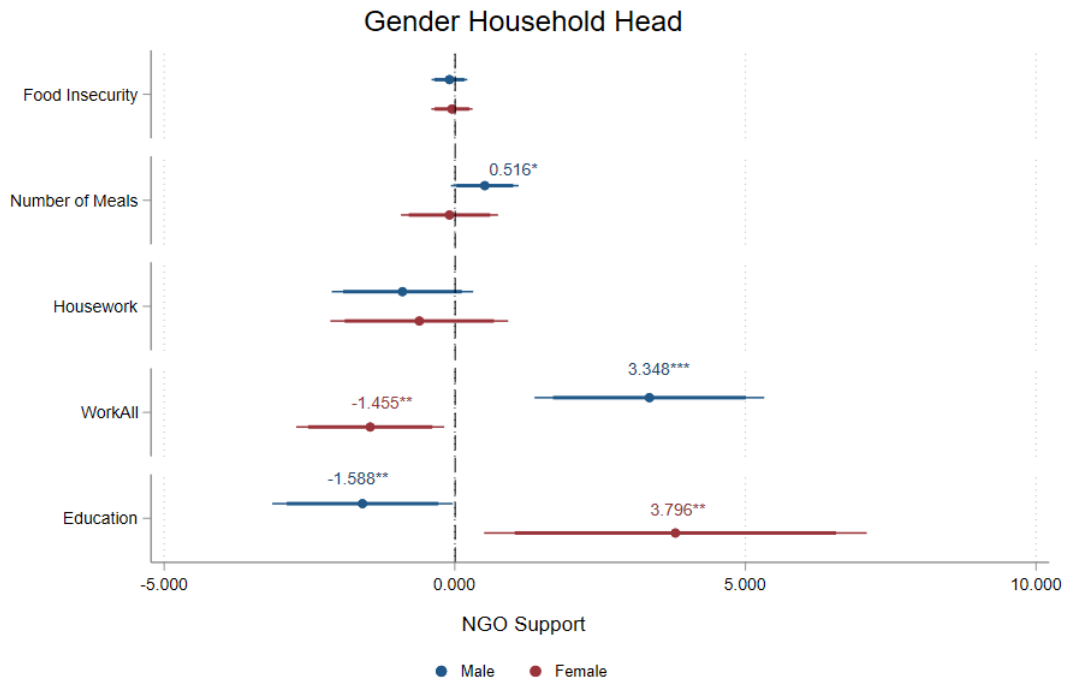


Standard errors are clustered at the community/village level. 95 percent and 99 percent confidence intervals are indicated for each coefficient.

Figure 2.7 : IV - Main Occupation Household Head

substituting time doing housework with income-generating activities. This result aligns with the literature stressing how support aiming to improve households' income activities (primarily in agriculture) can lead to an increase in child labour in the absence of a workforce to be hired outside the household.

Another important household characteristic worth investigating in this analysis is the gender of the household head; families with a female head are considered to be more economically disadvantaged than those with a male head.



Standard errors are clustered at the community/village level. 95 percent and 99 percent confidence intervals are indicated for each coefficient.

Figure 2.8 : IV - Gender of the Household Head

Figure 2.8 clearly indicates that receiving NGO support in a female-headed household produces an opposite impact on children's time-use than in the case of a male-headed household. Notably, while children living in male-headed households are reducing time invested in education, increasing the number of hours spent in income-generating activities, those living in female-headed households are reducing time spent in income-generating activities, increasing time in education. Unfortunately, with available data, it is not possible to provide evidence of the mechanism and the channel that drives these results. Specifically, I am not able to determine if NGOs assist households differently depending on the gender of the household head (not only in the type of support provided but also on the approach used) or if female-headed households react to NGO support differently and in the opposite direction with respect to male-headed households. Nonetheless, these results are relevant

in providing evidence of the different behaviours between male- and female-headed households in defining household and child outcomes. As described by Duflo (2012), women’s empowerment is a relevant topic for economic development, not only for equity and equality reasons but specifically for the differences in how empowered females allocate resources compared to males. Thomas (1990), in his seminal paper on intra-household resource allocation, clearly stated that gender preferences matter and, thus, income in the hands of male or female members has different implications for children’s development outcomes. Evidence of the positive impact of transfers targeting women on children’s outcomes is described, for example, by Duflo (2003) for health. Rises in female income through transfers or empowerment programs have been observed to impact investment in education positively; Asiedu et al. (2024) show that female-headed households in Ghana tend to invest from 31% to 38% more in children’s education than their male counterparts. Similarly, other studies in different countries analysing the relationship between female empowerment and children’s educational outcomes agree in finding a positive impact (Rangel, 2006; Doss, 2006).

Tables 2.15 and 2.16 compare the results obtained in the heterogeneous analysis, highlighting the number of observations and the value of the F-statistic in each specification. In Appendix Tables A.5 and A.6, I report the confidence interval produced following Lee et al. (2023). This methodology confirms the results obtained in the heterogeneous analysis, providing consistent estimates in the case of a weak instrument, thus when the F-statistic value is lower than 10. The F-statistic is, in fact, lower than 10 when analysing the urban subsample, the tercile representing the wealthiest households and the subsample of families with the family head’s main occupation being a non-primary or non-paid activity.

Overall, food security measures considered in this research seem unaffected by receiving NGO support, except in the case of children living in families residing in rural areas, coming from families in the poorest tercile of the dataset or having the household head involved in agricultural activities, for which we observe significant improvements in the food security condition. For families in these subsamples, we observe an increase in the number of meals per day of the YL child and, only for families belonging to the second wealth tercile, also a reduction in the household food insecurity measure. The results concerning children’s time-use are more heterogeneous. Overall, children living in families receiving NGO support are substituting time spent in non-income-generating activities with time spent in income-generating activities, such as working in the family business. This response to NGO support might be described, although I cannot provide evidence, by an increase in investments in the family business to maximise the returns of the support. The wealth channel seems to be driving the results; families seem to react to the provision of

Table 2.15 : IV - Heterogeneous Analysis

NGO Support	Location		Wealth		
	Rural	Urban	1 st Tercile	2 nd Tercile	3 rd Tercile
Food Insecurity	−0.217 (0.167)	−0.090 (0.202)	−0.116 (0.106)	−0.609** (0.242)	0.221 (0.329)
Number of Meals	0.657** (0.320)	−0.199 (0.381)	0.706*** (0.249)	0.468 (0.539)	−0.209 (0.480)
Housework	−1.127* (0.687)	0.046 (0.773)	−1.337*** (0.422)	−0.864 (1.124)	0.476 (1.020)
WorkAll	2.874* (1.500)	−1.011 (0.671)	2.596** (1.066)	3.007 (1.886)	−1.078 (1.278)
Education	0.008 (1.122)	1.176 (0.972)	−0.474 (1.080)	−0.568 (1.602)	1.894 (1.240)
Kleibergen-Paap F	32.80	5.91	27.63	13.61	4.14
Observations	1,770	955	912	904	906

*p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the community/village level.

Table 2.16 : IV - Heterogeneous Analysis

NGO Support	Occupation HH			Gender HH	
	Agriculture	Non-Primary	Non-Paid	Male	Female
Food Insecurity	−0.314* (0.165)	0.340 (0.295)	−0.161 (0.260)	−0.092 (0.157)	−0.049 (0.181)
Number of Meals	0.563** (0.273)	0.152 (0.421)	0.493 (0.710)	0.516* (0.297)	−0.091 (0.426)
Housework	−1.812** (0.856)	0.627 (0.864)	−2.848** (1.363)	−0.900 (0.621)	−0.610 (0.781)
WorkAll	3.341*** (1.293)	0.422 (1.437)	−2.055 (1.545)	3.348*** (1.008)	−1.455** (0.650)
Education	−0.096 (0.802)	0.935 (1.459)	3.738 (2.860)	−1.588** (0.793)	3.796** (1.680)
Kleibergen-Paap F	27.29	9.47	6.71	26.80	13.29
Observations	1,273	1,080	345	2,159	566

*p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the community/village level.

goods and services rather than to the rights and values component of the NGO approach. Nonetheless, different from the literature, results do not describe a trade-off between labour and education; education appears to be unaffected by NGO support. Notably, I observe an economically relevant impact on education only when considering the gender of the household head. Female-headed households receiving NGO support increase the time children spend on education, reducing the time spent on income-generating activities, while the opposite is true for male-headed households.

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2.7 Conclusion

This research investigates the short-term impact of receiving Non-Governmental Organisations' support on children's food security and time-use in Ethiopia. It contributes to this literature by focusing specifically on the role of NGOs, which, although increasingly present in developing countries, still represent an understudied topic in the economic literature. This research also contributes to the economic literature by considering an almost never empirically treated topic, namely the impact of restrictive NGO policies on social and economic outcomes. It exploits the implementation timing of a restrictive NGO law, the Charities and Societies Proclamation (CSP), introduced in the country in 2009, to solve the potential endogeneity concerns related to the research question. By considering a specific interview Round of the Ethiopian Young Lives Dataset, collecting observations from October 2009 to March 2010, I leverage a specific implementation phase of the CSP to define a relevant instrument for receiving NGO support at the household level. The results obtained in the analysis highlight the critical role of NGO support in determining children's daily schedules. I observe that children living in families receiving NGO support, although not experiencing improvements in food security measures, substitute time spent on non-income-generating activities (such as caring for other family members) with income-generating activities. Although I am unable to provide evidence on the theoretical mechanism driving these results, I hypothesise -as shown in the literature- that families, when receiving support (such as income, technology or credit), aiming to maximise returns from it, might be incentivised in employing child labour when in the absence of reliable workforce in the community in which they live. Notably, different from the literature describing a trade-off between labour and education for children, in this research, the increase in the time spent in income-generating activities is not detrimental to time invested in education, which appears

²⁸Appendix: the F-statistic value for female-headed households is small, although greater than 10. Nonetheless, VtF methodology for robust-weak-instrument inference confirms the statistical significance of the result.

to be unaffected by receiving NGO support. Indeed, the trade-off described in this research is between different types of labour.

This research aims to estimate the average impact of NGO support on children's economic outcomes without focusing on specific NGOs or programs, thus initially and for the main analyses not characterising the type of support provided by NGOs but focusing on individual and household characteristics. Nonetheless, when considering the type of support NGOs provide to families, I observe preliminary evidence that children's outcomes are sensitive to income support rather than education support. Moreover, because the NGO support and its impact might also vary according to individual and household characteristics, I introduce a heterogeneity analysis considering four relevant dimensions in the household context: living in rural or urban communities, the level of household wealth, the main occupation and the gender of the household head. For all these subsamples, it is possible to observe consistent results concerning children's time-use with respect to the ones retrieved in the main sample. Additionally, for children living in the most disadvantaged families and those living in rural areas, receiving NGO support also positively impacts the number of meals received per day. Similar results are also observed for children living in households in which the main occupation of the household head is in the primary sector. The only group of households for which NGO support significantly impacts children's time invested in education is female-headed households. Notably, when considering male-headed and female-headed households separately, results illustrate an opposite impact of NGO support on children's time allocation outcomes. Children living in female-headed households invested more time in education while reducing the time spent in income-generating activities. In contrast, the opposite is true for children living in male-headed households. Although it is not possible with available data to state whether this is due to a different approach followed by NGOs in targeting female-headed families or by a different response of such households, these results highlight the crucial role of female empowerment in determining children's economic outcomes.

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Bibliography

- Akabayashi, H. and Psacharopoulos, G. (1999). The trade-off between child labour and human capital formation: A tanzanian case study. *The Journal of Development Studies*, 35(5):120–140.
- Aldashev, G. and Navarra, C. (2018). Development ngos: basic facts. *Annals of public and cooperative economics*, 89(1):125–155.
- Alderman, H., Hoddinott, J., and Kinsey, B. (2006). Long term consequences of early childhood malnutrition. *Oxford economic papers*, 58(3):450–474.
- Alvi, E. and Dendir, S. (2011). Sibling differences in school attendance and child labour in ethiopia. *Oxford development studies*, 39(3):285–313.
- Amnesty International (2012). Ethiopia: The 2009 Charities and Societies Proclamation as a serious obstacle to the promotion and protection of human rights in Ethiopia. <https://www.amnesty.org/en/documents/afr25/007/2012/en/>.
- Angrist, J. D. and Pischke, J.-S. (2009). *Mostly harmless econometrics: An empiricist’s companion*. Princeton university press.
- Ariti, A. T., van Vliet, J., and Verburg, P. H. (2018). What restrains ethiopian ngos to participate in the development of policies for natural resource management? *Environmental Science & Policy*, 89:292–299.
- Asiedu, E., Karimu, A., and Iddrisu, A. G. (2024). Structural changes in african households: Female-headed households and children’s educational investments in an imperfect credit market in africa. *Structural Change and Economic Dynamics*, 68:30–42.
- Aurino, E., Fledderjohann, J., and Vellakkal, S. (2019). Inequalities in adolescent learning: Does the timing and persistence of food insecurity at home matter? *Economics of Education Review*, 70:94–108.
- Aurino, E., Gelli, A., Adamba, C., Osei-Akoto, I., and Alderman, H. (2023). Food for thought?: Experimental evidence on the learning impacts of a large-scale school feeding program. *Journal of Human Resources*, 58(1):74–111.
- Babatunde, R. O. and Qaim, M. (2010). Impact of off-farm income on food security and nutrition in nigeria. *Food policy*, 35(4):303–311.
- Balcha, D. M. (2014). The impact of charities and societies proclamation no. 621/2009 on addressing hiv/aids issues in ethiopia. *Int’l J. Not-for-Profit L.*, 16:53.

- Bandiera, O., Burgess, R., Deserranno, E., Morel, R., Sulaiman, M., and Rasul, I. (2023). Social incentives, delivery agents, and the effectiveness of development interventions. *Journal of Political Economy Microeconomics*, 1(1):162–224.
- Basu, K. and Van, P. H. (1998). The economics of child labor. *American economic review*, pages 412–427.
- Batomen Kuimi, B. L., Oppong-Nkrumah, O., Kaufman, J., Nazif-Munoz, J. I., and Nandi, A. (2018). Child labour and health: a systematic review. *International journal of public health*, 63:663–672.
- Beegle, K., Dehejia, R. H., and Gatti, R. (2006). Child labor and agricultural shocks. *Journal of Development economics*, 81(1):80–96.
- Bhalla, G., Handa, S., Angeles, G., and Seidenfeld, D. (2018). The effect of cash transfers and household vulnerability on food security in zimbabwe. *Food policy*, 74:82–99.
- Bhalotra, S. and Heady, C. (2003). Child farm labor: The wealth paradox. *The World Bank Economic Review*, 17(2):197–227.
- Birru, J. G. and Wolff, J. (2019). Negotiating international civil society support: the case of ethiopia’s 2009 charities and societies proclamation. *Democratization*, 26(5):832–850.
- Björkman-Nyqvist, M. (2013). Income shocks and gender gaps in education: Evidence from uganda. *Journal of Development Economics*, 105:237–253.
- Borga, L. G. (2019). Children’s own time use and its effect on skill formation. *The Journal of Development Studies*, 55(5):876–893.
- Chang, G. (2022). How is adolescents’ time allocation associated with their self-esteem and self-efficacy? evidence from four developing countries. *The Journal of Development Studies*, 58(11):2237–2262.
- Cheeseman, N. and Dodsworth, S. (2023). Defending civic space: When are campaigns against repressive laws successful? *The Journal of Development Studies*, 59(5):619–636.
- Christiaensen, L. and Alderman, H. (2004). Child malnutrition in ethiopia: can maternal knowledge augment the role of income? *Economic Development and cultural change*, 52(2):287–312.
- Coates, J., Swindale, A., and Bilinsky, P. (2007). Household food insecurity access scale (hfias) for measurement of food access: indicator guide: version 3.

