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Cash Is Queen

Local Economy Effects of Cash Transfers to Women in West Africa

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Abstract

This paper examines the direct and spillover effects of cash transfers paid in a rural and low-income setting. In the short run, an unconditional cash transfer program for ultra-poor households in Northern Nigeria led to a 12 percentage point increase in micro-enterprise formation for program recipients. Moreover, benefits continued to increase in magnitude after program cessation and also extended to nearby non-beneficiary households when compared to counterparts in other villages where no cash transfers were paid. One year after program cessation, beneficiary women increased their enterprise ownership rate by 20 percentage points, while the rate for non-beneficiary women increased by 13 percentage points. Both groups of households enjoyed higher consumption and food security, and shifted away from husband-centered toward joint intrahousehold decision-making. One mechanism for this growth spillover is a boost to aggregate demand for local goods, in part identified by the positive link between the (randomly determined) neighborhood density of cash transfer households and enterprise creation. The increase in local female entrepreneurial activity translates to a partial income multiplier of at least 0.32. Women face restrictive social norms around work in this context and the slack productive resource brought into activity by the cash transfer is female labor, specifically female-led entrepreneurship near the home.

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1 Introduction

Cash transfer programs are an increasingly common means to provide support to poor households (Banerjee et al., 2024). Witness the national responses to the COVID-19 pandemic during which at least 203 countries instituted or repurposed 962 cash transfer programs (Gentilini, 2022). Cash injections into poor communities may not only benefit direct recipients but also extend benefits to the wider community. Economic evaluations of cash transfer programs, however, have largely ignored the indirect effects on non-beneficiaries and less is known about how an influx of income affects the local economy and people living nearby (for some recent exceptions, see Egger et al., 2022; Filmer et al., 2023). Measuring these "spillover" effects and understanding the mechanisms that generate them is crucial for the design of effective policy (Angelucci and Di Maro, 2015). In this paper we examine both the direct and indirect effects of a USAID-funded unconditional cash transfer program to households living in extreme poverty.

Gains to beneficiaries from cash transfer programs have been observed to include increased consumption and micro-entrepreneurship, at least when cash and training are offered to ultra-poor households in Bangladesh, Uganda, and Nigeria (Bandiera et al., 2017; Blattman et al., 2016; Carneiro et al., 2021). The unconditional cash transfer studied here, offered without corresponding training to women in ultra-poor households in Northern Nigeria, led to large gains in rates of female business ownership, profits, and household consumption. Importantly, these gains were sustained a year after the last grant was paid. Further, we find that benefits were not limited to recipient households but also extended to non-beneficiary households residing nearby. We identify the local market characteristics associated with spillovers to non-beneficiaries and, by doing so, indicate the likely multiplier channels of a cash transfer in an ultra-poor setting.

The unconditional cash transfer (UCT) program was offered to a randomly chosen subset of women in rural, ultra-poor households in the northern state of Kebbi in Nigeria. To measure spillover effects we use a counterfactual in unaffected local markets (where no cash transfers were ever paid) and estimate effects at two time intervals — immediately after transfer cessation and then one year later. To identify within-village spillovers, we contrast outcomes across both the randomly selected treated households and their untreated counterparts in the same village, with similar households in non-program villages where no cash was paid. These non-program villages were excluded due to a sharp discontinuity in village vulnerable population size which determined eligibility for the cash transfer program. To quantify whole-village program impacts, we contrast outcomes with this quasi-experimental counterfactual group of non-program villages located in the same study districts.[1] To aid the

[1]We show consistent results whether we formally exploit the discontinuity or include the full set of study

identification of within-village program spillovers to non-beneficiaries, we leverage exogenous variation in the local density of cash transfer households generated by the household-level randomization process.[2] We find evidence of local market competition effects in the short run that dissuade business entry to some extent, but not to the degree that countermands the main effect for cash-receipt beneficiaries. In the short run, cash transfer treatment households experience a 12 percentage point increase in the likelihood of a woman running a business (measured at one month after the last cash transfer payment). Only a full year after program cessation does a positive spillover effect become evident. It appears that the gradual rise in local economic activity, fueled by female-led entrepreneurship and an increase in local demand, eventually benefits the wider economy.

One year after the cessation of the transfers, the program contributes to local economic growth to such an extent that cash-recipient women are 20 percentage points more likely to operate a business while untreated women in program villages are 13 percentage points more likely to operate a business. Business creation among non-beneficiaries is also positively related to the density of cash transfer recipients in the locality. There are various knock-on benefits from this increase in economic activity including higher levels of consumption for both treated and untreated households, increased investment in household farm production, and improved food security. By one year after the end of the cash transfer program, a partial income multiplier, based only on reported income from female micro-entrepreneurship, is estimated to be 0.32. This is a lower bound estimate: for every dollar transferred, the cash transfer program generated at least 0.32 dollars in subsequent economic activity based on female entrepreneurship alone.[3] These results contribute to an active recent empirical literature that estimates multipliers of cash transfers (see Gassmann et al., 2023).

While there is a rich literature that explores the direct impacts of cash transfers on consumption, savings, and investments (see, for example, Crosta et al., 2024; Leight, Hirvonen and Zafar, 2024; Bastagli et al., 2019; Haushofer and Shapiro, 2016), measuring spillovers is a more significant challenge and hence evidence of cash transfer program spillovers to non-beneficiaries is more limited. Some exceptions include Egger et al. (2022) who find a positive spillover to the local economy of a one-time large cash transfer in Kenya, with an estimated total local transfer multiplier of 2.4. Angelucci and De Giorgi (2009) find spillover effects among untreated households in the Progresa (Oportunidades) cash transfer program

villages.

[2]Here the "local market" is defined as a neighborhood typically smaller than most study villages. Given the rural and pastoral nature of the setting, villages tend to be widely dispersed over space.

[3]We find no evidence that the program resulted in income or activity declines in other productive sectors - indeed we find an increase in agricultural yields - suggesting that this partial multiplier is a lower bound of the total multiplier.

in Mexico. In other contexts cash support has led to detrimental impacts such as increased prices of key food goods and increased malnutrition, at least among very poor and remote villages in the Philippines (Filmer et al., 2023). In this study we find broad local benefits from an infusion of cash on non-farm business creation and increased earnings but note that the positive spillover effect only emerged over a longer period of time — in the year after the program ended. One take away is the need for a sufficiently long study period to allow for dynamic responses of households. If we ended the evaluation period at the point when the program was discontinued — a common stopping point in the evaluative literature — we would not have identified such positive spillovers to non-beneficiaries.

Another key finding is that the increase in economic activity is driven by female micro-entrepreneurship. Studies often show that male-owned but not female-owned businesses benefit from cash grants (e.g., De Mel, McKenzie and Woodruff, 2009), in part explained by intrahousehold redistributive pressures (Bernhardt et al., 2019).[4] In the standard economic framework of fiscal multipliers, the existence of a multiplier requires the presence of slack or underutilized productive factors.[5] Walker et al. (2024) discusses various potential slack factors of productivity including the indivisibility of production inputs. We identify these factors, here in this setting, as female-led entrepreneurship and broader female labor force participation, which are significantly underutilized due to various barriers (Chiplunkar and Goldberg, 2024). Women in the study region face obstacles such as restrictive social norms, early marriage, and low bargaining power within their households, making it difficult for them to work (World Bank, 2022).[6] Pre-program data revealed a low rate of female labor force participation — only 34% of women had been involved in any income-generating activity at baseline — significantly lower than a national average of 52.1% and a Sub-Saharan Africa average of 61% (World Bank, 2023).[7] The cash transfer program alleviated a capital constraint by giving beneficiary program women the financial resources to finance informal firm entry. More importantly, to account for the positive spillovers identified in the longer run, it appears that demand for locally produced goods increased due to greater income from the transfer and consequent enhanced economic activity. The rise in local demand further facilitates informal firm entry, especially for nearby non-program women.

[4]Cash transfer recipient women, on average, keep 54% of the cash transfer, share 26% with husbands, 14% with children; and the remaining 6% with friends and family in and out of the community.

[5]Our study context is a rural area in Northern Nigeria characterized by extreme poverty and a heavy reliance on agriculture, where the majority of households face food insecurity and fall below the poverty line.

[6]Restrictive gender norms are consistently emphasized as important determinants of women's work (Bernhardt et al., 2018; Bursztyn, Gonzalez and Yanagizawa-Drott, 2020; Jayachandran, 2021).

[7]Income-generating activities include farming, non-farm business, livestock rearing, and wage work. Approximately 90% of men in the study sample were active in agriculture or animal husbandry. Most of women's engagement in income-generating activity at baseline occurred on household-operated farms.

We explore a number of potential spillover mechanisms. We rule out a sharing of cash from program recipients to other households as well as a change in social norms that may propel women's entry into the labor force.[8] Instead the cash transfers appear to both help households overcome liquidity and credit constraints for entry, as well as raise expected profitability for potential firm entrants by increasing demand for locally produced goods. These results are not fully restricted to female entrepreneurship — some men respond to the demand shock. However, the larger effects by an order of magnitude are among women, an underutilized productive factor in our study context, who circumvent restrictive norms by starting local businesses.

In this study region of Northern Nigeria, perceptions about a woman working outside the home are characterized by patriarchal norms. For instance, within our study sample, among both sexes the perceived norm is that half of the community would speak badly of a woman who works outside the home and think a man is a bad provider if his wife is working for pay. This implies an expectation of social sanctions for a woman deciding to work and violating societal norms (see Akerlof and Kranton, 2000; Bertrand, Kamenica and Pan, 2015). Given this stasis, women in our study sample act strategically in terms of the type of work that they pursue when they receive a cash transfer. Women start small, often home-based, non-farm businesses such as a shop, cooking, oil-processing, or crop-processing business. Most women conduct business operations in or near the home (73%), with 19% located at a central market, 5% selling door-to-door, and 3% in a formal shop or other location. Since a woman's ability to work outside the home for pay is sanctioned in the region, the formation of a "cottage industry" where work is performed in and around the home allows women to successfully participate in work within the boundaries of their own opportunity set (Lanjouw and Lanjouw, 2001). Normative constraints on women's work, time, and mobility make any product demand concentrated within the local proximity particularly relevant in our study context. The types of businesses created allow women to cater to customers within the local area and the patterns of new business entry suggest that women make strategic choices within the limited choice set they face.[9]

The remainder of this paper is organized as follows. Section 2 presents a conceptual framework of micro-entrepreneurship and local market conditions germane to this setting. Section 3 describes the cash transfer program and context, while section 4 introduces the data and presents sample and covariate balance tests. Section 5 summarizes the estimation strategy, while section 6 discusses the results for micro-entrepreneurship and other economic

[8]Despite the female labor supply response to the transfer of cash, we find limited treatment impacts on reported attitudes and norms around the acceptability of a woman working outside the home.

[9]Women in the study sample tend to be of prime working age and the majority have children. Therefore, locating a business near the home may also allow women to continue to provide childcare and perform chores.

activity, household welfare and income, and women's economic empowerment. Section 7 explores the possible mechanisms for the observed spillovers, estimates a partial income multiplier for the program, and reviews the likely factors that generated the spillover. We provide concluding thoughts in section 8.

2 Conceptual Framework: Firm Entry and Local Demand for Local Goods

This framework demonstrates how a cash transfer in this study setting can lead to spillovers on cash non-recipients and generate fiscal multipliers. Constraints to firm entry and local economic growth can arise on both the demand and supply side of the ledger. On the one hand, potential firms may face entry costs or other supply-side constraints that dissuade entry. On the other hand, a firm would not enter a market unless anticipated demand was sufficient to support positive profit expectations. A cash transfer program can therefore, in principle, address both types of constraints: it may directly alleviate entry-cost constraints among transfer recipients as well as increase general demand for local goods if there is a sufficient density of cash recipients.

More formally, the following modified model adapted from Berry and Reiss (2007) posits a firm's entry decision as a function of the expected profit function $\pi(.)$. Let N denote the number of homogeneous firms that choose to enter a market to produce a homogeneous good.[10] Given N_m entrants in market m , each entrant earns profits:

$$\pi(N_m) = V(N_m, x_m(S_m, PET)) - F_m \tag{1}$$

where $V(.)$ represents a firm's variable profits and F is a fixed cost of entry into the market. The fixed costs of entry could capture either financial or social costs of entry.[11] The vector x_m contains demand and cost variables specific to the local market, m, that affect variable profits. In this paper we model x_m to be a function of the size of the local market (S_m), encoding the number of potential consumers, and intensity of cash transfer treatment within the local market. This measure of treatment intensity we term the proportion of eligible transfers, or PET. The greater density of people (customers) and the greater density of cash transfers in the local market, the higher the market demand, which in turn increases

[10] In our study setting there are five potential markets that women generally enter: cooking, crop-processing, oil-processing, trading, and a residual other services. We assume firms produce homogeneous goods. The quality of the goods is unobserved in the data but we expect them to be relatively uniform in this setting.

[11] The social costs of entry may be high for women where there are restrictive norms around female labor. Social costs may be reduced as more women enter the labor market; and in the longer run, greater exposure to working women may reduce norm costs associated with women's work (Bertrand, 2020).

the expected profits and the likelihood of firm entry into the market. We model the market demand function for market m in equation 3 below.

To link firms' equilibrium entry decisions to N we consider two equilibrium conditions.[12] In equilibrium, N^* represents the firms that enter where the expected profits are greater than the fixed costs: $V(N^*, x) - F \geq 0$; and for any of the other potential entrants that do not choose to enter the expected profits minus fixed costs is negative: $V(N^* + 1, x) - F < 0$. These two equilibrium conditions place an upper and lower bound on fixed costs:

$$V(N^*, x) \geq F > V(N^* + 1, x) \tag{2}$$

As V is declining in N, a reduction in F (perhaps through a reduction in financing costs) can sustain a larger value of N^*. Further, if x shifts due to an increase in the number of cash transfer beneficiaries, this increases N^* as it allows for more firms to enter the market in equilibrium. We formalize these parameters that constitute local market demand. Specifically, let the demand function $X(.)$ take the form:

$$X_m = S_m(HH_m, PEV_m)\gamma(PET), \tag{3}$$

where market demand is partly a function of market size S that in turn is a function of both the number of households in the local market (HH) and the poverty level of the local market (PEV). The expectation is that an increase in the number of households leads to a greater number of potential customers in the market and higher expected profits; and a relatively poorer market suggests less aggregate wealth which lowers market demand and expected profits.[13] That is, the more dense and richer the market, the higher the expected profit function is relative to the fixed cost of entry. Both measures are taken as exogenous variables at baseline in our analysis.[14] γ designates per-household demand, defined as a function, in part, of the density of cash transfers in the local market (PET). For practical purposes, this proportion is defined by the total number of cash transfer households over the number of eligible households surrounding household i within a radius of r. Aligned with the empirical model, each household faces a local market at which it is the center and the market extends a distance of r in every direction. The presence of a sufficiently dense cash

[12] In this setup firms have perfect information and profits are a non-increasing function of N.

[13] Sato, Tabuchi and Yamamoto (2012) show that a larger market size measured by population density increases the incentive of firm entry by entrepreneurs in Japan.

[14] PEV accounts for the proportion of extremely vulnerable households or ultra-poor out of the total number of households in the local neighborhood and $\#HH$ corresponds to the total number of households situated around household i in the local market. As will be shown, the local market around a household is defined as all households falling within a specified radius r.

transfer in the local market is expected to increase local aggregate demand and hence firm entry.

We show that, in this Northern Nigerian setting, the presence of a cash transfer alleviates constraints to firm entry — the fixed cost of entry and/or low local demand for produced goods. In other words, the cash alleviates a poverty trap for micro-enterprise formation as described in McKenzie and Woodruff (2006). Regarding dynamics of entry, we find that cash transfer recipients enter the local market sooner (during the initial follow-up period) as they can likely directly finance the cost of entry with the cash transfer. Non-beneficiaries in cash transfer program villages also enter but with a lag, as they must first perceive the local economy to be wealthier before they enter, i.e., that the anticipated profit function has shifted due to greater wealth in the local economy. These effects emerge only in the later follow-up period (i.e., one year after the cessation of the cash transfer program).

While we do not formally model labor specialization by gender within the household, the gender distribution of activity is another salient factor in household production decisions in this setting and indeed can be influenced by cash transfer receipt (Daye, Kandpal and Schnitzer, 2025). Women, at baseline, are more likely to engage in non-farm enterprise activity, while their husbands operate farming and livestock activities. Gains from a cash transfer could be utilized in various ways: not only invested in non-farm enterprises but of course consumed outright or invested in agriculture. Our results suggest that some of the increased total resources (from combined cash transfers and business profits) are also invested in agriculture.

3 Research Design

3.1 Context

The study was carried out in Kebbi state, located in Northwest Nigeria. The study focused on a sample of extremely vulnerable households in rural areas of Northern Nigeria, where there is an overwhelming reliance on agriculture for livelihood. At baseline, 92% of the households were living below the poverty line (less than USD 1.90 per day (in 2015 purchasing power parity [PPP])). Approximately 23% of households were engaged in polygamous marriages. In this study context women have comparatively limited agency, especially with regard to work outside the home. Intrahousehold constraints on women's labor supply are strong where husbands typically have primary decision-making power with regard to their wife's work. Moreover, social norms around women's work and mobility are restrictive. According to our survey data, 40% of men (30% of women) think it is inappropriate for women to accept a paid job outside the home.

3.2 The Unconditional Cash Transfer Program

The unconditional cash transfer (UCT) program is a core component of the Feed the Future Nigeria Livelihoods Project (FNLP). FNLP was implemented in Nigeria's Kebbi state from 2015 to 2018 and aimed to assist vulnerable households graduate out of poverty.[15] The program, implemented by Catholic Relief Services (CRS) and funded by the United States Agency for International Development (USAID), is modeled on ultra-poor graduation programs (see Banerjee et al., 2015). FNLP is a multifaceted livelihoods program offered at the village level to households selected based on specific vulnerability criteria. Only the most vulnerable households or "ultra-poor" were eligible for unconditional cash transfers.

