DRAFT

How Income Uncertainty Affects Child Labor: Evidence from the Cocoa Households' Financial Diaries

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Abstract

We use data from the Cocoa Households' Financial Diaries to study how income uncertainty affects child labour. The Cocoa Households' Financial Diaries is an on-going research in Ghana aimed at tracking a continuous year-long worth of month-to-month income and other indicators for 360 cocoa producing households' from twenty cocoa districts (twenty-four political districts) in five administrative regions of the country. Some preliminary findings from five months of data collection provide us with clearer understanding of a rarely observed nature of income volatility among cocoa producing households. Our descriptive analysis indicates that where child labor takes place, incomes are consistently lower and also more stable. However, where no child labor occurs, there is probably less economic uncertainty as income from cocoa harvesting during the main crop season could last far longer around the year.

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Introduction

Child labor has been a very crucial developmental and human rights issue in Ghana's cocoa sector. Child labour as defined by the International Labour Organisation (ILO) is work that is mentally, physically or morally dangerous and harmful to children and interferes with their schooling, deprives them of the opportunity to attend school or obliging them to leave school prematurely or by requiring them to attempt to combine school attendance with excessively long and heavy work (ILO, 2013). We examine whether two government-led strategies, the Harking – Engel Protocol (2001) and the Frame Work of Action (2010) have been successful in minimizing child labor by examining a wide range of factors that can lead to higher levels of child labor on the local level by using financial diaries. It is estimated that in 2013/14, 2.12 million children worked in cocoa production in Ghana and The background information that we have now can be. In the case of Ghana, an estimate of children in cocoa-growing households (5-17 year) stood at 2,236,1249 in 2013/14, out of which 1,493,564 representing 66.8% involved in working in cocoa production (Bertrand and Elke de Buhr, 2015).

Specific areas of focus for this research will be to: (1) Understand the concept of child labor, and the composition in the cocoa processes. (2) Investigate the extent of the child labor situation in some cocoa growing communities in Ghana. (3) Identify, analyze and assess the impact of innovation/interventions on children's social circumstances and measures in improving the conditions of cocoa-growing regions. (4) Investigate the contributions of women in the production processes. (5) Investigate farmers' income and

coping strategies being adopted by farmers as far as credit facilities are concerned. (6) Explore policy direction and concrete measures that need to be taken for sustainable change to occur.

International consumers and industries have raised the issue of child labor in cocoa as unethical in the production processes of the commodity and often advocated for a complete abolition and demand that the global chocolate industries plow back their returns to improve the situation as far as child labor is concerned. In respect of this a protocol dubbed "Harkin – Engle protocol" was signed to restrict cocoa-producing countries such as Ghana to ensuring that cocoa beans and their derivatives products are produced in a manner that complies with the ILO convention 182. In Ghana, however, child labor issue is discussed not in isolation but in the context of the socio-economic and socio-cultural environment within which cocoa cultivation takes place. The proliferation of interventions to tackle Worst Forms Child Labor (WFCL) in the cocoa sector in Ghana after the Harkin-Engel Protocol in 2001 has been recognized including Government and industry-led interventions (MMYE 2007, 2008). The National Programme for the Elimination of WFCL in Cocoa sector (NPECLC) under the auspices of the Ministry of Employment and Labour Relations (MELR) was created to intervene and to serve as a framework for governmental interventions. The framework and interventions were put in place from the understanding of economic theories discussion of child labor, which has been based on some shared premises that child labor is a socially undesirable phenomenon and as such its reduction is commendable objective by any society (Jafarey and Lahiri, 2000).

Two significant innovations have been introduced by this public-private initiative: 1) Public Certification System (PCS) as unified, continuous improvement process

(WCFL, 2005) and Child Labour Monitoring and Remediation System (CLMRS) as a data collection and remediation tool, undertaken by the International Cocoa Initiative. Apart from these, individual chocolate industries and other non-governmental organizations are also implementing parallel product certification models using traceability/certification model and fair-trade certification. The question is whether these initiatives have achieved the expected outcome as far as child labor elimination in the cocoa sector or not and whether interventions have been appropriate and led to structural sustainability in the production, marketing and consumption of cocoa products with positive impact on cocoa farm families.

