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Impact of Cash Transfers Programme on Agricultural Production in Kenya: Focus on the Orphans and Vulnerable Children

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Abstract

Orphans and children from low-income households are especially vulnerable to the adverse effects of a widening wealth gap, given their position at the bottom of the social hierarchy. The majority of these households reside in rural areas and are primarily involved in farming activities. Governments can employ initiatives such as cash transfers (CTs) to alleviate the impact of economic uncertainty on the impoverished. After the implementation of the cash transfer program targeting orphans and vulnerable children in Kenya, this paper focuses on analysing its impact on agricultural output and labor supply. Employing a difference-in-differences estimation method, the study revealed that families of orphans and vulnerable children who received cash transfers experienced an 8.5% increase in agricultural output. Expenditure on labor supply and recruitment of employees for agricultural activities within households headed by orphans and vulnerable children surged by 121% following the program's initiation, as compared to households led by non-orphans and non-vulnerable children. These findings offer further evidence supporting the necessity for governments to augment both direct and indirect cash transfers to marginalized populations, particularly orphans. This underscores the significant impact cash transfers wield on their overall quality of life. Implementing affirmative policies targeted at these groups remains crucial for bolstering their social well-being. Future studies should include youths who are ravaged by high rates of unemployment due to limited

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opportunities within various governments.

Keywords: Orphans, OVC, Cash Transfer

Introduction

According to the Food and Agriculture Organization (FAO, 2012), 1.5 billion individuals in the developing world reside in smallholder households, contributing to 80 percent of Sub-Saharan Africa's (SSA) food production. Notably, it is estimated that over 800 million individuals worldwide suffer from hunger, representing nearly 11 percent of the global population (FAO, 2015). The majority of these individuals reside in low-income and middle-income countries.

Sub-Saharan Africa (SSA) is the only region of the world where the rural population will continue to grow beyond 2050 (Jayne et al., 2017). In Kenya, the agricultural sector contributes to over 33 percent of the Gross Domestic Product (GDP), providing employment for over 40 percent of the total population, with more than 70 percent residing in rural areas (Republic of Kenya, 2019). According to the World Bank (2028), the agricultural sector contributes to more than 51 percent of Kenya's GDP, with 26 percent attributed directly and 25 percent indirectly. It also generates 60 percent of the country's employment opportunities and accounts for 65 percent of its exports. Ultimately, this sector stands as the cornerstone of Kenya's economy, supporting a significant portion of the vulnerable population for their livelihoods.

Agricultural productivity has remained stagnant since Kenya gained independence. This stagnation has really affected the poor living in rural areas, which bear the brunt of the sector's fluctuations and shocks. However, some contributing factors to this stagnation include the continued reliance on outdated technological methods and the prohibitive cost of inputs. While the absolute number of Kenyans employed in farming has been on the rise, as a proportion of the overall workforce, this figure is declining (Yeboah & Jayne, 2016). Despite the increasing number of workers in farming, there have been concerns regarding declining productivity. The productions of maize yields per hectare in Kenya were lower in 2014 compared to 1994 (World Bank, 2018). Research spanning 1990-92 and 2014-16 revealed that Kenya was among the few countries selected in Sub-Saharan Africa to undergo an overall decline in maize yields (Wiggins, 2018).

The impact of low agricultural production is particularly notable among low-income households, as they lack the financial means to access necessary farming inputs and employ suitable technology, especially orphans and vulnerable individuals who face challenges in borrowing due to lack of collateral. This situation exposes them to credit rationing, stemming from

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asymmetric information or government policies (Feder et al., 1990). Given the worrying statistics of the vulnerable and the growing recognition, there is need for social safety nets. These programs aim at protecting households from poverty and the devastating consequences, even as nations strive for economic growth (de Janvry et al., 2006). According to World Bank (2013), households tend to respond to negative income shocks through strategies that make it possible to maintain their normal level of consumption. However, poor households often lack access to mechanisms facilitating consumption smoothing, such as insurance and credit. The coping strategies employed by the poor, including orphans and vulnerable children (OVC), differ significantly from those of rich households (Carter, Little, Mogues & Negatu, 2007).