To accurately assess the UCT's impact, the study design included cash transfers to ultra-poor households in villages that were not receiving other FNLP services, thereby isolating the cash transfers' direct effects. Village selection involved a first-stage randomization at the village level for FNLP's evaluation, designating villages as either FNLP or non-FNLP. This paper analyzes data from non-FNLP villages chosen for the cash transfer experiment. This study focuses on cash transfers distributed between September 2015 and March 2017. The primary recipient of the UCT was the foremost female household member, receiving 75,000 Nigerian naira over fifteen months, which is equivalent to approximately USD 693 in 2015 PPP terms.[16] Cash transfer disbursements were made monthly or quarterly by banking agents.[17] Further details about the cash transfer features are provided in appendix A1.

3.2.1 Targeting and Program Eligibility

After selecting program areas in Kebbi state in Nigeria, the implementing partner, CRS, convened a household targeting committee (HTC) meeting in approximately 120 villages across two local government areas (LGAs) and eight wards selected by the program. These meetings facilitated community identification of vulnerable households and involved committee members listing all households they considered to be vulnerable in their community.

To verify and rank the poverty of listed households, a proxy means test was conducted using a modified Progress out of Poverty Index (PPI) survey.[18] The PPI serves as a poverty assessment tool, comprising 20 questions that cover household demographics, health, human

[15] FNLP targeted 42,000 vulnerable households across rural Northwest Nigeria between 2013 and 2018.

[16] The average annual consumption for an ultra-poor household is about twice the total transfer amount in PPP terms.

[17] This paper refers to these simply as "cash transfers" since there was a limited impact difference found between these disbursement frequencies (see Bastian, Goldstein and Papineni, 2017).

[18] The survey is based on the 'Progress out of Poverty Index' (PPI) originally developed by the Grameen Foundation. The version used was slightly modified for the Nigerian context by the implementing partner, CRS. For more information visit https://www.povertyindex.org.

capital, and assets. It was administered to a total of 18,272 listed households. GPS coordinates of each household included in this census listing exercise were utilized to estimate local market boundaries in the analysis of spatial spillovers, described further in the empirical strategy section. PPI scores were calculated for each household to rank their relative vulnerability, with higher PPI scores indicating a greater level of vulnerability.

Households were then stratified into three vulnerability categories based on the PPI score. The *extremely vulnerable* (EV) category was defined as the most vulnerable 16 percent of households within their respective ward. The 16 percentile cutoff was determined based on power calculations to estimate cash transfer impacts on selected outcomes. The remaining households were categorized as: *very vulnerable* (VV) households, defined as the 17th to 85th most vulnerable percentiles, and *market limited* (ML) households, defined as the 15 least vulnerable percentiles based on the PPI score. Households that were not considered vulnerable are referred to as *market ready* (MR) by the program and were not included in the study or program.[19] The EV households (i.e., the "ultra-poor") within each village were eligible for the cash transfer program and are the main focus of our analysis. We also explore potential spillover effects on the VV and ML households in appendix E1.

The paper studies the 52 villages that were randomly assigned to non-FNLP control villages after a village-level randomization was conducted for the overall FNLP impact evaluation.[20] As FNLP villages are not included in this paper, the possibility of program spillovers across FNLP and non-FNLP villages was investigated, and the findings showed no evidence of cross-village spillovers: leveraging the exogenous distance between FNLP and non-FNLP villages, given random program assignment, the estimated influence of cash transfers is unrelated to the distance of the nearest FNLP treatment village.[21]

There are a total of 1463 EV households in the 52 study villages. An imposed criterion, decided by the implementing partner, was that there had to be at least 18 EV households within a village for that village to be deemed eligible for receiving the cash transfer program. Since the implementing partner relied on agents to deliver the cash transfers, it would be difficult for them to justify travelling to villages to deliver to a limited number of households. This cutoff was strictly applied and villages with fewer than 18 EV households (12 villages and a total of 110 households) were excluded from receiving the cash transfer program. We refer to these villages as "non-program villages" where no cash transfers were ever offered

[19]Based on estimates from the implementing partner, CRS, the average share of households in a village that were considered vulnerable at baseline was high, ranging from 60% to 95% of the village population across the villages included in the study.

[20]Note that prior to the randomization, to reduce the risk of inter-village spillovers, villages that were either within a half mile (.80 km) radius of one another or were within a half mile of each other by road, were grouped together into a randomization unit.

[21]In appendix B4 we analyze the stable unit treatment value assumption (SUTVA) in more detail.

and conduct a number of tests to establish that these villages serve as a valid counterfactual in the analysis. We also utilize the sharp discontinuity at 18 EVs in the village to estimate program effects with a Regression Discontinuity design.

3.2.2 Cash Transfer Household-Level Randomization

For those villages with at least 18 households identified as extremely vulnerable (EV), a public lottery was utilized to randomly assign eligible households in the EV category to receive a cash transfer or not.[22] Given the communal sensitivities in the study area, the program's implementing partner focused on ensuring the allocation process was open and transparent. As a result of the household randomization process, 665 households were selected to receive cash transfers, while 689 households were randomly excluded from receiving transfers within the 40 villages participating in the cash transfer program. In the 12 non-program villages, no cash transfers were ever distributed.

4 Data

4.1 Survey Rounds and Main Outcomes

Surveys were conducted with both a primary woman in the household and her male spouse (if applicable). Individual- and household-level data collection comprised three key survey rounds: baseline, midline, and endline. This information is complemented by administrative program data.

The baseline questionnaire, conducted between April and June 2015, included a wide array of survey modules, as detailed in appendix A2. Cash transfers were initiated in September 2015. The first follow-up survey round (midline survey) took place approximately one month after the final cash transfer payment (April–June 2017) and was administered to both the woman and her husband in the household. This survey round covered fewer topics than both the baseline and endline surveys. The second follow-up survey (endline survey) was administered one year after the conclusion of cash transfer payments (May–July 2018) and again included the primary woman and her husband as respondents in the household. It included the same topics covered in the baseline and midline surveys, along with more comprehensive information on gender attitudes, norms, and anthropometric measurements of young children. Our analysis primarily focuses on responses from the primary female who was targeted for the cash transfer program.[23]

[22] There was an equal likelihood of an EV household selected to receive a cash transfer as not. Details of the public randomization ceremonies are provided in appendix A1.

[23] For individual-level outcomes, we rely on reports from either the primary female or the male respondent.

We examine a range of primary and secondary outcomes and present productive impacts (for both non-agricultural business and agricultural outcomes), household consumption and food insecurity, and women's economic empowerment in the main tables. Comprehensive definitions of the main outcome variables, including the questions used and types of variables, are listed in Table A1. When the dependent variable is a continuous monetary variable, we utilize the inverse hyperbolic sine (IHS) transformation. Consequently, the point estimates are adjusted to elasticities for percentage change interpretation, in line with Bellemare and Wichman (2020).[24]

4.2 Randomization Balance and Attrition

At baseline 1,463 ultra-poor households were surveyed prior to start of the program, 1,329 households were tracked and surveyed at midline, and 1,250 households at endline (equivalent to a 91% and 85% response rate, respectively). In appendix A3 we investigate the possible differential characteristics of cash transfer beneficiary and non-beneficiary households in program and non-program villages who attrit from the study, as well as information regarding the balance of main variables across sub-groups after attrition. No differential attrition rates by treatment status or key characteristics are found.

In Table 1, we conduct tests to assess experimental balance on observable baseline characteristics across various treated and comparison groups. We present statistical tests for mean differences across groups and in the last three columns of Table 1 we display the normalized differences between treatment groups, providing a scale-invariant measure of disparity. Following a commonly accepted threshold, differences of 0.25 or smaller indicate an acceptable degree of balance (see Imbens and Rubin, 2015).

The household randomization process, when comparing cash transfer beneficiaries (column 1) and non-beneficiary households (column 2) in cash transfer program villages, produced balanced groups at baseline for the majority of baseline indicators investigated. When comparing these households to the (non-experimental) untreated households in villages where no cash transfers were ever paid (column 3), we observe mean differences in marital status (divorced/widowed). The second vertical panel presents balance tests for the observations in the RDD sub-sample. these estimates include inverse propensity score derived weights to improve pre-treatment balance within the sample (see, for example, Imai and Ratkovic,

As a robustness check for household-level outcomes (e.g., household income), we conduct analyses using responses from both the primary female and male in the household separately.

[24]In determining the suitability of interpreting the IHS transformation as a percentage change we note the number of zeros in the variable to assess the extent of an extensive margin effect. We also report the mean outcome variable for the pure control group in levels at the bottom of each results table. More details on the IHS transformation and its specific applications can be found in appendix A6.1.

Table 1: Covariate Balance — Household-Level Characteristics

	Full Sample (CTs and NCTs)						RDD (CTs and NCTs)					
	(1)	(2)	(3)				(1)	(2)	(3)			
	Cash Transfers (CT) in Program Villages	No Cash Transfers (NCT) in Program Villages	Pure Control in Non-Program Villages	Normalized differences			Cash Transfers (CT) in Program Villages	No Cash Transfers (NCT) in Program Villages	Pure Control in Non-Program Villages	Normalized differences		
Variable		Mean/SE		(1)-(2)	(1)-(3)	(2)-(3)		Mean/SE		(1)-(2)	(1)-(3)	(2)-(3)
Demographic Characteristics of Household Head												
Age (Years)	46.14	45.29	48.42	0.05	-0.13	-0.18	44.45	44.99	44.69	-0.03	-0.01	0.02
	(0.67)	(0.63)	(1.80)				(1.17)	(1.23)	(1.64)			
Marital Status												
Married Polygamous(=1)	0.11	0.09	0.06	0.07	0.18*	0.11	0.08	0.09	0.08	-0.02	-0.00	0.02
	(0.01)	(0.01)	(0.02)				(0.02)	(0.02)	(0.03)			
Divorced/Widowed(=1)	0.11	0.07	0.18	0.11**	-0.22**	-0.33***	0.11	0.09	0.10	0.05	0.03	-0.02
	(0.01)	(0.01)	(0.04)				(0.02)	(0.02)	(0.02)			
Never married(=1)	0.02	0.02	0.01	0.03	0.11	0.08	0.02	0.02	0.01	-0.01	0.06	0.06
	(0.01)	(0.01)	(0.01)				(0.01)	(0.01)	(0.01)			
Literacy (Can you read or write in any language=1)	0.29	0.31	0.22	-0.05	0.16	0.21	0.29	0.31	0.22	-0.04	0.15	0.20
	(0.02)	(0.02)	(0.04)				(0.03)	(0.03)	(0.05)			
Household Characteristics												
Number of household members	4.59	4.70	4.39	-0.05	0.09	0.13	4.70	4.74	4.55	-0.02	0.06	0.08
	(0.09)	(0.10)	(0.21)				(0.18)	(0.16)	(0.20)			
Number of HH members(Age under 15)	2.19	2.19	2.15	0.00	0.03	0.03	2.14	2.19	2.24	-0.05	-0.10	-0.05
	(0.04)	(0.04)	(0.10)				(0.07)	(0.06)	(0.10)			
Number of agriculture plots (0-7)	0.57	0.57	0.48	-0.00	0.13	0.13	0.70	0.70	0.60	0.01	0.15	0.14
	(0.03)	(0.03)	(0.06)				(0.04)	(0.05)	(0.08)			
Farm size less than 1 hectare (=1)	0.86	0.85	0.86	0.01	-0.02	-0.04	0.84	0.85	0.83	-0.02	0.03	0.05
	(0.01)	(0.01)	(0.03)				(0.02)	(0.02)	(0.04)			
Daily adult equivalent expenditures (Naira) †	66.65	64.81	50.74	0.02	0.19	0.17	62.26	63.98	47.98	-0.02	0.18*	0.21*
	(3.61)	(3.33)	(7.29)				(5.80)	(5.52)	(6.03)			
Poverty line below $1.90 at baseline (Yes=1)	0.92	0.93	0.94	-0.02	-0.06	-0.04	0.93	0.93	0.96	0.02	-0.10	-0.12
	(0.01)	(0.01)	(0.02)				(0.02)	(0.02)	(0.02)			
Food Insecurity Index (0-6)	4.14	4.04	4.12	0.04	0.01	-0.03	4.06	4.12	4.35	-0.03	-0.12	-0.10
	(0.09)	(0.09)	(0.21)				(0.17)	(0.15)	(0.23)			
Number of enterprises owned by the household (0-5)	0.08	0.11	0.06	-0.08	0.07	0.14	0.13	0.13	0.11	0.00	0.05	0.05
	(0.01)	(0.02)	(0.03)				(0.03)	(0.02)	(0.05)			
Primary Female Characteristics												
Farming work (=1 if anyone in the household)	0.41	0.42	0.47	-0.03	-0.13	-0.10	0.47	0.48	0.53	-0.03	-0.13	-0.10
	(0.02)	(0.02)	(0.05)				(0.03)	(0.03)	(0.05)			
Modified A-WEAI Empowerment Index Score (0-1)	0.35	0.36	0.36	-0.04	-0.04	-0.00	0.35	0.36	0.36	-0.01	-0.01	-0.00
	(0.01)	(0.01)	(0.02)				(0.01)	(0.01)	(0.02)			
Empowered (=1 if adequacy in modified A-WEAI)	0.12	0.11	0.11	0.04	0.04	0.00	0.15	0.10	0.11	0.15	0.12	-0.03
	(0.01)	(0.01)	(0.03)				(0.02)	(0.02)	(0.03)			
Decision Making Index (0-6)	0.50	0.47	0.45	0.04	0.07	0.03	0.49	0.55	0.50	-0.07	-0.01	0.06
	(0.03)	(0.03)	(0.07)				(0.05)	(0.05)	(0.09)			
Female Non Farm Enterprise (Yes=1)	0.03	0.03	0.02	-0.02	0.07	0.09	0.03	0.03	0.04	-0.00	-0.08	-0.08
	(0.01)	(0.01)	(0.01)				(0.01)	(0.01)	(0.03)			
Female any economic activity in past year (Yes=1)	0.31	0.36	0.37	-0.11**	-0.13	-0.02	0.37	0.46	0.38	-0.18*	-0.03	0.15
	(0.02)	(0.02)	(0.05)				(0.03)	(0.03)	(0.05)			
F-test of joint significance (P-value)				0.39	0.40	0.20				0.78	0.40	0.36
Number of observations	664	689	110	1,353	774	799	231	242	105	473	336	347

Notes: The value displayed for t-tests are the differences in the means across the groups and normalized differences in the means across the groups. As a rule of thumb differences of 0.25 or less are taken to indicate good balance (see Imbens and Rubin, 2015). Table includes variables measured during the baseline survey only. Bottom row presents the F-statistic of joint significance of the t-tests of all variables tested for baseline balance. The value displayed for F-tests are p-values. The covariate variable local government area (LGA) is included in all estimation regressions. A-WEAI is a modified index of the Abbreviated Women's Empowerment in Agriculture Index.

† Value variables are winsorized at the ninety-five percentile. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

2013; McCaffrey et al., 2013; Lopez and Gutman, 2017) The covariates used to estimate such propensity weights include age, marital status, household head literacy, and number of agricultural plots. Estimation details are in Supplementary Appendix D. Overall, Table 1 shows that the treatment assignment was balanced on observable characteristics, and that the F-test for joint significance of covariates by treatment assignment is not statistically significant.[25] In appendix A Table A5, we conduct a similar exercise to demonstrate balance for village-level characteristics across program and non-program villages.

5 Empirical Strategy

Our study leverages the random assignment of cash transfers to households to contrast outcomes of cash recipients with their non-beneficiary neighbors. To identify within village-spillovers, we compare household outcomes in treated villages with outcomes in villages not participating in the cash transfer program (the pure control group). These pure control villages were randomly selected as part of the broader Feed the Future Nigeria Livelihoods Project (FNLP) impact evaluation, however their exclusion from the cash transfer program was not determined randomly but rather through a known feasibility assessment. This feature enables the regression discontinuity design (RDD) approach with an optimally determined bandwidth that complements the main results of the paper.

Throughout this paper, we investigate within-village externalities driven by income transfer impacts to local markets by leveraging random variation in the local density of cash transfer households created through the household level randomization process. We compare these outcomes with those of households in villages without the program, where no cash transfers were ever distributed. The analysis largely exploits the household panel framework, but also adopts a cross-sectional analysis for any outcomes that were not measured across all survey rounds.

One identifying assumption we utilize is the absence of program spillovers across villages (i.e. a SUTVA assumption at the village level). We investigate the possibility of cross-village spillovers and find no evidence of such an effect, as detailed in appendix B4. This analysis leverages the exogenous variation in the geographic distances between non-program villages and those receiving cash transfers and uses the assumption that the intensity of any cross-village spillover is a function of distnace to a treated village. Our results show that key outcomes for households in control villages are not influenced by their proximity to villages

[25]We find a greater likelihood that program households were located in one local government area (LGA), Birnin Kebbi, than in the other, Danko Wasagu. The extent to which households in one LGA can take better advantage of program services may bias estimates, therefore we control for LGA, a stratification variable, in the main analysis.

with cash transfers.

5.1 Benchmark Model with Panel Data

We discuss the model in stages, beginning with the direct treatment effect of the cash transfer on recipients, its impact on non-beneficiary households in program villages, and then compare both to households in non-program villages. We then sequentially introduce control variables related to local market characteristics, utilizing geocoded data as described below to explore within-village spatial spillover effects. Finally, we discuss the regression discontinuity design (RDD) estimation framework.

5.1.1 Specification for the Cash Transfer Treatment Effect on Beneficiaries

$$Y_{ivt} = \beta_0 + \beta_1(CT_{iv} \times M_t) + \beta_2(CT_{iv} \times E_t) + \alpha_t + \delta D_v + \epsilon_{ivt} \tag{4}$$

In equation 4, Y_{ivt} is the outcome of interest for household i in village v at time t. Only cash recipient households and households in non-program villages (which we will term the "pure control" are included in equation 4.CT_{iv} is a treatment indicator for residing in a treatment village and being a cash transfer recipient household. In equation 4, β_1 and β_2 capture the effect for cash transfer recipients vis-à-vis pure control at midline (M_t) and endline (E_t), respectively. α_t represents time fixed effects. D_v is a district-level fixed effect (a binary indicator for the LGA level) that controls for district-level characteristics. Standard errors are clustered at the village level.

5.1.2 Specification for Effects on Non-beneficiaries

$$Y_{ivt} = \beta_0 + \beta_1(NCT_{iv} \times M_t) + \beta_2(NCT_{iv} \times E_t) + \alpha_t + \delta D_v + \epsilon_{ivt} \tag{5}$$

Parallel to the above, equation 5, only includes non-beneficiary households in program villages as well as pure-control households. NCT_{iv} is an indicator for a non-beneficiary household i residing in a cash transfer treatment village. β_1 and β_2 capture the effect for them versus pure control households at both midline and endline.