It is observed that the Ghana cocoa sector is predominantly owned and managed by families. It is labor-intensive such that every member of the cocoa household tends to play a role in the family business and to some extent, children are not exempted. Cocoa serves as a source of livelihood for about 800,000 households constituting about 60% of the agricultural base of the country and accounting for about 61% of household income (Bymolt, Laven and Tyszle 2017).

It further is observed that irrespective cocoa contribution to the GDP (i.e., 3357 million in the year 2017), farmers struggle with the accessibility of credit facilities to maintain their farms as well as taking care of their essential needs. Majority of cocoa farmers are not able to source for credit facilities from the banks and other financial institutions because there is none available in the cocoa-growing communities. The few farmers who save with the banks must commute form their communities to the district capitals to access financial institutions. Most farmers have the perception that due to their low level of education, they do not qualify to transact business with them while some are of the view that bank processes are very complex and challenging. To access loans, one

needs to have a security or collateral to benefit from loans, and this serves as a deterrent to cocoa farmers. Indeed, all these factors put together make the cocoa farmers financially stressed and are not able to cater for their basic needs, maintain their farms, hire laborers to work on the farms and cater for their children's need during the lean season. This research will therefore, thoroughly investigate and examine the incomes of farmers and sources of credit facilities.

Women cannot be ruled out of cocoa households and their occupation (i.e., cocoa farming) yet they are always relegated at the background. At the family settings, women play a vital role such as taking care of babies, cooking for the family, and participating in farming activities. Due to the problematic nature of cocoa activities, it is perceived as a male job. The male counterparts seem to take control of cocoa farming yet there are other activities women undertake that without them cocoa production will not be successful. The research, therefore, seeks to examine the extent to which women function in the production processes.

All in all, the main objective of this research is to analyze the extent of child labor situation in the cocoa sector after the signing of the Harking – Engel Protocol (2001) and the Frame Work of Action (2010). It also seeks to examine the structures in place to ensure the total abolishing of the menace while considering gender attributes and income as well as credit facilities available to farmers. By using financial diaries over a year, we add to the scholarship

This research will lead to several theoretical and empirical contributions. There is a substantial body of research on child labor, suggesting that this is highly relevant (Bertrand and Elke de Buhr, 2015; Hütz-Adams, Laven and Tyszler, 2017; Jafarey and Lahiri, 2000; Sam, 2016). These studies are to a large extent, qualitative and have

generated a deep and multifaceted understanding of the general nature of child labor. However, there are few empirically testable models that consider child labor within the cocoa sector. Our use of financial diaries will better measure many of the determinants of child labor that can vary over a year. Gathering data from respondents over the course of a year can uncover many financial issues that could lead to child labor that one time or annual survey research would not (Hannagan and Morduch 2015; Morduch and Siwicki 2017).

A main contribution is to conceptualize and operationalize the concept of child labor, and the composition in the cocoa production process into a measurable empirical phenomenon that can also be used in future studies. The project will increase our knowledge about the extent of the child labor situation in the cocoa sector in Ghana. By investigating to what extent innovations and interventions influence child labor and under what circumstances, we will offer policymakers guidance regarding future policy directions. This study will also address the issue of access to credit and the gender gap in the cocoa sector of Ghana.

Change and Continuity in Ghana's Cocoa Sector

Marketing board policy has long determined the productivity of Ghana's cocoa sector (Vigneri and Kolavalli 2018). Historically at independence Ghana had a large cocoa sector but with declining prices in the early 1980s, the cocoa sector had been cut in half. By the early 2000s, higher global prices and a commitment by the marketing board to raise the earnings of farmers lead to rapid increases in production. Ghana's cocoa sector benefits from having a reputation for high-quality cocoa that sells for more on the global market than most other states (Kolavalli and Vigneri 2011). Some of this is due to the role that the Ghanaian cocoa board plays in terms of ensuring quality.

Market liberalization in Ghana's cocoa sector led to substantial increases in labor productivity and the amount of land used for cocoa farming Teal and Vigneri (2004). The government also created effective programs to help farmers gain access to fertilizer and machinery. These changes helped raise productivity on small farms more than large farms and cut poverty among those working in the cocoa sector by half since 2005 (Vigneri and Kolavalli 2018). Interestingly, the amount of workers in the cocoa sector seems to have declined, although workers do appear to be working more hours (Teal, Zeitlin, and Maamah 2006). In recent years an estimated 6.3 million Ghanaians rely on the cocoa trade for their livelihood (Peprah 2015), making this an essential economic sector that influences the trajectory of the country more broadly.