With the increasing concerns about this low productivity, government and non-governmental organizations (NGOs) have come up with various programs aimed at reducing rural poverty. While efforts seek to diversify income sources for farmers, increasing smallholder production remains integral to enhancing farmer livelihoods. Most cash transfer programs primarily target poverty alleviation and food insecurity, with the aim to improve education, health status, and nutrition (Slater, 2011). These initiatives particularly focus on vulnerable groups in the society such as children, women, and orphans.

The cash transfer scheme implemented in Kenya is known as the Hunger Safety Net Programme (HSNP), which was initiated in 2008. Its primary objectives are poverty reduction, addressing food insecurity, and fostering asset accumulation within the arid and semi-arid regions of Kenya. According to Hennessy (1998), the willingness to take risks, often stimulated by increased liquidity or reduced risk aversion due to cash transfers, may prompt farmers to expand production through amplified input use. This includes investing in fertilizers and improved seeds, thus increasing farm production. In addition, cash transfers are noted to prompt short-term stimulation of agricultural production by altering household labor dynamics and increasing demand for hired labor. This is primarily driven by investments in farm technologies and the encouragement of households to engage in riskier activities, which leads to higher returns (FAO, 2015).

Although cash transfers (CT) play an important role in creating social safety to the vulnerable, Ferguson (2015) argued that African CT programs are part of a new politics of distribution across the continent involving distributive transfers from government to citizens. Another important characteristic indicates that most food-insecure households live in poverty, possessing few or no assets. Many lack land and those who do often possess land have very small plots. In addition, these households commonly experience a high dependency ratio. This prompted the need for policy action

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to enhance the capacity of poor and vulnerable people to protect them from poverty and create better ways to manage risks and shocks (OECD, 2009).

In Zambia, Lawlor et al. (2019) showed that cash transfers allowed households to thrive during the agricultural production and price shocks. Their randomized study revealed significant increases in both food consumption and overall food security.

Kilburn et al. (2016) found that cash transfers led to increase in food production among orphans, showing positive and significant impacts on both orphan and non-orphan males from treatment households, as indicated by their improved Hope scores. Several empirical studies conducted in Kenya have examined the effects of cash transfers. For instance, Covarrubias et al. (2012), utilizing the Differences-in-Differences (DID) approach, observed that growth in agricultural production correlated with heightened ownership of agricultural tools and livestock. Furthermore, Haushofer and Shapiro (2016) conducted a study in Kenya, presenting evidence that Unconditional Cash Transfers (UCTs) significantly impacted psychological well-being, resulting in an overall increase in satisfaction. The treatment fostered elevated consumption patterns and savings through durable goods purchases and investments in self-employment activities. There is no clarity on the impact of the cash transfers in Kenya on agricultural production among the OVC families. This study examined how cash transfers affected the CT-OVC. It used DID and instrumental variable (IV) methods, leveraging the three waves of data collected by Oxford Policy Management (OPM) for UNICEF in the supported districts (Garissa, Homa Bay, Kisumu, Kwale, Migori, Nairobi & Suba) from March to August 2007. Specifically, the study aimed to determine whether monetary transfers had an effect on agricultural output among Kenya's orphans and vulnerable children (OVC). In addition, the study sought to investigate whether these monetary transfers influenced the involvement of OVC in agricultural labor.

Literature review

Kilburn et al. (2016) conducted a study focusing on young people, employing a logistic regression model. Their findings suggested that participation in the cash transfer program correlated with improved mental health outcomes. Notably, the study primarily centred on young men, highlighting the strongest effects among older males aged 20–24 years. However, significant impacts were observed among orphans. They noted that those who were treated showed fewer depressive symptoms and were more hopeful about their lives. As a result, they experienced improved overall health compared to their previous condition. Furthermore, it was noted that the positive impact of the program was stronger among the subgroup of orphans, who consisted up to 54 percent of those who were involved. Orphans and non-

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orphan males from treatment households registered positive and significant impact on their Hope scores.