- Cockburn, J. and Dostie, B. (2007). Child work and schooling: The role of household asset profiles and poverty in rural ethiopia. *Journal of African economies*, 16(4):519–563.
- Cornwall, A. and Nyamu-Musembi, C. (2004). Putting the ‘rights-based approach’ to development into perspective. *Third world quarterly*, 25(8):1415–1437.
- Dammert, A. C., De Hoop, J., Mvukiyehe, E., and Rosati, F. C. (2018). Effects of public policy on child labor: Current knowledge, gaps, and implications for program design. *World development*, 110:104–123.
- De Hoop, J., Groppo, V., and Handa, S. (2020). Cash transfers, microentrepreneurial activity, and child work: evidence from malawi and zambia. *The World Bank Economic Review*, 34(3):670–697.
- Deserranno, E., Nansamba, A., and Qian, N. (2024). The impact of ngo-provided aid on government capacity: Evidence from uganda. *Journal of the European Economic Association*, page jvae029.
- Doss, C. (2006). The effects of intrahousehold property ownership on expenditure patterns in ghana. *Journal of African economies*, 15(1):149–180.
- Duflo, E. (2003). Grandmothers and granddaughters: old-age pensions and intra-household allocation in south africa. *The World Bank Economic Review*, 17(1):1–25.
- Duflo, E. (2012). Women empowerment and economic development. *Journal of Economic literature*, 50(4):1051–1079.
- Dupuy, K., Ron, J., and Prakash, A. (2016). Hands off my regime! governments’ restrictions on foreign aid to non-governmental organizations in poor and middle-income countries. *World Development*, 84:299–311.
- Dupuy, K. E., Ron, J., and Prakash, A. (2015). Who survived? ethiopia’s regulatory crackdown on foreign-funded ngos. *Review of International Political Economy*, 22(2):419–456.
- Dzanku, F. M. (2019). Food security in rural sub-saharan africa: Exploring the nexus between gender, geography and off-farm employment. *World Development*, 113:26–43.
- European Commission (2024). European civil protection and humanitarian aid operations. https://civil-protection-humanitarian-aid.ec.europa.eu/where/africa/ethiopia_en#:~:text=In%202023%2C%20the%20EU%20has%20the%20impact%20of%20floods.

- FAO (2024). FAOSTAT Ethiopia. <https://www.fao.org/faostat/en/#country/238>.
- Fischer, G., Karlan, D., McConnell, M., and Raffler, P. (2019). Short-term subsidies and seller type: A health products experiment in uganda. *Journal of Development Economics*, 137:110–124.
- Frelat, R., Lopez-Ridaaura, S., Giller, K. E., Herrero, M., Douchamps, S., Djurfeldt, A. A., Erenstein, O., Henderson, B., Kassie, M., Paul, B. K., et al. (2016). Drivers of household food availability in sub-saharan africa based on big data from small farms. *Proceedings of the National Academy of Sciences*, 113(2):458–463.
- Government of the Federal Democratic Republic of Ethiopia (2009). Proclamation to Provide for the Registration and Regulation of Charities and Societies. Proclamation 621/2009.
- Hadley, C., Lindstrom, D., Tessema, F., and Belachew, T. (2008). Gender bias in the food insecurity experience of ethiopian adolescents. *Social science & medicine*, 66(2):427–438.
- Haile, G. and Haile, B. (2012). Child labour and child schooling in rural ethiopia: nature and trade-off. *Education Economics*, 20(4):365–385.
- Hannum, E., Liu, J., and Frongillo, E. A. (2014). Poverty, food insecurity and nutritional deprivation in rural china: Implications for children’s literacy achievement. *International journal of educational development*, 34:90–97.
- Humphries, D. L., Dearden, K. A., Crookston, B. T., Fernald, L. C., Stein, A. D., Woldehanna, T., Penny, M. E., and Behrman, J. R. (2015). Cross-sectional and longitudinal associations between household food security and child anthropometry at ages 5 and 8 years in ethiopia, india, peru, and vietnam. *The Journal of Nutrition*, 145(8):1924–1933.
- International Labour Organisations (ILO) (2017). Global estimates of child labour: Results and trends, 2012-2016. Technical report.
- Kana, M., Phoumin, H., and Seiichi, F. (2010). Does child labour have a negative impact on child education and health? a case study in rural cambodia. *Oxford Development Studies*, 38(3):357–382.
- Kassie, M., Ndiritu, S. W., and Stage, J. (2014). What determines gender inequality in household food security in kenya? application of exogenous switching treatment regression. *World development*, 56:153–171.

- Keane, M., Krutikova, S., and Neal, T. (2022). Child work and cognitive development: Results from four low to middle income countries. *Quantitative Economics*, 13(2):425–465.
- Khanna, M. and Thomas, M. (2024). Gendered time poverty in three developing countries: An intra-household analysis of children’s time use. *Journal of International Development*, 36(1):316–342.
- Kruks-Wisner, G. (2011). Seeking the local state: Gender, caste, and the pursuit of public services in post-tsunami india. *World Development*, 39(7):1143–1154.
- Lee, D. S., McCrary, J., Moreira, M. J., and Porter, J. (2022). Valid t-ratio inference for iv. *American Economic Review*, 112(10):3260–3290.
- Lee, D. S., McCrary, J., Moreira, M. J., Porter, J. R., and Yap, L. (2023). What to do when you can’t use ‘1.96’ confidence intervals for iv. Technical report, National Bureau of Economic Research.
- Mango, N., Zamasiya, B., Makate, C., Nyikahadzoi, K., and Siziba, S. (2014). Factors influencing household food security among smallholder farmers in the mudzi district of zimbabwe. *Development Southern Africa*, 31(4):625–640.
- Mason, R., Ndlovu, P., Parkins, J. R., and Luckert, M. K. (2015). Determinants of food security in tanzania: gendered dimensions of household headship and control of resources. *Agriculture and human values*, 32:539–549.
- Maziya, M., Mudhara, M., and Chitja, J. (2017). What factors determine household food security among smallholder farmers? insights from msinga, kwazulu-natal, south africa. *Agrekon*, 56(1):40–52.
- Meskerem, G. (2009). The New Charities and Societies Proclamation and its Impact on the Operation of Save the Children Sweden -Ethiopia. <https://resourcecentre.savethechildren.net/document/new-charities-and-societies-proclamation-and-its-impact-operation-save-children->
- Musila, G. (2019). The Spread of Anti-NGO Measures in Africa. <https://freedomhouse.org/report/special-report/2019/spread-anti-ngo-measures-africa-freedoms-under-threat>.
- Mutisya, M., Ngware, M. W., Kabiru, C. W., and Kandala, N.-b. (2016). The effect of education on household food security in two informal urban settlements in kenya: a longitudinal analysis. *Food Security*, 8:743–756.
- OECD (2022). Aid for civil society organisations. Technical report, OECD.

- Poppe, R., Frölich, M., and Haile, G. (2019). School meals and educational outcomes in rural ethiopia. *The Journal of Development Studies*, 55(8):1741–1756.
- Rangel, M. A. (2006). Alimony rights and intrahousehold allocation of resources: evidence from brazil. *The Economic Journal*, 116(513):627–658.
- Save The Children (2022). Save The Children. <https://ethiopia.savethechildren.net/>.
- Singh, A., Park, A., and Dercon, S. (2014). School meals as a safety net: an evaluation of the midday meal scheme in india. *Economic Development and Cultural Change*, 62(2):275–306.
- Stock, J. H. and Yogo, M. (2002). Testing for weak instruments in linear iv regression.
- Thomas, D. (1990). Intra-household resource allocation: An inferential approach. *Journal of human resources*, pages 635–664.
- Tibesigwa, B. and Visser, M. (2016). Assessing gender inequality in food security among small-holder farm households in urban and rural south africa. *World development*, 88:33–49.
- Tiwari, S., Daidone, S., Ruvalcaba, M. A., Prifti, E., Handa, S., Davis, B., Niang, O., Pellerano, L., Van Ufford, P. Q., and Seidenfeld, D. (2016). Impact of cash transfer programs on food security and nutrition in sub-saharan africa: A cross-country analysis. *Global Food Security*, 11:72–83.
- Trinh, T.-A. (2020). Mental health impacts of child labour: evidence from vietnam and india. *The Journal of Development Studies*, 56(12):2251–2265.
- UNESCO (2024). Ethiopia: Education Country Brief. <https://www.iicba.unesco.org/en/node/98>.
- UNICEF (2017). National Situation Analysis of Children and Women in Ethiopia. Technical report.
- UNICEF (2024). UNICEF Ethiopia. <https://www.unicef.org/ethiopia/every-child-nutrition#:~:text=Undernutrition%20accounts%20for%2045%20percent,age%20five%20are%20associated%20with>.
- UNICEF, CSA Ethiopia and C4ED (2020). Child Labour Analysis in Ethiopia 2020. Technical report.

- United Nations (1945). U.N. Charter art. 71. <https://www.un.org/en/about-us/un-charter>.
- USAID (2012). 2010 NGO SUSTAINABILITY INDEX FOR SUB-SAHARAN AFRICA. <https://2012-2017.usaid.gov/africa-civil-society/2010>.
- Usmani, F., Jeuland, M., and Pattanayak, S. K. (2022). Ngos and the effectiveness of interventions. *Review of Economics and Statistics*, pages 1–45.
- Uvin, P. (2007). From the right to development to the rights-based approach: how ‘human rights’ entered development. *Development in practice*, 17(4-5):597–606.
- Wichern, J., van Wijk, M. T., Descheemaeker, K., Frelat, R., van Asten, P. J., and Giller, K. E. (2017). Food availability and livelihood strategies among rural households across uganda. *Food security*, 9(6):1385–1403.
- World Bank (2020). Human Capital Index. <https://thedocs.worldbank.org/en/doc/64e578cbeaa522631f08f0cafba8960e-0140062023/related/HCI-AM23-ETH.pdf>.
- World Bank (2024a). Fertility rate, total (births per woman). <https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?locations=ET>.
- World Bank (2024b). Population ages 0-14 (<https://data.worldbank.org/indicator/SP.POP.0014.T0.ZS?locations=ET>).
- Zereyesus, Y. A., Embaye, W. T., Tsiboe, F., and Amanor-Boadu, V. (2017). Implications of non-farm work to vulnerability to food poverty-recent evidence from northern ghana. *World Development*, 91:113–124.

2.8 Appendix

A. Robustness Test for Weak Instrument

Tables A.1 and A.2 illustrate IV results for the main analysis, introducing the confidence intervals constructed using Lee et al. (2023) VtF methodology. This methodology uses the empirical correlation between the residuals in the main equation and the first stage for hypothesis testing, specifically for confidence interval construction.

Table A.1: IV - Food Security

		Food Insecurity		Number Meals	
		IV(I)	IV(II)	IV(I)	IV(II)
NGO Support	IV	-0.049	-0.020	0.364	0.471*
	VtF 95% CI	[-0.33; 0.23]	[-0.29; 0.25]	[-0.16; 0.89]	[-0.04; 0.99]
	VtF 99% CI	[-0.46; 0.31]	[-0.40; 0.33]	[-0.40; 1.04]	[-0.22; 1.15]
Controls		✓	✓	✓	✓
Kleibergen-Paap F		34.49	40.63	34.49	40.63
Observations		2,725	2,725	2,725	2,725
Sample Mean		0.75	0.75	3.84	3.84

*p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the community/village level. IV estimate of receiving NGO support on outcome variables; VtF 95% and 99% confidence intervals produced following Lee et al. (2023).

Table A.2: IV - Children's Time Use

		Housework		WorkAll		Education	
		IV(I)	IV(II)	IV(I)	IV(II)	IV(I)	IV(II)
NGO Support	IV	-0.800**	-0.758*	1.762**	1.739*	0.223	0.213
	VtF 95% CI	[-1.54; -0.06]	[-1.58; 0.06]	[0.12; 3.40]	[0.07; 3.41]	[-1.22; 1.66]	[-1.28; 1.72]
	VtF 99% CI	[-1.89; 0.16]	[-1.91; 0.29]	[-0.60; 3.88]	[-0.49; 3.96]	[-1.63; 2.39]	[-1.72; 2.29]
Controls		✓	✓	✓	✓	✓	✓
Kleibergen-Paap F		34.49	40.63	34.49	40.63	34.49	40.63
Observations		2,725	2,725	2,725	2,725	2,725	2,725
Sample Mean		2.75	2.75	1.60	1.60	6.41	6.41

*p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the community/village level. IV estimate of receiving NGO support on outcome variables; VtF 95% and 99% confidence intervals produced following Lee et al. (2023).

Tables A.3 and A.4 replicate the extensive and intensive margin analysis for time-use outcome variables by specifying VtF confidence intervals. The significance of the results for receiving NGO support is confirmed and even improved in the case of the Housework variable in the intensive analysis.

Table A.3: IV - Extensive Margin Children's Time Use

		Housework (dummy)		WorkAll (dummy)		Education (dummy)	
		IV(I)	IV(II)	IV(I)	IV(II)	IV(I)	IV(II)
NGO Support	IV	-0.063	-0.008	0.268	0.275	0.040	0.080
	VtF 95% CI	[-0.26; 0.13]	[-0.22; 0.21]	[-0.13; 0.67]	[-0.13; 0.68]	[-0.19; 0.27]	[-0.14; 0.31]
	VtF 99% CI	[-0.31; 0.23]	[-0.28; 0.32]	[-0.32; 0.78]	[-0.28; 0.79]	[-0.25; 0.40]	[-0.21; 0.42]
Controls		✓	✓	✓	✓	✓	✓
Kleibergen-Paap F		34.49	40.63	34.49	40.63	34.49	40.63
Observations		2,725	2,725	2,725	2,725	2,725	2,725
Sample Mean		0.87	0.87	0.44	0.44	0.86	0.86

*p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the community/village level. IV estimate of receiving NGO support on outcome variables; VtF 95% and 99% confidence intervals produced following Lee et al. (2023).

Table A.4: IV - Intensive Margin Children's Time Use

		Housework		WorkAll		Education	
		IV(I)	IV(II)	IV(I)	IV(II)	IV(I)	IV(II)
NGO Support	IV	-0.838*	-0.942**	1.675**	1.626**	-0.372	-0.809
	VtF 95% CI	[-1.69; -0.03]	[-1.78; -0.12]	[0.43; 2.92]	[0.33; 2.93]	[-1.84; 0.96]	[-2.46; 0.66]
	VtF 99% CI	[-2.18; 0.19]	[-2.25; 0.11]	[0.09; 3.60]	[-0.03; 3.62]	[-2.77; 1.31]	[-3.51; 1.04]
Controls		✓	✓	✓	✓	✓	✓
Kleibergen-Paap F		33.14	41.23	37.99	39.96	21.87	24.78
Observations		2,375	2,375	1,191	1,191	2,337	2,337
Sample Mean		3.15	3.15	3.67	3.67	7.48	7.48

*p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the community/village level. IV estimate of receiving NGO support on outcome variables; VtF 95% and 99% confidence intervals produced following Lee et al. (2023).

Tables A.5 and A.6 summarise all the results obtained in the heterogeneous analysis. VtF methodology guarantees the construction of unbiased confidence intervals in the case of weak instruments (e.g. in the case of an F test that is below 10), thus making it possible to produce valid inference analysis even if the F statistic is as low as $3.84 = 1.96^2$.

Table A.5: IV - Heterogeneous Analysis

NGO Support		Location		Wealth		
		Rural	Urban	1 st Tercile	2 nd Tercile	3 rd Tercile
Food Insecurity	IV	-0.217	-0.090	-0.116	-0.609**	0.221
	VtF 95% CI	[-0.55; 0.09]	[-0.47; 0.43]	[-0.31; 0.09]	[-1.13; -0.19]	[-0.25; 2.74]
	VtF 99% CI	[-0.75; 0.18]	[-∞; ∞]	[-0.36; 0.20]	[-1.53; -0.06]	[-∞; ∞]
Number of Meals	IV	0.657**	-0.199	0.706***	0.468	-0.209
	VtF 95% CI	[0.06; 1.25]	[-1.31; 0.44]	[0.25; 1.17]	[-0.56; 1.41]	[-2.85; 0.54]
	VtF 99% CI	[-0.15; 1.47]	[-∞; ∞]	[0.12; 1.43]	[-1.24; 1.95]	[-∞; ∞]
Housework	IV	-1.127*	0.046	-1.337***	-0.864	0.476
	VtF 95% CI	[-2.52; 0.05]	[-1.23; 2.34]	[-2.15; -0.56]	[-3.35; 1.31]	[-0.98; 8.49]
	VtF 99% CI	[-3.23; 0.40]	[-∞; ∞]	[-2.62; -0.35]	[-5.12; 2.28]	[-∞; ∞]
WorkAll	IV	2.874*	-1.011	2.596**	3.007	-1.078
	VtF 95% CI	[0.08; 5.70]	[-3.49; 0.02]	[0.63; 4.64]	[-0.65; 6.28]	[-8.76; 0.78]
	VtF 99% CI	[-0.84; 6.78]	[-∞; ∞]	[0.11; 5.81]	[-3.11; 8.08]	[-∞; ∞]
Education	IV	0.008	1.176	-0.474	-0.568	1.894
	VtF 95% CI	[-2.08; 2.16]	[-1.14; 3.16]	[2.47; 1.52]	[-3.83; 2.26]	[-0.08; 8.51]
	VtF 99% CI	[-2.63; 3.36]	[-∞; ∞]	[-3.13; 2.45]	[-6.20; 3.41]	[-∞; ∞]
Kleibergen-Paap F		32.80	5.91	27.63	13.61	4.14
Observations		1,770	955	912	904	906

*p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the community/village level. IV estimate of receiving NGO support on outcome variables; VtF 95% and 99% confidence intervals produced following Lee et al. (2023).