5.1.3 Full Specification with Local Economy Characteristics

Now, we shift our focus to exploring spillover effects. In this context, we pool beneficiary, non-beneficiary, and pure-control households and introduce additional variables, discussed in section 2, that measure local market conditions. To do this we adopt an OLS panel regression as specified in equation 6, accounting for both spatial and serial correlation in our analysis.

$$Y_{ivtr} = \beta_0 + \beta_1(CT_{iv} \times M_t) + \beta_2(CT_{iv} \times E_t) + \beta_3(NCT_{iv} \times M_t) + \beta_4(NCT_{iv} \times E_t) + \gamma_1 PET_{ivr} + \gamma_2 PEV_{ivr} + \gamma_3 HH_{ivr} + \alpha_t + \delta D_v + \epsilon_{ivtr} \quad (6)$$

PET_{ivr} is a vector that includes the proportion of actual cash transfer households (i.e., the total number of cash transfer households excluding household i divided by the number of eligible households) within the local neighborhood as defined by a radius r. Thus, γ_1 measures the influence of changes in local intensity of treatment around household i regardless of the treatment status of household i. PEV_{ivr} is the share of extremely vulnerable households within a radius r and HH_{ivr} corresponds to the total number of households situated in radius r. We include these two measures as proxies for the relative poverty and size of the local market respectively.

To model possible spatial dependence among households, we estimate a linear regression model incorporating Conley standard errors (Conley, 1999, 2008). Specifically, the matrix used for the computation of the variance-covariance matrix is a Bartlett kernel, which allows for weights to linearly decrease as the distance between households i and j increases. The Bartlett kernel assumes that observations closer to each other in space are more likely to have correlated errors, while those further apart are weighted less.[26] We allow for the dependence of error terms both in space and over time. The error of each household is assumed to be correlated with the errors of all households located within a radius of r meters, as well as with the same household across time, where the temporal correlation diminishes as the time gap between observations increases. This approach ensures that both spatial and temporal clustering in the error terms are accounted for, leading to robust standard errors that adjust for these correlations. We adopt Conley (1999) standard errors as our preferred inference strategy as this method allows for correlation in error terms to decay smoothly with geographic distance, capturing the localized nature of potential spillovers or correlated shocks. It is particularly well-suited to our setting, where treatment intensity and socioeconomic conditions vary within villages by design. Similar approaches have been adopted in spatially heterogeneous development settings (e.g., Harari and Ferrara, 2018).

For each household i, the distance r will be equivalent to the radius of a circle where the center point of the circle is given by the geo-spatial location of household i. To select a value of r, we first estimate a series of models varying r in successive spatial bands from 100 meters to 1 kilometer, in increments of 100 meters. In the main results tables, we report

[26]For robustness, we also explore a binary matrix of the variance-covariance matrix where for each household-pair it contains 1 if they are the two households located within the distance threshold and 0 otherwise. Results are appreciably the same.

the estimate for 400 meters since this is the distance that minimizes the Schwartz Bayesian information criterion (BIC) for almost all outcomes. Nevertheless, we also report estimates of equation 6 using the entire set of bands (200–1,000 meters) for the main outcomes in appendix B2.

For a select number of outcome variables, such as agricultural activity, either no midline information is collected or the outcome is consistently measured across midline and endline survey rounds but signifcantly modified from baseline. Therefore, we estimate the effects for these outcome in a cross-sectional specification with the midline and endline estimates in separate panels. For these outcomes, we adopt an analysis of covariance (ANCOVA) regression specification that controls for the outcome at baseline $Y_{iv,t=0}$ (McKenzie, 2012).

5.1.4 Regression Discontinuity Specification

For robustness purposes regarding alternative counterfactual construction, we also exploit a regression discontinuity to estimate the local average treatment effect of cash transfers and the subsequent within-village externalities to non-beneficiaries. In the study, villages with 18 or more extremely vulnerable households (EV ≥ 18) are eligible for the cash transfer program and therefore we may consider households in villages to be more plausibly exogenously distributed around the cutoff of 18 EVs. Our RDD approach follows the local randomization-based method as per Cattaneo et al. (2016).

This method assumes that within a narrow band proximate to the cutoff, the treatment is randomly distributed. Once this assumption is investigated, we use the specifications described in section 5.1.3 to estimate results for the RDD sample. We present the RDD analysis results in the final columns of the main results tables. This analysis adheres to the specification mentioned in equation 6 for the RDD sample, and accounts for selected baseline covariates as described in section 4.2. A comprehensive breakdown of the RDD methodology, including bandwidth selection, inference methodology, covariance balance for the RD sample, and criteria for weight selection is presented in appendix D. Despite the reduced sample size, the robustness of our results will indicate that non-program villages serve as an appropriate counterfactual for our analysis.

6 Results

We begin by examining the direct and indirect impacts of cash transfers on productive outcomes, with a focus on female enterprise activity and household agricultural production. This is followed by further downstream impacts of the program, with an emphasis on household consumption and women's economic empowerment outcomes, which will help interpret the within-village spillover effects. Secondary outcomes that include husband's economic activity, asset investments, child health, education, time use, as well as gender attitudes and perceived norms around women's work out of the home are presented in appendix F.

6.1 Female Entrepreneurship

Table 2 presents the effects on women's participation in a non-farm enterprise activity in the past 30 days and on average unconditional monthly business profits (expressed in real terms, with zero profits for women not operating a business in the past 30 days).[27]

It is important to note that the baseline level of non-farm enterprise activity among ultra-poor women in the study sample was very low but increased over time even among households in pure-control villages.[28] However, villages where cash transfers were paid ("program villages") experienced significant growth in female entrepreneurship activity over and above the secular trend.[29] We first present the direct effects for cash transfer treatment households (CT in CT villages) in columns 1 and 2. The receipt of a cash transfer leads to a 7 percentage point increase in average women's non-farm enterprise participation at midline and a 24 percentage point increase at endline (the increase is statistically significant at endline only). That is, cash transfer beneficiaries were more likely to participate in non-farm enterprise activity, relative to the pure control households in non-program villages by one year after program cessation. Income gains were also substantial, with column 2 suggesting that receipt of a cash transfer leads to an increase in average monthly earnings of 40 percentage points from non-farm businesses at midline [A] and 166 percentage points at endline [B], relative to the pure control households (again only significant at endline).[30]

Next, in columns 3 and 4 we turn to the impacts for women in untreated households

[27] In the appendix we show that results with the IHS transformation of profits are robust to the levels of monthly profits in Nigerian naira winsorized at the 95th percentile. Since this winsorization still leaves a very dispersed long tail, and a standard deviation of profits that is two to three times the mean, it results in lower power.We also present profits conditional on start-up and survival in Appendix Table F1

[28] Only 7% of women report any non-farm enterprise activity over the past year at baseline.

[29] The time trend in Table 2 is shown by the positive coefficients on the time dummy variables, *Midline* and *Endline* indicating growth in business activity among ultra-poor women over the three-year study period. Unconditional mean business earnings in the pure control group also increased over time with businesses earning near to nothing at baseline to an average of approximately 500 Nigerian naira per month by endline. It is possible that the general presence of development programming in the region, as well as an improving

Table 2: Impact on Non-Farm Enterprise Outcomes

	CT Beneficiary HHs in Program Villages		*Non-beneficiary HHs in Program Villages*		*CT Beneficiary HHs in Program Villages*		*Non-beneficiary HHs in Program Villages*		*Full Sample (CTs and NCTs) in Program Villages*		*RDD (CTs and NCTs) in Program Villages*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Non-farm Enterprise (Yes =1)	Real Monthly Profits (IHS)	Non-farm Enterprise (Yes =1)	Real Monthly Profits (IHS)	Non-farm Enterprise (Yes =1)	Real Monthly Profits (IHS)	Non-farm Enterprise (Yes =1)	Real Monthly Profits (IHS)	Non-farm Enterprise (Yes =1)	Real Monthly Profits (IHS)	Non-farm Enterprise (Yes =1)	Real Monthly Profits (IHS)
CT in CT villages Midline [A]	0.07	0.40			0.13***	0.96***			0.12**	0.79**	0.09	0.67
	[0.08]	[0.64]			[0.05]	[0.37]			[0.05]	[0.39]	[0.09]	[0.67]
CT in CT villages Endline [B]	0.24***	1.66***			0.26***	2.02***			0.20***	1.38***	0.13***	0.84***
	[0.06]	[0.47]			[0.04]	[0.37]			[0.02]	[0.21]	[0.03]	[0.24]
NCT in CT villages Midline [C]			-0.05	-0.43			0.03	0.07	0.01	0.03	-0.00	-0.04
			[0.08]	[0.62]			[0.07]	[0.49]	[0.06]	[0.42]	[0.09]	[0.67]
NCT in CT villages Endline [D]			0.17***	1.19**			0.10**	0.43*	0.13***	0.93***	0.08***	0.46***
			[0.06]	[0.48]			[0.04]	[0.25]	[0.02]	[0.17]	[0.02]	[0.14]
PET Midline [E]					-0.10***	-0.93***	-0.09	-0.55	-0.07	-0.59	0.01	0.00
					[0.03]	[0.30]	[0.09]	[0.66]	[0.05]	[0.41]	[0.11]	[0.91]
PET Endline [F]					-0.04	-0.78**	0.17*	1.58**	0.08***	0.55***	0.06**	0.47**
					[0.06]	[0.37]	[0.10]	[0.63]	[0.02]	[0.19]	[0.03]	[0.23]
PEV Midline [G]					-0.34***	-2.52***	-0.27***	-2.10***	-0.29***	-2.15***	-0.26***	-2.23***
					[0.11]	[0.80]	[0.08]	[0.70]	[0.10]	[0.78]	[0.09]	[0.82]
PEV Endline [H]					-0.16***	-1.41***	-0.15***	-1.09***	-0.15***	-1.19***	-0.08**	-0.78**
					[0.04]	[0.32]	[0.04]	[0.37]	[0.04]	[0.33]	[0.04]	[0.31]
#HH Midline [I]					0.05*	0.34	0.03	0.15	0.04*	0.27	0.03	0.18
					[0.03]	[0.23]	[0.02]	[0.13]	[0.02]	[0.17]	[0.02]	[0.19]
#HH Endline [J]					0.05***	0.33***	0.03**	0.28**	0.04***	0.32***	0.03	0.27
					[0.01]	[0.11]	[0.02]	[0.12]	[0.01]	[0.11]	[0.02]	[0.19]
Midline [K]	0.24***	1.85***	0.24***	1.82***	0.28***	2.17***	0.28***	2.16***	0.28***	2.12***	0.29***	2.30***
	[0.08]	[0.58]	[0.08]	[0.59]	[0.07]	[0.52]	[0.05]	[0.42]	[0.06]	[0.48]	[0.05]	[0.39]
Endline [L]	0.15***	1.25***	0.15***	1.23***	0.15***	1.34***	0.15***	1.25***	0.15***	1.27***	0.20***	1.69***
	[0.05]	[0.42]	[0.05]	[0.42]	[0.03]	[0.28]	[0.03]	[0.28]	[0.03]	[0.28]	[0.03]	[0.28]
Observations	1884	1884	1866	1866	1884	1884	1866	1866	3498	3498	1401	1401
Local neighborhood radius (Mts)					400	400	400	400	400	400	400	400
Mean Pure Control												
Baseline	0.01	5.95	0.01	5.95	0.01	5.95	0.01	5.95	0.01	5.95	0.01	5.95
Midline	0.25	290.56	0.25	290.56	0.25	290.56	0.25	290.56	0.25	290.56	0.25	290.56
Endline	0.15	269.15	0.15	269.15	0.15	269.15	0.15	269.15	0.15	269.15	0.15	269.15
CT recipients around (%)					0.41	0.41	0.43	0.43	0.45	0.45	0.40	0.40
EVs around (%)					0.32	0.32	0.34	0.34	0.34	0.34	0.30	0.30
Households around (#)					1.14	1.14	1.16	1.16	1.19	1.19	0.78	0.78
Elasticities - Adjustment following Bellemare and Wichman (2020)												
CT in CT villages Midline [A]		0.22				1.45				1.04		0.57
CT in CT villages Endline [B]		3.74				6.08				2.88		1.26
NCT in CT villages Midline [C]				-0.46				-0.05		-0.05		-0.24
NCT in CT villages Endline [D]				1.93				0.49		1.5		0.56
PET Midline [E]						-0.16		-0.1		-0.1		0
PET Endline [F]						-0.14		0.28		0.1		0.08

Notes: *p < 0.05, **p < 0.01, ***p < 0.001. EV = extremely vulnerable; CT = cash transfers; NCT = no cash transfers; RDD = regression discontinuity design.

(1) Outcome variables are as follows: (1) "Non-farm Enterprise" indicates if the female respondent did any non-farm enterprise activity in past 30 days. (2) "Profits" is the inverse hyperbolic sine (IHS) transformed measure of average monthly profits in real terms. The point estimates presented in this table require an adjustment to be interpreted as a percentage change following Bellemare and Wichman (2020). Adjustment values can be found at the bottom of the table. The mean of the pure control group at the bottom of the table for profits is the 95th percentile winsorized levels of real profits expressed in Nigerian naira (in the appendix we also present the effects in levels).

(2) Regression uses ordinary least squares (OLS) for panel data. All regressions control for location, i.e., local government area (LGA) fixed effects. In columns 1 to 4 standard errors are clustered at the village level; and in columns 5 to 12 Conley standard errors that account for spatial correlation in the data are used (Conley 1999; 2008).

(3) CT in CT villages = 1 if household was randomly assigned to receive cash transfers in a cash transfer program village; NCT in CT villages = 1 if household was randomly assigned to receive no cash transfers in program villages; and Pure Control = 1 if household did not receive cash transfers in a non-program village where no cash transfers were ever paid (reference group in the regression). Midline and Endline are time fixed effects.

(4) Columns 5 to 12 include a set of variables to control for local neighborhood effects that includes the size of the local market (#HH), the density of cash transfers (PET), and the relative level of poverty (PEV) in a 400 meter radius. #HH is the total number of households in the local area rescaled by a factor of 100. PET is a vector for the proportion of cash transfer households in the local area equivalent to the total number of cash transfer households over the number of eligible households around household i in a 400m radius. PEV is the proportion of extremely vulnerable households out of the total number of households in the local neighborhood.

,(5) The sample in Table 2 is a balanced panel that includes all ultra-poor households that were interviewed at baseline, midline, and endline.

(6) The regression discontinuity (RD) estimation is presented in columns 11 and 12 that exploits the sharp discontinuity at the 18 EV cutoff that determined village-level program eligibility to receive cash transfers.We estimate the local average treatment effect (LATE) for the panel sample using only observations close to the equally weighted cutoff. In columns 11 and 12 the bandwidth is defined as +/- 18 EVs around the cutoff i.e. any villages with 0 to 36 EVs are included in the estimation (note minimum number of EVs in a village is 4). The optimal bandwidth was selected using rdwinselect command on Stata (see Cattaneo et al. 2016 and Appendix for further information).

(i.e. the NCT in CT villages). We find no effect at midline [C] and then a positive spillover effect at endline [D]. Non-beneficiary women who live in a cash transfer program village are 17 percentage points more likely to start a business and earn higher profits at endline than pure control households in non-program villages.

To examine the possibility of within village spatial spillover effects in columns 5 to 12 we include controls for local market characteristics using geocoded data (i.e. the local cash transfer treatment intensity, market size, and relative poverty of the market). We present the results with the local market defined as a 400-meter radius around each observed household i and find that the magnitude, direction, and significance of possible spillover effects depends on the density of cash transfers within the local market and the time since the transfers ended.

In columns 5 and 6, among the cash transfer recipients, the main program effects remain the same at endline and are now significant at midline as well. The receipt of a cash transfer leads to a 13 percentage point increase in average women's non-farm enterprise participation at midline and a 26 percentage points increase at endline, relative to pure control households (now significant at the 99% significance level). At midline the greatest impact on entry for recipients of a cash transfer occurs when there are no other transfer recipients in the local area. As the proportion of cash recipients increases, the conditional likelihood of entry declines, consistent with a declining expected profitability from increased possibility of entry (see the negative coefficient on *PET* in [E] and [F]). This effect tempers by endline, perhaps indicating that the disincentive to enter is mitigated by improved local economic conditions and increased expected profits. On the other hand, other local economic characteristics related to the density and aggregate wealth of the local market increase business entry among women (we find *Num of HH* is positively correlated, and *PEV* is negatively correlated with business activity). This is consistent with a higher expectation of average firm profitability in these areas.

In columns 7 and 8 we conduct similar analysis for the non-cash transfer households. At endline, we find a large positive spillover for untreated women in program villages who are 10 percentage points more likely to start a business than pure control households (D). At endline the coefficient on *PET* (F) is also positive, which suggests the influence of *PET* is, on balance, different in the longer run for non-cash transfer households — as the proportion of

Nigerian macroeconomic climate during the study period may have propagated this growth.

[30]We show that the impact on the winsorized unconditional real levels of profits is also positive and significant in Table F1 in the appendix. Profits conditional on any business are negative, suggesting our profit results are achieved at the extensive margin (more businesses are started) rather than at the intensive margin (higher profits among existing businesses). This result further suggests that increased business entry increases competitive forces that reduce the rents or profit earned by the earlier entrants.

cash transfers around household i increases, the more likely a woman is to start a business. One possible explanation for these large increases in enterprise activity is that, as local markets build in part through the activity of cash-transfer households, a greater number of non-cash-transfer households see profitable opportunities for firm entry. In the appendix Table C1 we find that the majority of untreated women in cash transfer villages report that the source of funds to start their business comes from drawing on their own savings rather than receiving transfers from others or formal loans, suggesting that profitability conditions changed rather than access to capital that may finance business entry costs.

In columns 9 and 10 we pool the sample and present the full specification as described in equation 6. The results remain the same. In the longer-run as the proportion of cash transfers around household i in their local neighborhood increases, and thus local market activity and wealth, the greater the likelihood that the primary female starts a business.