The South African study by Hajdu et al. (2020) investigated the long-term productive effects of cash transfers on the livelihood of rural households. The findings of the study suggested that households who received more income were better-off in some ways relative to those who received less income. They showed a positive correlation between receiving more CSG income and owning productive assets such as fridges, cellular phones and ploughs, rearing of poultry, and crops production. Women bought these items using program CSG income accumulated in local savings group. Maluccio (2010) utilized household panel data surveys conducted in both intervention and control areas of RPS before the program's inception, initially in 2000, and subsequently in 2001, 2002, and 2004. The findings suggest enduring effects, notably an upsurge in child health and educational investments. The study highlighted limited evidence, indicating that the program led to increased investments in other aspects within the rural localities where it was implemented. The researchers utilized a randomized community-based evaluation method to fulfill their study objectives. The empirical analysis conducted in Lesotho by Prifti, Daidone, and Davis (2019) focused on assessing the impacts of cash transfers through a randomized control trial within Lesotho's Child Grants Program. Their findings presented compelling evidence that the cash transfer initiative resulted in a significant 33.5 percent increase in farm production. However, none of these impacts were achieved through changes in farm labor use. There was also no evidence of the impact of significant changes in the use of hired-in labor.

Using the household and individual-level data in Sub-Saharan Africa, Daidone, Davis, Handa, and Winters (2019) concluded that cash transfers significantly impacted the livelihoods of beneficiary households in agricultural activities, with varying effect from country to country. The impacts in Ethiopia, Kenya, and other nations were more selective in nature, while the LEAP program in Ghana witnessed fewer direct impacts on productive activities. Cash transfers reduced adult agricultural wage labor in all countries except Ghana and Zimbabwe. Agricultural wage labor and even many non-agricultural activities in rural areas were referred to as a “refuge” sector, where poor households work to survive, mitigate agricultural uncertainties, and acquire immediate cash flow. In Zambia, a notable shift occurred in agricultural wage labor participation, resulting in substantial increments of 20 days dedicated to farm work and a rise in the establishment of nonfarm businesses.

Haushofer and Shapiro (2013) found that employing randomized controls revealed a significant impact on consumption, showing a rise from $157 to $194 per month within four months of initiating the transfer. They

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established differences between female and male households in consumption, production, and investment decisions.

The study utilized a two-level cluster-randomized controlled trial. It employed both within-village and across-village treatment estimates for estimation purposes, all of which were deemed valid.

Haushofer and Shapiro (2016) conducted an empirical study examining the effects of unconditional cash transfers (UCTs) on significant economic and psychological outcomes. The investigation focused on the program implemented by the NGO GiveDirectly in Kenya between 2011 and 2013. During this period, GiveDirectly distributed UCTs, amounting to at least USD 404 per individual, to randomly selected impoverished households in western Kenya using M-Pesa. The GD program serves as an excellent testing ground for researching the impacts of unconditional transfers since many existing programs tend to provide relatively minor monetary assistance. The study further provided evidence indicating that UCTs had a sizable effect on psychological well-being, with a 0.16 std. dev. increase in happiness and a 0.17 std. dev. increase in satisfaction. They also found a 0.26 std. dev. reduction in the level of stress. The treatment effects increased both consumption and savings through durable goods purchases, along with increased investment in their self-employment activities.

Taylor et al. (2013) evaluated general equilibrium impacts of cash transfers using the Monte Carlo methods in the LEWIE analysis. It was established that there was a significant positive spill over from transfers to orphans and vulnerable children. Their simulation was based on both direct and indirect effects to the relevant household groups. Furthermore, the findings suggested that interventions to loosen constraints on the local supply response were critical to avoid inflationary effects and maximize the real impact of transfers on local economies.

The study conducted by Todd, Winters, and Hertz (2020) explored how the Oportunidades program affected agricultural production in Mexico. They assessed its indirect influence on food consumption sourced from personal production and its direct impact on land use, livestock ownership, and expenditure related to crop production. Specifically, the program elevated the likelihood of consuming several highly nutritious self-produced foods, such as fruits, vegetables, and meat, by a margin of 16 to 32 percent. This implies that cash transfers directly correlated with the increase in agricultural productivity. According to the results, there was general increase in land use, livestock ownership, and expenditures on crop production. In addition, a significant increase was observed in the likelihood of expenditures on agricultural inputs during the autumn season. An upsurge in livestock ownership associated with the program was also evident during the spring season.