Table A.6: IV - Heterogeneous Analysis

NGO Support		Occupation HH			Gender HH	
		Agriculture	Non-Primary	Non-Paid	Male	Female
Food Insecurity	IV	-0.314*	0.340	-0.161	-0.092	-0.049
	VtF 95% CI	[-0.69; 0.01]	[-0.15; 1.21]	[-0.81; 0.28]	[-0.40; 0.20]	[-0.38; 0.28]
	VtF 99% CI	[-0.95; 0.13]	[-0.25; 2.44]	[-2.02; 0.61]	[-0.60; 0.28]	[-0.69; 0.41]
Number of Meals	IV	0.563**	0.152	0.493	0.516*	-0.091
	VtF 95% CI	[0.06; 1.07]	[-0.79; 0.85]	[-0.76; 2.21]	[-0.03; 1.06]	[-0.86; 0.69]
	VtF 99% CI	[-0.12; 1.29]	[-1.77; 1.27]	[-1.79; 5.18]	[-0.33; 1.23]	[-1.44; 1.27]
Housework	IV	-1.812**	0.627	-2.848**	-0.900	-0.610
	VtF 95% CI	[-3.48; -0.12]	[-0.81; 2.96]	[-7.33; -0.68]	[-2.05; 0.24]	[-2.15; 0.74]
	VtF 99% CI	[-5.10; 0.51]	[-1.11; 6.02]	[-20.32; -0.28]	[-2.73; 0.60]	[-3.48; 1.41]
WorkAll	IV	3.341***	0.422	-2.055	3.348***	-1.455**
	VtF 95% CI	[0.97; 6.14]	[-2.40; 3.16]	[-6.36; 0.41]	[1.50; 5.19]	[-2.99; -0.33]
	VtF 99% CI	[0.20; 7.99]	[-4.73; 5.29]	[-16.15; 1.70]	[0.79; 6.23]	[-4.52; -0.03]
Education	IV	-0.096	0.935	3.738	-1.588**	3.796**
	VtF 95% CI	[-1.57; 1.42]	[-1.50; 4.39]	[-1.26; 10.73]	[-3.04; -0.13]	[0.88; 7.74]
	VtF 99% CI	[-1.98; 2.27]	[-2.62; 8.20]	[-5.26; 23.05]	[-3.80; 0.36]	[0.65; 11.68]
Kleibergen-Paap F		27.29	9.47	6.71	26.80	13.29
Observations		1,273	1,080	345	2,159	566

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at the community/village level. IV estimate of receiving NGO support on outcome variables; VtF 95% and 99% confidence intervals produced following Lee et al. (2023).

B. Main Results

Table B.1: OLS - Food Security

	Food Insecurity		Number Meals	
	OLS(I)	OLS(II)	OLS(I)	OLS(II)
NGO Support	0.009 (0.023)	0.009 (0.023)	0.073** (0.030)	0.075** (0.030)
Distance from T	-0.001 (0.001)		-0.002 (0.001)	
Distance up to T		-0.001 (0.001)		-0.002 (0.002)
Rural	0.050 (0.050)	0.052 (0.050)	-0.012 (0.100)	-0.009 (0.099)
Sex Child	0.001 (0.020)	0.001 (0.020)	0.017 (0.024)	0.016 (0.024)
Age Child (months)	-0.0001 (0.0003)	-0.0001 (0.0002)	-0.003*** (0.0004)	-0.003* * * (0.0004)
Natural Event	0.102*** (0.037)	0.102*** (0.037)	-0.027 (0.066)	-0.026 (0.065)
Female Household Head	0.133*** (0.026)	0.0134*** (0.026)	-0.053 (0.033)	-0.052 (0.033)
Age Household Head	0.001 (0.001)	0.001 (0.001)	0.001 (0.002)	0.001 (0.002)
Education Household Head less than primary	0.059** (0.024)	0.059** (0.024)	-0.124*** (0.030)	-0.124*** (0.030)
Education Household Head higher than primary	0.002 (0.027)	0.002 (0.027)	0.018 (0.032)	0.017 (0.032)
Household Size	-0.001 (0.005)	-0.001 (0.005)	-0.001 (0.009)	-0.001 (0.009)
Share Females in Household	-0.074** (0.035)	-0.074** (0.035)	0.043 (0.072)	0.043 (0.072)
Muslim	0.048** (0.020)	0.048** (0.020)	-0.198*** (0.035)	-0.197*** (0.035)
Orthodox	0.110*** (0.026)	0.111*** (0.026)	-0.066 (0.055)	-0.065 (0.054)
Amhara (ethnicity)	-0.172** (0.065)	-0.170*** (0.065)	0.057 (0.053)	0.056 (0.053)
Gurage	0.013 (0.042)	0.014 (0.042)	-0.092 (0.059)	-0.092 (0.059)
Oromo	0.024 (0.049)	0.026 (0.049)	-0.063 (0.063)	-0.061 (0.063)
Tigrian	-0.189* (0.103)	-0.190* (0.103)	0.224*** (0.083)	0.236*** (0.084)
Wolavta	0.103** (0.049)	0.105** (0.051)	0.052 (0.093)	0.048 (0.098)
SNNP (region)	-0.036 (0.070)	-0.036 (0.070)	-0.056 (0.100)	-0.057 (0.100)
Oromia	-0.132 (0.096)	-0.132 (0.100)	0.120 (0.109)	0.116 (0.109)
Tigray	-0.172 (0.131)	-0.170 (0.131)	0.054 (0.174)	0.060 (0.173)
Constant	0.704*** (0.132)	0.698*** (0.134)	4.196*** (0.147)	4.161*** (0.154)
Observations	2,725	2,725	2,725	2,725
R-squared	0.088	0.088	0.087	0.086
F	25.88	26.52	31.15	31.35
Sample Mean	0.75	0.75	3.84	3.84

* p<0.1; ** p<0.05; *** p<0.01

Standard errors are clustered at the community/village level. Distance from T is the difference in days between the threshold and the interview date (dint - T); Distance up to T is the difference in days between the threshold and the interview date if interviewed before T and 0 otherwise.

Table B.2: OLS - Children's Time Use

	Housework		WorkAll		Education	
	OLS(I)	OLS(II)	OLS(I)	OLS(II)	OLS(I)	OLS(II)
NGO Support	-0.027 (0.074)	-0.026 (0.075)	0.247* (0.148)	0.256* (0.148)	0.097 (0.118)	0.090 (0.116)
Distance from T	-0.001 (0.002)		-0.004 (0.003)		0.002 (0.004)	
Distance up to T		-0.001 (0.002)		-0.005 (0.004)		0.003 (0.005)
Rural	0.589*** (0.123)	0.591*** (0.125)	1.449*** (0.192)	1.459*** (0.184)	-1.472*** (0.201)	-1.478*** (0.202)
Sex Child	1.521*** (0.130)	1.521*** (0.131)	-1.510*** (0.223)	-1.512*** (0.223)	0.139 (0.144)	0.140 (0.145)
Age Child (months)	0.011* * * (0.002)	0.011*** (0.002)	0.003* (0.001)	0.003* (0.001)	0.019*** (0.004)	0.019*** (0.004)
Natural Event	0.056 (0.111)	0.055 (0.111)	0.487** (0.190)	0.484** (0.188)	-0.517** (0.212)	-0.514** (0.211)
Female Household Head	-0.136 (0.125)	-0.136 (0.125)	-0.363** (0.145)	-0.360** (0.144)	-0.159 (0.142)	-0.161 (0.141)
Age Household Head	-0.013*** (0.003)	-0.013*** (0.003)	0.003 (0.003)	0.003 (0.003)	-0.003 (0.006)	-0.003 (0.006)
Education Household Head less than primary	0.212* (0.124)	0.211* (0.124)	0.180 (0.109)	0.178 (0.109)	-0.557*** (0.176)	-0.556*** (0.176)
Education Household Head higher than primary	-0.122 (0.091)	-0.123 (0.091)	0.171** (0.081)	0.168** (0.081)	0.015 (0.139)	0.017 (0.139)
Household Size	0.006 (0.018)	0.005 (0.018)	0.041 (0.025)	0.041 (0.025)	-0.071*** (0.027)	-0.070** (0.027)
Share Females in Household	-0.441*** (0.150)	-0.441*** (0.149)	0.336 (0.210)	0.334 (0.210)	0.295 (0.230)	0.297 (0.230)
Muslim	0.505*** (0.118)	0.505*** (0.118)	0.391*** (0.078)	0.391*** (0.078)	-0.395 (0.396)	-0.396 (0.396)
Orthodox	0.290*** (0.076)	0.291*** (0.077)	0.155 (0.095)	0.157 (0.095)	-0.025 (0.314)	-0.027 (0.313)
Amhara (ethnicity)	-0.230* (0.130)	-0.226* (0.131)	0.209 (0.138)	0.225 (0.142)	0.092 (0.287)	0.078 (0.289)
Gurage	-0.405*** (0.143)	-0.404*** (0.143)	0.372*** (0.117)	0.375*** (0.115)	-0.403 (0.453)	-0.406 (0.451)
Oromo	-0.044 (0.158)	-0.042 (0.159)	0.198* (0.119)	0.209* (0.116)	-0.172 (0.257)	-0.180 (0.256)
Tigrian	-0.417*** (0.153)	-0.414*** (0.154)	0.076 (0.212)	0.082 (0.211)	0.247 (0.325)	0.239 (0.325)
Wolavta	0.299 (0.195)	0.307 (0.198)	0.216 (0.162)	0.247 (0.172)	-0.084 (0.397)	-0.111 (0.404)
SNNP (region)	0.507*** (0.174)	0.508*** (0.175)	-0.687** (0.338)	-0.686** (0.338)	0.524 (0.361)	0.523 (0.362)
Oromia	-0.143 (0.161)	-0.142 (0.162)	-0.054 (0.369)	-0.053 (0.368)	-0.179 (0.310)	-0.182 (0.312)
Tigray	-0.403* (0.219)	-0.403* (0.220)	0.379 (0.376)	0.385 (0.378)	1.285*** (0.483)	1.282*** (0.485)
Constant	1.037*** (0.318)	1.026*** (0.329)	-0.119 (0.482)	-0.171 (0.506)	5.258*** (0.567)	5.297*** (0.576)
Observations	2,725	2,725	2,725	2,725	2,725	2,725
R-squared	0.323	0.323	0.312	0.312	0.304	0.304
F	236.56	232.88	212.92	218.48	110.51	120.79
Sample Mean	2.75	2.75	1.60	1.60	6.41	6.41

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at the community/village level. Distance from T is the difference in days between the threshold and the interview date (dint - T); Distance up to T is the difference in days between the threshold and the interview date if interviewed before T and 0 otherwise.

Table B.3: IV - First Stage

	NGO Support	NGO Support
After T	−0.219*** (0.037)	−0.192*** (0.030)
Distance from T	0.004*** (0.001)	
Distance up to T		0.004*** (0.001)
Rural	−0.055 (0.050)	−0.062 (0.051)
Sex Child	−0.001 (0.023)	0.001 (0.023)
Age Child (months)	0.0005* (0.0002)	0.0005* (0.0003)
Natural Event	0.105** (0.042)	0.107** (0.042)
Female Household Head	0.014 (0.027)	0.012 (0.026)
Age Household Head	−0.0003 (0.001)	−0.0003 (0.001)
Education Household Head less than primary	−0.031 (0.022)	−0.023 (0.022)
Education Household Head	−0.026 (0.022)	−0.023 (0.022)
Household Size	0.010** (0.004)	0.011** (0.004)
Share Females in Household	−0.065* (0.037)	−0.063* (0.037)
Muslim	0.012 (0.032)	0.011 (0.032)
Orthodox	0.030 (0.034)	0.026 (0.034)
Amhara (ethnicity)	−0.023 (0.046)	−0.032 (0.047)
Gurage	−0.129** (0.061)	−0.130** (0.059)
Oromo	0.004 (0.056)	−0.004 (0.053)
Tigrrian	0.027 (0.056)	0.027 (0.055)
Wolavta	−0.128*** (0.047)	−0.146*** (0.050)
SNNP (region)	0.003 (0.068)	0.008 (0.065)
Amhara	−0.041 (0.085)	−0.034 (0.085)
Oromia	−0.038 (0.067)	−0.029 (0.063)
Constant	0.367*** (0.113)	0.391*** (0.116)
Observations	2,725	2,725
R-squared	0.057	0.062

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at the community/village level. Distance from T is the difference in days between the threshold and the interview date (dint - T); Distance up to T is the difference in days between the threshold and the interview date if interviewed before T and 0 otherwise.

Table B.4: IV - Food Security

	Food Insecurity		Number Meals	
	IV(I)	IV(II)	IV(I)	IV(II)
NGO Support	-0.049 (0.149)	-0.018 (0.145)	0.364 (0.280)	0.471* (0.275)
Distance from T	-0.000 (0.001)		-0.003** (0.001)	
Distance up to T		-0.001 (0.001)		-0.002 (0.002)
Rural	0.048 (0.051)	0.050 (0.050)	0.001 (0.090)	0.010 (0.085)
Sex Child	0.001 (0.021)	0.001 (0.020)	0.016 (0.025)	0.015 (0.026)
Age Child (months)	-0.0001 (0.0003)	-0.0001 (0.0003)	-0.003*** (0.0004)	-0.003* * * (0.0004)
Natural Event	0.108*** (0.038)	0.105*** (0.038)	-0.059 (0.034)	-0.071 (0.078)
Female Household Head	0.134*** (0.027)	0.0134*** (0.027)	-0.059* (0.034)	-0.060* (0.035)
Age Household Head	0.001 (0.001)	0.001 (0.001)	0.001 (0.002)	0.001 (0.002)
Education Household Head less than primary	0.057** (0.025)	0.058** (0.024)	-0.114*** (0.028)	-0.112*** (0.028)
Education Household Head higher than primary	0.001 (0.026)	0.001 (0.026)	0.027 (0.029)	0.028 (0.029)
Household Size	0.000 (0.006)	-0.000 (0.006)	-0.004 (0.009)	-0.005 (0.009)
Share Females in Household	-0.077** (0.038)	-0.075** (0.038)	0.062 (0.076)	0.067 (0.078)
Muslim	0.049*** (0.019)	0.049** (0.019)	-0.201*** (0.041)	-0.202*** (0.042)
Orthodox	0.112*** (0.027)	0.111*** (0.026)	-0.072 (0.056)	-0.073 (0.055)
Amhara (ethnicity)	-0.171*** (0.064)	-0.170*** (0.064)	0.058 (0.056)	0.062 (0.057)
Gurage	0.006 (0.050)	0.010 (0.048)	-0.056 (0.065)	-0.042 (0.066)
Oromo	0.025 (0.046)	0.026 (0.047)	-0.069 (0.073)	-0.066 (0.077)
Tigrian	-0.187* (0.102)	-0.189* (0.102)	0.235*** (0.086)	0.229*** (0.085)
Wolavta	0.098* (0.051)	0.102* (0.054)	0.079 (0.087)	0.098 (0.092)
SNNP (region)	0.135 (0.118)	0.134 (0.118)	-0.107 (0.130)	-0.111 (0.130)
Amhara	0.169 (0.131)	0.169 (0.131)	-0.041 (0.155)	-0.041 (0.153)
Oromia	0.037 (0.119)	0.036 (0.119)	0.079 (0.150)	0.075 (0.149)
Constant	0.548*** (0.159)	0.537*** (0.163)	4.145*** (0.201)	4.099*** (0.211)
Kleibergen-Paap F	34.492	40.632	34.492	40.632
Observations	2,725	2,725	2,725	2,725
R-squared	0.085	0.087	0.052	0.022
F	25.81	23.93	28.89	29.81
Sample Mean	0.75	0.75	3.84	3.84

* p<0.1; ** p<0.05; *** p<0.01

Standard errors are clustered at the community/village level. Distance from T is the difference in days between the threshold and the interview date (dint - T); Distance up to T is the difference in days between the threshold and the interview date if interviewed before T and 0 otherwise.