Finally, in columns 11 and 12 we present the results of the RDD to estimate treatment and spillover effects. The RDD specification reduces the study sample size by 60% but many of the main effects are still precisely estimated. We again present the full spatial specification that includes the local market controls. The main impact results on non-farm enterprise activity outcomes are robust to sample truncation and identification based on a discontinuity. As before, we show that the magnitude of the spillover effect changes with the density of cash transfers around household i. In columns 11 and 12 the PET at endline is positive and significant, which suggests a higher density of cash transfers around household i leads to greater enterprise activity and subsequently higher unconditional profits at endline.[31]

In appendix C we examine in detail the patterns of enterprise creation among cash transfer beneficiaries and non-beneficiaries to analyze how women respond to the increased incentives and opportunities within their local market. We show that women appear to be making strategic business choices through their choice of business sector and location of the business. Indeed, Table C3 confirms that the greater the density of businesses in the local neighborhood around household i at time $t-1$, the more likely the female in household i operates a business at time t.[32] Table C4 examines the types of businesses created and whether there is evidence of complements or substitutes of business entry with respect to existing business types.[33] We find suggestive evidence that women start similar businesses to the businesses being started around them in their local neighborhood. Specifically, the greater the density of cooking businesses around household i within a radius of 400 m at midline, the more likely the

[31] In appendix A5 we show that the sharpened q-values consistently support our findings across all tables.

[32] Spatial agglomeration forces imply that more concentrated economic activity arises from higher returns due to greater scope for specialization or capacity to take advantage of complementarities (Moreno-Monroy, 2012).

[33] Business types include cooking, oil processing, crop processing, trading, services, and other.

business will be a cooking business, and the less likely she operates an oil processing business at endline. We also find that the higher density of oil processing businesses around household i at midline, the more likely household i operates an oil- or crop-processing business at endline, with similar patterns among services. These results are robust after controlling for cash transfer receipt. Our results suggest complementarity, perhaps with shared capital goods such as cooks stoves or firepits in the case of cooking, or mimicry in business type. However, without further granularity on the final products produced, it is not possible to definitively claim the businesses are truly complements.

6.2 Agricultural Outcomes

Agricultural activity is the main source of income generation among households in the study area. At baseline the majority of men and some women said they were engaged in agricultural productive activities (farming or livestock raising) in the 12 months prior to the survey. At endline we find similar activity rates, of 93% men and 34% women active in agriculture. We examine the program's impact on agricultural outcomes such as yields per hectare and expenditures on agricultural inputs at endline.[34]

Table 3 presents results at endline controlling for baseline levels of the outcome variable. The outcome variables include a binary variable for whether the household had a positive agricultural yield in the last cropping season (one indicator of agricultural activity), the total agricultural yield of all crops cultivated by the household, and total expenditures on agricultural inputs per hectare in the last agricultural season.[35] These values are estimated across all households regardless of whether they operate a farm or not.

In columns 1 to 3 we present results for the full sample. The results in column 1 suggest households in cash transfer program villages are 22 percentage points more likely to have a positive agricultural yield at endline. Both cash transfer beneficiaries and non-beneficiaries also report a three-fold increase in yields per hectare compared to the pure control group.[36] The *PET* variable is not statistically significant, and yields are negatively correlated with both the density of households and the relative poverty of the local market.

[34]Comprehensive modules on agricultural outcomes were only collected at baseline and endline with the respondent of this module the owner or manager of the plot, typically the male household head or primary male decision-maker. Outcomes are aggregated values across crops and plots cultivated by the household.

[35]To calculate agricultural yields per hectare, we divide the total value of harvest by the total area of land cultivated and apply the inverse hyperbolic sine (IHS) transformation. The Nigerian Naira value of harvest was calculated by multiplying the total quantity of harvest in kilograms of each crop by the median sales value of the crop per kilogram in each village and aggregating across all crops at the household level.

[36]We find no change in the number of crops cultivated by cash transfer households due to the program. However, these households are more likely to cultivate cowpea at both the intensive and extensive margins, while non-beneficiary households show a preference for cultivating rice, a cash crop in the region (not shown).

Column 3 indicates overall higher expenditures on inputs per hectare on agricultural plots among households in cash transfer villages. Households increase their spending on both organic and inorganic fertilizers per hectare and also utilize more family labor on plots. We find no evidence that the program altered the ownership of agricultural land or the total area cultivated. For a detailed breakdown of investments in non-labor and labor-related agricultural inputs see appendix Tables F6 and F7.

Overall, both households receiving cash transfers and non-beneficiary households in program villages report higher yields and increased agricultural investments at endline compared to pure control households. These higher levels of harvested value are principally consumed or stored for the next season. Less than 10 percent of yields are sold to market for cash (see breakdown in Table F8). To help contextualize these high returns we acknowledge that the program was targeted to the most vulnerable households with relatively small land holdings (where 85% of EV households reported to have less than 1 Hectare of land) and low agricultural yields (with average yields across all study households approximately 408,000 Nigerian naira in real terms) at baseline. Therefore, the returns are realized from a low base.

Columns 4 to 6 present the regression discontinuity approach. The main findings on agricultural outcomes remain robust under the RDD estimation. Both cash and non-cash transfer households in treated villages exhibit an increase in the likelihood of positive yields, a rise in yields per hectare, and, related to this increase, a rise in farm inputs utilized.

Taken together, Tables 2 and 3 suggest that the cash transfers led to greater economic and investment opportunities for households both on and off the farm and for both beneficiary and non-beneficiary poor households. In appendix Table F2 we confirm that women in program villages increase their total labor force participation (see column 1 for being active in any work in the past month) relative to the pure control. Women are more likely to shift into operating non-farm businesses and some women are in both farming and non-farm activities. There does not appear to be evidence of crowding out from one type of income generation to another. We do not find evidence of a net change in husband's labor supply but rather some labor reallocation from farming to off-farm work (see appendix Table F3). It is noteworthy that increases in aggregate economic activity are exclusively in the non-farm and farm entrepreneurial sectors - there are no observed gains in wage employment (see appendix F Table F4). The opportunities for wage work is limited in this context with less than 5% of men and women, on average, reporting being active in any wage or salaried employment in the last month. Given the identified impacts on productive outcomes, next we turn to downstream outcomes related to household welfare.

Table 3: Impact on Agriculture Outcomes

	Full Sample (CTs and NCTs)			***RDD (CTs and NCTs)***		
	(1)	(2)	(3)	(4)	(5)	(6)
	Positive agricultural yield (Yes =1)	Yields (IHS)	Total inputs used on the plot per hectare (IHS)	Positive agricultural yield (Yes =1)	Yields (IHS)	Total inputs used on the plot per hectare (IHS)
CT in CT villages [A]	0.22**	3.36***	1.58***	0.22**	3.42**	1.65***
	[0.08]	[1.18]	[0.50]	[0.10]	[1.37]	[0.62]
NCT in CT villages [B]	0.22**	3.49***	1.63***	0.24***	4.03***	1.84***
	[0.09]	[1.20]	[0.53]	[0.09]	[1.33]	[0.66]
PET [C]	-0.12	-2.14	-0.12	-0.02	-0.79	-0.38
	[0.10]	[1.39]	[0.78]	[0.13]	[1.82]	[0.97]
PEV [D]	-0.26*	-4.01**	-0.60	-0.08	-2.05	0.44
	[0.13]	[1.93]	[0.67]	[0.19]	[2.77]	[1.17]
#HH [E]	-0.05*	-0.77*	-0.35*	-0.01	-0.22	-0.73***
	[0.03]	[0.46]	[0.20]	[0.05]	[0.75]	[0.27]
Constant	0.78***	11.00***	0.21	0.70***	10.26***	0.09
	[0.09]	[1.22]	[0.40]	[0.09]	[1.33]	[0.54]
Observations	1166	1166	1166	467	467	467
Adjusted R-squared	0.05	0.05	0.09	0.11	0.12	0.14
Local neighborhood radius (Mts)	400	400	400	400	400	400
Mean Pure Control Endline	0.67	9.31	0.62	0.67	9.57	0.62
CT recipients around (%)	0.45	0.45	0.45	0.40	0.40	0.40
EVs around (%)	0.34	0.34	0.34	0.30	0.30	0.30
Households around(#)	1.19	1.19	1.19	0.78	0.78	0.78
Elasticities - Adjustment following Bellemare and Wichman (2020)						
CT in CT villages [A]		5.41	3.74		5.08	4.14
NCT in CT villages [B]		7.11	3.97		20.13	5.18
PET[C]		-0.98	-0.06		-0.35	-0.2

Notes: *p < 0.05, **p < 0.01, ***p < 0.001. EV = extremely vulnerable; CT = cash transfers; NCT = no cash transfers; RDD

(1) Outcome variables are as follows: (1) "Positive agricultural yield" is a binary variable for whether the household achieved a non-zero yield at endline (Yes =1; No=0); (2) "Yields" is the inverse hyperbolic sine (IHS) transformed measure of the value of household agricultural yields on all cultivated land. The point estimates presented in this table require an adjustment to be interpreted as a percentage change following Bellemare and Wichman (2020). (3) "Total inputs used on the plot/ha" is the IHS transformed measure of the value of agricultural inputs (e.g. fertilizers, seeds and labor) used on agricultural land per hectare. The main respondent for the agriculture module was typically the male household head, or female when the male was absent.

(3) Regression uses ANCOVA estimation that controls for the baseline level of the outcome.

(4)All regressions control for location i.e. local government area (LGA) fixed effects and conley standard errors that account for spatial correlation in the data are used (Conley 1999; 2008).

(5) CT in CT villages =1 if household was randomly assigned to receive cash transfers in a cash transfer program village; NCT in CT villages = 1 if household was randomly assigned to receive no cash transfers in program villages; and Pure Control = 1 if household did not receive cash transfers in a non-program village where no cash transfers were ever paid.

(6) We include a set of variables to control for local neighborhood effects that includes the size of the local market (#HH), the density of cash transfers (PET) and the relative level of poverty (PEV) in a 400 meter radius. #HH is the total number of households in the local area rescaled by a factor of 100. PET is a vector for the proportion of cash transfer households in the local area equivalent to the total number of cash transfer households over the number of eligible households around household i in a 400m radius. PEV is the proportion of extremely vulnerable households out of the total number of households in the neighborhood.

(7) Agricultural outcomes are measured at baseline and endline only. Sample is a cross-sectional regression that includes all ultra-poor households surveyed at both midline and endline.

(8) The regression discontinuity (RD) estimation is presented in Table 3 columns 4 to 6 that exploits the sharp discontinuity at the 18 EV cutoff that determined village-level program eligibility to receive cash transfers.We estimate the local average treatment effect (LATE) using only observations close to the cutoff where the bandwidth is defined as +/- 18 EVs around the cutoff.

6.3 Consumption and Food Security

In Table 4 we examine impacts on measures of consumption and food security. The outcome for consumption is the value of total household consumption converted to a daily adult-equivalent measure expressed in real value terms.[37] The outcome measure of food security is a weighted standardized index that averages various measures of food security and hunger.[38] According to our survey data, there is considerable food insecurity in this region: at baseline approximately 25% of households report having gone a whole day and night without eating in the past week and 30% report having fewer than three meals a day.

In Table 4, results are estimated in a panel framework, as described in equation 6. Columns 1 and 2 show results for the full specification with the local market defined within a 400-meter radius around household i, including controls for cash transfer treatment intensity, market size, and relative poverty of the local market.[39] Results in Table 4 demonstrate a positive and significant cash treatment effect on measures of food security and consumption compared to pure control households. For cash transfer beneficiaries, this positive effect is noticeable at both midline and endline. At endline, cash transfer households experience a 0.79 standard deviation increase in the food security index and a 39 percentage point increase in consumption compared to pure control group households in non-program villages.[40]

Effects for non-beneficiary households in program villages show no significant changes at midline, but at endline results are robust and as pronounced as those for cash transfer recipients. We find non-beneficiaries have a 0.84 standard deviation increase in their food security index and a 39 percentage point increase in consumption compared to pure control households. These findings follow the pattern of non-farm enterprise creation results shown in Table 2. Cash transfer beneficiary households demonstrate positive effects sooner - and the effects persist after cessation of transfers - but eventually, even non-beneficiary households

[37]The consumption outcome measure captures expenditures on all food and non-food items reported over seven-day, one-month and six-month recall periods, converted to a daily expense and divided by the total number of household members that assigns a weight of 1 to the first household member, 0.7 to each additional adult, and 0.5 to each child. The value is inflation-adjusted and the inverse hyperbolic sine (IHS) transformation of the consumption measure is presented in Table 4. In Table F9 in appendix F we present a breakdown of total consumption into sub-groups.

[38]The food security index includes six coping strategies and behaviors undertaken to offset food security in the past seven days, the number of meals eaten by adults and children per day, whether they consumed fish or meat in the past seven days, and whether the household faced a situation where there was not enough food to eat in the past 12 months. The variables are combined into an index following Anderson (2008).

[39]The secular improvement in consumption is evident from the coefficients on *Midline* and *Endline*. The real value of consumption increased over the study period for pure controls, mirroring the upward trend in women's engagement in enterprise activities shown in Table 2. However, these households were no less food insecure at endline (see Table 4, column 1 coefficient on *Endline*). While both treatment and control households were surveyed during the same periods, this difference might reflect seasonal influences if households experienced seasonal hunger at endline.

[40]To interpret the effect as a percentage change we refer to the elasticities at the bottom of the table.

in cash transfer villages benefit.

Analysis of market condition effects reveals that, at midline, the coefficient on PET in column 1 is negative, perhaps indicating a short-run crowding-out of economic activity or reduction of economic rents, where a greater number of cash transfers around household i correlates with increased food insecurity. By endline, this pattern no longer persists. Regarding market size ($Num\ of\ HH$), a larger number of households in the local area correlates with higher food security, underscoring greater earnings potential in a denser market. In contrast, the relative poverty level (PEV) of the local market is negatively correlated with both food security and consumption.

In columns 3 and 4, we demonstrate that the results for food security and consumption remain largely robust when applying the RDD estimation. However, in the RDD sample, we do observe effects for non-beneficiaries at midline, and notably, the PET becomes positive and significant at endline. This indicates that a higher density of cash transfers around household i correlates with improved food security and consumption at endline within the RDD sample, again indicating the presence of positive spillovers from receiving transfers.

Overall, the combined direct and indirect impacts on food security and consumption indicate that ultra-poor households in program villages experienced substantial improvements in food security and household consumption one year after the conclusion of the cash transfer program.

Table 4: Impact on Food Security and Consumption

	Full Sample (CTs and NCTs)		***RDD (CTs and NCTs)***	
	(1)	(2)	(3)	(4)
	Household Food Security Index (Standardized)	Consumption: Real Expenditures Adult Equivalent 7days (IHS)	Household Food Security Index (Standardized)	Consumption: Real Expenditures Adult Equivalent 7days (IHS)
CT in CT villages Midline [A]	0.22**	0.29**	0.33**	0.46***
	[0.10]	[0.14]	[0.14]	[0.12]
CT in CT villages Endline [B]	0.28***	0.34***	0.18***	0.06
	[0.05]	[0.10]	[0.06]	[0.08]
NCT in CT villages Midline [C]	0.01	0.02	0.24**	0.24**
	[0.07]	[0.15]	[0.11]	[0.10]
NCT in CT villages Endline [D]	0.29***	0.33***	0.33***	0.11
	[0.06]	[0.11]	[0.04]	[0.09]
PET Midline [E]	-0.33***	0.12	-0.95***	-0.05
	[0.08]	[0.15]	[0.09]	[0.18]
PET Endline [F]	0.18*	0.06	0.19	0.31***
	[0.11]	[0.11]	[0.15]	[0.07]
PEV Midline [G]	-0.10	-0.68***	0.13	-0.58***
	[0.11]	[0.12]	[0.14]	[0.22]
PEV Endline [H]	-0.14*	-0.19	-0.37***	-0.19
	[0.08]	[0.18]	[0.11]	[0.14]
#HH Midline [I]	0.03	-0.11	-0.03	-0.37***
	[0.02]	[0.07]	[0.03]	[0.10]
#HH Endline [J]	0.00	-0.05	-0.04	-0.05
	[0.02]	[0.06]	[0.03]	[0.09]
Midline [K]	0.20	1.89***	0.32*	2.15***
	[0.15]	[0.19]	[0.16]	[0.22]
Endline [L]	-0.02	1.70***	0.11	1.88***
	[0.06]	[0.15]	[0.11]	[0.17]
Observations	3498	3493	1401	1401
Local neighborhood radius (Mts)	400	400	400	400
Mean Pure Control				
Baseline	-0.1	367.0	-0.1	367.0
Midline	0.1	846.6	0.1	846.6
Endline	-0.1	1013.2	-0.1	1013.2
CT recipients around (%)	0.45	0.45	0.40	0.40
EVs around (%)	0.34	0.34	0.30	0.30
Households around (#)	1.19	1.19	0.78	0.78
Elasticities - Adjustment following Bellemare and Wichman (2020)				
CT in CT villages Midline[A]		0.32		0.57
CT in CT villages Endline[B]		0.39		0.06
NCT in CT villages Midline[C]		0.01		0.26
NCT in CT villages Endline[D]		0.39		0.12
PET Midline[E]		0.02		-0.01
PET Endline[F]		0.01		0.05

Notes: *p < 0.05, **p < 0.01, ***p < 0.001. EV = extremely vulnerable; CT = cash transfers; NCT = no cash transfers; RDD = regression discontinuity design.

(1) Outcome variables are as follows: (1) "Household Food Security Index" is a variance-weighted index, following Anderson (2008) that is composed of various measures of food security and hunger. (2) "Consumption: Real Expenditures Adult Equivalent" is the inverse hyperbolic sine (IHS) transformed value of total household consumption converted to a daily adult-equivalent measure and inflation-adjusted. The point estimates presented in this table require an adjustment to be interpreted as a percentage change following Bellemare and Wichman (2020). The mean of the pure control group is real consumption expressed in Nigerian Naira.

(2) Regression uses ordinary least squares (OLS) for panel data. All regressions control for local government area (LGA) fixed effects and Conley standard errors that account for spatial correlation in the data are used throughout (Conley 1999; 2008).

(3) CT in CT villages = 1 if household was randomly assigned to receive cash transfers in a cash transfer program village; NCT in CT villages = 1 if household was randomly assigned to receive no cash transfers in program villages; and Pure Control = 1 if household did not receive cash transfers in a non-program village where no cash transfers were ever paid. Midline and Endline are time fixed effects.