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Cash transfers play an important role in ensuring food security in Sub-Saharan Africa (Burchi, Scarlato & d'Agostino, 2018). Kenya is among the countries in Sub-Saharan Africa where cash transfers were found to affect food security outcomes on household dietary variety. They clearly demonstrated that cash transfers have had significant and positive impact on the way households achieved food security through the accumulation of productive assets. Therefore, it was concluded that cash transfers play a vital role in reducing monetary poverty as well as enhancing access to food by the households, especially if they account for important aspects related to design and implementation.

Covarrubias, Davis, and Winters (2012) conducted a study focusing on the productive outcomes of the Malawi Social Cash Transfer scheme, while looking beyond its primary social protection function. The analysis scrutinized the program's influence on productive activities, and data were collected from 365 treatment households and 386 control households. Also, complete questionnaires were gathered during pre-treatment and post-treatment rounds of data collection spanning the 2007–2008 period. Through the use of Difference-in-Differences (DID) approach, a causal relationship was established between the program and increased ownership of agricultural tools and livestock, indicating that these agricultural investments were a direct result of the program. Furthermore, households reduced participation in low-skilled activities, such as agricultural wage labour and “ganyu” work, which is associated with vulnerability in Malawi.

The Zambian study conducted by Lawlor, Handa, Seidenfeld, and the Zambia Cash Transfer Evaluation Team (2019) utilized panel data obtained from the randomized rollout of the Zambian Child Grant Programme. This study tracked 2515 households in rural Zambia between 2010 and 2012, which encompassed a time marked by widespread droughts, floods, and other negative shocks in the regions. It was concluded that cash transfers allowed households to thrive during the agricultural production and price shocks. This is in addition to increased food consumption and overall food in the randomized study. The impact was more favorable to the households living in communities with widespread agricultural production and price shocks.

Multiple studies have explored the influence of cash transfers on agricultural production in vulnerable societies across both developed and developing regions. According to the study of Kilburn et al. (2016), which focused on young individuals, it was concluded that the program's positive impact was stronger within the subgroup of orphans. It was also noted that orphans and non-orphan males from treatment households registered positive and significant impact on their Hope scores. Lawlor et al. (2019) observed that cash transfers enabled households to withstand agricultural production and price shocks, while also contributing to increased food consumption and

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overall food security within the context of their randomized study. Using DID, Covarrubias et al. (2012) concluded that agricultural production increased due to the programme. This in turn increased ownership of agricultural tools and livestock. Haushofer & Shapiro (2016) conducted a study in Kenya, offering evidence that Unconditional Cash Transfers (UCTs) significantly impacted psychological well-being. The study revealed a substantial increase of 0.16 std. dev in happiness and a 0.17 std. dev. increase in satisfaction. In addition, the treatment led to heightened consumption and savings through purchases of durable goods, along with increased investment in self-employment activities. This study aims to investigate the impact of cash transfers on the Caregiver-Targeted Orphaned and Vulnerable Children (CT-OVC) using Difference-in-Differences (DID) approach. This research will leverage three waves of data collected by Oxford Policy Management (OPM) for UNICEF/DFID-supported districts (Garissa, Homa Bay, Kisumu, Kwale, Migori, Nairobi, and Suba) between March and August 2007.

Methodology

Theoretical Model

The Kenyan government implemented the Cash Transfer for Orphans and Vulnerable Children (CT-OVC), with the objective of bolstering and encouraging the retention of OVCs within communities. This initiative further aims to enhance the human capital of these vulnerable children by providing essential supplementary income to their caregivers (Ward, Hurrell et al., 2010). Assuming it works as intended, the program could indirectly raise their income by allowing investment for increased farm productivity or by increasing the local demand for their produce (Tiwari et al., 2016). To assess the impact of the CT-OVC programme, the theoretical foundation of this study closely follows that of Koundouri et al. (2002), which emanates from the Von Neuman-Morgenstern utility model. It is assumed that a farmer produces a single output q, with its price denoted as p, and $f(.)$ denotes the production function. On the other hand, X represents the vector of inputs and r is the vector of the associated input prices. Efficiency in the use of these essential inputs is assumed to vary across various farmers. Hence, $h\ (\alpha)$ is incorporated, where α represents farmers characteristics/ demographics. Based on this, the production function is defined as:

$$qf(h(\alpha)X \quad \ldots\ldots 1$$

Assuming that farmers are price-takers both in the input and output markets, the main problem for the farmers is to maximize the expected utility of profits/agricultural produce. This is defined as:

$$Max\ E[U(\pi)] = \int \quad [\,U(pf(\varepsilon, h(\alpha)\ X - \ r'X)] \quad \ldots\ldots 2$$