Despite many improvements in Ghana's cocoa sector, many challenges remain. For instance; supply chain corruption, environmental degradation, and incursions on Ghana's economy by the oil industry threaten the livelihoods of many connected directly to the cocoa trade (Peprah 2015). Children working in Ghana's cocoa industry are exposed to a wide range of health risks, especially pesticides and overly strenuous work (Mull and Kirkhorn 2005). A significant reason for this is that children have a lack of training, and there is a general lack of education about the health risks that cocoa producers face.

Smuggling cocoa to the Ivory Coast from Ghana is common (Amankwah-Amoah, Debrah and Nuertey 2018). Also, farmers lack options on a local level in terms of selling their cocoa so traders often use scales and price estimates that are well under market value. However, since farmers often have few choices and it would be more expensive to transport their cocoa to a region where they could get a fairer price they are often left with no option but to sell to cocoa companies that are ripping them off. In some regions of Ghana, there is an "institutional void" that has allowed unfair practices and smuggling to

systematically take place.

In theory, Ghana could gain far more wealth from its cocoa production if it was processed within the country. However, there is a paradox to processing cocoa in Ghana (Mulangu, Miranda, and Maïga 2015). Lowering the price of beans would make firms more likely to produce more cocoa but would lower profits along the supply chain. Cocoa processing firms dropped their amount of workers from 442 in the early 2000s to 117 in 2015 (Mulangu, Miranda, and Maïga 2015), thus favorable policies to encourage cocoa processing might not result in the high levels of local employment.

Child Labor and Household Dynamics

In the study of child labor it is clear that household dynamics matter but there is a lot of debate about what is important or how this should be modeled. For instance, Basu and Van (1999;416) provide a simple and influential model of how child labor can exist as economic equilibria: "The Luxury Axiom: A family will send the children to the labor market only if the family's income from non-child-labor sources drops very low. The Substitution Axiom: From a firm's point of view, adult labor and child labor are substitutes. More specifically, child labor can be substituted by adult labor." Using this model, they argue that banning child labor can have adverse effects. They assume, in contrast to other theories (Baland and Robinson 2000; Bommier and Dubois 2004), that parents only have their children work out of economic necessity. If there are multiple equilibria, one in which adult wages are low, and children do work and another in which adult wages are high, and children do not work, then banning child labor makes sense. When a society is caught in the former equilibrium, which is likely the case in developing countries, then legislation to end child labor might have little effect and might lead to even worse forms of child labor. At times bans on imports that are tied to child labor can lead to fewer

opportunities for children to work in areas that lead to export goods, but probably have little influence on preventing child labor for products that are used in the domestic market. Thus, in some cases, bans on imports tied to child labor can be a form of economic protectionism.

Other models add to Basu and Van (1999). For instance, Fan (2011, 27) adds two conditions "(1) parents care about both children's leisure and their human capital, (2) a child's human capital formation depends on both money input and her time input." In contrast, Bommier and Dubois (2004) argue that there may be a "rotten parents effect" where parents will have their children work at a high level thus undermining their ability to get the human capital that would allow them to make more money as adults. This dynamic might exist even if parents expect to get monetary transfers of wealth from their children as adults. Thus, child labor might not take place out of economic necessity it might have more to do with the beliefs and tradeoffs that parents are willing to make.

Increases in global wealth have not necessarily resulted in decreases in child labor, thus causing a sort of paradox that past models of child labor have difficulty accounting for. Sarkar and Sarkar (2016) call this the "child labor trap" that has been accelerated by globalization. According to these authors, globalization has brought about considerable inequality that has resulted in many children being caught in the equilibria identified by Basu and Van (1999) in which adult wages are low, and children work. Thus, banning child labor in contexts with these equilibria might lead to lower levels of human capital among children and hurt their ability to gain the human capital for future generations to get out of this "trap." Sarkar and Sarkar (2016) argue that policy proposals to get out of this "trap" should include promoting education that is good enough to advance future economic opportunities of students and improvements in healthcare that will also lead to

declines in child labor. This complements an earlier model by Swinnerton and Rogers (1999) who argue that when child labor exists in wealthier countries it is often due to income inequality; thus government redistribution of wealth can lead to an equilibrium in which child labor is less likely. Interestingly, some studies find that the number of children in a household does not affect how much time any specific child would spend working (Ray 2002).