(4) We include a set of variables to control for local neighborhood effects that includes the size of the local market (#HH), the density of cash transfers (PET) and the relative level of poverty (PEV) in a 400 meter radius. #HH is the total number of households in the local area rescaled by a factor of 100. PET is a vector for the proportion of cash transfer households in the local area equivalent to the total number of cash transfer households over the number of eligible households around household i in a 400m radius. PEV is the proportion of extremely vulnerable households out of the total number of households in the local neighborhood.

(5) Sample in Table 4 is a balanced panel that includes all ultra-poor households that were interviewed at baseline, midline and endline.

(6) The regression discontinuity (RD) estimation is presented in Table 4 columns 3 and 4 that exploits the sharp discontinuity at the 18 EV cutoff that determined village-level program eligibility to receive cash transfers.We estimate the local average treatment effect (LATE) using only observations close to the cutoff where the bandwidth is defined as +/- 18 EVs.

Table 5: Impact on Women's Economic Empowerment and Decision-Making Power

	Full Sample (CTs and NCTs)					***RDD (CTs and NCTs)***				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Pro-WEAI Empowerment Index	Decision Making Index	Who decides how money from a relative is shared… (Yes =1)			Pro-WEAI Empowerment Index	Decision Making Index	Who decides how money from a relative is shared… (Yes =1)		
			Self	*Spouse*	*Joint*			*Self*	*Spouse*	*Joint*
CT in CT villages [A]	0.52**	0.55**	-0.08	-0.14*	0.19***	0.42	0.35	-0.06	-0.21***	0.24***
	[0.22]	[0.27]	[0.08]	[0.07]	[0.05]	[0.28]	[0.35]	[0.11]	[0.08]	[0.07]
NCT in CT villages [B]	0.38*	0.28	-0.15*	-0.08	0.21***	0.32	0.15	-0.08	-0.18**	0.24***
	[0.22]	[0.27]	[0.09]	[0.07]	[0.06]	[0.25]	[0.33]	[0.11]	[0.08]	[0.08]
PET[C]	-0.23	-0.05	0.14	0.05	-0.17*	-0.37	0.17	0.12	0.12	-0.20*
	[0.33]	[0.44]	[0.12]	[0.10]	[0.09]	[0.41]	[0.60]	[0.18]	[0.13]	[0.11]
PEV[D]	-0.12	-1.03***	-0.17**	0.29***	-0.11	0.03	-0.94**	-0.46***	0.43**	0.05
	[0.26]	[0.28]	[0.08]	[0.09]	[0.07]	[0.57]	[0.45]	[0.16]	[0.20]	[0.12]
#HH[E]	-0.01	-0.02	0.01	0.04	-0.05***	0.06	0.07	-0.04	0.08**	-0.04
	[0.07]	[0.08]	[0.03]	[0.03]	[0.02]	[0.12]	[0.14]	[0.04]	[0.04]	[0.03]
Observations	1166	1166	1166	1166	1166	467	467	467	467	467
Adjusted R-squared	0.01	0.05	0.02	0.02	0.03	0.01	0.03	0.04	0.03	0.06
Local neighborhood radius (Mts)	400	400	400	400	400	400	400	400	400	400
Outcome Mean Pure Control	0.95	0.68	0.61	0.36	0.04	0.95	0.68	0.61	0.36	0.04
CT recepients around (%)	0.45	0.45	0.45	0.45	0.45	0.40	0.40	0.40	0.40	0.40
EVs around (%)	0.34	0.34	0.34	0.34	0.34	0.30	0.30	0.30	0.30	0.30
HH around(#)	1.19	1.19	1.19	1.19	1.19	0.78	0.78	0.78	0.78	0.78

Notes: *p < 0.05, **p < 0.01, ***p < 0.001. EV = extremely vulnerable; CT = cash transfers; NCT = no cash transfers; RDD = regression

(1) Outcome variables are as follows: (1) "Pro-WEAI Empowerment Index" is a variance-weighted index based on the methodology described by Anderson (2008) consisting of 11 dummy variables that represent "adequacy in empowerment" based on a modified version of the project-level Women's Empowerment in Agriculture Index (Pro-WEAI) toolkit (see Alkire et al. 2013). (2) "Decision Making Index" is a variance-weighted based on Anderson (2008) that comprises seven key decisions where the woman has some influence. (3) "Who decides how money from a relative is shared… (self, spouse, or joint)" are 3 dummy variables from a vignette/scenario question that asks hypothetically who within the household would have the final say over how money (10,000 NGN) from a close relative gets shared?

(2) Regressions use an ANCOVA estimation, which accounts for the baseline level of the outcome variable. The baseline empowerment index (0–11) is a modified A-WEAI rescaled to a 0–1 scale. For the Decision-Making Index and sharing variables, we control for the baseline Decision-Making Index (0–6)

(3) All regressions control for location i.e. local government area (LGA) fixed effects and Conley standard errors that account for spatial correlation in the data are used throughout (Conley 1999; 2008).

(4) CT in CT villages =1 if household was randomly assigned to receive cash transfers in a cash transfer program village; NCT in CT villages = 1 if household was randomly assigned to receive no cash transfers in program villages; and Pure Control = 1 if household did not receive cash transfers in a non-program village where no cash transfers were ever paid.

(5) We include a set of variables to control for local neighborhood effects that includes the size of the local market (#HH), the density of cash transfers (PET) and the relative level of poverty (PEV) in a 400 meter radius. #HH is the total number of households in the local area rescaled by a factor of 100. PET is a vector for the proportion of cash transfer households in the local area equivalent to the total number of cash transfer households over the number of eligible households around household i in a 400m radius. PEV is the proportion of extremely vulnerable households out of the total number of households in the local neighborhood.

(6) Women's empowerment outcomes were measured at baseline and endline only and sample is a cross-section that includes all ultra-poor households surveyed at both midline and endline.

(7) The regression discontinuity (RD) estimation is presented in Table 6 columns 6 to 10 that exploits the sharp discontinuity at the 18 EV cutoff that determined village-level program eligibility to receive cash transfers.We estimate the local average treatment effect (LATE) using only observations close to the cutoff where the bandwidth is defined as +/- 18 EVs around the cutoff.

6.4 Women's Empowerment and Decision-Making Power

Table 5 presents the impact results on women's economic empowerment and intrahousehold decision-making power, measured at endline. To measure women's empowerment we follow guidance from the Women's Empowerment in Agriculture Index (WEAI) toolkit (see Alkire et al., 2013). We modified the abbreviated WEAI (A-WEAI) during the baseline survey and the WEAI for project use (pro-WEAI) during the endline survey.[41] The outcome in column 1 is an index of women's empowerment calculated as an unweighted sum of 11 adequacy indicators from the pro-WEAI toolkit (Malapit et al., 2019). Column 2 details the impacts on an index of decision-making power that aggregates seven key decisions that are consistently measured across all survey rounds.[42]

Columns 1 and 2 show that for cash transfer beneficiaries, the impacts on both the pro-WEAI index and the decision-making power index are positive and statistically significant, relative to the pure control group. Specifically, cash transfers lead to a 0.58 standard deviation increase in the women's empowerment index and a 0.31 standard deviation increase in the decision-making power index. However, we do not find evidence of an impact on women's empowerment among non-beneficiary households (the coefficients are positive but not precisely estimated). Regarding local economic conditions of the neighborhood, the coefficient on PET is not significant and the relative community poverty level (PEV) is negatively correlated with women's decision-making power.

Additionally, in columns 3 to 5 we examine a vignette measure of household bargaining power through a scenario-based question asking who (self, spouse, or joint) would decide on the allocation of 10,000 Nigerian naira from a relative. This allows us to gauge the extent of sole versus joint decision-making power within households. The analysis of the vignette on bargaining power indicates a shift towards joint decision-making between women and their husbands at endline for households in program villages. That is, we find a shift from sole and husband-centered decision-making power towards joint decision-making in the household

[41] Details of the pro-WEAI were released before the endline survey which included new indicators of empowerment that were not part of earlier iterations of the WEAI, assessing areas such as self-efficacy, attitudes towards violence, and intrahousehold relationships (see Malapit et al., 2019). The domains included in the A-WEAI and pro-WEAI capture important dimensions of intra-household models of bargaining power, including production, productive resources, income, leadership, and time use. The pro-WEAI captures additional psychosocial factors, including acceptance of gender-based violence, self-efficacy, and respect among household members.

[42] Decision-making index contains the following seven decision categories: female makes the most decisions on any plots; female is sole decision-maker on enterprise activities; female has control over the use of income from enterprise activity; named as owning any of the plots; named as making the decision to borrow; decided to cultivate any of the seven key crops; and named as having the final say over the purchase of assets. For each decision category in the index, we record whether the person who has the final say over a particular decision includes the female respondent (solely or jointly with a spouse).

at endline. Seemingly, the cash transfer and the increased labor force participation among women in program villages at endline are granting women relatively greater power within their households. Women appear to shift from a state of no power in household decisions to some joint decision-making with husbands. Our data do not allow us to capture to what extent women are able to realize their individual preferences when decisions are made jointly.[43]

Lastly, columns 6 to 10 reveal that the results on women's empowerment for the RDD subsample, while positive, are no longer precisely estimated. However joint-decision making impacts are the same as in the overall sample. In appendix F, we provide supplementary results covering various additional secondary outcomes, including male productive activity, farming input expenditures, time allocation, gender attitudes, and norms for both female respondents and their husbands. In Tables F13 and F14 in appendix F we find limited evidence of an effect on the personal gender attitudes or perceived norms around the acceptability of women's work out of the home, despite the increase in female labor. Perhaps engaging in enterprise activity may require breaking a subset of norms around women's work outside the home, but staying close to home enables women to conform to other gender norms.

6.5 Multiple Hypothesis Testing Corrections

Given the range of potential impacts from cash transfers, we employ two methods to ensure valid inference when multiple hypotheses are tested: dimension reduction and false discovery rate (FDR) corrections. The former technique reduces the number of tests conducted and the latter adjusts the p-values for multiple hypothesis testing. First, we create indices for primary outcomes when a group of outcomes will be affected in a consistent direction (e.g., consumption and assets) following the methodology described in Anderson (2008). Second, in cases where each hypothesis is treated as a separate test, we adjust the critical values to correct for multiple testing. We present sharpened false discovery rate (FDR) q-values in appendix A5 based on the method by Benjamini and Hochberg (1995). These sharpened q-values show little to no departure from our main results.

[43]Bakhtiar et al. (2024) conduct a lab-in-the-field experiment with a random subsample of women in our study sample to show cash transfer women exert greater demand for agency in a lab setting, but only when their decisions are kept a secret from their husbands.

7 Discussion

7.1 Spillover Mechanisms

This paper identifies a positive spillover in local markets, with non-recipients of cash transfers also benefiting from the program and the degree of benefit positively related to the local density of program recipients. However, just as important as identifying the presence of program spillovers is identifying the drivers of such behavior.

First, we consider the possible redistribution of transfer resources across households through social interactions which can pose a potential threat to identification (Angelucci and De Giorgi, 2009; Finan and Bobonis, 2009). The recipients of cash transfers may directly share resources with ineligible households, either those nearby or those further away but in the same social network. Moreover, social norms could pressure women to share cash, capital, or earnings with family members in or outside of the household (di Falco and Bulte, 2011; Bernhardt et al., 2019; Friedson-Ridenour and Pierotti, 2019). Women may also lack autonomy and see their cash diverted (Tauchen, Witte and Long, 1991). To collect evidence on possible direct redistribution of the transfers we asked female recipients how much of the female-targeted cash transfer was retained for themselves and how much they shared with others in and out of the household. On average, the proportion of the cash transfer that the female recipient kept herself was 54%, while she shared 26% of the transfer with her husband and 14% with her children.[44] As over 90% of the transfer value was kept in the immediate family, we find limited redistributive pressures to other households with only 4% of the transfer shared with friends or family within the village and 2% outside the village.

Second, we consider spillover effects that might stem from changing social norms within the locality as a result of the program. In our study context a change in the norm regarding the acceptability of women's paid work might occur as cash transfer recipient women use the transfer to start businesses. For example, Bertrand (2020) proposes that direct exposure to a proscribed counter-stereotypical behavior, such as women's work out of the home, may eventually reduce norm costs associated with the behavior and help erode a restrictive norm. Husbands may see their neighbor's wife working and so perceive greater support for female work within the community, and thereby grow less concerned they will be judged if their own wives open a business. However, we measure the perceived community judgment among women and their husbands concerning women's work out of the home at endline (see appendix Tables F13 and F14). We find limited evidence of a social norms channel to explain the positive spillovers effects observed. In fact, women in program villages perceive a larger

[44]Receiving transfers in monthly or quarterly disbursements made no significant difference in the proportion of the transfer retained by the women recipients.

proportion of their community would judge them badly for working out in the fields, relative to pure control households.

A third potential spillover mechanism includes general equilibrium price and real income effects. Theory predicts that program effects on market-mediated demand and supply, and therefore on non-recipients, could go in either direction (Mobarak and Rosenzweig, 2014). A cash transfer program might affect equilibrium relative prices of goods through changes in either supply or demand. As cash is transferred into the economy we would expect increases in aggregate demand, and therefore upward pressure on prices if aggregate supply does not respond (Filmer et al., 2023). Alternatively, increased investments in business activity may lead to an increase in supply of the services that businesses are providing. These supply-side effects can work to lower prices or raise real income. To examine these effects on local prices, in appendix E3 we observe unit values for a number of local commodities, consumer goods, small animal livestock, and durable goods, as well as prices for inputs like labor and capital. These unit values are observed for the first time before the rollout of the cash transfer program, and again one month and one year after the cash was disbursed. Based on these results, we rule out any sizable general equilibrium effect on relative price changes, which implies that any increase in aggregate demand from the cash transfer was largely met by a supply response, and real incomes, following nominal incomes, are higher than before.

Finally, we examine competition effects, whereby a transfer that increases the ability of poor households to finance business starts, in turn, crowds out existing business or dissuades other potential entrants, creating a negative spillover. This would imply potential redistribution in business activity across households but not necessarily an increase in aggregate economic activity. In a scenario such as this, the indirect effects of the program may offset the direct effects. For example, in a slack labor market, job placement could simply change who is employed without affecting the overall employment rate (e.g., Crépon et al., 2013). In our study context at baseline there were very few women operating non-farm businesses and therefore initial displacement effects on any incumbent firms from new business entry were limited. In appendix E1 we also examine impacts on households that were not ultra-poor, and therefore ineligible for the cash transfers, but were still classified as vulnerable in the villages. We show that these households also experience an increase in business activity and profits in program villages one year after the cash transfers were disbursed. The results do suggest that at the midline survey there may have been a negative competition effect on non-beneficiaries as the PET coefficient is negative. However, by the time of the endline survey this effect has turned positive, suggesting that the rising local demand due to the transfers outweighs any negative competitive effect in the longer term.

We are unable to find clear evidence supporting spillover mechanisms related to redis-

tribution, changing norms, competitive effects, or general equilibrium price effects. We conclude that the rise in local demand for locally produced goods as a result of the cash transfer program most likely led the observed increase in general economic activity.

7.2 Estimated Income Multiplier and Likely Channels of Influence

Alongside the household-level estimates of program impact, a further summary of program gains can be encapsulated in estimates of a transfer multiplier with regard to household income. Unfortunately our data do not contain sufficiently consistent information over rounds to estimate a multiplier that accounts for income from agricultural or wage earning activities. Hence, we estimate a partial income multiplier focused solely on net earnings from women-led microenterprises. The total transfer amount is compared to changes in profits for all women-led businesses from the targeted EV households, as well as the non-targeted VV and ML households. This partial income multiplier is found to be 0.32 (the full estimation steps are described in appendix E2). That is, for every dollar transferred in this context, the cash transfer program generated at least 0.32 dollars in the assessed type of economic activity. As Table 3 also indicates gains to farm yields, a full income multiplier would likely be greater than this partial estimate (i.e., assuming no negative impacts in the wage market which seems likely given no observed changes in wage employment).

As these gains are realized through increased microentrepreneurial activity, this study identifies a key behavioral channel that can drive fiscal multipliers in low-income settings. The underlying logic of a fiscal multiplier is largely one of underutilized factors of production (Lewis, 1954; Kahn, 1931) perhaps due to borrowing constraints that prevent would-be producers from financing the fixed cost of microenterprise entry, or the indivisibility of inputs at low-levels of production (Walker et al., 2024), or due to the lack of demand for local products that dissuades microenterprise creation. In addition, contemporary fiscal multiplier models typically require the presence of hand-to-mouth consumers who do not borrow or save, and instead consume all their income in every period (Galí, López-Salido and Vallés, 2007; Farhi and Werning, 2016). These supply and demand constraints, as well as capital market imperfections, apply to this study setting.

Howitt (2006) proposes a stylized microfoundation for the fiscal multiplier particularly apt for this setting, one that highlights the role of firms not as only producers but as market facilitators that enable transactions that otherwise would not occur. A positive local income shock that induces firms to enter the market increases the density of trading relationships and connects suppliers to consumers. The revenue increase from a new viable microenterprise is then paid to suppliers of intermediate goods or extracted as profit. Income recipients then have further resources to spend on transactions, perhaps through a new enterprise that

connects the consumer with suppliers offering the desired goods.

As in the Egger et al. (2022) study that estimates a transfer income multiplier in Kenya, this cash transfer is seen by beneficiary households as temporary and unrelated to future tax payments, as it is donor-financed, and thus potential behavioral complications related to Ricardian equivalence should not apply in this setting. However, unlike Egger et al. (2022), who find increased economic activity in communities close to recipient villages, we find no evidence of inter-village spillovers from the cash transfer, perhaps partly because we study a transfer smaller in aggregate magnitude. Further, the concentrated spillover, confined within the village, highlights the relatively sparsely populated context we study, the existence of partially separate village-level markets, and supports the identifying assumptions utilized in the comparison between treatment and control villages.

The slack productive resource brought into activity by the cash transfer is female labor, specifically female-led entrepreneurship. At baseline, the female labor force participation rate for the study sample was low, with most women engaged mainly in household work or childcare – only 33 percent of women in program villages report any engagement in income-generating activities in the twelve months prior to the baseline survey, and most of this engagement occurred on household-operated farms. With the arrival of the cash transfer, women appear to circumvent restrictive labor norms by starting non-farm businesses located near the home, and by endline the female labor force participation rate increases to 42 percent.