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Where U (.) is the Von Neuman-Morgenstern utility function. Considering the impact of the policy intervention, it is assumed that a farmer benefits from the cash transfer program. This is defined as i= 1 for beneficiary and i=0 for non- beneficiary, which is likely to affect efficiency of inputs, such that $h_1(\alpha) > h_0\ (\alpha)$ for $0 < \alpha < 1$.
In this instance, the first order condition for the inputs related to receiving cash transfers is given as:

$$\frac{r^1}{p} = E\left(\frac{\partial f(\varepsilon, h_1(\alpha)X^1)}{\partial X}\right) + \left(\frac{cov\ (U^1, \partial f(\varepsilon, h_1(\alpha)X^1)}{E\ (U')}\right) \ldots\ldots\ldots\ldots\ldots\ldots 3$$

Whereas, for the non-beneficiaries, it is presented as:

$$\frac{r^0}{p} = E\left(\frac{\partial f(\varepsilon, h_0(\alpha)X^0)}{\partial X}\right) + \left(\frac{cov\ (U^0, \partial f(\varepsilon, h_1(\alpha)X^0)}{E\ (U')}\right) \ldots\ldots\ldots\ldots\ldots\ldots 4$$

The program is considered beneficial to the farmers if the expected utility of receiving cash transfer is higher than the expected utility of not receiving cash transfer. The expected utility for the farmers who receive cash transfer is defined as:

$$E[U(\pi^1) = \int \quad [U(\ pf(\varepsilon, h_1(\alpha)X^1 - r^1X^1)] \ldots\ldots\ldots\ldots\ldots\ldots 5$$

Whereas, for those who do not receive the cash transfers, the expected utility is given by:

$$E[U(\pi^0) = \int \quad [U(\ pf(\varepsilon, h_0(\alpha)X^0 - r^0X^0)] \ldots\ldots\ldots\ldots\ldots\ldots 6$$

The impact of the cash transfer program is beneficial if:

$$E[U(\pi^1) - E[U(\pi^0) > 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 7$$

Analytical Model

When working with panel data that includes both pre- and post-intervention information, an appropriate statistical method for deriving the average treatment effects of the CT-OVC is the Difference-in-Differences (DiD) estimator. This estimation technique involves calculating the change in an indicator (Y), such as the aggregate value of agricultural produce (livestock and crop produce), between baseline and follow-up period for beneficiary (Treated) and non-beneficiary (Control) households and comparing the magnitude of these changes. The main assumption behind the DiD is that there is no systematic unobserved time varying difference between the treatment and control groups. The basic DiD model is defined as follows:

$$Y_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 R_t + \beta_3 (R_t * D_t) + \epsilon\, \beta_i Z_i + \varepsilon_{it} \ldots\ldots\ldots\ldots 8$$

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Accordingly, Y_{it} represents the outcome variable (value of agricultural produce in Kenya Shilings and value of labor supply in Kenya Shilings). D_{it} is a dummy variable represented as 1 for the household that received cash transfer, while 0 represents otherwise. R_t represents time dummy which is defined as 0 for baseline and 1 for follow-up/ end line. $R_t * D_t$ is the interaction term between the intervention and time dummies, and ε_{it} represents the error term. Z_i represents the vector of household characteristics/demographics which are likely to influence the outcome variable. Z_i indicates controls for the observable differences across households. β_0 is the constant term, while β_1 captures the time-invariant differences between the treatment and control. β_2 gives the changes over time, and β_3 represents the double difference estimator which signifies the impact of the programme.