Another influential household model of child labor is given by Baland and Robinson (2000), who present a model that portrays child labor as a trade-off with the human capital that children can gain from school. Even though child labor is often an economically inefficient choice for parents, they may often lack the information to understand the negative externalities that can exist from child labor. Thus, banning child labor may sufficiently raise the costs to discourage child labor when the long term economic inefficiency of child labor is not apparent to parents. Child labor can be viewed as a sort of borrowing mechanism in which parents forgo higher future earnings if children can more human capital for lower but immediate payoffs if their children work in the present.

Finally, some empirical studies that look at household dynamics. Sam (2016) finds that the two significant factors that explain child labor in Ghana's cocoa sector are household poverty and that parents who were once child laborers themselves are more likely to have their children work. This suggests a sort of intergenerational dynamic. In a very large study, Webbink, Smits and De Jong (2015) use data on 168,000 children in 16 states across Africa and Asia. They find that the wealth and education level of parents is the primary factor in whether or not their children will be involved in child labor.

Poverty and Child Labor

It would seem intuitive that household poverty would be a significant determinate of

child labor, however in the literature of child labor the results have been mixed with household poverty often not having as much of an influence as some of the theoretical literature would predict (Canagarajah and Coulombe 1999; Deb and Rosati 2002; Ray 2002). Drawing on survey data from Ghana and Pakistan, Bhalotra and Heady (2003) find that in agricultural societies the more land owned by parents, the more likely children are to work and the less likely they are to go to school. This is what the authors call the "wealth paradox" in which most child laborers in modern societies work in the agricultural sector and the vast majority of child laborers would on their parent's farm. These findings are in contrast to the assumptions by Basu and Van (1999) that child labor is only likely for impoverished households. Bhalotra and Heady (2003) hypothesize that child labor exists for larger farm owners because they prefer family members, who are children, to adult laborers whom they would likely have to pay more and would have more difficulty controlling. Also, labor shortages or a simple lack of available adult laborers may lead to more child labor on large farms.

Rogers and Swinnerton (2004) argue that in low-income families, children often transfer money to their parents, to some degree as repayment for allowing them to go to school instead of working as children. In wealthier families, adult children will no longer see transfers of money as being necessary; thus parents will be less likely to send their kids to school because it is less likely they will ever be repaid. Household poverty can lead to a lower level of schooling, but this does not necessarily lead to child labor (Canagarajah and Coulombe 1999).

Studying rural Vietnam from 1993-1998, Edmonds and Pavcnik (2005) find that increases in rice prices brought about by globalization lead to lower levels of child labor, especially in households that were large producers of rice. They theorize that the main

reason for this is higher earnings overall and while this would extend to child labor, households usually used these improved earnings to avoid labor for their children. Thus, a bad on imports from countries that have ties to child labor would appear from this study not to produce the desired effects as more economic demand brought about by globalization leads to lower levels of rural child labor in Vietnams rice sector.

The conditions under which household poverty influences child labor in Ghana, if it does at all, is unclear when examining studies that focus on Ghana. Adonteng-Kissi (2018) used multiple in-depth interview techniques to find that there are differences in how rural and urban Ghanaians view child labor. Rural Ghanaians view work as part of a child's socialization process, especially those who adhere to more traditional cultural views. Many Ghanaians view work by children that may include hazards negatively, in rural areas, cultural beliefs are seen as the major contributing factor, whereas in urban areas, it is extreme poverty. Alternatively, using surveys from Ghana and India, Deb and Rosati (2002) find that poorer households with less parental education are more likely to send their children to school and that the level of child labor is unaffected by income levels. Hamenoo, Aprakru, Dwomoh, and Dako-Gyeke (2018) find that a significant reason why children in Ghana participate in child labor is that relevant laws are weakly enforced and the government has been unable to provide resources to poor households as a disincentive to use child labor as a source of income. Thus, a big part of the connection between poverty and child labor may have as much if not more to do with poor governance in certain geographical areas as household poverty does.

Other influences on Child Labor?

There is a longstanding correlation between the quality of schooling and the

likelihood of child labor (Sarkar and Sarkar 2016), especially with older children (Ray 2002). Abou (2016) finds that in the Ivory Coast controlling for other significant variables, children who have access to schools with water and electricity will be less likely to engage in child labor. Abdul-Mumuni, Vijay, Camara (2018) find that foreign remittances lead to a lower level of child labor in Ghana, mainly if the head of the household is female. Looking at 11,000 members of cocoa households, Nkamleu and Kielland (2006) find that older children work on cocoa production at a far higher rate.