8 Conclusion

The possibility of a multiplier effect from the transfer of cash resources in a low-income setting has long been considered. However, given the contexts of these programs and the study designs, there has been little clear evidence. Empirically, there are few examples where cash transfers "pay for themselves" (Egger et al. (2022) is a rare exception) so understanding where and why such an effect may arise is of primary policy import.

In this paper we present evidence of a pattern of local market impacts of an unconditional cash transfer program in Northern Nigeria. Women in households assigned to the cash transfer treatment start profitable non-farm enterprise activities, and we find evidence that untreated women within those program villages also benefit in the longer run. Women are found to start a small, often home-based, non-farm businesses like a small store, cooking, oil- or crop-processing business. The majority of women operate a business in or near the home. The net total of such activity spurred by the program increases incomes by a further 35 percent over the total value of the transfer, and distributes this gain beyond direct transfer

recipients to many of their neighbors.

The spillover effects to non-beneficiary women appear to be driven by a boost in aggregate demand in the local market where cash transfers are paid. That is, the cash transfer program leads to increased consumption of locally produced goods and services. Most businesses operated by women are in sole proprietorships and these types of firms mainly depend on local demand, typically not producing goods that are exported to wider markets. In the study context, markets for financial services (such as credit and insurance) are very sparse. When cash transfers were provided in a regular and predictable fashion, they likely helped recipient households to rapidly overcome credit constraints and finance firm entry. This may be the reason why we observe only beneficiary households increase firm entry by the time of the midline survey, with more generalized entry at endline as local markets are gradually more able to support greater overall activity.

The transfers to ultra-poor households led to an overall positive impact on many dimensions of household welfare for both cash recipients and non-recipients. Women were more likely to work, agricultural yields and business profits were significantly higher, and the whole household consumed more and had a more diverse diet. There is also a shift towards greater joint decision-making power within married couples.

These results have implications for the evaluation of cash transfers and similar interventions. The majority of the growth effects of this program arise after the end of the program where we see business entry by both treated and untreated women in program villages. These gains are observed in relation to households residing outside the local markets that receive the intervention. An evaluation that either does not include a counterfactual in unaffected local markets, or that ends before second wave gains can be realized, would yield a biased estimate of impact (biased downward in this setting).

In general, women in the region are discouraged from working by norms that decree what is acceptable behavior. The cash transfer appears to loosen the norm around female labor supply leading to increased enterprise activity. However, without changes in attitudes or norms around female work outside the home, women are constrained to operate small-scale businesses in or near the home, limiting their ability to grow beyond microenterprise scale. While, in this context, women are a constrained (i.e., "slack") factor of production, prevailing norms still impose constraints that are not fully alleviated by the transfer program alone. Implementing policies and programs that are designed to work around norms that bind women's labor is another strategy to promote female employment. If social customs limit women's mobility or ability to interact with men other than their husband, then programs that enable women to more easily network with other women, especially those beyond the immediate area around the home, may further erode restrictive norms around female work.

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Supplementary Appendix

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A Details on Program Design and Data

This appendix provides further details on the intervention design and the study's data aspects. Section A1 details the process for targeting vulnerable households, selecting female recipients, and describes the cash transfer features and public randomization process. Section A2 further elaborates on the survey methods from baseline to endline where we present the program timeline and include descriptions of outcomes. Section A3 examines survey attrition, offering an analysis of its impact on the integrity of our study's findings. In section A5 we address the issue of multiplicity in hypothesis testing by controlling for the False Discovery Rate (FDR) for our main results. Lastly, section A6 discusses the hyperbolic sine (IHS) transformation used in our analysis.

A1 Cash Transfer Features

Transfer Recipient: The main recipient of the cash transfer was the primary female in the household. In polygamous households, where wives occupy one housing unit together, the female primary decision-maker was identified by the household.[45] In cases where the wives live in separate housing units within the same compound or in different compounds, each wife was classified as separate households. The implementing partner acknowledged that wives living in separate housing units are likely to have different budgets and so should be considered separate households for the program.

Conditionality: The cash transfers did not come with any explicit conditions of how the money should be spent or shared. However, during the sensitization campaign households were told by traditional leaders that the money was intended for the female. While the cash transfers did not come with hard conditions, the content during the sensitization campaign could have influenced the female's ability to keep more of the cash transfer or put it to productive use.

Distribution Mechanism: The cash transfers were originally designed to be paid via mobile money e-wallets and mobile phones were distributed to all recipients before the first cash transfer payment. However, there were many practical issues with using mobile payments (e.g., network issues, SIM card registration problems, electricity for phone charging, etc.) and the program quickly shifted to using a banking agent to deliver the cash transfers in each village. Therefore, cash transfers were collected cash in hand, usually at the village chief's palace, using an identification card. Since payments were made in a common area in each village, the timing of the cash transfer was likely to be known by others in the village.

Transfer Size: A total of 75,000 Nigerian naira (roughly USD 693 purchasing power

[45] Approximately 23% of the study sample were determined to be in polygamous marriages at baseline.

parity) was transferred over fifteen months to the female primary decision maker identified in the households assigned to receive a transfer. In contrast, the average annual consumption in the local area for an ultra-poor household is roughly double the total transfer amount.

Transfer Payment Structure: As described in the cash transfer randomization process, the total amount of 75,000 naira was either distributed as a monthly or quarterly payment. The monthly group received fifteen monthly payments of 5,000 naira and the quarterly group received 15,000 naira cash in five installments over the same overall time frame. Each monthly cash transfer payment was 5,000 naira, which was approximately equivalent to 30% of their monthly household consumption, and each quarterly cash transfer payment was 15,000 naira, equivalent to approximately 100% of monthly household consumption. Since overall impacts of the monthly and quarterly payments were found to be similar (see Bastian, Goldstein and Papineni (2017)), here we simply refer to the payment as a "cash transfer." On average, women were able to keep control of the majority of the cash transfer and this was similar under the quarterly and monthly payment schemes.

Public Randomization of Cash Transfers: In all eligible villages (those with more than 18 EVs), a public lottery was used to randomly assign eligible households in the EV category to receive a cash transfer or not. There was an equal likelihood for an EV household to receive a cash transfer or not. Since the cash transfers were being offered to a limited number of the most vulnerable populations, it was deemed important to make the allocation process open and transparent. Eight ward-level public randomization ceremonies were organized. Community representatives from each village were invited to participate in the ceremonies. The implementing partner explained about the cash transfer program and the randomization process. Four containers were placed at the front of the assembled group: one marked "Monthly Cash Transfers," one marked "Quarterly Cash Transfers," and two marked "No Cash Transfers." The order of the containers for each ward-level ceremony was randomized by the research team in advance of the ceremony. Paper slips containing the names of all eligible households were kept in an envelope. Members of the audience would come up to the front, draw out a slip, read out the name and village, and place it in a container and announce the treatment assignment. After all the containers had been cycled through, they would come back to the first and continue until all names were assigned to a treatment arm.

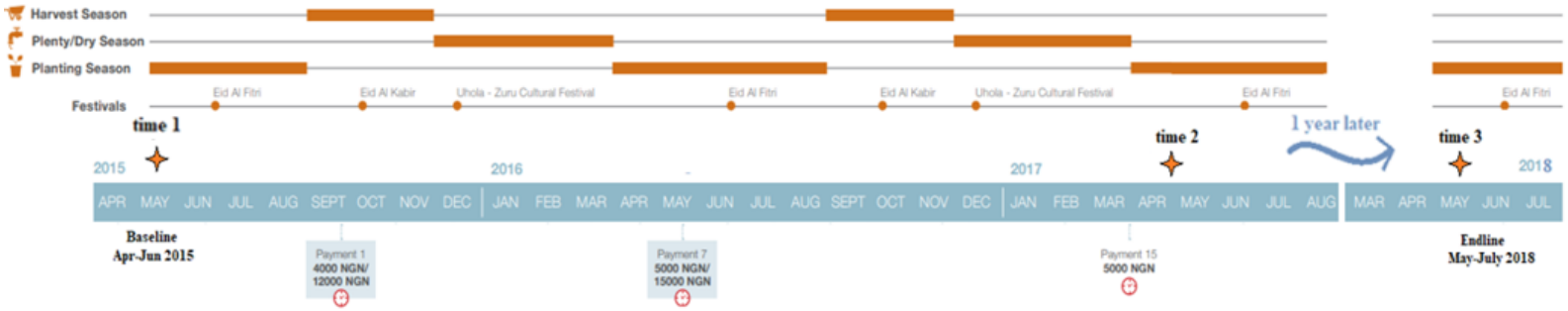
Cash Transfer Targeting: Household targeting committee (HTC) meetings were held in each community to identify vulnerable households. HTC meetings included key community stakeholders such as village chief heads and their counsellors, religious leaders, health workers, leaders of farmers' groups, and teachers. The implementing partner provided guidance on the characteristics of vulnerable households to committee members and the HTC

listed the vulnerable households residing in their communities.[46] These lists were collected and digitized to form the sampling frame for the program and impact evaluation. To verify and rank the poverty of households identified in this step, a proxy means test was conducted using a modified Progress out of Poverty Index (PPI) survey. The PPI serves as a poverty assessment tool, comprising 20 questions that cover household demographics, health, human capital, and assets. It was administered to a total of 18,272 listed households. To verify the vulnerability status of households, the PPI was scored to rank their relative vulnerability, with higher PPI scores indicating a greater level of vulnerability among households.

A2 Overview of Survey Instruments

This section provides further detail on the data collection instruments. Our surveys were used to capture a comprehensive picture of the agricultural practices, intrahousehold dynamics, and community characteristics of the study population. Figure A1 depicts the sequence of events and activities related to the cash transfer program and impact evaluation from April 2015 to July 2018. The timeline is marked with key events, such as the baseline survey in April-June 2015. The intervention began in September 2015 with the first UCT payment and subsequent payments were made every month or quarter until the final 15th payment in March 2017. Follow-up surveys are indicated in the timeline as time 2 and time 3, with the midline starting in April 2017 and endline in May 2018. The timeline also includes information about the local agricultural seasons that delineate the harvest, planting, and dry seasons and celebrated cultural events, i.e., festivals during the study period.

Figure A1: Study and Unconditional Cash Transfer Program Timeline



[46] Community leaders were read the following guidelines to define vulnerability: "Vulnerable households are households that have low income, they have few assets (like televisions, radios, bicycles, or hoes), and they own less than one acre of land. They probably eat only a few times per day and eat meat only very rarely. Vulnerable households might also have children out of school, people too sick to work, or very old. They might also have many babies or pregnant women."

Baseline Survey

The baseline survey covered a range of topics that included a household roster, information on dwelling characteristics, household-level consumption module, expenditures and assets, exposure to shocks, and participation in social safety nets. A detailed agricultural module included information about crops, livestock, land holdings, agricultural production, sales and income, and participation in extension programs. The agriculture module design was informed by the World Bank's Living Standards Measurement Study—Integrated Surveys on Agriculture (LSMS-ISA) 2014 questionnaire. Furthermore, the survey captured plot-level information from both male and female decision-makers in the households. The survey also included individual-level information collected from the primary decision-making woman and her male spouse. These questions covered topics such as food security, risk aversion, aspirations, and time preferences. The female respondent was also asked a modified version of the Abbreviated Women's Empowerment in Agriculture Index (A-WEAI) module.

At baseline a community questionnaire was also administered in each village to gather socio-economic indicators at the community level, including location, size, accessibility, and availability of health services and educational facilities.

Midline Survey

A shorter follow-up survey module (midline) was collected one month after the last cash transfer payment was made that focused on household consumption, labor supply, productive investments, savings, health, diet, food security, employment, housing, and a measure of women's bargaining power. This survey aimed to track changes and developments since the baseline study.

Endline Survey

The second follow-up survey (endline) was conducted a year after the cash transfer payments concluded. The content was similar to the baseline survey and included additional questions on gender attitudes, norms towards women's work outside the home, intimate partner violence, and anthropometric measurement of children aged 0–5 years. Furthermore, this survey incorporated a modified version of the pro-WEAI index, expanding the scope of women's empowerment indicators beyond those measured in the baseline survey.

Table A1 presents the primary outcomes with an explanation of the methods employed to construct the variables.

Table A1: Main Outcomes Description

Category	Outcome	Description
P1: Entrepreneurship	Non-farm business owner	Binary variable indicates the individual is owner of a non-farm business.
	Real monthly Profits (IHS)	Business profits in past 30days in real terms (2015 prices).
P2: Agriculture	Positive agricultural yields (Yes =1)	Positive agricultural yield" is a dummy variable for whether the household achieved a non-zero yield at endline (Yes =1; No=0)
	Yields (IHS)	"Yields" is the inverse hyperbolic sine transformed (IHS) measure of the value of household agricultural yields on all cultivated land.
	Total spend on inputs in the plot/ha (IHS)	Total inputs used on the plot/ha" is the IHS transformed measure of the value of agricultural inputs (e.g. fertilizers and labor) used on agricultural land per hectare. Respondent for agriculture outcomes are typically the male household head or female, whenever male was absent.
P3: Consumption and Food Security	Household Food Security Scale (0-6)	"Household Food Security Index" is a variance-weighted index, following Anderson (2008) that is composed of various measures of food security and hunger.
	Consumption: Real Expenditures Adult Equivalent 7days (IHS)	"Consumption: Real Expenditures Adult Equivalent" is the inverse hyperbolic sine transformed (IHS) value of total household consumption converted to a daily adult-equivalent measure and inflation-adjusted.
P4. Women Empowerment and Decision-Making Power	Pro-WEAI Empowerment Index	"Pro-WEAI Empowerment Index": This is a variance-weighted index based on the methodology described by Anderson (2008). It consists of 11 dummy variables that represent "adequacy in empowerment," as outlined by the project-level Women's Empowerment in Agriculture Index (Pro-WEAI) toolkit (refer to Alkire et al. 2013). Our measure is a modified version of the Pro-WEAI, tailored to assess women's empowerment.
	Decision Making Index	"Decision Making Index" This index, also variance-weighted according to Anderson (2008), comprises 7 key decisions where the woman has some influence.
	"Who decides how money from a relative is shared…"	"Who decides how money from a relative is shared… (self, spouse, or joint)" are 3 dummy variables from a vignette/scenario question that asks hypothetically who within the household would have the final say over how money (10,000 NGN) from a close relative gets shared?

A3 Attrition

Table A2 examines survey attrition by treatment status. Panel A showcases the attrition rates for the extremely vulnerable (EV) households, while Panel B outlines the findings for the very vulnerable (VV) and market-limited (ML) samples. Tracking rates were consistently high at 90 percent and 85 percent at midline and endline, respectively. As shown in Table A2, we find no discernible differential attrition based on treatment status, both for the extremely vulnerable, and the very vulnerable and market-limited households.

To evaluate whether attrition at midline and endline could introduce potential biases into our results due to its potential association with treatment status or baseline covariates, we conduct regression analysis as presented in Table A3 and Table A4. Examining the data for EV households, we observe minor discrepancies in age and marital status. While these differences are not large, as an additional robustness check, we conduct the analysis exclusively on married households, and the results remain consistent. Conversely, in the case of the VV and ML households, our findings indicate that households with higher expenditures or multiple plots at baseline in program villages are more likely to attrit.

A4 Balance on Village-level Characteristics

In Table A5 we present the main characteristics of the sub-sample of villages used in the regression discontinuity analysis described more fully in the main paper. As expected, the differences of several key characteristics, such as the number of vulnerable households and the mean PPI score, narrows with the regression discontinuity (RD) sample. The omnibus F-test again is indicative of overall balance.

A5 Multiple Hypothesis Testing Corrections

In this section we address the issue of multiplicity in hypothesis testing by controlling for the false discovery rate (FDR) for all our main results tables. The FDR measures the expected proportion of type I errors (false rejections) among all rejections. To do this, we calculate sharpened q-values by Benjamini and Hochberg (1995) as described by Anderson (2008).

Table A6 compares the main model's p-values with the sharpened q-values for all primary outcomes in the main tables. The sharpened q-values consistently support our results. As Anderson (2008) highlights, sharpened q-values can be lower than unadjusted p-values, particularly when many hypotheses are successfully rejected. This happens because, with a high number of true rejections, even a few false ones can still keep the false discovery rate low. An illustration of this can be seen with the PET coefficient for the variable 'positive agricultural yields' in Table 3.

Table A2: Attrition Balance Check

PANEL A - Ultra-poor (EV) households									
Household-level treatment assignment									
	(1)	(2)	(3)						
	Cash Transfers (CT) in Program Villages	No Cash Transfers (NCT) in Program Villages	Pure Control in Non-Program Villages	T-test			Normalized Difference		
	Mean/SE			(1)-(2)	(1)-(3)	(2)-(3)	(1)-(2)	(1)-(3)	(2)-(3)
Attrition at Midline	0.08	0.10	0.14	-0.02	-0.06**	-0.04	-0.07	-0.21	-0.13
	[0.01]	[0.01]	[0.03]						
Attrition at Endline	0.13	0.16	0.15	-0.03*	-0.02	0.02	-0.10	-0.05	0.05
	[0.01]	[0.01]	[0.03]						
Attrition at Midline and Endline	0.18	0.22	0.24	-0.04*	-0.06	-0.02	-0.10	-0.14	-0.04
	[0.01]	[0.02]	[0.04]						
N	664	689	110						
F-test of joint significance (p-value)				0.24	0.23	0.39			
F-test, number of observations				1353	774	799			

PANEL B - VV and ML households				
Village-level treatment assignment				
	(1)	(2)		
	VVs and MLs in Non-Program Villages	VVs and MLs in Program Villages	T-Test Difference	Normalized Difference
Variable	Mean/SE		(1)-(2)	(1)-(2)
Attrition at Midline	0.09	0.09	-0.00	-0.01
	[0.03]	[0.01]		
Attrition at Endline	0.23	0.18	0.04	0.10
	[0.04]	[0.02]		
Attrition at Midline and Endline	0.25	0.23	0.01	0.03
	[0.04]	[0.02]		
N	102	476		
F-test of joint significance (p-value)			0.46	
F-test, number of observations			578	

Notes: The values displayed are normalized differences in the means across the groups. The value displayed for F-tests are p-values.The covariate variable for location LGA (1 = Birnin Kebbi and 0 = Danko Wasagu) is included in all estimation regressions. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

(2) Attrition=1 for the household if the female, who is the main respondent in this paper, was not present at the moment of the follow-up surveys (midline and/or endline.) On average, 91% of the baseline sample were surveyed at midline and 85% at endline. The main reasons for attrition from the survey is the respondent died or relocated/migrated. Survey attrition rates are balanced across the treatment assignments.