Table B.5: IV - Children's Time Use

	Housework		WorkAll		Education	
	IV(I)	IV(II)	IV(I)	IV(II)	IV(I)	IV(II)
NGO Support	-0.800** (0.399)	-0.758* (0.434)	1.761** (0.877)	1.739* (0.891)	0.223 (0.776)	0.213 (0.794)
Distance from T	0.001 (0.002)		-0.006 (0.003)		0.002 (0.003)	
Distance up to T		0.001 (0.002)		-0.009 (0.003)		0.003 (0.004)
Rural	0.555*** (0.117)	0.555*** (0.118)	1.516*** (0.167)	1.532*** (0.159)	-1.466*** (0.201)	-1.472*** (0.204)
Sex Child	1.522*** (0.127)	1.523*** (0.128)	-1.513*** (0.212)	-1.516*** (0.211)	0.139 (0.143)	0.140 (0.144)
Age Child (months)	0.011*** (0.002)	0.011*** (0.002)	0.002* (0.002)	0.002 (0.002)	0.019*** (0.004)	0.019*** (0.004)
Natural Event	0.141 (0.120)	0.138 (0.121)	0.320 (0.220)	0.317 (0.220)	-0.531** (0.223)	-0.528** (0.227)
Female Household Head	-0.120 (0.126)	-0.122 (0.125)	-0.395*** (0.152)	-0.387** (0.151)	-0.161 (0.138)	-0.163 (0.136)
Age Household Head	-0.013*** (0.003)	-0.013*** (0.003)	0.004 (0.003)	0.004 (0.003)	-0.002 (0.006)	-0.002 (0.006)
Education Household Head less than primary	0.186 (0.121)	0.188 (0.120)	0.231** (0.113)	0.225** (0.111)	-0.553** (0.170)	-0.552*** (0.168)
Education Household Head higher than primary	-0.146 (0.095)	-0.144 (0.095)	0.217*** (0.083)	0.210** (0.084)	0.019 (0.140)	0.020 (0.139)
Household Size	0.014 (0.020)	0.014 (0.020)	0.024 (0.026)	0.023 (0.027)	-0.072*** (0.028)	-0.072** (0.028)
Share Females in Household	-0.490*** (0.156)	-0.486*** (0.154)	0.433* (0.238)	0.426* (0.238)	0.303 (0.237)	0.305 (0.240)
Muslim	0.515*** (0.119)	0.514*** (0.119)	0.371*** (0.078)	0.372*** (0.094)	-0.397 (0.393)	-0.397 (0.392)
Orthodox	0.306*** (0.079)	0.305*** (0.079)	0.155 (0.095)	0.129 (0.103)	-0.028 (0.313)	-0.029 (0.312)
Amhara (ethnicity)	-0.229* (0.129)	-0.237* (0.130)	0.209 (0.146)	0.247* (0.149)	0.092 (0.283)	0.080 (0.284)
Gurage	-0.500*** (0.165)	-0.496*** (0.165)	0.560*** (0.186)	0.562*** (0.176)	-0.388 (0.455)	-0.390 (0.455)
Oromo	-0.029 (0.137)	-0.034 (0.140)	0.169 (0.178)	0.193 (0.166)	-0.174 (0.254)	-0.181 (0.253)
Tigrian	-0.392** (0.168)	-0.400*** (0.168)	0.027 (0.249)	0.053 (0.238)	0.243 (0.329)	0.237 (0.325)
Wolavta	0.226 (0.184)	0.215 (0.191)	0.360 (0.132)	0.434 (0.149)	-0.072 (0.391)	-0.096 (0.396)
SNNP (region)	0.901*** (0.185)	0.901*** (0.186)	-1.047*** (0.309)	-1.051*** (0.233)	-0.759 (0.499)	-0.756 (0.498)
Amhara	0.367* (0.219)	0.369* (0.217)	-0.308 (0.317)	-0.316 (0.313)	-1.279*** (0.481)	-1.277*** (0.482)
Oromia	0.227 (0.192)	0.226 (0.192)	-0.368 (0.253)	-0.367 (0.238)	-1.458*** (0.428)	-1.458*** (0.426)
Constant	0.842** (0.355)	0.849** (0.369)	-0.148 (0.332)	-0.242 (0.322)	6.509*** (0.659)	6.542*** (0.663)
Kleibergen-Paap F	34.492	40.632	34.492	40.632	34.492	40.632
Observations	2,725	2,725	2,725	2,725	2,725	2,725
R-squared	0.293	0.296	0.226	0.230	0.304	0.304
F	214.76	221.47	138.56	165.60	118.75	121.08
Sample Mean	2.75	2.75	1.60	1.60	6.41	6.41

*p<0.1; **p<0.05; ***p<0.01

Standard errors are clustered at the community/village level. Distance from T is the difference in days between the threshold and the interview date (dint - T); Distance up to T is the difference in days between the threshold and the interview date if interviewed before T and 0 otherwise.

C. Robustness Analysis

We might be concerned that NGOs change their targeting strategy to respond to the policy, thus supporting families with different characteristics before and after the threshold. I partly try to tackle this issue by controlling for a large set of characteristics both at the household and YL individual level; still, I can not rule out the existence of unobserved factors that might differ between supported households before and after the 1st of January 2010. As a robustness test, Table C.1 lists all the variables used as covariates in the econometric models and provides evidence of the results for a test on the differences in variables' means between individuals receiving NGO support before and after the threshold.

Table C.1: Group differences in the Covariates

	1 st January				1 st January		
	Before	After	Difference		Before	After	Difference
Rural	0.664 (0.018)	0.423 (0.047)	0.240*** (0.049)	HH Size	6.494 (0.076)	5.856 (0.190)	0.638*** (0.206)
Addis Ababa	0.150 (0.013)	0.216 (0.039)	-0.067* (0.037)	Share Female	0.523 (0.007)	0.518 (0.023)	0.005 (0.020)
SNNP	0.208 (0.015)	0.207 (0.039)	0.001 (0.041)	Rel. Muslim	0.135 (0.013)	0.126 (0.032)	0.009 (0.035)
Amhara	0.194 (0.015)	0.099 (0.028)	0.095** (0.039)	Rel. Orthodox	0.741 (0.017)	0.775 (0.040)	-0.034 (0.045)
Oromia	0.195 (0.015)	0.207 (0.039)	-0.012 (0.041)	Eth. Amhara	0.281 (0.017)	0.243 (0.041)	0.037 (0.046)
Tigray	0.254 (0.016)	0.270 (0.042)	-0.017 (0.045)	Eth. Gurage	0.036 (0.007)	0.063 (0.023)	-0.027 (0.020)
Natural Event	0.537 (0.019)	0.261 (0.042)	0.276*** (0.050)	Eth. Oromo	0.209 (0.015)	0.207 (0.039)	0.002 (0.042)
Head Female	0.208 (0.015)	0.252 (0.041)	-0.044 (0.042)	Eth. Tigrian	0.274 (0.017)	0.324 (0.045)	-0.051 (0.046)
Head Age	46.031 (0.419)	45.477 (1.020)	0.554 (1.128)	Eth. Wolavta	0.041 (0.008)	0.090 (0.027)	-0.049*** (0.022)
Head No-Edu	0.339 (0.018)	0.261 (0.042)	0.078 (0.048)	YL Female	0.483 (0.019)	0.432 (0.047)	0.050 (0.051)
Head Higher-Primary	0.259 (0.017)	0.279 (0.043)	-0.020 (0.045)	YL Age (months)	127.473 (1.511)	126.313 (3.730)	1.158 (4.080)
N. Obs	702	111			702	111	

*p<0.1; ** p<0.05; ***p<0.01

List of covariates, group differences between households receiving NGO support interviewed before and after the 1st of January 2010. Own elaboration.

Group differences are mainly related to location characteristics, which I controlled for in the specification and would not represent a main concern for the analysis. Specifically, fewer families living in rural areas have been receiving NGO support after the 1st of January 2010, and the same is true for those households that reported being hit by a natural event in the last 4 years. If NGOs had to change their targeting strategy after the 1st of January 2010, and if we do believe in the samaritan view

for which NGOs' primary objective is to provide support to the poorest groups of the population, these results are not in line with expectations. Households living in rural areas or having suffered from natural events are, in fact, usually considered to be among the most economically disadvantaged groups. It is also possible to observe two more variables which exhibit a statistically significant difference before and after the threshold: household size and the Young Lives child belonging to the Wolavta ethnicity. I do not observe statistically significant differences for all the other variables considered in the model. Although it is not possible to provide evidence regarding unobservable characteristics, for the majority of the variables considered -used as controls in all the specifications- I do not observe differences for observations interviewed before and after the threshold.

On the Role of NGOs in Contrasting Elite Capture in Developing Countries: A Multidisciplinary Literature Review

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Abstract

This literature review uses a multidisciplinary approach bridging quantitative and non-quantitative contributions in economics and social sciences in order to investigate the origins and the impact of elite capture in developing countries. We specifically assess how elite capture can alter the allocation of resources made available by Governmental and Non-Governmental Organisations (NGOs) programs and how this is mediated by culture and social norms. Our results describe how elite capture is also present when NGOs provide support and highlight new potential mechanisms that may favour it.

Keywords: NGO, Elite Capture, Political Connections, Literature Review

JEL Classification: L31, D02, D63, D73

3.1 Introduction

Elite dominance and elite capture are commonly used concepts in the economic and non-economic literature to define a societal behaviour present at the community level in which elites or groups of individuals with a societal status, either because of their wealth, education, or political power, are systematically able to control everyday life of villagers and capture and divert economic resources intended to support marginalised people.

A substantial body of economic and non-economic literature, using quantitative and qualitative methods, has discussed the implications of elite capture in developing countries. By gathering evidence mainly from the field of economics but also from the broader field of social sciences, this literature review aims to bring together different perspectives, providing an economic interpretation of elite capture in developing countries. The motivation for using a multidisciplinary approach is twofold. Firstly, because elite dominance and capture might manifest in different circumstances, it is difficult to provide a unique definition, and it is important to enrich the analysis of the causes and implications of this phenomenon considering aspects which are differently studied in different disciplines. Secondly, this literature review aims to compare elite behaviour by considering the varying identity of the resource provider, particularly in the case of Non-Governmental Organisations (NGOs), investigating whether these organisations can play a role in limiting elite capture. When discussing the role of NGOs in society, it is worth noting that this literature has been observed to be mainly qualitative and not necessarily economic (Brass et al., 2018). Given the context of analysis, a natural consequence for this review is to consider studies from different disciplines attempting to contextualise the strategies adopted and the results obtained using an economic perspective.

This literature review aims, starting by acknowledging the relevant role that elite capture has in the development sector, to collect evidence to understand the channels and mechanisms behind this phenomenon, investigating potential parallels and differences in elite behaviour depending on the identity of the support provider, namely governments and non-governmental organisations. As development economists interested in evaluating the economic and social impact of development policies on household and individual outcomes, it appears crucial to analyse whether providing support through non-governmental actors might represent a valid alternative to limit this phenomenon, thus improving the efficacy of development programs within communities. NGOs' presence in developing countries introduces a new layer of complexity in the social and economic equilibrium of the communities. On the one hand, these organisations can eventually be unrelated to the culture and norms of places in which they operate, thus not being *a priori* bounded by the local power

and social structure. On the other hand, they need to engage with the local, district, and state officials and institutions to operate legally while also gaining the trust and legitimacy of both villagers and elite groups. The results could then be helpful for policymakers, international agencies, and governments in understanding the complications related to local development and identifying the best alternative in the delivery system in order to minimize the impact of elite capture.²⁹

Overall, elite capture has been mainly -but not only- studied in cases of decentralised programs or programs aiming to empower communities (Mansuri and Rao, 2012; Mansuri and Rao, 2004). This phenomenon has been usually described as ineluctable when the last-mile delivery of a governmental or non-governmental program is delegated to community officials or committees of villagers with the power to define the final list of beneficiaries or the distribution process of the support (Ribot, 2004; Platteau and Gaspard, 2003; Platteau and Abraham, 2002). Elite dominance within communities is a direct consequence of the evolution of power relationships and inequalities between different groups of villagers, and it might not be stable over time (Lund and Saito-Jensen, 2013). Actions of non-elites, institutional changes, and the emergence of benevolent elites or external actors, such as NGOs, might subvert the dominance of locally powerful groups of individuals and limit the elite capture phenomenon (Saito-Jensen, 2010). Although most of the time, elite dominance translates into favouritism to groups and kinship, elite control of resources and processes might also increase efficiency in the implementation of programs and delivery of resources due to the superior information and skills in the hands of elites (Dasgupta and Beard, 2007; Fritzen, 2007). The superior information at the local level, unknown to central policymakers and other development actors, makes elites privileged interlocutors for the last-mile delivery of policies. However, by holding a dominant position in societies due to their political power or wealth status and deriving their legitimacy from traditional norms and cultural elements, elites have the ability and the knowledge to influence the decision-making process of policies and divert economic resources toward their network. As a consequence, elite capture has the potential to reduce the amount of resources allocated to the most fragile and, therefore, to fuel social inequalities.

This literature review includes studies conducted using different approaches. Some of these studies adopt econometric techniques to evaluate the presence and the impact of elite capture in specific programs, while others use ethnographic strate-

²⁹The research which led to the collection of studies considered in this review has been conducted by using the Google Scholar search engine. The papers were selected by using keywords such as elite, elite capture, NGOs, and developing programmes, as well as by considering studies that, although not focusing on this specific phenomenon, had elements that could be traced back to elite presence. The review focuses primarily on recent English-written papers from the year 2000 onwards published in the major economic and social science journals.

gies and case studies to provide qualitative evidence of the phenomenon, discussing potential mechanisms and relationships between agents and elites at the community levels. Quantitative approaches further divide between studies employing randomised control trials (RCT) and those adopting other econometric techniques by using secondary data. These methodologies have different strengths and weaknesses. Although the RCT methodology allows for a more robust causal interpretation of results, the experimental setup might define an "artificial" framework with respect to the real-life implementation of policies and the dynamics between different actors. Conversely, secondary data (such as surveys) complicates the causal interpretation of results, eventually suffering endogeneity issues related to individual social and economic characteristics, necessitating more robust analyses that might be precluded by the difficulties related to data access in remote areas of developing countries. Enriching the investigation by means of qualitative methodologies, although precluding causal interpretation, can thus be considered a useful tool for researchers to delve deeper into the mechanisms and dynamics which regulate elite capture in communities and indicate aspects and channels that quantitative researchers might be interested in exploring further.

The rest of the paper is organised as follows. Section 3.2 defines elite dominance and elite capture, discussing the potential causes of this phenomenon ranging from historical context to the cost for the most marginalised people in counteracting the presence of the elites. Section 3.3 discusses elite capture and its different characteristics in the case of programs promoted by Governmental organisations. Section 3.4 highlights the relevant role NGOs have acquired in the development context and analyses whether programs implemented by such organisations might or might not have been affected by elite interference. Section 3.5 provides a general overview of open issues related to elite capture in developing countries and the limitations of this study. Conclusions are found at the end of this section.

3.2 The Presence of Elite Capture in Society

Before analysing the role of elite capture in the implementation of developing programs, it is worth considering which determinants favour its emergence. Many authors have already investigated the motivations that led elites to arise, evolve, and perpetuate through time, as well as the characteristics representing fertile grounds for them to affect the economic development of communities. Specifically, elite capture appears to be more likely in cases of decentralised programs lacking effective monitoring systems and when institutions are unable, either because of a lack of human capital and resources or for historical reasons, to limit elites' dominant role in society. In this section, we aim to enlarge the analysis of elite dominance by

investigating the potential mechanisms that favour the presence of power-related inequalities at the community level in developing countries.

Historical Context

One of the most prominent motivations for the emergence of elites can be found in the historical evolution of countries and their institutions. Particularly in the case of weak institutions, the economic impact of official entities depends on the interaction between the *de jure* and *de facto* power; between formal institutions and local political or economic elites (Acemoglu and Robinson, 2008).

The evolution of elites usually goes hand in hand with the evolution of a country's institutions, and their development is determined through their interaction. Transitions from autocracy to democracy or vice versa represent occasions for elites to gain or increase their influence over communities thanks to their political or economic status. In a competitive environment, new elites can emerge from political changes, while existing elites attempt to leverage their networks to maintain monopolistic power in villages. Martinez-Bravo et al. (2017) studied the persistence of elites in Indonesia, highlighting how agents from the old regime managed to retain dominant positions in their communities during the transition from autocracy to democracy. Specifically, the authors studied the economic impact of allowing regime mayors to finish their terms before being replaced by new leaders. Using different data sources on district mayors in Indonesia and other economic outcomes, the authors estimated the impact of the varying communities' exposure to old regime agents due to not synchronised political cycles on future electoral competition and development. Potential endogeneity concerns related to mayor appointment timing were discussed by considering the orthogonality of the variable with respect to a set of predetermined district characteristics. Districts with longer exposure to old-regime agents were observed to have weaker rules of law, higher rent-seeking behaviour, and minor public goods provisions regarding health and education. Additionally, in these districts, firms exhibited a 7.6 percentage point increase in the probability of paying illegal fees to the security force per additional year of exposure. The authors described a dynamic that might be common to other developing countries. Old elites, aiming to maintain their dominant positions and having the opportunity to remain in charge during political transition periods, have incentives to form alliances with other influential groups such as the military, criminal and other non-violent organisations, exchanging security and votes, required to be re-elected, for money and favouritism.