In much of the literature on child labor, there seems to be a difference between the type and amount of labor that girls and boys do. Canagarajah and Coulombe (1999) find that the more education a father has, the less likely his children will work and this effect is higher for girls than boys. Girls tend to do more unpaid household work while boys have a higher likelihood of doing paid labor Canagarajah and Coulombe (1999).

Certification Schemes

There is a wide-ranging and active debate about whether policy changes or government programs can lessen child labor. Reviewing 33 impact evaluations on different programs to combat child labor, Dammert et al. (2018) find that programs that reduce household vulnerability to economic decline usually result in a low level of child labor. On the other hand, programs that increase demand for adult labor, such as micro-finance programs, appear to also lead to a higher level of child labor. However, Dammert et al (2018) find that there are interesting levels of variation between studies and programs that point to the need to further research on strategies to lessen child labor.

Asamoah et al. (2018) argue that in Ghana's Ashanti region, “child labor” has become an integral part of the production process, particularly at the harvesting stage. They find that many local farmers feel as though NGO’s do not understand that children

can learn valuable skills and contribute to the overall wealth of the region and that these dynamics lead to more educational opportunities for children. Furthermore, many children will one day take over their parent's farms, and if the participation of children in the cocoa production process drops significantly, so will production levels thus leading to a more impoverished region overall.

Some scholars are critical of schemes to end child labor on a universal level. For instance, Maconachie and Hilson (2016) study child miners in the Kono district of Sierra Leone and find that in this context child labor can help relieve extreme poverty and that through working some children can afford to attend a school that would not be able to otherwise. Jonah and Abebe (2018) find that in Amansie West District, Ghana child miners have also used the income to access education that they would not have had access to otherwise. Luckstead, Tsiboe and Nalley (2019) use a farm-household model and find that Ghana's cocoa board could eliminate most forms of hazardous child labor by paying 2.81 percent more. However, eliminating all forms of child labor would require Ghana's marketing board to raise prices over 50%, thus making this implausible. In some cases, such as the Harkin Engle Protocol, bans on exports tied to child labor might move this labor toward agricultural good that will be sold domestically. The existence of Ghana's monopsony gives the country a higher possibility of being able to monitor child labor and being able to export cocoa without the taint of child labor could have economic benefits. However, while consumers in developed countries prefer products that are not tied to child labor there are limits to how much they are willing to pay for this.

There is evidence that in Ghana more government intervention may lead to desirable outcomes. Owusu-Amankwah (2015) compare regions in Ghana and finds that the government-run community-based child labor monitoring system has led to a lower rate

of child labor, particularly hazardous labor. On the other hand, business-led certification schemes have the potential to lessen child labor, but if this has happened is not clear.

Financial Diaries

Our contribution to the above literature is to examine the determinates of child labor by using financial diaries. Most survey research is done once, or annually but by doing multiple surveys within a year, we hope to comprehensively uncover the determinants of child labor in the short term. This type of survey research has been found to be particularly useful in studying poverty in the United States, as research using financial diaries has found that many people fall in and out of different definitions of poverty over the course of a year (Hannagan and Morduch 2015; Morduch and Siwicki 2017). Thus, one time or annual surveys cannot measure the dynamics of poverty as well as multiple surveys over the course of a year.

A few studies use financial diaries to study economic behavior in Ghana (Dzokoto and Appiah 2014; Awunyo-Vitor 2015). These studies examine the ability of Ghanaians to access financial instruments. There is a lot of recent research using financial diaries to study the determinants of poverty, for instance, in India (Saxena and Punekar 2020), Bangladesh (Linares and Su 2020), and Uganda (Smits and Günther 2018). While these studies do not examine the determinants of child labor, they illustrate the usefulness of financial diaries for explaining economic outcomes related to short-term economic calculations. This likely applies to child labour.

Data

The Cocoa Households' Financial Diaries is an ongoing research project tracking the financial activities of 360 cocoa producing households in Ghana and 120 of their counterparts in Ivory Coast over the course of 12 months. In this paper, we present

preliminary results for 280 households from Ghana whose baseline survey and five months of financial diaries data have been collected.