(3) Sample in Panel A includes all extremely vulnerable (EV) households that were survyed at baseline in program and non-program villages. Panel B sample includes all very vulnerable (VV) and market limited (ML) households surveyed at baseline in cash transfer program villages and non-program villages.

Table A3: Attrition Regression for Extremely Vulnerable Households

	(1)	(2)
	Attrition at Midline and Endline	
CT in CT villages	-0.082	-0.393
	[0.14]	[0.34]
NCT in CT villages	-0.177	-0.382
	[0.14]	[0.34]
Age (Years)	-0.003***	-0.003
	[0.00]	[0.00]
Marital Status (Married=1)=1	-0.189***	-0.183*
	[0.06]	[0.10]
Literacy (Can you read or write in any language=1)=1	0.018	0.030
	[0.06]	[0.08]
Number of household members	-0.016	-0.030
	[0.02]	[0.03]
Daily adult equivalent expentitures (Naira)	0.000	-0.000
	[0.00]	[0.00]
Baseline: Number of plots	0.025	0.070
	[0.08]	[0.08]
Females owns a non-farm enterprise (Yes=1)	0.367	0.210
	[0.36]	[0.38]
Modified A-WEAI Score (0-1)	0.147	-0.160
	[0.24]	[0.16]
Location LGA DANKO/WASAGU	0.049*	0.011
	[0.03]	[0.06]
CT # Age (Years)	0.004**	0.004
	[0.00]	[0.00]
NCT # Age (Years)	0.003**	0.004
	[0.00]	[0.00]
CT # Marital Status (Married=1)=1	0.060	0.090
	[0.07]	[0.11]
NCT # Marital Status (Married=1)=1	0.128*	0.165
	[0.07]	[0.11]
CT # Literacy (Can you read or write in any language=1)=1	0.006	-0.019
	[0.07]	[0.09]
NCT # Literacy (Can you read or write in any language=1)=1	0.085	0.075
	[0.07]	[0.09]
CT # Number of household members	0.008	0.022
	[0.02]	[0.03]
NCT # Number of household members	-0.009	0.007
	[0.02]	[0.03]
CT # Daily adult equivalent expentitures (Naira)	-0.000	0.000
	[0.00]	[0.00]
NCT # Daily adult equivalent expentitures (Naira)	-0.000	-0.000
	[0.00]	[0.00]
CT # Baseline: Number of plots	-0.043	-0.054
	[0.08]	[0.08]
NCT # Baseline: Number of plots	-0.019	-0.068
	[0.09]	[0.08]
CT # Female owns a non-farm enterprise (Yes=1)	-0.348	-0.174
	[0.37]	[0.40]
NCT # Female owns a non-farm enterprise (Yes=1)	-0.336	-0.215
	[0.37]	[0.39]
CT # Modified A-WEAI Score (0-1)	-0.237	0.010
	[0.25]	[0.18]
NCT # Modified A-WEAI Score (0-1)	-0.013	0.223
	[0.25]	[0.18]
CT # Location LGA DANKO/WASAGU	-0.068	-0.030
	[0.05]	[0.07]
NCT # Location LGA DANKO/WASAGU	0.007	-0.011
	[0.04]	[0.07]
Constant	0.377***	0.664*
	[0.12]	[0.33]
Observations	1463	1463
Adjusted R-squared	0.06	0.04
Respondent	Female and Male Respondent	Female Respondent

Notes: (1) The samples represented in the tables consist of households classified as extremely vulnerable.(2) In Column 1, "Attrition" is marked as 1 if neither the primary female nor male respondents in a household were available to answer the survey during the midline and endline evaluations. In Column 2, "Attrition" is marked as 1 if the primary female respondent was unavailable to answer the survey at both midline and endline. (3) The values for variables denominated in Nigerian Naira are adjusted by winsorization at the 95th percentile to limit extreme values. (4) Significance levels are denoted as follows: *p < 0.05 (significant), **p < 0.01 (highly significant), ***p < 0.001 (very highly significant). *p < 0.05, **p < 0.01, ***p < 0.001.

Table A4: Attrition Regression for Very Vulnerable and Market Limited Households

	(1)	(2)
	Attrition at Midline and Endline	
VVs and MLs in Program Villages	-0.029	0.153
	[0.33]	[0.33]
Age (Years)	-0.004*	-0.006***
	[0.00]	[0.00]
Marital Status (Married=1)=1	-0.201	-0.134
	[0.15]	[0.19]
Literacy (Can you read or write in any language=1)=1	0.026	0.091
	[0.05]	[0.08]
Number of household members	0.023	0.024
	[0.02]	[0.02]
Daily adult equivalent expentitures (Naira)	-0.001**	0.000
	[0.00]	[0.00]
Baseline: Number of plots	-0.149**	-0.072
	[0.07]	[0.07]
Females owns a non-farm enterprise (Yes=1)	-0.050	-0.139
	[0.09]	[0.16]
Modified A-WEAI Score (0-1)	0.219	0.267
	[0.15]	[0.16]
Location LGA DANKO/WASAGU	0.048	0.029
	[0.10]	[0.17]
Program Villages # Age (Years)	0.002	0.004
	[0.00]	[0.00]
Program Villages # Marital Status (Married=1)=1	0.053	-0.144
	[0.17]	[0.22]
Program Villages # Literacy=1	-0.043	-0.086
	[0.06]	[0.10]
Program Villages # Number of household members	-0.027	-0.028
	[0.02]	[0.02]
Program Villages # Daily adult equivalent expentitures (Naira)	0.001**	-0.000
	[0.00]	[0.00]
Program Villages # Baseline: Number of plots	0.165**	0.062
	[0.07]	[0.07]
Program Villages # Females owns a non-farm enterprise (Yes=1)	0.174	0.390
	[0.17]	[0.28]
Program Villages # Modified A-WEAI Score (0-1)	-0.279	-0.232
	[0.17]	[0.19]
Program Villages # DANKO/WASAGU	0.015	0.066
	[0.11]	[0.17]
Constant	0.390	0.411
	[0.31]	[0.30]
Observations	578	578
Adjusted R-squared	0.05	0.06
Respondent	Female and Male Respondent	Female Respondent

Notes: (1) The samples represented in the tables consist of households classified as very vulnerable and market limited.(2) In Column 1, "Attrition" is marked as 1 if neither the primary female nor male respondents in a household were available to answer the survey during the midline and endline evaluations. In Column 2, "Attrition" is marked as 1 if the primary female respondent was unavailable to answer the survey at both midline and endline. (3) The values for variables denominated in Nigerian Naira are adjusted by winsorization at the 95th percentile to limit extreme values. (4) Significance levels are denoted as follows: *p < 0.05 (significant), **p < 0.01 (highly significant), ***p < 0.001 (very highly significant). *p < 0.05, **p < 0.01, ***p < 0.001.

Table A5: Covariate Balance — Village-level Characteristics

	(1)	(2)	(1)-(2)	(3)	(3) - (2)
	Program Villages	Non-Program Villages		Program Villages (RD Sample)	
Variable	Mean/(SE)		Normalized difference	Mean/(SE)	Normalized difference
Village Labor Force Participation					
Farming work (=1 if anyone in the household)	0.53	0.45	0.39	0.49	0.18
	(0.06)	(0.03)		(0.03)	
Baseline:Non-Farm Enterprise (Household)	0.06	0.07	-0.17	0.08	-0.29
	(0.02)	(0.01)		(0.02)	
Wage work (=1 if anyone in the household)	0.28	0.21	0.40	0.24	0.25
	(0.07)	(0.02)		(0.02)	
Baseline:Any farming work(Wife)	0.11	0.08	0.32	0.07	0.45
	(0.04)	(0.01)		(0.01)	
Baseline:Any farming work(Husband)	0.48	0.43	0.31	0.47	0.05
	(0.05)	(0.03)		(0.03)	
Baseline:NonFarm Enterprise (Wife)	0.03	0.02	0.03	0.02	0.03
	(0.01)	(0.01)		(0.01)	
Baseline:NonFarm Enterprise (Husband)	0.04	0.06	-0.34	0.07	-0.50
	(0.01)	(0.01)		(0.01)	
Geospatial and Household Distance Metrics					
Distance to closest market (Km)	9.79	6.89	0.62*	6.84	0.65*
	(1.57)	(0.61)		(0.72)	
Minimun distance to a CT village	3.75	3.46	0.13	3.21	0.27
	(0.64)	(0.36)		(0.36)	
Minimun distance to a FNLP village	3.83	3.88	-0.02	3.51	0.18
	(0.50)	(0.38)		(0.36)	
Mean distance between households within village (Kms)	0.96	1.06	-0.07	1.15	-0.12
	(0.50)	(0.20)		(0.29)	
Maximum distance between households within village (Kms)	3.05	4.86	-0.32	5.21	-0.36
	(1.58)	(0.93)		(1.34)	
Village Socioeconomic Indicators and Community Metrics					
#Vulnerables by village	111.25	173.25	-0.65*	132.46	-0.28
	(16.31)	(19.50)		(18.67)	
Overall PPI Score	37.94	40.83	-0.88***	40.03	-0.66*
	(0.85)	(0.57)		(0.70)	
PPI Score (Median)	37.75	40.62	-0.84**	39.77	-0.61*
	(0.87)	(0.60)		(0.73)	
Community Infrastructure (# Items)	2.53	3.49	-0.54	3.07	-0.36
	(0.31)	(0.36)		(0.37)	
Community Engagement Index (# Items)	4.13	4.66	-0.31	4.22	-0.05
	(0.54)	(0.25)		(0.36)	
F-test of joint significance (F-stat)			1.29		1.13
Number of observations	12	40	52	24	36

Notes: The values displayed are the normalized differences in means across the groups. The table includes variables measured only during the baseline survey. Column 2 shows the means for the full sample of villages and column 3 the restricted set of villages used in the RD analysis. The bottom row presents the F-statistic of joint significance for the t-tests of all variables tested for baseline balance, the stars next to the Fstat indicate level of significance, in this case there is not overall significance. The covariate variable "Local Government Area (LGA)" is included in all estimation regressions. The Community Infrastructure Index includes the following facilities: primary school, secondary school, health center, hospital, doctor, pharmacy, bus stop, main access road, microfinance institution (MFI), police station, market, mosque, community center, and bank. The Community Engagement Index includes the following groups and committees: village development committee, agricultural groups, financial groups, women's groups, youth groups, education or health committees, NGOs, and community police. ***, **, and * indicate significance at the 1%, 5%, and 10% critical levels, respectively.

Table A6: Multiple Hypothesis Testing Corrections

			Full Sample		RDD Sample	
Category			*Model p-value*	*Sharpened Q-value*	*Model p-value*	*Sharpened Q-value*
T2. Female Entrepreneurship	Non Farm Enterprise	CT in CT villages Midline[A]	0.05	0.05	0.38	0.29
		CT in CT villages Endline[B]	0.00	0.00	0.00	0.04
		NCT in CT villages Midline[C]	0.90	0.35	0.99	0.99
		NCT in CT villages Endline[D]	0.00	0.00	0.00	0.09
		PET Midline[E]	0.21	0.12	0.95	0.95
		PET Endline[F]	0.00	0.01	0.04	0.32
	Real Monthly Profits(IHS)	CT in CT villages Midline[A]	0.08	0.07	0.39	0.27
		CT in CT villages Endline[B]	0.00	0.00	0.00	0.10
		NCT in CT villages Midline[C]	0.94	0.35	0.96	0.93
		NCT in CT villages Endline[D]	0.00	0.00	0.00	0.16
		PET Midline[E]	0.22	0.12	1.00	1.00
		PET Endline[F]	0.01	0.02	0.07	0.36
T3. Agriculture Outcomes	Positive Agricultural Yields	CT in CT villages[A]	0.09	0.09	0.09	0.05
		NCT in CT villages [B]	0.08	0.09	0.02	0.03
		PET [C]	0.14	0.09	0.61	0.80
	Yields(IHS)	CT in CT villages[A]	0.05	0.08	0.06	0.04
		NCT in CT villages [B]	0.04	0.07	0.00	0.02
		PET [C]	0.03	0.07	0.22	0.55
	Total spend on inputs in the plot/ha(IHS)	CT in CT villages[A]	0.00	0.00	0.00	0.00
		NCT in CT villages [B]	0.00	0.00	0.00	0.00
		PET [C]	0.61	0.16	0.53	0.68
T4. Food Security and Consumption	Household Food Security Scale (0-6)	CT in CT villages Midline[A]	0.04	0.04	0.0	0.2
		CT in CT villages Endline[B]	0.00	0.00	0.0	0.0
		NCT in CT villages Midline[C]	0.90	0.44	0.7	0.8
		NCT in CT villages Endline[D]	0.00	0.00	0.0	0.0
		PET Midline[E]	0.00	0.00	0.0	0.1
		PET Endline[F]	0.20	0.15	0.3	0.5
	Real Expenditures Adult Equivalent(IHS)	CT in CT villages Midline[A]	0.04	0.04	0.1	0.1
		CT in CT villages Endline[B]	0.00	0.00	0.0	0.1
		NCT in CT villages Midline[C]	0.90	0.44	1.0	1.0
		NCT in CT villages Endline[D]	0.00	0.00	0.0	0.1
		PET Midline[E]	0.45	0.34	0.2	0.3
		PET Endline[F]	0.61	0.44	0.2	0.5
T5. Empowerment Outcomes	Pro-WEAI Empowerment Index (0-11)	CT in CT villages[A]	0.00	0.00	0.00	0.06
		NCT in CT villages [B]	0.14	0.06	0.17	0.39
		PET [C]	0.60	0.19	0.90	0.92
	Decision Making Index (0-7)	CT in CT villages[A]	0.00	0.00	0.00	0.04
		NCT in CT villages [B]	0.21	0.09	0.06	0.32
		PET [C]	0.35	0.14	0.65	0.73
	Who decides how money from a relative is shared: Self	CT in CT villages[A]	0.02	0.01	0.06	0.34
		NCT in CT villages [B]	0.00	0.00	0.00	0.04
		PET [C]	0.00	0.00	0.04	0.28
	Who decides how money from a relative is shared: Spouse	CT in CT villages[A]	0.00	0.00	0.00	0.02
		NCT in CT villages [B]	0.04	0.03	0.00	0.05
		PET [C]	0.09	0.05	0.01	0.20
	Who decides how money from a relative is shared: Joint	CT in CT villages[A]	0.00	0.00	0.00	0.00
		NCT in CT villages [B]	0.00	0.00	0.00	0.00
		PET [C]	0.00	0.00	0.00	0.01

Notes: *p < 0.05, **p < 0.01, ***p < 0.001. (1) Model p-values represent the p-values for the main coefficients of interest for each outcome in the main analysis. (2) Sharpened Q-values are calculated according to the method described by Anderson, 2008.

A6 Data Transformations

A6.1 Inverse Hyperbolic Sine (IHS) Transformation

In this study we apply the inverse hyperbolic sine (IHS) transformation on monetary outcomes to address issues of skewness and the presence of zero-valued observations. The implementation and interpretation of the IHS transformation requires careful attention as detailed in Chen and Roth (2023). In order to accurately interpret the coefficients as a percentage change we convert the result into semi-elasticities and elasticities employing the methodology recommended by Bellemare and Wichman (2020). Below, we summarize the specific formulas used for these transformations:

Transformation 1: Arcsinh-Linear Specification

$$\hat{\xi}_{yx} = \hat{\beta}\cosh(\text{arsinh}(y)) \cdot \frac{x}{y} = \hat{\beta}x \cdot \frac{\sqrt{y^2+1}}{y}, \tag{7}$$

where Y is our dependent variable and X is our independent variable.

Transformation 2: Arcsinh-Linear Specification with Dummy Independent Variable

This transformation approximates the percentage change in outcome y due to a discrete change in dummy variable d, employing the standard Halvorsen and Palmquist (1980) result for logarithmic equations:

$$\frac{\hat{P}}{100} \approx \exp\left(\hat{\beta}\right) - 1. \tag{8}$$

Upon implementing the small-sample bias adjustment proposed by Kennedy (1981), the estimation transitions to:

$$\frac{\hat{P}}{100} \approx \exp\left(\hat{\beta} - 0.5\text{Var}(\hat{\beta})\right) - 1. \tag{9}$$

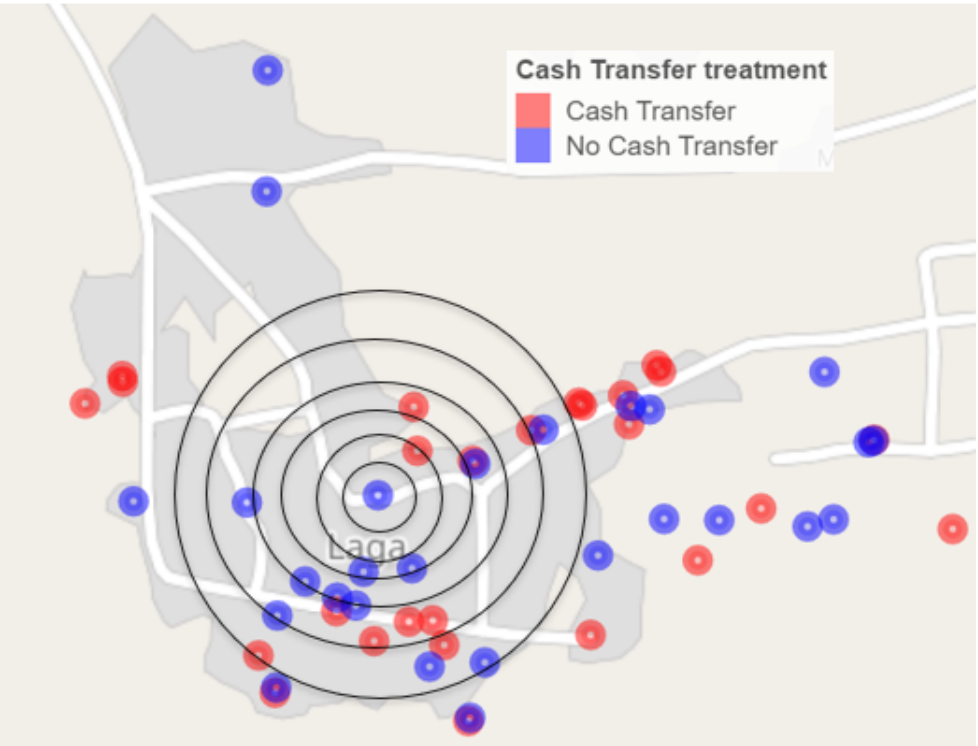
When analyzing continuous monetary variables, we apply the designated IHS transformation and document the number of zero observations to examine the magnitude of the extensive margin effect before interpretation of the IHS transformation as a percentage change. We adjust the point estimates for percentage interpretation as proposed by Bellemare and Wichman (2020). These adjustments are presented at the bottom of the results tables. For robustness, regression results for value outcomes expressed in levels, winsorized at the 99th percentile, are presented in appendix F.