Estimation Issues /Diagnosis

Table 1. Variable Definition and Measurement

VARIABLE	MEASUREMENT
Intervention	
Cash Transfer	1 if household received cash transfer in all three waves, 0 otherwise.[1]
Outcomes of interest	
Agricultural Output	This is the total amount earned through the sale of crop produce and livestock produce for the past 12 months based on the year of survey. The amount is presented in Kenya Shillings (Ksh).
Labor Supply	This is the total amount spent on labor supply/hiring labor for agricultural activities both for livestock production and crop production. The amount is presented in Kenya Shillings (Ksh).
Covariates	
Sex of Household Head	1 if female, 0 otherwise.
Age of Adult Household Head (>17 years old)	Years.
Land Input	Total amount of land used for agricultural activities measured in hectares.
Education of household head	Total number of schooling years completed by the household head.

Data Description and Sources

This study focuses on Phase 2 of the CT-OVC program, which involved an impact evaluation. UNICEF commissioned Oxford Policy Management (OPM) to assess the impact of cash transfer programs

[1]The CT variable represents only those households that received transfer throughout the three waves. This allows observation of a clear trend over the given time period, thus leading to an accurate estimation of the treatment effect. It also implements control for differential attrition to ensure internal validity.

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implemented in Kenya, specifically targeting the improvement of welfare among orphans and vulnerable groups. OPM undertook a baseline quantitative survey of households and communities within the seven UNICEF/DFID-supported districts (Garissa, Homa Bay, Kisumu, Kwale, Migori, Nairobi and Suba) between March and August 2007. In each district, two locations were randomly selected to benefit from the intervention and two acted as controls. The latter were slated for assistance during the later stages of the program expansion. In each location, households were selected for evaluation according to the programme eligibility criteria. Among eligible households, priority was accorded to those with the youngest child caregivers, the oldest adult caregivers, disabled household members, or the highest number of OVCs. Within the treatment localities, a total of 1,540 eligible households were ultimately chosen as CT-OVC recipients, compared to 754 eligible households in the control localities for the evaluation (Ward, Hurrell et al., 2010). Households in both arms were surveyed prior to knowledge of selection (Carolina Population Center, 2011).

OPM re-interviewed 1,328 recipient households and 579 control households between March and July 2009[2] in a follow-up survey, following a panel design. The attrition of households between baseline and midline exceeded expectations, and this was partly attributed to the 2007/08 post-election violence. A second follow-up survey was conducted by the Carolina Population Center in 2011, interviewing 1,811 households (Carolina Population Center, 2011). This study utilizes longitudinal data comprising of merged individual level datasets from the three waves (2007, 2009 and 2011). To analyze the data for the pre-and post-treatment, the two datasets were merged. This resulted to 19,724 individual observations from 1,810 households[1].

Results and discussion

This session of the study presents the findings from the descriptive statistics analysis, which typifies the initial characteristics of the study's variables and subsequent developments. Agricultural production, monetary transfers, labor supply, sex of household head, age of household, and land inputs are all considered. According to Table 2, when the OVC-CT program was included in the analysis, agricultural output increased. Notably, the intervention was linked to a rise in output as measured by a rise in the mean output from 1559.4114 to 3494.8445. Since the categorization was based on whether or not a person received transfer of cash, the mean decreased from

[2]One household was excluded from the study sample, reducing the total to 1,810 households from the original count of 1,811, conducted by the Carolina Population Center. This exclusion was necessary due to missing data on variables aligned with the row structure, resulting from the difference-in-differences model specification.

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0.2303 to 0.2169. There was a significant drop in land inputs from 14.7365 to 11.9013 over the follow-up period. The study highlights the highest and lowest values, indicating the extremes, and examines the distribution with regard to skewness and kurtosis, both of which are associated with the normal distribution.