Another important element in shaping elite dominance within villages is competition among those elites. Acemoglu et al. (2014) provide an example of the impact of elite competition on the economic development of villages in Sierra Leone. The historically dominant political position held by elites, whose role was introduced by

the British during the country’s colonisation, gave them a wide authority ranging from the power to determine taxation and the choice of projects to be implemented, to the power to decide whether a private plot of land could or could not be sold and to whom. Nonetheless, the authors noted how, through decades, competition between different types of elites (e.g. political and economic) emerged and how it helped mitigate the political power and the control that chiefs had over villagers. Collecting detailed data on chieftdom elections, field surveys and interviews with local oral historians, the authors created a complete list of ruling families in the country. This dataset, combined with DHS data and other national datasets collecting local economic information, allowed the researchers to estimate the impact of the number of ruling families on the economic development of villages. After having ruled out the possibility that the number of ruling families was determined by colonial prosperity or other geographical determinants, the authors displayed the relevant role of competition on a large set of economic outcomes at the village level. Results display how higher competition corresponded to a smaller control over the everyday life of villagers, which contributed to achieving a larger economic development of the community. Communities with a larger number of ruling families were observed to have higher literacy rates, improved health outcomes, larger non-agriculture employment rates and overall better development outcomes.

The Cost of Participation

Elites are, therefore, intrinsically linked to society, drawing their influence mainly from the historical evolution of a country, its norms and culture, and cannot be analysed in isolation. Although the economic literature mainly focuses on the impact of elite control on the distribution of resources, it is worth considering that elites, as their presence is deeply rooted in societies, are part of a broader mechanism that must be studied by considering the relationships that also exist between elites and institutions and between elites and non-elites. Prokopy et al. (2009), analysing the socio-economic impact in different regions and communities of rural drinking programs implemented in India, also investigated which determinants encouraged or precluded non-elites to participate in the local implementation of these projects and the social and economic cost they incurred in doing so. Non-elites, who are systematically less wealthy than educated and influential elites, are usually economically and socially constrained to participate in meetings and debates to define the programs’ details. From an economic point of view, although the opportunity cost is higher for wealthier families, for the non-elites attending these meetings and participating in the decision-making process requires the investment of valuable time that they could otherwise spend working for money or at home, which could be crucial to ensure their daily subsistence level. Such costs are usually higher for fe-

males who are commonly heavily involved in household sustainment activities and the care of other family members, thus increasing gender-related inequalities and their marginalisation within communities. Moreover, if elite groups hinder non-elite participation, the social and psychological costs have to be considered, depending on the social cohesion and capital of the community (e.g. culture, accepted norms or paternalism). Non-elites are likely to participate in decision-making and -eventually- contrast elites only when participation benefits more than offset costs. These benefits might be individual, such as access to resources (e.g. water), or collective, such as in the case of sharing public goods with other non-elite groups. Interpersonal relationships among elites and between elites and non-elites, together with the level of social capital within communities, are thus important elements to be considered when studying the emergence of elites and their impact on socio-economic outcomes. Fafchamps (2004) clearly stated the importance of social capital for development, particularly in countries with weak institutions, and the role of informality, trust, and reciprocity in daily life and interpersonal relationships. In similar scenarios, all these elements are fundamental to countering elites' dominance and undermining the perception of elites' legitimacy and their role in society. This legitimacy can either be derived from the necessity to identify capable leaders to organise and manage the community (elites might have a relatively higher education level) or from cultural norms rooted in the society. As Saito-Jensen (2010), Fafchamps (2004) also observed that external organisations might play an important role in contributing to increasing social cohesion and trust among non-elites, eventually reducing the costs which were precluding the possibility of collective actions by marginalised groups, which are needed to limit elite dominance within communities. Untied from the community they operate in, NGOs and similar organisations might compensate for the state's shortcomings by providing resources, values, and skills needed to enable non-elites to raise their voices and defend their interests.

3.3 Elite Capture in Governmental Programs

Elite dominance and elite capture are usually considered unavoidable in developing countries, depending on the evolution of the power equilibrium structure at the community level and having a significant impact on how economic resources are allocated and distributed among villagers, especially when institutions are weak and no effective monitoring strategies are adopted. Elite groups often hold dominant community positions due to their economic, political or traditional status. These positions can be formal, such as elected officials, or informal, such as having leadership roles in local committees. Having access to important information about the community's economic and non-economic characteristics, elite groups can

control various aspects of the population’s everyday life, including decisions such as property sales, public goods provision and support distribution. In a context where governments are increasingly designing anti-poverty programs targeting individuals and households depending on their economic characteristics, this valuable information owned by local leaders, which are most of the times not in the hands of the central government, appears crucial for improving the overall effectiveness of these policies and ensuring the correct targeting of beneficiaries. However, entrusting the targeting process to elected officials or ad-hoc committees at the local level could potentially result in favouritism and the misallocation of resources towards households and individuals with social or political connections with local leaders and elites (Haseeb and Vyborny, 2022). Governments are thus facing a trade-off when implementing anti-poverty programs. On the one hand, they can try to exploit information held by local leaders, delegating the targeting process and risking elite capture of resources. On the other hand, they can rely on less precise data available at the state level, thus potentially being unable to target eligible households correctly. The decentralisation of governmental policies has been extensively studied in the economic and non-economic literature, investigating whether this approach effectively led to improved outcomes and studying the role and impact of elite capture.

3.3 .1 Decentralised Governmental Programs

After the end of the Cold War, decentralised strategies aiming to support economic development became increasingly adopted in most developing countries and considered a solution to the inefficiencies associated with centralisation. Issues such as bureaucratic red tape, corruption among state officials, and the lack of accurate local data were among the reasons that led to the shift in the locus of the decision-making process from the central government to local districts and villages. Although elite capture is likely to occur regardless of the method that governments adopt in implementing policies, transferring the decision-making process to villages has been observed to potentially exacerbate it. Many researchers in the development field have already investigated the impact of decentralised policies in developing countries and their effectiveness in delivering resources to the poor. In their book on localising development, Mansuri and Rao (2012) reviewed the evolution of the decentralisation and participation approaches, highlighting the key elements determining community empowerment’s success or failure in policy decision-making and targeting processes. The goal of decentralisation is to reduce information asymmetries between policy-makers and citizens by placing providers and beneficiaries at the same level, thus aligning -on paper- their incentives (Casey, 2018). Unfortunately, in the presence

of heterogeneous preferences and inequalities within communities at the economic and/or political levels, local elites holding leadership positions might have the incentives to divert funds to their networks (Lund and Saito-Jensen, 2013). This issue is particularly exacerbated in remote, often rural, villages, where monitoring the behaviour of elites is more challenging and in impoverished communities with enduring economic inequalities. The decentralisation process was also intended to allow citizens, particularly the most marginalised, to participate in defining the last-mile delivery of programs, enabling them to raise their voices, thus taking an active role in society. However, the economic and social marginalisation caused by extreme poverty and low literacy rates has been observed to hinder the participation of the poorest segment of the population, leaving the decision-making process in the hands of the wealthiest and most educated groups of citizens (Mansuri and Rao, 2004). As explained by Bardhan and Mookherjee (2005), although local governments should be responsible for the welfare of the entire community, a bias against the poor can be observed. Specifically, this is due to the poor's low levels of political awareness, which can be attributed to low literacy rates and the lack of the necessary skills to influence and participate in the design of policies effectively. Consequently, although wealthy people are not the target of decentralised policies, usually aiming to reduce poverty within communities, local elites often are the only group of citizens who possess the technical knowledge required to understand policy details and thus have the power to influence them. Another element to consider in the rise of elite capture is the absence of control over the behaviours of local officials and individuals appointed to positions of authority in the community. This is either because the design of policies did not include a monitoring mechanism or because those in charge of the decision-making process are not required to be accountable for their choices.

With few exceptions, the literature on elite capture has mainly focused on decentralised policies, investigating whether elite capture, defined as the increased likelihood of being targeted by specific policies thanks to connections with elite groups, exists and what its welfare effect is. Additionally, elite capture mechanisms have also been observed to potentially reduce the time needed for connected families to receive support compared to other households, especially following natural disasters or other exogenous events. Trinh et al. (2022) in Vietnam and Takasaki (2011) in Fiji observed how, in the aftermath of natural events, having political connections at the household or community level helped grease the wheels of bureaucracy and accelerate the receipt of economic support. In the former study, the authors, using panel data from the Vietnam Household Living Standards Survey (VHLSS) and Vietnam Access to Resources Household Survey (VARHS) between 2012 and 2014, analysed how communities with a greater number of political connections at the district level were more likely being targeted by the relief funds in the aftermath

of a natural event. Employing different econometric techniques consisting mainly of the use of fixed effects and a rich set of covariates at the commune level to account for potential endogeneity concerns, the authors observed how a unit increase in the number of political connections per family in villages led to a 30% increase in the probability of receiving support. In the latter study, the author, by collecting original household survey data and data on the impact of a cyclone that hit Fiji in 2003, was able to estimate the effect of elite capture on the allocation of housing reconstruction funds. The results highlighted how families with a member holding a clan leadership role at the community level received the relief funds before the official planned distribution, thus observing a *temporal elite domination* of receipt.

Elite control on the distribution of governmental resources is a main concern with respect to anti-poverty programs, which are designed for the most disadvantaged sectors of the population. In this work, we will refer to anti-poverty programs as policies that aim to improve the living conditions of the poor by directly providing resources, such as income support or food aid, or productive inputs and technology, to the most marginalised villagers. Panda (2015) and Besley et al. (2012) provide evidence of the presence of elite capture in the resource allocation and the targeting process of anti-poverty programs in South India. They describe how having a household member appointed in an official position at the local level increased the family's probability of receiving subsidies specifically designed for households living below the poverty line, especially in urban villages. Notably, Besley et al. (2012) estimated that the increase in the probability of receiving support due to political elite capture was economically relevant and similar in magnitude to the increasing impact on the probability of receiving the subsidy for landless families. Specific features of anti-poverty program designs might also unintentionally contribute to elite capture by local leaders, as Pan and Christiaensen (2012) described analysing an agricultural voucher program in Tanzania. The program aimed to help poor farmers by allowing them to buy agricultural inputs at a discount price and, at the same time, to increase agricultural production in rural areas. However, due to elite control in the decision-making process and the ambiguity in policy purposes, families with political connections were more likely to receive support, particularly in the most unequal and remote villages. Using data on the Kilimanjaro region from the Vulnerability Household Panel between 2003 and 2009, the authors estimated, through a probit model, how the ambiguity in the purposes of the program contributed to exacerbating inequalities in the resource distribution within villages. Indeed, the agricultural vouchers ended up going to richer, politically connected and more productive farmers, who were more likely to maximise total production within communities, and not to the poorest households with small plots of land.

The probability of being targeted by a policy does not uniquely depend on the

vertical connection families have with elites but also on the power structure in the community. Broussard et al. (2014) and Caeyers and Dercon (2012) analysed the distribution of food aid in Ethiopia by decentralised community committees (the peasant associations) and investigated the importance of vertical and horizontal connections in the villages. Broussard et al. (2014) observed how the relevant power relationships in villages were not only the ones with the elites (vertical ties) but also the ones existing with other villagers (horizontal ties). Exploiting panel information of 943 households coming from the Ethiopian Rural Household Survey, the authors noted that the probability of receiving free food disbursement was, in fact, increasing both with respect to elite connections and household self-reported relative power in the community. Similarly, Caeyers and Dercon (2012) analysed whether, in the aftermath of a severe drought which hit Ethiopia between 2002 and 2003, horizontal connections, used by non-elite groups as a safety net in the case of exogenous shocks, were effective in contrasting elites' capture in the food aid distribution process. Horizontal connections are assumed to guarantee the possibility for households in need to ask for support from other families in the network in an exchange based on future reciprocity and trust, thus potentially representing an insurance mechanism with respect to elite capture. Using data coming from the Ethiopian Rural Household Survey between 1999 and 2004 and by means of a probit model, the authors observed how, in the immediacy of the event, households having vertical connections had a higher likelihood of receiving free food and that, on the opposite, increasing the number of horizontal connections was found to decrease the probability of receiving support. Elite leaders might have been less likely to deliver food to well-connected households that could already rely on an informal insurance network.

On the aggregate, elite dominance and elite capture dynamics seem to be transversal and independent of the policy's content, ranging from forest conservation (García-López, 2019) to antipoverty or relief programs. Moreover, elite capture has also been observed when no local decentralisation processes are in place. Indeed, elite capture in the form of kinship favouritism has even been observed with respect to access to energy sources. Chatterjee and Pal (2021) in India analysed the impact of having a political connection at the household level (as having a member of the family in a political party) on access to energy sources, specifically electricity and liquefied petroleum gas (LPG). The study found that having a political connection increased the likelihood of families gaining access to electricity distributed by a state-owned company by allowing them to bypass bureaucratic hurdles through their political connections. However, when the provider was not public, as in the case of LPG, no increase in access was observed for these households. Nevertheless, the study found that political connections increased the likelihood of families obtaining LPG

through illegal channels.

3.3 .2 Economic Costs of Elite Capture

Decentralisation is only one of the many approaches governments in developing countries adopt when implementing their programs (Coady et al., 2004). It appears then crucial to investigate whether adopting decentralised policies, at the risk of elite capture, is more efficient than other targeting methods. The main reason for delegating targeting to local leaders who might be part of or influenced by local elites is to unlock local-level information unknown to the centralised government. For this reason, researchers have analysed whether the potential increase in targeting performance due to superior information availability can eventually compensate for the impact of elite capture. Comparing different targeting methods is difficult because it is extremely rare to observe the same policy that has been delivered using different targeting techniques. The two leading solutions that researchers have adopted to overcome the problem have been to either analyse policies for which there were available governmental guidelines indicating the characteristics needed on paper for eligibility, or to compare the decentralised targeting to a formula-based method using a proxy-mean tested (PMT) methodology for identifying beneficiaries. This technique uses economic proxies at the household level to determine the welfare status of a family, thus enabling researchers to define a possible eligibility list depending on a poverty score.

Basurto et al. (2020), examining the efficiency of a decentralised anti-poverty program in Malawi, observed how, although nepotism was present in favour of families having political connections with local leaders, the capturing made by this elite only had a marginal impact on the overall efficiency of the policy. Using original household panel data, the authors were able to compare effective decentralised targeting with formula-based PMT constructed using individual observable characteristics to identify households potentially eligible for support. The authors observed how, in villages affected by widespread poverty, having political connections and being considered poor were not necessarily excludable conditions. In this situation, a family might then be targeted both in the case of decentralisation and by a PMT procedure, but for different reasons, thus leading to a minimal impact on the efficiency of the overall targeting process. Indeed, the local decision-makers have been able to improve the efficiency of the targeting process by, for example, including in the list of beneficiaries households that were hit by natural disasters that the PMT strategy would have otherwise left out. Differently from Basurto et al. (2020), Alatas et al. (2019) directly compared different targeting strategies by defining a randomised control trial through which they were able to vary, at the village level,

the targeting process of a public welfare policy in Indonesia. Out of the 400 villages in the sample, half were selected to have a targeting process determined by government officials, while the remaining villages had to decide the program's beneficiaries through community meetings. To vary the level of elite capture, these villages were further randomly selected into two additional treatments. In the first, meetings were open to the participation of the entire community, while in the second, participation was granted only to a limited number of local leaders. The authors found no evidence of elite capture in any of the treatments, and when comparing the effective distribution with a PMT distribution, they observed that the welfare loss, specifically due to elite capture, was small compared to a PMT allocation. Notably, they observed that elite capture accounted only for less than a 1% welfare loss in the decentralised strategy and that adopting a PMT approach would produce a gain more than 20 times larger than focusing only on eliminating elite capture.

A similar result is also observed by Han and Gao (2019) with respect to a large welfare program, the Dibao, in rural China. The authors, using nationally representative rural household survey data from the 2013 China Household Income Project, studied the effective distribution of resources made by local governments and observed how having political connections was crucial in increasing the probability for a family to receive support. Similar to Alatas et al. (2019), the researchers noted that not every political connection had the same importance and that features in policy design might prevent the capture from happening. In the Chinese context, the introduction of an anti-corruption law prevented elite capture made by local formal officials; in fact, families having a link with elected officials in the village where they reside did not experience an increased probability of receiving the support. Nonetheless, the power void left by these local elites was filled by district officials who, unaffected by the new law, were not bound by it and did not risk getting easily caught while favouring households with parental connections. Specifically, the authors found that not only did having a connection at the household level with district officials increase the probability of receiving support by 44%, but it also affected the amount of support received. Comparing the list of effective beneficiaries with the list derived from a formula-based PMT, the authors observed that, although affected by elite capture, the selection of the beneficiaries made by local officials was better able to consider the multidimensionality of poverty.

The evidence collected from these studies indicates that when comparing decentralisation to other targeting approaches, it might be difficult to assert if the negative impact derived from elite capture is less or more than compensated by the use of more precise information at the local level. Using an income poverty formula or other PMT mechanisms might preclude the selection of households that, considering local and individual economic and non-economic characteristics, a villager

would define as poor and thus eventually eligible to receive the policy support.