The Cocoa Households' Financial Diaries follows the traditional financial diaries method and also applies the tradition method of data collection by field researchers. We first conducted a baseline survey for all the household. Then by following the traditional financial diaries method, diaries are given to the households to record information on their income, expenditures, assets and loans as well as economic activities. Enumerators use phone calls to collect the information captured in the diaries every fortnight and in situations where there is a difficulty in contacting the head of the household through the telephone, the enumerator pays the household a visit to collected the recorded information.

We aimed to use the two weeks' phone call data collection and a follow up enumerator meetings with the households within the month to ensure data quality and to minimize reliance on long periods of recall. For the past five months since the study started, 12,828 income and expenditure flows and 7,710 economic activities have been collected. The high-frequency nature of the data means that we are in position to capture every income and expenditure of the household, their sources, and the type of economic activities that the household engages besides cocoa production. The collected data will also give us the chance to identify consistencies in the reported baseline survey child labour indicator.

Our baseline survey took place on two different periods; the first was which covered 98 households from two cocoa districts took place in February and March 2020, while the scale-up survey covering 182 households from 12 cocoa districts was happened in June 2020. During the baseline survey, households were interview with respect to their socio-demographic and socio-economic situations. The socio-economic interviews

covered income and expenditures as well as economic activities and child labor.

The financial diary survey started in July 2020 and it is still on-going. In this survey, data is being collected on various outcomes variables which includes, economic activities, expenditures, income, and asset as well as credit and loans. Since our aim in this paper is to examine income uncertainty and child labour, we discuss the economic activities and income data in detail. The economic activities data that we are collecting include non-farm activities like wage and salary work, domestic work, farm activities, non-farm activities, family help non-farm and non-productive agriculture as well as apprenticeship. Some cocoa farm activities for children in the household depending on their age were asked. Examples are, clearing of forest and felling of trees, bush burning working with agro-chemicals and others. We also ask about hours of work. The analysis in this paper basically covers hours of work. The financial diary income data covers income from; sales of coca beans, food stuffs, additional livelihoods (i.e., on-farm activities like day labour, masonry, mechanic works and others) and remittances.

Child labour DefinitionIn our empirical analysis we measure child labour following the International Labour Organization (ILO) definition of child labour. The definition is based on the ILO Conventions C138 from 1973 and C182 from 1999. According to the convention, a working in hazardous occupation is automatically classified as a child labour. In our study, these are jobs that are classified as Worst Forms Child Labor in the cocoa sector. These jobs may include clearing of forest/felling of trees, using machetes and long cutlass for weeding and others. In the case of non-hazardous occupation, child labour depends on age and hours of work. Any child below 12 years who work for more than 1 hour per week, children between 12 and 13 who work more than 14 hours per week and juveniles between 14 and 17 who worked more than 43 hours per week are classified

as child labour (Landmann and Frolich 2015). In both the baseline and the financial diaries surveys our questionnaires capture information on hours of work on all activities mentioned above. Potential child labourers in our sample are children aged 5 years or older.

Results

Since this study is an on-going one, hence, we would like to share with our readers some brief descriptive statistics from the baseline survey and five months of data collected from the financial diaries survey.

From the descriptive statistics, we can see that in our sample, child labor takes place almost 32% of the time. Among all respondents, 47.3 are men, and the average age is just over 30. Of individuals in the sample, 34.4 percent are married.

Table 1: Descriptive statistics at baseline for individual members

	N	Mean	Std. Dev.
Hours of work	1172	20.039	13.129
Dummy for children under 12	1172	.212	.409
Dummy for children under 17	1172	.314	.464
Children under 18	1172	2.148	1.719
Child labor	1172	.317	.466
Gender (Male = 1)	1172	.473	.499
Age	1150	30.131	21.276
Number of adults	1172	3.027	1.432
Number of women	1172	1.509	.994
Number of men	1172	1.123	.95
Married	1153	.344	.475
Consensual Union	1153	.009	.093
Separated	1153	.003	.059
Divorced	1153	.029	.169
Widowed	1153	.047	.211
Never Married	1153	.35	.477

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Table 2: Descriptive statistics at baseline for household heads

	N	Mean	Std. Dev.
Hours of work	280	20.368	14.419
Dummy for children under 12	280	0	0
Dummy for children under 17	280	0	0
Children under 18	280	1.579	1.498
Child labour	280	.254	.436
Gender	280	.629	.484
Age	258	53.229	13.389
Number of adults	280	2.607	1.271
Number of women	280	1.243	.887
Number of men	280	.989	.853
Married	261	.72	.45
Consensual Union	261	.011	.107
Separated	261	.008	.087
Divorced	261	.08	.273
Widowed	261	.149	.357
Never Married	261	.023	.15