Table 2. Descriptive Statistics

Variable	Mean	SD	Min	Max	Skewness	Kurtosis
Baseline						
Agric_Output	1559.4114	6493.7071	0	9.61e+04	6.4692	55.2121
Cash_Tran	0.2303	0.4210	0	1.0000	1.2812	2.6416
Labor_Sup	192.7444	1466.0652	0	5.00e+04	16.8580	388.3585
Sex_HHH	0.5250	0.4994	0	1.0000	-0.1001	1.0100
Age_HH	42.5235	20.8590	18	110.0000	0.4002	1.8762
Land_Input	14.7365	80.8232	0	2880.0000	30.4927	1076.8170
Follow up						
Agric_Output	3494.8445	9837.8034	0	9.61e+04	4.2287	24.7405
Cash_Tran	0.2169	0.4123	0	1.0000	1.3741	2.8880
Labor_Sup	616.5657	3352.2617	0	5.00e+04	10.1463	125.4902
Sex_HHH	0.5436	0.4982	0	1.0000	-0.1750	1.0306
Age_HH	31.6529	15.6240	18	100.0000	1.6037	5.0426
Land_Input	11.9013	28.6136	0	98.0000	2.6283	8.0376

Instrumental Variable and OLS Model Results

Comparing the pooled OLS and the IV, it was found that cash transfers considerably raised agricultural production by 30.4% and 72.5%, respectively. The pooled OLS and IV estimate that an increase in labor supply would boost agricultural output by 4.44 percent and 4.62 percent, respectively. When examining OLS versus IV methods, the presence of a female participant resulted in a decrease of 18.9 percentage points in agricultural output. This influence is significant enough to substantially impact the coefficients. In these situations, unforeseen land inputs diminished agricultural production for families with orphans and vulnerable children (OVC). The use of land for agricultural purposes lowered yields by 0.474 and 0.488 percent. In both conditions, the constants represent the levels of output that would be achieved if the influence of the independent variables were held constant (Table 3).

While cash transfers were found to reduce spending by $256.5 on labor supply activities in the OLS, they were shown to raise revenue by $1,634 in the IV. This discrepancy is statistically significant. However, due to the potential for biases generated by confounding factors and measurement errors in the omitted variable, OLS estimation is not as robust as IV. The female breadwinner effect in OVC families was 172.4 points lower in OLS and 168.1 points lower in IV. In conventional least squares and instrumental variables models, age has the largest effect when the labor supply is the dependent variable, thus increasing it by 8.746 and 6.812, respectively. The impact of

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business inputs on the outcome of land inputs is negative and insignificant in both scenarios (Table 3).

Table 3. Instrumental Variable and OLS Model Results

	Agriculture Output		**Labor Supply**	
	OLS	**IV**	**OLS**	**IV**
Cash Transfer	0.304***	0.725**	-256.5***	1,634**
	(0.0803)	(0.335)	(89.90)	(638.1)
Labor Supply	6.59e-05***	6.85e-05***	--	--
	(9.98e-06)	(1.02e-05)	--	--
Sex of HHH	-0.189***	-0.178***	-172.4**	-168.1**
	(0.0674)	(0.0683)	(76.42)	(79.82)
Age of HH	-0.000696	-0.000997	8.746***	6.812***
	(0.00165)	(0.00167)	(1.850)	(2.038)
Land Input	-0.00474***	-0.00488***	-0.124	-0.643
	(0.00105)	(0.00106)	(0.384)	(0.437)
Constant	8.546***	8.461***	412.4***	78.61
	(0.0816)	(0.105)	(89.89)	(145.7)
R-squared	0.041	0.028	0.007	0.034

The researcher derived estimates for agricultural production and labor supply using DID and calculated the average treatment impact (ATET). These estimations were based on findings obtained from the IV and OLS models (Table 4). The study revealed an 8.5% increase in agricultural output for recipients of financial transfers compared to non-recipients. Notably, among OVC who received these transfers, there was a substantial surge in agricultural output, indicating the intervention's significance. After the introduction of cash transfers, the expenditure by OVCs on labor supply and hiring labor for agricultural activities, encompassing both livestock and crop production, in the specified regions surged by 121%. This was a substantial increase compared to non-recipients of the cash transfers (Table 4).