3.3 .3 Governmental Programs, Elite Capture, Culture and Social Norms

Among the leading causes of elite capture in developing countries, together with political, economic, and power inequalities, a crucial role is also played by culture and social norms. The coexistence of formal local governments and traditional or tribal leaders is common in many developing countries that have either recently transitioned from autocratic regimes to democracy or are still rooted in cultural and traditional institutions. When these two forms of government coexist in a village, interactions with one form of political power or the other might also depend on individual characteristics. Kruks-Wisner (2011), in a paper examining the presence of institutions in the aftermath of a tsunami in India, clearly addressed the self-selection of villagers into different types of local elite when asking for economic support. In the paper, the author observed both qualitatively and quantitatively how marginalised groups, such as households from backward castes and women, are those relying on formal elected institutions when asking for support. In contrast, richer and well-connected households preferred to leverage informal networks with unrecognised traditional leaders. The difference in the behaviours between these two groups underlines how individual characteristics might shape the channels through which people access goods and services and the way in which power is perceived in the population. When tradition and cultural norms are extensively present, it is also important to consider the evolution of institutions and power relationships in villages and countries analysed. Dasgupta and Beard (2007) qualitatively observed the role of elite dominance in the proceeding of an urban poverty program (UPP) in Indonesia, focusing on the evolution of power structures and institutions in villages with inherently different histories and characteristics. The authors noticed how different types of elites were simultaneously present in villages and how their power relationship changed and evolved through time as villages grew economically and socially. Traditional (old) elites were thus gradually being replaced by new (young) elites able to exert power and control through their economic status. While elite capture was extensively present in villages, its impact depended on the villages' social capital and cohesion. Communities known to have a long tradition of collective actions were observed to have mechanisms through which non-elite groups could monitor the elites' dominance. In other communities, the UPP guaranteed a possibility of wider participation and opened up new spaces for non-elites to contribute to the decision-making process of the program. Notably, the authors highlighted a difference between elite dominance and capture, particularly when it is possible

for non-elites to monitor the elite's behaviour and when elite dominance does not prevent resources from reaching the poor. In this case, the authors define elite capture as benevolent capture. Cultural norms and traditions also regulate how individuals relate with elites and elites with the central government. Mustafa et al. (2016) provide an example by analysing the implementation of a public infrastructure, co-financed by international organisations, for improving and regulating the water distribution system in Jordan. This Middle Eastern country has been historically strongly characterised by norms and traditions that still today determine the distribution of power within villages, delegating the administration of specific areas of the country to tribes. The new infrastructure, aiming to reduce water waste and theft, contemplated the creation of new local committees of citizens to monitor and manage the water distribution locally. As expected, the leadership positions of these organisations were captured by the tribe's representatives in the more tribal regions and strongly influenced by entrepreneurs in farmer-dominated regions. Nonetheless, the role of local elites was crucial as they acted as intermediaries between citizens' needs and the state; on the one hand, legitimising power relations in the communities, but, on the other hand, representing a credible interlocutor with the central government and by having the political power to prevent water stealing.

Additional studies would be needed to empirically assess under which circumstances households and individuals prefer to rely on formal or elite support, also considering village economic and social characteristics, which qualitative studies have hinted to be crucial determinants of the success of anti-poverty programs. Notably, considering how rooted elites are in societies, empirical analyses on the impact of the interaction between elites and governmental bodies are needed to understand the economic impact of a possible cooperation between central, formal political power and local, informal elites.

Table 3.1 summarizes the studies discussed in this section, dividing them into quantitative and qualitative analyses. It provides information on the data, the country analysed, the program considered and the methodology adopted. Additionally, it describes the elite capture variable that has been used and the results obtained. This table (which will also be replicated in the section dedicated to NGOs) will help define a framework for researchers and practitioners to delineate how the topic has been discussed in the literature.

Table 3.1 : Elite Capture and Governmental Programs - Quantitative Studies

Quantitative Studies

Authors	Data and Country	Program	Elite Variable	Methodology	Results
Thrin et al. (2022)	Vietnam Access to Resources Household Survey VARHS (2012-2014)	Post-Disaster Recovery	Number of political connections per commune at the district level	Logit Panel Model with FE & Linear Panel Model with FE	Higher prob. to receive support in the post-shock period
Chatterjee and Pal (2021)	India Human Development Survey IHDS (2011,2012)	Access to Services	Household member in political party Having acquaintance with elected politician	OLS, Probit and Logit & Propensity Score Matching	Increased prob. access electricity and illegal market for liquified petroleum gas
Basurto et al. (2020)	Own Data, Malawi (2011-2013)	Agricultural subsidies Food Aid	Household member is a chief	Proxy-Means Tests strategy & Linear Panel Model with FE	Chiefs more likely to target relatives but minimal welfare consequences
Alatas et al. (2019)	Own Data, Indonesia (2010-2012)	Direct Cash Assistance (BLT)	Household member holds a formal or informal leadership position	Proxy-Means Tests strategy	Elite capture in case formal position not informal ones
Han and Gao (2019)	China Household Income Project CHIP (2013)	Rural Welfare Program (DIBAO)	Household member is political elite	Probit, Logit and Tobit & Propensity Score Approach	Higher prob. of receiving DIBAO only for political leader outside village
Panda (2015)	India Human Development Survey IHDS (2005)	Anti-Poverty Policies (BPL)	Household head connected to a local political executive	Probit & Recursive Bivariate Probit	Increased prob. receiving poverty-alleviation entitlement, BPL card
Broussard et al. (2014)	Ethiopian Rural Health Survey ERHS (1994-2004)	Food Aid	Holding position in village organisations Self-Reported Empowerment	Probit and Tobit & Linear Panel Model with FE	Higher prob. receiving aid and larger amounts
Besley et al. (2012)	Own Data, India (2002)	Anti-Poverty Policies (BPL)	Being elected councillor	OLS and LPM	Increased prob. receiving poverty-alleviation entitlement, BPL card
Caeyers and Dercon (2012)	Ethiopian Rural Health Survey ERHS (2002-2004)	Food Aid	Household member holds a formal position in village	Probit and OLS	Higher prob. of receiving food aid
Pan and Christiaensen (2012)	Vulnerability Household Panel Tanzania (2003, 2004 and 2009)	Input Voucher Program	Housheold member in voucher committee or elected official	Probit, OLS & Descriptive Analysis	Higher prob. of being voucher beneficiaries
Takasaki (2011)	Own Data, Fiji (2005)	Post-Disaster Recovery	Leadeship role (clan, village)	Hurdle Two-Step Strategy	Earlier access to reconstruction benefits

Qualitative Studies

García-López (2019)	Own Data, Mexico (2010)	Inter-community Forestry Associations (FAs)	FA leadership position and role of corporations	Semi-Structured Interviews of key actors within forest associations	Unfair profit distribution and increased political power
Mustafa et al. (2016)	Own Data, Jordan (2013-2014)	Water Management	Leadership role of Water Use Associations (WUAs)	Interviews of key actors using an ethnographic strategy	Tribes or larger farmers dominate WUA but positive role in negotiation
Kruks-Wisner (2011)	Own Data, India (2007)	Post-Disaster Recovery	Which channel for asking support?	Interviews of key actors and other secondary data	Women and marginalised formal channels Men and dominant caste traditional leaders
Dasgupta and Beard (2007)	Own Data, Indonesia (2003)	Urban Poverty Program UPP	Elite control over project decisions	Semi-Structured Interviews through focus group discussions	Benevolent capture by elites poor still benefit from project

Summary of the main empirical and qualitative research considered in Section 3.3; not included studies which are only theoretical or unrelated to elite capture.

3.4 Elite Capture in Non-Governmental Programs

In the last decades, local elites have also largely benefited from the globalisation process that, while accompanying the shift of the majority of developing countries from centralised economies to market economies, also allowed governments to benefit from the new influx of monetary resources coming from international institutions in their economic renovation process (e.g. International Monetary Fund). The economic and social empowerment of poor and remote communities became not just a byproduct of economic growth but a main objective for governments, international organisations and the expanding sector of non-governmental organisations (NGO). Specifically, having shifted from democratisation and revolutionary issues to humanitarian aid, service and good provision, NGOs got heavily funded by individual donors, international organisations and Western governments becoming prominent actors in the development arena. In the last decades, international agencies have largely relied on the NGO sector for the last-mile delivery of their developing programs, eventually preferring them with respect to underperforming governmental agencies (Shin et al., 2017). Indeed, almost 90% of the World Bank projects involve the participation of an NGO or other civil society organisations (Brass et al., 2018), and in 2020, more than 21 billion US dollars of the OECD Official Development Assistance were channelled to or through NGOs or other similar organisations (OECD, 2022). The growth of the NGO sector is exemplified by the exponential increase in the number of international and local organisations operating worldwide and the total amount of resources poured into the sector (Aldashev and Navarra, 2018). The literature that analysed NGOs and their impact on households and individual outcomes has been observed to be mainly qualitative and not necessarily economic (Brass et al., 2018). Nonetheless, this richness of analysis from different fields enables us to consider the relationship between NGOs and elites from a more comprehensive perspective.

Although it is not possible to clearly identify a literature specifically discussing elite capture in the case of NGO support, aspects of this phenomenon can be retrieved and analysed considering the broader literature on the economic impacts of NGO support on household and individual outcomes in developing countries. The analysis of the role of these organisations in development has been carried out in several research areas, employing different techniques, from purely qualitative to quantitative or mixed analysis. Despite limiting the causal interpretation of the results, this variety allows us to understand which mechanisms might drive elite capture in the case of non-governmental organisations and acquire additional information on the relationship between NGOs, the citizens and the elites. The main question we aim to address is to understand whether the unique features of non-governmental

organisations, such as their independence, identity and human and technical capital, are sufficient for limiting the role of elites in the villages and precluding these groups from capturing the support provided. Alternatively, the tightening in the relationships between them and the governmental institutions, coupled with the need to be legitimised in the villages in which they operate, might open the door for elites to influence NGOs' operations and exert control over their support in a similar way to what they do with the governmental one.

How NGOs relate to elites and whether their presence can somehow mitigate or exacerbate local elites' dominance and ability to capture resources are important questions to understand better the role and impact of these organisations and the dynamics behind elite capture in developing countries. In fact, as shown by Usmani et al. (2022) in India and Fischer et al. (2019) in Uganda, the identity of support providers might play an important role in program effectiveness in developing countries. In the first study, the authors described how the adoption rate of an improved technology promoted by an Indian NGO was higher for communities that had already been exposed to NGOs due to the reputation effect of these organisations. In the second study, the authors compared different types of sellers (NGOs, governmental, and private providers) and observed that the takeover rate of health products in Uganda was higher in the case of sellers who identified as working for an NGO. We might then expect the NGOs' identity to play an important role in society. As external organisations aiming to alleviate the burden of poverty and being usually unrelated to the communities in which they operate, NGOs might be able to increase trust in the poorest segment of the population and act as intermediaries for the distribution of resources, eventually limiting the role of the local social power structure.

3.4 .1 Elite Capture and the Design of NGO Programs

Although it is common to tend to align the identity of NGOs with those of the volunteers who are physically implementing a project, it is also possible for these organisations to leverage local knowledge and information to improve the targeting by involving local delivery agents in the program implementation phases. As previously explained, the use of local information might be crucial to unlocking the knowledge on specific economic and non-economic characteristics at individual, household or community levels that are unknown to non-local organisations, such as the central government and, in our case, non-governmental organisations. Bandiera et al. (2023) specifically addressed this issue in the context of an agricultural extension intervention aimed at poor farmers in Uganda promoted by BRAC, one of the largest NGOs in developing countries. The researchers, leveraging a randomised control

trial design in which they were able to vary the targeting process of the agricultural support, have been able to observe how delivery agents' ties with other farmers were crucial in the selection of the beneficiaries. The study conducted in the African country from 2012 to 2015 aimed to evaluate how BRAC and local delivery agents with various social ties targeted farmers differently in communities. Local delivery agents were purposely selected from successful entrepreneurs within the communities for their ability to effectively explain the benefits of the agricultural extension and for their extensive networks, which allowed them to reach more farmers. The authors observed how, although delivery agents were successful in delivering the extension program, increasing the number of farmers reached with respect to BRAC delivery, non-poor ties were more likely to receive support than the poor ones. The reason for this favouritism seems to be related to a reciprocation and legitimisation mechanism between richer farmers in the communities. The delivery agents have then been found to improve the targeting process by leveraging individual information at the cost of abusing the dominant position for personal interest. The need for specific information that is not easily accessible either because it is private or because NGOs do not have the capability to access it, e.g. lack of personnel or abilities, might thus justify the use of intermediary agents in the implementation of projects.

The importance of information access is also exemplified by the research of Mada-jewicz et al. (2021). The authors conducted a study using information gathered between 2007 and 2011 from over 7,000 households in Bangladesh, where they examined how delegating decision-making to communities influenced the implementation of a public health program initiated by a large Bangladeshi NGO consisting of the placement of deep tubewells to provide safe drinking water to the communities. By implementing a randomised control trial, the authors were able to observe how varying levels of villagers' participation in the decision-making process affected access to safe drinking water. In the authors' design, villages were randomly selected into the three possible treatment procedures: a top-down approach (TD) in which NGO members had to choose the placement of the tubewells with no interaction with the community; a regulated community participation process (RCP) with conditions allowing a wide representation of the overall preferences of villagers (e.g. veto power) or an un-regulated community participation process (CP), which may potentially be prey of local elites. Results indicate that, although the use incidence of safe drinking water increased in all three cases, the largest increase was observed for the RCP approach. The mechanism underlying these results has been found to be due to the location selection process of tubewells in the communities. In the RCP approach, the location of tubewells was closer to a greater number of families, and negotiations between groups of individuals, some of whom already had access to

safe drinking water, have been made to improve access to existing wells. In the CP case, only a smaller number of individuals -mainly from the wealthiest segments of the population- attended the meetings, limiting the participation process and delegating the location selection to elites. The TD approach was instead characterised by NGO volunteers having to decide on locations without interacting with villagers, thus having no information on individual or aggregate preferences. The negotiation phase, which happened in the RCP approach, was fundamental in improving the final decision; the increase in the information available helped in the correct selection of areas and thus to a Pareto improvement with respect to TD and CP approaches. Results display how the use of safe drinking water increased about 80% more in the case of the RCP approach than with respect to the other two treatments. Specifically, the increase was equal to 27 percentage points in RCP villages, 15 percentage points in CP villages and 14 percentage points in villages adopting a TD approach. Notably, the results obtained by the TD and CP approaches are qualitatively similar, leading to a comparable increase in the use of safe drinking water. On the one hand, CP allowed elites to influence the tubewells' location decisions, making their interests, but having at least a general knowledge of villagers' preferences; on the other hand, the external TD intervention aimed to find locations only in public areas without having access to information available to elites. The ability of NGOs to determine their approach to delivering support enables researchers to compare various targeting strategies. These comparisons are then useful to understand the mechanism behind elite capture and emphasize the importance of effectively utilising information, ensuring broad participation in decision-making processes.

3.4 .2 The Relationships between NGOs and Governments in NGO Programs

Although -on paper- unrelated to governmental dynamics and power structures at the local and state levels, extensive literature has already discussed the interconnections between the NGO sector and institutions in developing countries, additionally considering the evolution of this relationship. Many economic and non-economic researchers have analysed the historical evolution of the NGO sector, discussing how the initial antagonism of such organisations to institutions, most of the time seen as autocratic, selfish and corrupted, slowly turned into cooperation. In the last decades, the sector that initially predominantly focused on democratisation and advocacy issues shifted towards working primarily on poverty relief through goods and services provision, with only a minority of organisations still addressing early instances (Banks et al., 2015). Harrison et al. (2017) for India and Lewis et al. (2017) for Bangladesh discussed the evolution of NGOs in these countries that, al-

though characterised by different histories, have witnessed a similar transformation. In both cases, the shift towards having more direct contact with institutions and increasing dependence on foreign donors' funding have led NGOs to tighten their relationship with governments and to bureaucratisation and professionalisation of their management. One of the reasons for the increase in connections between NGOs and governmental officials was to reduce bureaucracy and facilitate the awarding of governmental contracts in a context of harsh competition between different organisations. It is important to note that the evolution and sophistication of these organisations have required a high level of educational attainment of leaders, who, most of the time, are found to be coming from the wealthier segments of the population, the elites, having lived and studied in the same areas and schools of the official leaders (Kumi and Copestake, 2022). The tight relationship between NGOs and governmental officials provides mutual benefits to the two sides. For NGOs having this network, it is a condition to survive competition by exploiting preferential channels to win contracts. At the same time, institutions see NGOs as a means to improve their programs' delivery and efficacy, specifically because of the higher technical knowledge and human capital found in NGOs and their volunteers (Bano, 2011). The qualitative nature of these analyses, which considers the relationship between NGOs and institutions (both central and local), although precluding us from having a causal knowledge of an elite capture dynamic in the local support provided by these organisations, suggests that -due to this tight relationship- the conditions exist for this to occur (Stiles, 2002). Additional empirical research would then be needed to investigate whether the increasing tightness in the relationship between NGO leaders and governmental officials appears to be beneficial and improve governmental programs' efficacy. Moreover, such analyses might also be helpful in studying whether this closeness could lead to elitist behaviour from the NGOs, which might favour governmental entities with the sole purpose of being awarded new contracts.