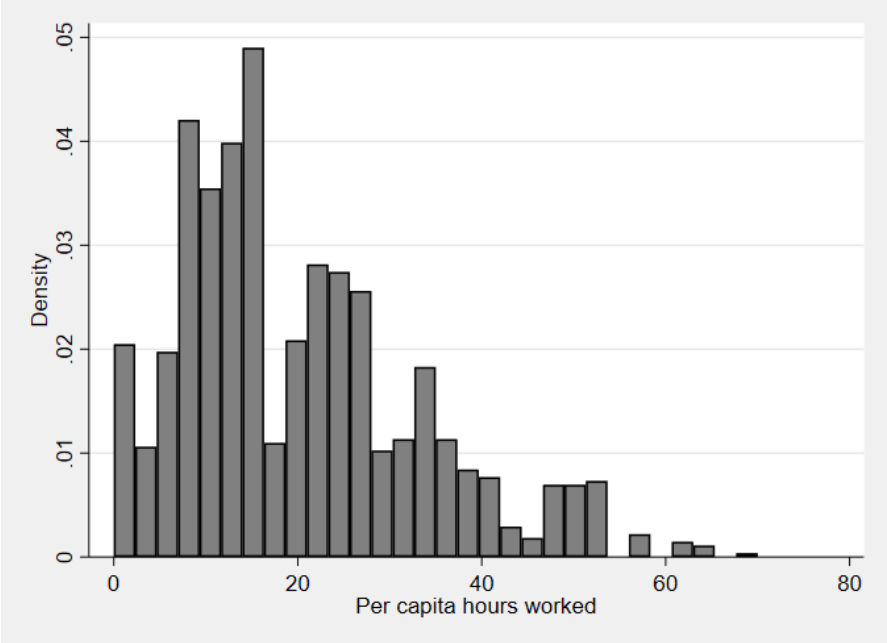
Looking at households, child labor takes place about one fourth of the time. In our sample, about 63 percent of household heads are men, 72 percent are married, and the average age is about 53. Households, on average, have 2.6 adults and 1.5 children under 18.

Table 3: Household income and their sources (July to November 2020)

	N	Mean	Std. Dev.
Total income (Monthly, GHS)			
Non-farm income	186	583.914	651.327
Income from sales of food stuffs	422	668.299	1584.366
Remittance income	79	335.253	275.424
Sale of food	506	1562.725	1523.503
Total	839	1439.635	1956.819
Per capita (monthly, GHS)			
Non-farm income	186	194.062	252.082
Monthly crop income	422	172.73	407.493
Monthly remittance in	79	122.156	99.59
Monthly cocoa income	506	465.663	497.623
Total	839	422.245	563.774
Proportion of household receiving income from these sources			
Non-farm income	839	.221	.415
Sales of food stuffs	839	.465	.499
Remittance income	839	.094	.292
Cocoa income	839	.592	.492