Table 4. Difference in Difference for Agricultural Output and Labor Supply

	Agricultural Output	**Labor Supply**
Before_Diff	0.289***	-0.563***
	(0.087)	(0.102)
After_Diff	0.374*	0.649*
	(0.304)	(0.534)
ATET (Cash Transfer (1vs0))	0.0851*	1.212**
	(0.316)	(0.544)
Observations	1714	4014
R-squared	0.034	0.0179
Adjusted for covariates	Yes	yes

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

The DID relies heavily on the ability to provide evidence for the identification assumption of the parallel trend. This will help prove that if the

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intervention had not taken place, the trend between the control and treatment groups would have been the same. Diagnostic charts for the years 2007-2009 are offered as proof. The trend demonstrates the validity of the parallel trend assumption by using observed averages and linear trends after 2007. Whether or not treatment is given, the unobserved differences between the test and control groups persist throughout time. This approach alleviates the bias issue arising from comparing the treatment group with itself over time, which might stem from trends influenced by other factors affecting the outcome. Similarly, it also mitigates bias when comparing the treatment group to the control group in the post-intervention period, which might be influenced by permanent differences between the groups. Efforts to illustrate and uphold this assumption in the research are depicted in Figure 1 for labor availability and Figure 2 for agricultural output. The early graphs in the setting demonstrate the correctness of this assumption, thereby providing support for DID.

Figure 1. Parallel Trend for Agricultural Output

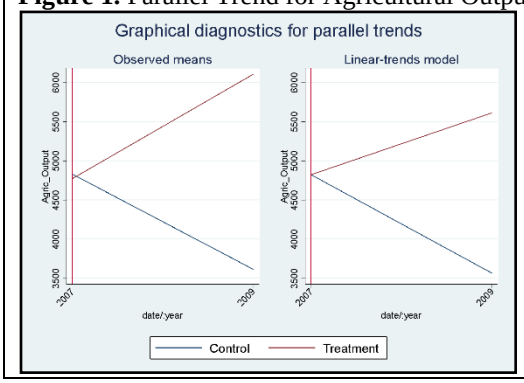
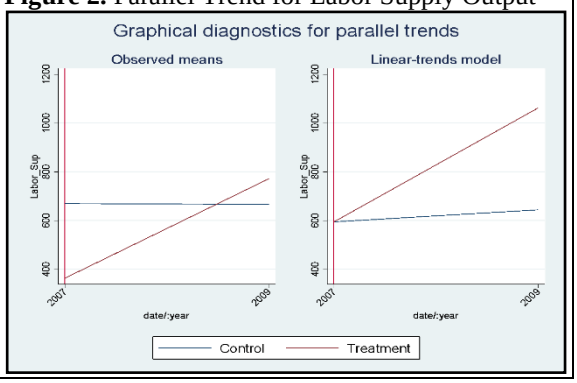


Figure 2. Parallel Trend for Labor Supply Output



Conclusion

In Kenya, there is scarcity of studies examining cash transfers among marginalized groups like orphans and vulnerable populations. Evidently, this is an area less explored in previous studies (Covarrubias et al., 2012; Haushofer, & Shapiro, 2016). The main contribution of this study focused on how cash transfers affect agricultural productivity for these vulnerable groups, including their social and economic welfare. This research examined the effect of cash transfers on agricultural output for orphans and vulnerable children in seven regions of Kenya. The findings showed that cash transfers boost agricultural productivity for OVCs by 30.4% and 72.5% respectively, as shown using pooled OLS. Contrarily, OLS-based CTs were shown to decrease labor supply by 256.5 percent, while IV estimates indicated that cash transfers would increase labor supply by 1,634 percent. The recipients of financial transfers increased their agricultural output by 8.5%. This is in accordance to difference-in-differences estimate. Furthermore, in contrast to individuals who did not receive financial transfers, orphans and

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vulnerable children experienced a substantial increase of 121% in their expenditure on labor supply and engagement of workers for agricultural tasks, following the implementation of the program. Based on these results, CTs have a significant impact on the quality of life for vulnerable populations like orphans. Therefore, policymakers should take steps to enhance direct and indirect cash transfers to this population. This is essential in giving people the economic agency to better their lives. The government should also formulate legal policy frameworks to effectively implement cash transfers programs for these vulnerable groups. In addition, there is potential for further research to explore other areas, such as extending the scope to encompass marginalized youths in Kenya, who consistently face escalating unemployment across different administrations.

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