Researchers have also criticised the lack of downward accountability. NGOs are found to be too dependent on donors' decisions and detached from communities' needs, too focused on collecting funds and reducing costs and not rooted enough in the villages in which they operate to empower the poor effectively, particularly for international organisations (Kilby, 2006; Feldman, 2003; Ebrahim, 2003). Nonetheless, non-economic literature has also highlighted how the collaboration between NGOs and official institutions might improve the socio-economic conditions of villages and the poor. Harrison et al. (2017) for India and Farid and Noguchi (2022) for China discussed, by collecting data through semi-structured interviews with grassroots NGOs and local government officials, how the tightening in the relationships between the parts did not necessarily have as a direct consequence the loss of NGOs' independence and the institutional control of these organisations. Instead, the au-

thors described how this closeness led to potential better coordination between the two actors to improve program efficacy in terms of economic and non-economic outcomes and cost reduction. In the first case, NGOs are used by local governments to obviate, for example, the lack of formal staff and provide services such as riding ambulances, implementing sanitation programs or running vaccination campaigns. In the second case, in an autocratic country, the involvement of governmental officials is seen as a mechanism to transmit knowledge from society to institutions. However, these two examples do not focus on the economic implications that this may cause, particularly concerning elite dominance and elite capture. The loss of independence, the lack of monitoring, the favouritism in awarding contracts and the closeness (education and social groups) between NGO leaders and local elites are all elements that might favour the elite capture of NGO support by the wealthiest, most educated and most powerful population groups. Unfortunately, to the best of my knowledge, studies that specifically address these issues using quantitative approaches are still lacking.

3.4 .3 NGO programs, Elite Capture, Culture and Social Norms

A crucial aspect for evaluating the impact of NGOs on development is to study whether NGOs are more effective in limiting elite capture than governments. Although it is almost impossible to measure the impact of elite capture on an identical intervention carried out by NGOs and governmental institutions simultaneously, it is common in developing countries for NGO programs and governmental interventions to coexist and provide similar support in the same villages. Lucas (2016) qualitatively described how beneficial elite control had been found in conservation and development projects promoted by local NGOs in two villages on the island of Sumatra, Indonesia. However, this was not the case when the government provided similar programs. Compared to government officials, NGO volunteers acted not just as facilitators for project implementation but also as a monitoring mechanism inducing an increase in the accountability of elites and NGOs toward the community. An important aspect that has not been widely analysed in the literature is the role of exposure to NGO values and programs in a community over time. Classen et al. (2008) qualitatively discussed how an agricultural participatory program in Honduras shifted from being elite-dominated to including the most marginal segments of the population and effectively being participatory, mainly thanks to the long exposure of communities to NGOs' values and projects. The transition that allowed non-elite individuals to hold leadership positions in different programs has been possible thanks to NGO presence, which, through time, has been able to promote

inclusiveness and participation of the most marginalised groups in villages. The time component in this example is crucial; the presence of NGOs and the possibility for these organisations to acquire information about individuals and households are important elements in the transformation process that these organisations aim to implement in the communities. Whether exposure to NGOs and their values is a necessary and sufficient condition to produce the expected results of inclusiveness, participation and democratisation of the decision-making process in communities is still an open question. The case of Honduras highlights how exposure to NGOs' values was crucial in the success of a participatory program in villages; nonetheless, other studies have analysed how this might not be systematically the case. The results obtained might instead be strictly related to the implicit monitoring role exerted by NGOs' presence in the community more than to an effective change in the preferences and incentives of citizens.

A quantitative research, which precisely aimed to analyse whether prolonged exposure to external values had a role in shaping individual and societal behaviour, is the one proposed by Humphreys et al. (2019). With the aim to understand the role of time exposure to external values, the authors analysed how a development reconstruction project promoted by American NGOs, aiming not only to support villagers but to encourage and promote democratisation in the communities, has not been able to limit elite dominance once NGOs left these communities. Two years after the end of the reconstruction project, the authors defined an experiment consisting of observing how similar villages which had been exposed to the reconstruction projects (treated) and villages that had not (untreated) decided how to spend money coming from an unconditional cash transfer project. Results highlighted how elites were observed to have regained their dominant position in treated communities, diverting funds and hijacking the decision-making process for resource use in the same way as elites did in untreated villages. Moreover, no differences in fraudulent behaviour were observed between different villages. An explanation for this result can be retrieved considering that cultural norms and preferences might not be easy to eradicate, specifically in countries like Congo, where the administrative power has been historically related to military control and kinship of local chiefs. Behavioural changes are not automatic and need not only time to happen but for norms and values to be accepted and somehow institutionalised in the communities (Arnall et al., 2013). Cultural traits and societal traditions, being inherently part of the history of a country, are strictly connected to its institutional framework and thus might be resilient to foreign values.

In specific cases, local leaders and communities' cultural and traditional traits might also be relevant in the selection process of NGOs and international organisations, either increasing or decreasing the probability for communities to be targeted

for specific programs. Specifically, similar information might be used by these organisations as a signal in their decision-making process regarding the quality of a community. Maiden and Brockway (2018) analysed how the distribution of agricultural aid allocation in Mali was biased in favour of villages whose local leaders spoke French and how NGOs and international agencies used this information as a signal indicating an educated leader with high social status. However, in line with the literature describing how elite capture is more likely to arise in communities which are either economic or non-economic unequal, the authors observed that, although being more likely to receive support, communities having a French-speaking leader (the colonisers' language spoken mainly by elites and bureaucrats) distributed support away from families that were most in need compared to villages in which the local leader spoke traditional languages.

NGOs are not the only organisations that can develop within villages. Indeed, groups of citizens may come together in local organisations to solve specific problems, creating, for example, insurance mechanisms, public goods committees or credit networks. In similar circumstances, elites can play a role in the formation and functioning of these local organisations and the use of funds. Having potentially a similar structure to NGOs, it is difficult to compare these different types of organisations, particularly when analysing the different (or similar) mechanisms that could lead to the domination or capture of elites. The analysis proposed by Arcand and Fafchamps (2012) is an example of research that, although primarily concerned with analysing the assortative matching of individuals in community-based organisations (CBO) in Burkina Faso and Senegal, also compared the composition of different types of CBOs. After having discussed the issues related to individual matching and sorting into CBOs, the authors specifically focused on donor-based CBOs (either funded by NGOs or international organisations) and discussed the differences in the composition existing with respect to non-donor-based CBOs. The results highlighted that in Burkina Faso, donor-sponsored CBOs were more elitist than non-sponsored ones, with members coming from richer families with more ties with village authorities. On the contrary, in Senegal, families with stronger ties with village authority were more likely to belong to non-donor-sponsored organisations, thus highlighting how differences between countries and communities exist, depending on specific economic and cultural characteristics. Therefore, elite dominance and capture might be observed independently of the type of organisations studied by researchers and must be considered when analysing the economic impact of these organisations on household members and village outcomes.

3.4 .4 NGOs as Elites

An aspect that the literature has not yet extensively considered is the one defining NGOs as elites, operating mainly for personal interest and providing preferential support to individuals who are better connected with them. The possibility of this condition arising can be related to the lack of downward accountability and the growth that these organisations have experienced in recent decades. Seddiky et al. (2022) and Ramprasad (2021) provide two qualitative examples of the potential elitist behaviour of NGOs. By analysing the crucial role of NGOs in providing training and risk awareness in a coastal area of Bangladesh prone to natural disasters, Seddiky et al. (2022) observed how different NGOs had a differential impact on households' economic outcomes depending on the type of programs provided. Collecting semi-structured interviews on a limited sample of 45 respondents including NGO managers and beneficiaries, the authors discussed the impact of a series of development programs promoted by NGOs in the area and their social implications. While positive results have been observed concerning health interventions, prevention, and food security, those programs aiming to provide monetary support, mainly microcredit, were observed to have the unintended consequence of worsening the economic condition of households. Specifically, by imposing strict conditionality on loans, high interest rates (higher than formal channels), and inflexibility on the terms and dates of payments, the NGO precluded the possibility for marginalised groups from accessing this service. Moreover, it eventually exposed financed families to a poverty cycle due to repayments that were even asked in the immediate aftermath of natural events or other income shocks. In the case of a missing payment, NGO officers were used to coming to the houses of financed households, verbally harassing women for having failed to pay the instalment, and seizing furniture and valuable objects. Additionally, even considering the other types of support, the authors noted how corruption occurred systematically, for example, by extorting money from recipients of medical health kits. The lack of a long-term perspective and the need to obtain immediate results have then led to a deterioration of the social stratum of communities, with NGOs having acquired a dominant position open to corruption and favouritism.

The elitist behaviour of NGOs has also been described by Ramprasad (2021) in India. The author, while primarily focusing on the interaction between NGOs and institutions, highlighting the implicit power these organisations hold in contracting with government bodies, also described a scenario in which powerful NGOs not only influenced the community decision-making process but also arbitrarily determined which households would receive support. This decision was often based on the level of fidelity that these households demonstrated toward the organization through time.

Indeed, the study observed how these NGOs were able to influence the resource distribution of governmental programs, either deciding the list of beneficiaries or the type of support (e.g. replacing what was designed to be an input support with monetary support). As in the study of Seddiky et al. (2022), this elitist behaviour has been primarily observed in the case of monetary support. An example discussed in the research is the one in which the WASSAN NGO, a large Indian organisation that has been awarded various governmental contracts for the last-mile delivery of developing programs, has been observed creating a preferential channel for microcredit support for households already engaged in other programs promoted by the same NGO. The diversion of the resources was then justified to the (on paper) intended beneficiaries using a list of false and misleading motivations, while it was clear that the main reason for the selection into the program was having a personal history of a good relationship with WASSAN; meaning a certain fidelity level with the organisation.

Although this qualitative evidence is helpful in examining potential issues related to NGO interventions, additional research will be needed to causally estimate how and under which circumstances NGOs might indeed behave as elite, exploiting their eventual monopolistic position in support provision to strengthen their influence over resource distribution within communities.

Overall, recognising the difficulties in externally validating results on specific programs or NGOs due to heterogeneity in the characteristics of different organisations, the results illustrate how NGOs -although crucial in delivering last-mile support- might not represent an embankment to elite dominance within communities. As noted by Platteau (2009, 2004), NGOs seem not to be able to systematically counteract local elite dominance in developing countries, being caught incurring similar problems already described in the case of governmental support. Moreover, the analyses on NGOs are also complicated by the difficulties related to data access compared to governmental policies, particularly in the case of small local organisations. Because elite capture is strongly related to the evolution of societies and their culture, future research should not only compare NGOs with other organisations or formal institutions but also consider the differences existing within the NGO sector. Whether an organisation is internationally funded or not, whether it is directly linked to a large international non-governmental organisation (e.g. Save The Children) or operating locally without external support, might represent important information in the understanding of why and how different NGOs might or might not be able or willing to empower communities and limit the role of elites effectively. Table 3.2 summarizes the studies discussed in this section; unlike the research focusing on governmental programs, most analyses discussing elite capture in

the NGO framework are qualitative, such as most of the literature investigating the impact of NGOs on development (Brass et al., 2018). Although they do not provide a causal interpretation of elite capture on development programs promoted by these organisations, the perspective presented by these studies might enable economists to enlarge their understanding of the elite capture phenomenon through analyses of case studies and enrich the knowledge of elite capture dynamics which might be complex to be captured otherwise.

Table 3.2 : Elite Capture and Non-Governmental Programs - Quantitative Studies

Quantitative Studies						
Authors	Data and Country	NGO (Nationality; Type)	Program	Elite Variable	Methodology	Results
Bandiera et al. (2023)	Own Data, Uganda (2011-2014)	BRAC International; Service	Agricultural extension Microfinance	Social ties of the delivery agent	RCT ANCOVA, DiD	Higher prob. for farmers having ties with delivery agent to be targeted
Madajewicz et al. (2021)	Own Data, Bangladesh (2007-2011)	Forum for Public Health National; Service	Safe Drinking Water deep tubewells installation	Location decision process	RCT DiD	Optimal allocation when location decision in the hand of local committee with wide participation
Humphreys et al. (2019)	Own Data, Eastern Congo (2007)	International Entities International; Advocacy	Exposure to democratisation limit elite capture of UCT	Funds embezzlement by elites	DiD with balancing	Indistinguishable differences between treated and untreated villages in the use of resources derived from UCT
Maiden and Broackway (2018)	World Bank, Northern Mali (2015)	International Entities International; Service	Agricultural Aid	Language of local leader	Randomised Survey OLS	French-speaking leader higher prob. receive aid but it is less likely to reach families in needs
Arcand and Fafchamps (2012)	Senegal, ASPRODEB Burkina Faso, PNDSA II (2002)	Donor Based Community Groups	Groups composition at village level	Wealthier villagers more involved	Dyadic Regressions	In Senegal, donor sponsored org. less elitist than non sponsored
Qualitative Studies						
Farid and Noguchi (2022)	Own Data, China (2009-2012, 2018-2019)	Set of local NGOs National; Mixed	Interview to NGO leaders and formal officials	NGO and political connections	Semi-Structured Interviews of key actors	Positive impact on community development when collaboration between State and NGOs
Seddiky et al. (2022)	Own Data, Bangladesh (2018)	Set of local NGOs National; Mixed	Effectiveness of non-disaster risk reduction programs	NGOs behave as potential elites	Semi-Structured Interviews of key actors	Different projects lead to different welfare results. Microfinance programs reinforced vulnerabilities. Corruption and violent behaviour might be present
Ramprasad et al. (2021)	Own Data, India (2014-2015)	Case Studies Different NGOs	Different type of local NGO program	NGOs behave as potential elites	Ethnographic Methods	NGOs hold disproportionate influence over beneficiaries. Fidelity is rewarded with preferential treatment by NGOs
Harrison et al. (2017)	Own Data, India (2006-2008)	Local NGOs Local; Mixed	Interview to NGO leaders and formal officials	NGO and political connections	Interviews to NGO leaders and Officials	Tight relationship between NGO and govt. State needs NGOs to supply services
Lucas (2016)	Own Data, Indonesia (2010)	WARSI National; Service	Conservation and developing projects	Capture and control over decision	Interviews to key actors	Differences in relationships between elites and institution define benevolent or not capture. Presence of NGOs limit capture
Classen et al. (2008)	Own Data, Honduras (1997)	FIPAH National; Advocacy	Agricultural participatory program CIAL	Time evolution of members' identity	Interviews of project participants	Long-term exposure to NGOs values such as inclusiveness increased participation of marginalised groups

Summary of the main empirical and qualitative research considered in Section 3.4; not included studies which are only theoretical or unrelated to elite capture.

3.5 Discussion

This review addresses a widely analysed topic in development economics: the ability of elites to exert control and pressure over citizens and influence the resource distribution within villages. This research seeks to contribute to the debate in two distinct ways. First, by adopting a multidisciplinary approach, it broadens the discussion by considering recent studies that address elite capture through methodologies and strategies that are not solely economic, interpreting results using an economic perspective. Second, this review considers the role of NGOs and discusses the behaviour of elites and their ability to capture resources depending on the identity of the support provider, highlighting potential differences and similarities between governmental and non-governmental agents. Specifically, taking advantage of the growing number of studies focusing on the impact of NGOs on development, this review gathers new evidence on elite capture dynamics, also highlighting potential circumstances in which NGOs exhibit elitist behaviour.

3.5 .1 Open Issues and Limitations

This review highlights the growing interest in development studies for elite capture within communities and underlines the importance of analysing how different support providers interact with elites. Nonetheless, several aspects remain understudied or not addressed in the literature.

By considering the identity of program providers, we emphasised the importance of reconciling studies with similar research questions but adopting different methodologies, particularly in the case of non-governmental agents. For this reason, we encourage researchers focusing on quantitative methods to empirically test the assumptions and mechanisms that qualitative studies have observed to be relevant in the emergence and evolution of elite capture within communities (e.g. social cohesion, participation costs and culture). We recognise the inherent difficulties in testing such hypotheses, particularly considering the scarce availability of data; wider dissemination would then be crucial for researchers to improve and enrich their analyses. A deeper knowledge of the mechanisms underlying elite capture would benefit not only the people receiving support but also, in primis, the organisations (whether governmental or non-governmental) which might adopt the results observed in the literature to improve their efficacy in limiting elite capture when providing support.