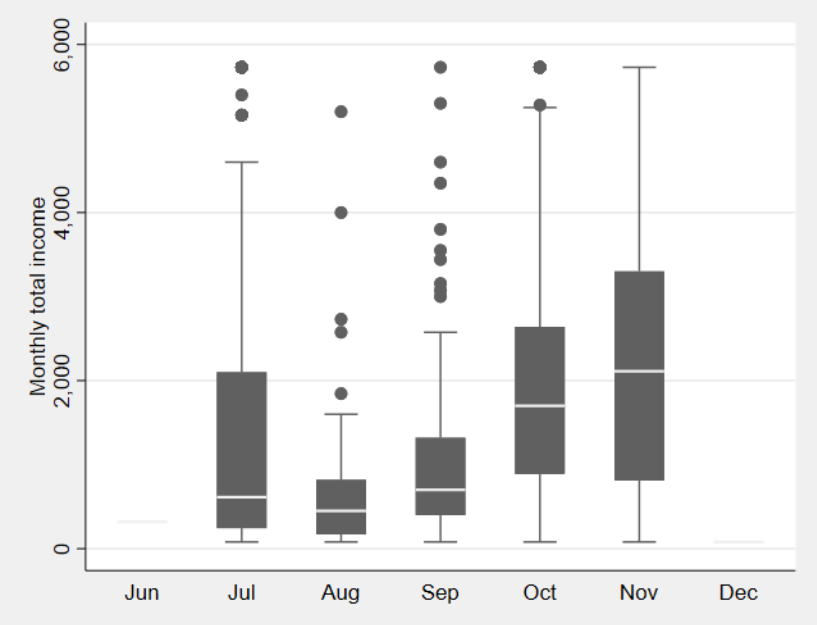
We can see from this figure that monthly income varies drastically among participants in our sample. During the cocoa harvesting season in October and November, most respondents' household income is far higher than in other months. Thus, this leads to uncertainty over time and a lack of employment or viable jobs for the rest of the year. Some farmers who make enough during harvesting might be able to save enough to get by the rest of the year, but for many, this presents an uncertain challenge. Furthermore, the amount that farmers make during harvesting is somewhat predictable, given the cocoa marketing board's incentive to pay a predictable price to farmers. However, the size of one's crop might vary from year to year. Thus, the ability to use savings from the cocoa season for the rest of the year may vary considerably, and for those who do not make enough to get by on the rest of the year, savings from harvesting season might not be an option.

Figure 1: Per capita hours worked



We can see from this sample that among our respondents, the number of hours worked per week varies heavily, with many respondents working around 15 hours a week. Still, a sizable amount is also working over 40 hours a week. This suggests that in our survey, there is a lot of uncertainty over how many hours' people will work week to week and that for many, they do not have a full-time job. Thus, many of our respondents likely have to rely on informal and seasonal work.

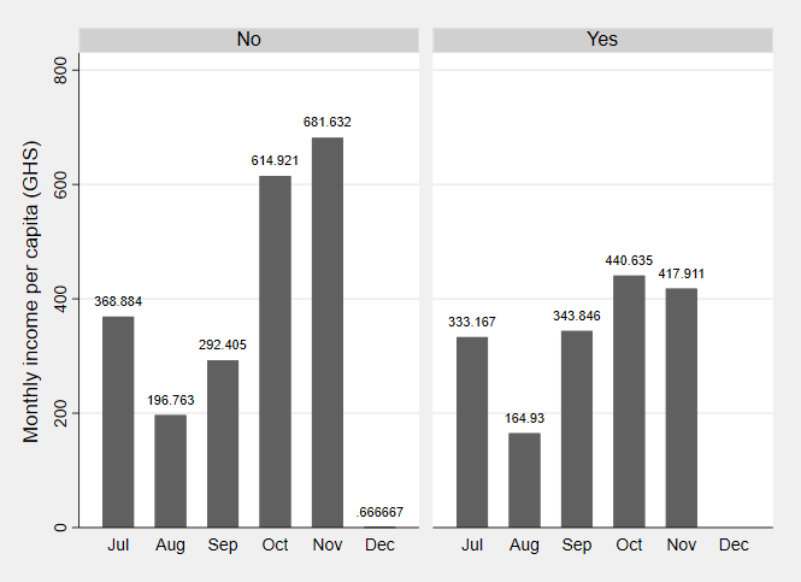
Figure 2: Distribution of Monthly Income of households



We can see from this figure that monthly income varies drastically among participants in our sample. During the cocoa harvesting season in October and November, most respondents' household income is far higher than in other months. Thus, this leads to uncertainty over time and a lack of employment or viable jobs for the rest of the year. Some farmers who make enough during harvesting might be able to save enough to get by the rest of the year, but for many, this presents an uncertain challenge. Furthermore, the amount that farmers make during harvesting is somewhat predictable, given the cocoa

marketing board's incentive to pay a predictable price to farmers. However, the size of one's crop might vary from year to year. Thus, the ability to use savings from the cocoa season for the rest of the year may vary considerably, and for those who do not make enough to get by on the rest of the year, savings from harvesting season might not be an option.

Figure 2: Distribution of Monthly income per capita by child labor status



Here we can see that in those households where child labor takes place, income is consistently lower. This is notable as in Ghana; it appears as though child labor is correlated with lower payments. Where child labor takes place, incomes are consistently lower and also more stable. However, where no child labor occurs, there is probably less economic uncertainty as income from cocoa harvesting season in October and November could last far longer around the year. It is notable that in this group, revenue more than doubles from previous months.

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