We also expect elite capture to impact villagers and families with different characteristics differently. Additional analyses would then be required to understand better the role of such characteristics and the mechanisms that different families adopt to overcome support shortages due to elite capture, particularly with respect

to gender and education.

Lastly, the interconnection between NGO leaders and governmental officials, observed by specific qualitative research, highlights a dynamic that has not yet been addressed through empirical analyses. Understanding the evolution in the interaction between different developing actors might shed new light on the evolution of elite capture and the interconnections between these leaders and local elites.

This literature review focuses explicitly on the main causes leading to elite capture in developing countries and primarily on the role of the identity of the support provider. Nonetheless, when considering the study's main purpose of comparing elite capture in the case of different providers, we recognise that some topics can be further explored in subsequent research. Firstly, by comparing elite capture in the case of governmental and non-governmental support, it has not been investigated yet how the presence and intensity of elite capture might depend on the within-group characteristics of different types of organisations, primarily NGOs (e.g. nationality, religiosity, values and size). Secondly, this literature review predominantly collects research analysing projects providing goods and services. Results might be different when considering programs primarily involved in advocacy issues. Lastly, we recognise that elite capture might manifest differently in different countries and regions, being strictly related to the evolution of institutions and culture. Additional analysis would be needed to investigate these differences and potentially enlarge the analysis to developed countries.

3.5 .2 Conclusion

Evidence collected in this review defines a scenario in which the provider's identity does not clearly play a role in the limitation of elite capture. Although there are many inherently different characteristics between governments and non-governmental organisations -such as values or the source of funds- both actors need to interact with elites or other local power groups to implement their projects and increase their effectiveness. One of the main reasons for this is the intrinsic lack of data and information readily available at the community level, which can only be retrieved through the involvement of elites, often the only source of crucial economic and non-economic information needed to implement various development programs. Studies in which governments, in the absence of precise data at the community level, or NGOs have tried to avoid elites' involvement have indeed been observed to lead to suboptimal equilibria.

Unlike in the case of governmental support, prolonged exposure to external values promoted by NGOs has been observed to potentially increase non-elite participation in the communities' decision-making processes. Nevertheless, evidence suggests that

the increased involvement of marginalised segments of societies is more likely when NGOs play an active role within societies and only when the same values proposed through their development programs have been culturally introjected and institutionalised. Indeed, elite capture appears to be strictly related to the evolution of countries, institutions, norms and cultures. Although providing values aiming to shift societal preferences towards a more shared view of society where marginalised groups are also involved in decision-making processes and are not overwhelmed by elite control, behavioural changes need time to root and be absorbed. Moreover, it is also crucial to recognise that societal structures in developing countries might not necessarily converge to those expected and designed in democratisation or empowerment programs; researchers will then eventually prefer to focus on the welfare implication of elite capture in similar frameworks. In this regard, exchanging information access with elite control does not systematically deteriorate community welfare. When comparing the actual pro-elite distribution of resources to households made by local committees with the on-paper list of eligible beneficiaries, the welfare loss due to misallocation and kinship favouritism is usually compensated by targeting improvements due to superior information, which is mostly unknown to external actors or policymakers.

Beyond the identity of the providers, what appears crucial to limiting the role of elites in developing countries is the removal of economic and non-economic obstacles that preclude marginalised groups from actively participating in communities' decision-making processes. Economic costs, such as those related to time invested in participating in debates and committees, and non-economic costs, such as social stigma or other psychological costs related to norms and tradition, hinder the participation of the weakest segments of the population: the poor and the women. Programs aiming to empower communities and enlarge participation should focus not only on delegating the processes to local bodies but also on reducing participation costs for the groups of people who are the targets of these programs. Additionally, monitoring bodies and conditionality in the local decision-making processes might be required to limit elite capture episodes.

To conclude, the evidence collected in this literature review does not provide a definitive answer to the question of whether NGOs might represent a possible solution to elite capture in developing countries. Additional research is required, particularly regarding NGOs' role in societies and their interaction with elites, to clearly identify if and how elite mechanisms are affected by the different characteristics of development actors. In particular, more quantitative analysis on NGOs would be needed, taking advantage of the increasing attention that development researchers devote to this type of organisation, to enrich and provide elements of causal analysis to the mainly qualitative literature dealing with elite captures in

relation to non-governmental actors.

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Bibliography

- Acemoglu, D., Reed, T., and Robinson, J. A. (2014). Chiefs: Economic development and elite control of civil society in sierra leone. *Journal of Political Economy*, 122(2):319–368.
- Acemoglu, D. and Robinson, J. A. (2008). Persistence of power, elites, and institutions. *American Economic Review*, 98(1):267–293.
- Alatas, V., Banerjee, A., Hanna, R., Olken, B. A., Purnamasari, R., and Wai-Poi, M. (2019). Does elite capture matter? local elites and targeted welfare programs in indonesia. In *AEA Papers and Proceedings*, volume 109, pages 334–339. American Economic Association 2014 Broadway, Suite 305, Nashville, TN 37203.
- Aldashev, G. and Navarra, C. (2018). Development ngos: basic facts. *Annals of public and cooperative economics*, 89(1):125–155.
- Arcand, J.-L. and Fafchamps, M. (2012). Matching in community-based organizations. *Journal of Development Economics*, 98(2):203–219.
- Arnall, A., Thomas, D. S., Twyman, C., and Liverman, D. (2013). Ngos, elite capture and community-driven development: perspectives in rural mozambique. *The Journal of Modern African Studies*, 51(2):305–330.
- Bandiera, O., Burgess, R., Deserranno, E., Morel, R., Sulaiman, M., and Rasul, I. (2023). Social incentives, delivery agents, and the effectiveness of development interventions. *Journal of Political Economy Microeconomics*, 1(1):162–224.
- Banks, N., Hulme, D., and Edwards, M. (2015). Ngos, states, and donors revisited: Still too close for comfort? *World development*, 66:707–718.
- Bano, M. (2011). Negotiating collaboration in pakistan: Expertise, networks and community embeddedness. *Public Administration and Development*, 31(4):262–272.
- Bardhan, P. and Mookherjee, D. (2005). Decentralizing antipoverty program delivery in developing countries. *Journal of public economics*, 89(4):675–704.
- Basurto, M. P., Dupas, P., and Robinson, J. (2020). Decentralization and efficiency of subsidy targeting: Evidence from chiefs in rural malawi. *Journal of public economics*, 185:104047.
- Besley, T., Pande, R., and Rao, V. (2012). Just rewards? local politics and public resource allocation in south india. *The World Bank Economic Review*, 26(2):191–216.

- Brass, J. N., Longhofer, W., Robinson, R. S., and Schnable, A. (2018). Ngos and international development: A review of thirty-five years of scholarship. *World Development*, 112:136–149.
- Broussard, N. H., Dercon, S., and Somanathan, R. (2014). Aid and agency in africa: Explaining food disbursements across ethiopian households, 1994–2004. *Journal of development economics*, 108:128–137.
- Caeyers, B. and Dercon, S. (2012). Political connections and social networks in targeted transfer programs: Evidence from rural ethiopia. *Economic Development and Cultural Change*, 60(4):639–675.
- Casey, K. (2018). Radical decentralization: does community-driven development work? *Annual Review of Economics*, 10(1):139–163.
- Chatterjee, S. and Pal, D. (2021). Is there political elite capture in access to energy sources? evidence from indian households. *World Development*, 140:105288.
- Classen, L., Humphries, S., Fitzsimons, J., Kaaria, S., Jimenez, J., Sierra, F., and Gallardo, O. (2008). Opening participatory spaces for the most marginal: Learning from collective action in the honduran hillsides. *World Development*, 36(11):2402–2420.
- Coady, D., Grosh, M. E., and Hoddinott, J. (2004). *Targeting of transfers in developing countries: Review of lessons and experience*. World Bank Publications.
- Dasgupta, A. and Beard, V. A. (2007). Community driven development, collective action and elite capture in indonesia. *Development and change*, 38(2):229–249.
- Ebrahim, A. (2003). Accountability in practice: Mechanisms for ngos. *World development*, 31(5):813–829.
- Fafchamps, M. (2004). *Social Capital and Development*. Department of Economics (University of Oxford).
- Farid, M. and Noguchi, L. (2022). Knowledge communities and policy influence in china. *World Development*, 150:105737.
- Feldman, S. (2003). Paradoxes of institutionalisation: The depoliticisation of bangladeshi ngos. *Development in Practice*, 13(1):5–26.
- Fischer, G., Karlan, D., McConnell, M., and Raffler, P. (2019). Short-term subsidies and seller type: A health products experiment in uganda. *Journal of Development Economics*, 137:110–124.

- Fritzen, S. A. (2007). Can the design of community-driven development reduce the risk of elite capture? evidence from indonesia. *World Development*, 35(8):1359–1375.
- García-López, G. A. (2019). Rethinking elite persistence in neoliberalism: Foresters and techno-bureaucratic logics in mexico’s community forestry. *World development*, 120:169–181.
- Han, H. and Gao, Q. (2019). Community-based welfare targeting and political elite capture: Evidence from rural china. *World Development*, 115:145–159.
- Harrison, T. (2017). Ngos and personal politics: The relationship between ngos and political leaders in west bengal, india. *World Development*, 98:485–496.
- Haseeb, M. and Vyborny, K. (2022). Data, discretion and institutional capacity: Evidence from cash transfers in pakistan. *Journal of Public Economics*, 206:104535.
- Humphreys, M., de la Sierra, R. S., and Van der Windt, P. (2019). Exporting democratic practices: Evidence from a village governance intervention in eastern congo. *Journal of Development Economics*, 140:279–301.
- Kilby, P. (2006). Accountability for empowerment: Dilemmas facing non-governmental organizations. *World Development*, 34(6):951–963.
- Kruks-Wisner, G. (2011). Seeking the local state: Gender, caste, and the pursuit of public services in post-tsunami india. *World Development*, 39(7):1143–1154.
- Kumi, E. and Copestake, J. (2022). Friend or patron? social relations across the national ngo–donor divide in ghana. *The European Journal of Development Research*, 34(1):343–366.
- Lewis, D. (2017). Organising and representing the poor in a clientelistic democracy: The decline of radical ngos in bangladesh. *The Journal of Development Studies*, 53(10):1545–1567.
- Lucas, A. (2016). Elite capture and corruption in two villages in bengkulu province, sumatra. *Human Ecology*, 44:287–300.
- Lund, J. F. and Saito-Jensen, M. (2013). Revisiting the issue of elite capture of participatory initiatives. *World development*, 46:104–112.
- Madajewicz, M., Tompsett, A., and Habib, M. A. (2021). How does delegating decisions to communities affect the provision and use of a public service? evidence from a field experiment in bangladesh. *Journal of Development Economics*, 150:102609.

- Maiden, E. and Brockway, M. (2018). Parlez-vous français? language and agricultural aid allocation strategies in northern mali. *World Development*, 106:356–375.
- Mansuri, G. and Rao, V. (2004). Community-based and-driven development: A critical review. *The World Bank Research Observer*, 19(1):1–39.
- Mansuri, G. and Rao, V. (2012). *Localizing development: Does participation work?* World Bank Publications.
- Martinez-Bravo, M., Mukherjee, P., and Stegmann, A. (2017). The non-democratic roots of elite capture: Evidence from soeharto mayors in indonesia. *Econometrica*, 85(6):1991–2010.
- Mustafa, D., Altz-Stamm, A., and Scott, L. M. (2016). Water user associations and the politics of water in jordan. *World Development*, 79:164–176.
- OECD (2022). Aid for civil society organisations. Technical report, OECD.
- Pan, L. and Christiaensen, L. (2012). Who is vouching for the input voucher? decentralized targeting and elite capture in tanzania. *World Development*, 40(8):1619–1633.
- Panda, S. (2015). Political connections and elite capture in a poverty alleviation programme in india. *The Journal of Development Studies*, 51(1):50–65.
- Platteau, J.-P. (2004). Monitoring elite capture in community-driven development. *Development and change*, 35(2):223–246.
- Platteau, J.-P. (2009). Information distortion, elite capture and task complexity in decentralized development. In *Does Decentralization Enhance Service Delivery and Poverty Reduction?* Edward Elgar Publishing.
- Platteau, J.-P. and Abraham, A. (2002). Participatory development in the presence of endogenous community imperfections. *Journal of Development Studies*, 39(2):104–136.
- Platteau, J.-P. and Gaspart, F. (2003). The risk of resource misappropriation in community-driven development. *World development*, 31(10):1687–1703.
- Prokopy, L. S. (2009). Determinants and benefits of household level participation in rural drinking water projects in india. *The Journal of Development Studies*, 45(4):471–495.
- Ramprasad, V. (2021). Institutional benefit pathways in development. *World Development*, 142:105453.

- Ribot, J. C. (2004). *Waiting for democracy - The politics of choice in natural resource decentralization*. WRI Report. Washington, DC: World Resource Institute.
- Saito-Jensen, M., Nathan, I., and Treue, T. (2010). Beyond elite capture? community-based natural resource management and power in mohammed nagar village, andhra pradesh, india. *Environmental Conservation*, 37(3):327–335.
- Seddiky, M. A., Giggins, H., and Gajendran, T. (2022). Non-drr ngos strategies for livelihood development in the coastal communities of bangladesh: a case study. *Natural Hazards*, 111(2):2155–2175.
- Shin, W., Kim, Y., and Sohn, H.-S. (2017). Do different implementing partnerships lead to different project outcomes? evidence from the world bank project-level evaluation data. *World Development*, 95:268–284.
- Stiles, K. (2002). International support for ngos in bangladesh: Some unintended consequences. *World Development*, 30(5):835–846.
- Takasaki, Y. (2011). Do local elites capture natural disaster reconstruction funds? *Journal of Development Studies*, 47(9):1281–1298.
- Trinh, T.-A., Feeny, S., and Posso, A. (2022). Political connections and post-disaster assistance in rural vietnam. *European Journal of Political Economy*, 72:102097.
- Usmani, F., Jeuland, M., and Pattanayak, S. K. (2022). Ngos and the effectiveness of interventions. *Review of Economics and Statistics*, pages 1–45.

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Estratto per riassunto della tesi di dottorato

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Dottorato: Economics

Ciclo: 36

Titolo della tesi : Essays on Development Economics

Abstract:

This PhD thesis considers and analyses three relevant topics in Development Economics. The first chapter investigates the impact of a public school feeding program, the Indian Mid-Day Meal Scheme, on children's health and cognitive development in the Indian State of Andhra Pradesh. Results display the critical role that the policy had on children's development, not only improving children's health and cognition but also reducing the existing gaps in these two dimensions between students enrolled in private and public schools. The second chapter investigates the impact of receiving Non-Governmental Organisations (NGO) support at the household level on children's food security and time allocation decisions in Ethiopia. I find evidence that receiving NGO support does not significantly improve children's food security but has a decisive impact on daily time use allocation by increasing the time children dedicate to income-generating activities while reducing time spent on household chores. The third and conclusive chapter carries out a literature review on a widespread phenomenon in developing countries: the elite capture of the resources provided by socioeconomic programs. This review collects economic and non-economic evidence of elites' behaviour in developing countries, investigating the mechanisms and understanding whether this phenomenon could be eradicated when programs are run by NGOs.

Questa tesi di dottorato considera ed analizza tre importanti argomenti in Development Economics. Il primo capitolo studia l'impatto di un programma alimentare scolastico, l'Indian Mid-Day Meal Scheme, sullo sviluppo cognitivo e di salute dei bambini nello stato indiano dell'Andhra Pradesh. I risultati mostrano l'importanza della politica nello sviluppo dei bambini, non solo migliorando la loro salute e le loro abilità cognitive, ma anche andando a ridurre le disparità esistenti in queste dimensioni tra bambini iscritti alla scuola privata e pubblica. Il secondo capitolo analizza l'impatto del ricevere supporto da organizzazioni non governative (ONG) in Etiopia sulla sicurezza alimentare delle famiglie e dei bambini e sulle decisioni riguardanti l'uso del tempo di questi ultimi. I risultati dimostrano come ricevere questo tipo di supporto non vada a migliorare la sicurezza alimentare familiare ma ha un impatto nell'allocazione temporale dei bambini andando ad aumentare il tempo dedicato ad attività che generano reddito, sostituendole ad attività che non generano reddito come le faccende domestiche. Il terzo capitolo raccoglie una review della letteratura su un fenomeno ben conosciuto nei paesi in via di sviluppo: la cattura da parte delle elite delle risorse messe a disposizione da parte di programmi di sviluppo socioeconomico. Questa review raccoglie paper economici e non economici che descrivono il comportamento delle elite nei paesi in via di sviluppo, studiandone i meccanismi e cercando di comprendere il ruolo delle ONG nel mitigare questo fenomeno.

Firma dello studente