B Further Details on Spatial Modeling of Spillovers

In this section we describe the spatial modeling techniques employed to investigate the spillover effects of the cash transfer program explored in this paper.

First, we illustrate how cash transfers may impact both recipients and their neighbors, emphasizing the importance of geographical proximity in these interactions using visual mapping and advanced spatial analysis. Figure B1 depicts a map of the study village of Laga, Nigeria. We use the image to highlight the distribution of households in a program village assigned to the 'Cash Transfer' program in red versus those assigned to 'No Cash Transfer' in blue. This visual representation serves as an example to demonstrate the spatial layout of CT beneficiary and non-beneficiary households within a program village. We identify a non-beneficiary household i on the map and draw concentric circles with radii ranging from 100 m to 1,000 m around them. These circles are used to define the local market area to conduct spatial analysis. The household randomization process used to allocate cash transfers ensures a randomly determined neighborhood density of cash transfers around each household, conditional on overall density, within the local market (see the distribution of red and blue markers in figure B1).

Figure B1: Intensity of Cash Transfers in the Local Neighborhood



In the next section, we examine spatial dependence. This type of dependence implies

that sample data collected from specific locations are not independent; instead, observations from one site are likely to be similar to those from nearby locations (LeSage and Pace, 2009).

B1 Evaluating Spatial Autocorrelation with Moran's I Statistic

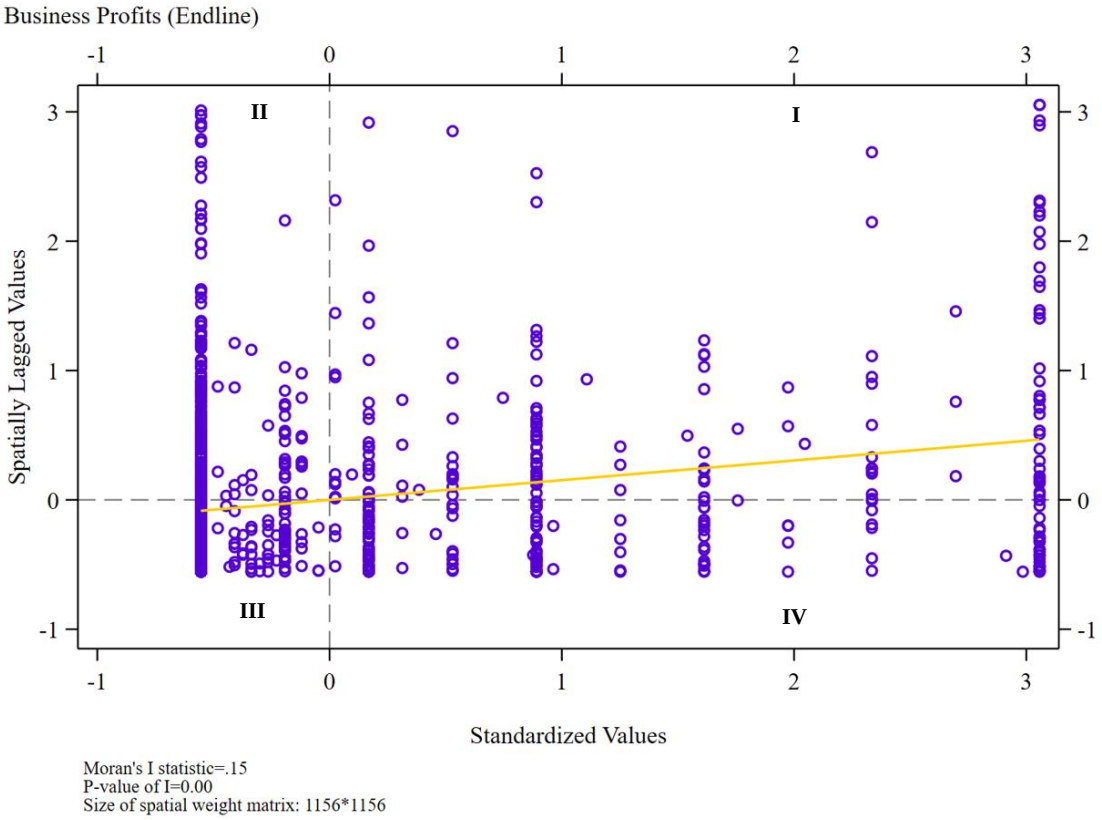
The presence of externalities, both beneficial and detrimental, arising from neighborhood characteristics is well documented in spatial economics (see LeSage and Pace, 2009). These externalities can have tangible impacts on various economic outcomes. In spatial analysis, the influence of neighboring attributes on an outcome of interest (e.g., business profits) can be examined, with spatial autocorrelation often indicating significant inter-dependencies among these attributes.

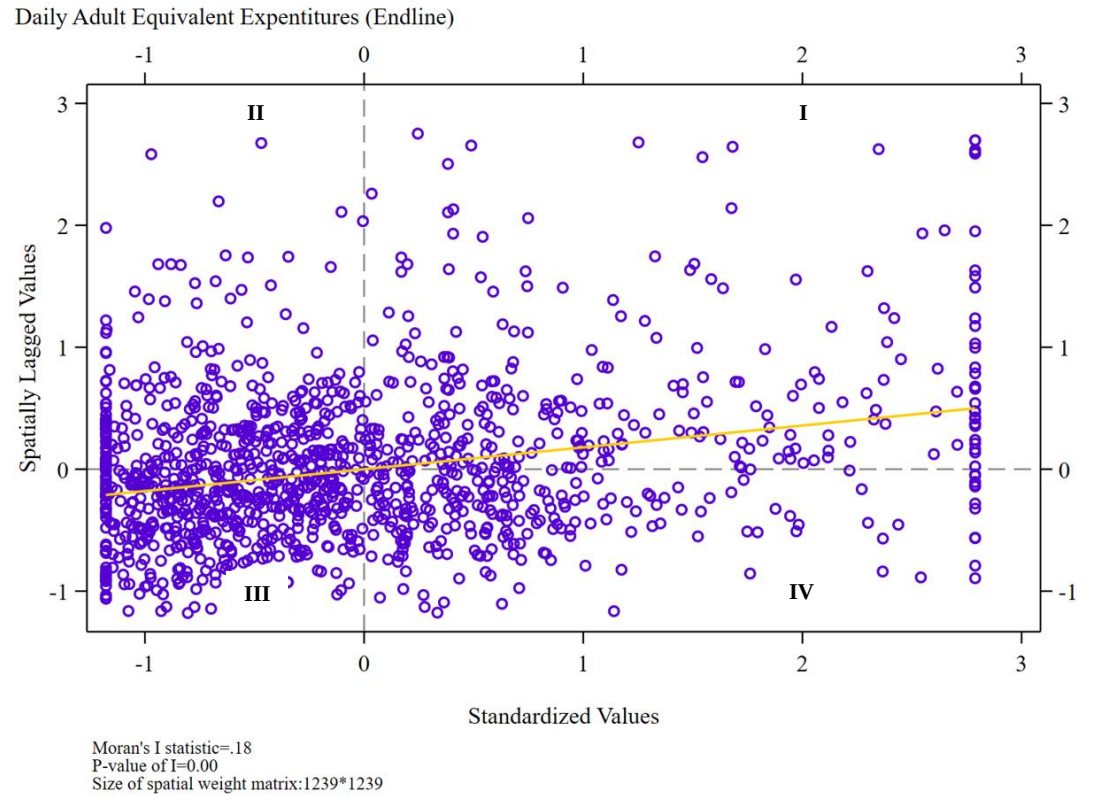
Here we examine the spatial correlation patterns by presenting Moran's I scatterplots for female business profits and household expenditures outcomes at endline (see figure B2). The Moran scatterplot is a graphical representation that plots standardized values of a variable against its spatially lagged counterpart. The horizontal axis represents the standard deviation from the mean of the observed variable for each household, while the vertical axis depicts the spatial lag, i.e., the average value of the selected attribute across neighboring locations. This analytical approach allows one to visually decipher the degree to which geographical proximity influences the similarity of economic outcomes. The distribution of data points across the Moran scatterplot's four quadrants offers insights into the nature and intensity of spatial auto-correlation, characterized as follows:

- **Quadrant I**: Households exhibiting above-average profits, with neighboring households also reporting higher-than-average profits.
- **Quadrant II**: Households with profits below the average, yet surrounded by households with above-average profits.
- **Quadrant III**: Households and their neighbors both showing profits below the mean.
- **Quadrant IV**: Households with above-average profits situated among neighbors with below-average profits.

Figure B2 suggests a positive and statistically significant Moran's I statistic at the 1% level for both women's business profits and household expenditures. This finding underscores the presence of positive spatial autocorrelation, indicating a tendency for similar values to cluster geographically. Such clustering suggests that households tend to resemble their neighbors in terms of economic outcomes, which serves as significant motivation for examining spatial spillovers within the context of the effects of a cash transfer program.

Figure B2: Moran's I Scatterplots





B2 Exploring Spatial Variation in Treatment

To identify the optimal radius for defining the local market to conduct spatial spillovers analysis, we consider the following three factors:

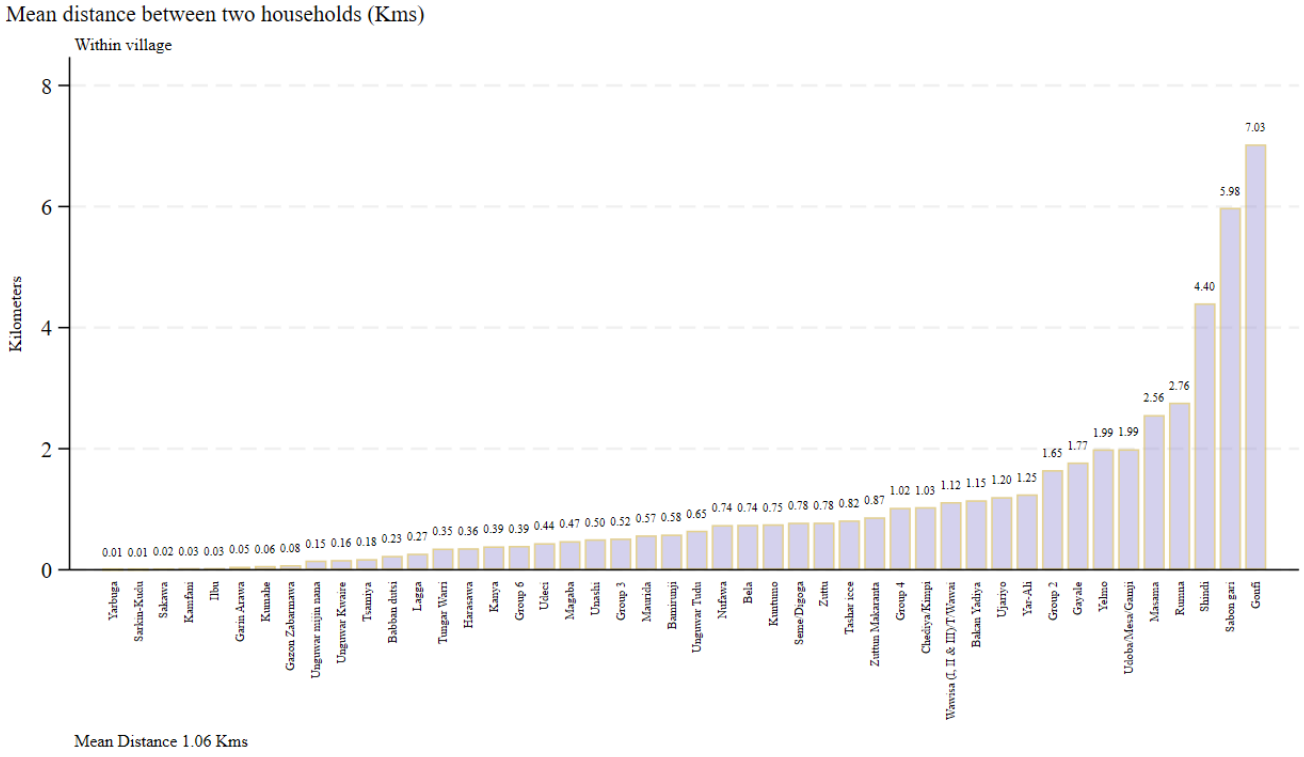
1. **Bayesian Information Criterion (BIC) and Akaike Information Criterion (AIC)**: The analysis begins by calculating the BIC and AIC to determine the optimal model specification. Since BIC and AIC are incompatible with Conley standard errors, standard errors are clustered at the village level to ensure a comparable specification. Specifically, a logit model is estimated for the main outcomes—nonfarm enterprise and farming work—while controlling for treatment status, market conditions, and an indicator for the local government structure (LGS). Although no single model optimally satisfies both criteria across all outcomes, the results indicate that a radius between 300 and 500 meters (m) yields the best BIC values, suggesting a more precise model fit. For the main analysis, the radius is fixed at 400 m, and robustness is assessed across different radii in Appendix Section B3.

2. **Village Size Considerations**: Given the variability in the geographic size of study villages, a radius extending beyond half a kilometer could potentially encompass an entire village in smaller-sized village cases. Within our study dataset, the median distance between households in a village is approximately 0.6 kms. Consequently, a radius exceeding 600 m would lead to the exclusion of 10 villages from our study sample. For additional details, please see Table B1 with descriptive statistics of distance variables and figure B3 with a histogram illustrating the mean distance between households within the village clusters in the study.

Table B1: Descriptive Statistics of Distance Variables between Households in Same Village

Statistics	**Mean**	**SD**	**Median**	**Min**	**Max**
Shortest (Meters)	2.26	3.53	1.29	0.05	20.51
Mean (Kilometers)	1.06	1.46	0.61	0.01	7.03
Maximum (Kilometers)	4.28	5.84	1.94	0.02	26.07
Distance to Market	7.82	4.57	7.07	0.5	20.22
Observations	46				

Figure B3: Average Distance between Household (km) per Village



3. **Analyzing Spatial Variation in the Local Market: PET, PEV, and #HH**

The descriptive statistics for three neighborhood variables: proportion of cash transfer recipients (PET), relative poverty (PEV), and market size ($\#HH$) across various radii (100 to 1,000 meters) are presented in Table B2. Figures B4 and B5 are kernel density plots depicting the distribution patterns of the variables. These plots employ color gradients to signify data point frequencies: warmer hues (yellow to red) denote higher frequencies, whereas cooler tones (purple to blue) indicate lower frequencies. Figure B4 shows the distribution of cash transfer recipients within the local neighborhood defined at different radii. A prominent peak at lower percentages suggests that fewer neighbors typically receive cash transfers, with the frequency diminishing as this percentage increases. This pattern might suggest neighborhoods with a large share of recipients are rare. Figure B5 shows the distribution of households is right-skewed, indicating that neighborhoods with fewer households are more prevalent (bottom plot). The density of eligible individuals is concentrated at lower percentages of vulnerable neighbors, suggesting that either few neighborhoods have high concentrations of vulnerability or that eligibility criteria are less often met in such areas (top plot).

Table B2: Local Neighborhood Statistics by radius 100m–1,000m

	Program Villages (Cash Transfers Paid)										
	100	200	300	400	500	600	700	800	900	1000	Total
	Proportion of neighbors that are cash transfers recipients (PET)										
Mean	44.73	46.86	47.95	48.28	48.37	48.58	48.63	48.5	48.53	48.49	47.89
SD	25.37	20.28	17.82	15.39	14.03	13.3	12.3	11.1	10.64	10.48	15.79
Min	0	0	0	0	0	0	0	0	0	0	0
Max	100	100	100	100	100	100	100	100	100	100	100
	Proportion of neighbors that are extremely vulnerable (PEV)										
Mean	47.41	40.67	37.21	34.55	32.69	31.29	30.72	29.68	29.15	28.37	34.17
SD	29.65	27.99	25.72	23.46	22.49	21.83	21.02	19.37	18.59	17.76	23.79
Min	0	0	0	0	0	0	0	0	0.79	0.8	0
Max	100	100	100	100	100	100	100	100	100	100	100
	Number of households in neighborhood (#HHs)										
Mean	402.26	750.58	1017.52	1231.08	1426.53	1599.54	1756.65	1932.6	2088.9	2257.7	1446.34
SD	412.42	661.71	876.73	1037.81	1216.18	1436.11	1662.16	1875.52	2032.61	2184.14	1561.92
Min	10	10	10	10	10	10	10	10	10	10	10
Max	1950	3670	4980	5110	6520	7990	8950	9940	10230	10340	10340
Observations	13,530										
	Non-Program Villages (No Cash Transfers Ever Paid)										
	100	200	300	400	500	600	700	800	900	1000	Total
	Proportion of neighbors that are extremely vulnerable (PEV)										
Mean	35.54	30.19	27.19	21.73	20.58	18.52	17.24	16.82	16.43	15.79	22
SD	28.64	24.39	20.95	17.95	15.79	11.11	9.85	9.66	9.82	9.51	18.2
Min	0	0	0	0	0	0	1.16	1.15	1.15	1.14	0
Max	100	100	100	100	100	43.75	40	40	40	40	100
	Number of households in neighborhood (#HHs)										
Mean	270.94	418.31	487.56	591.78	630.55	669.28	721.97	764.99	808.89	878.04	624.23
SD	165.71	275.6	319.25	336.84	359.43	361.5	379.28	400.8	418.57	425.43	393.24
Min	10	10	10	10	10	50	50	50	50	50	10
Max	830	1060	1090	1100	1320	1430	1550	1600	1610	1620	1620
Observations	1,100										

Figure B4: Density of Cash Transfers in the Local Neighborhood (PET) for radius 100m–1,000m

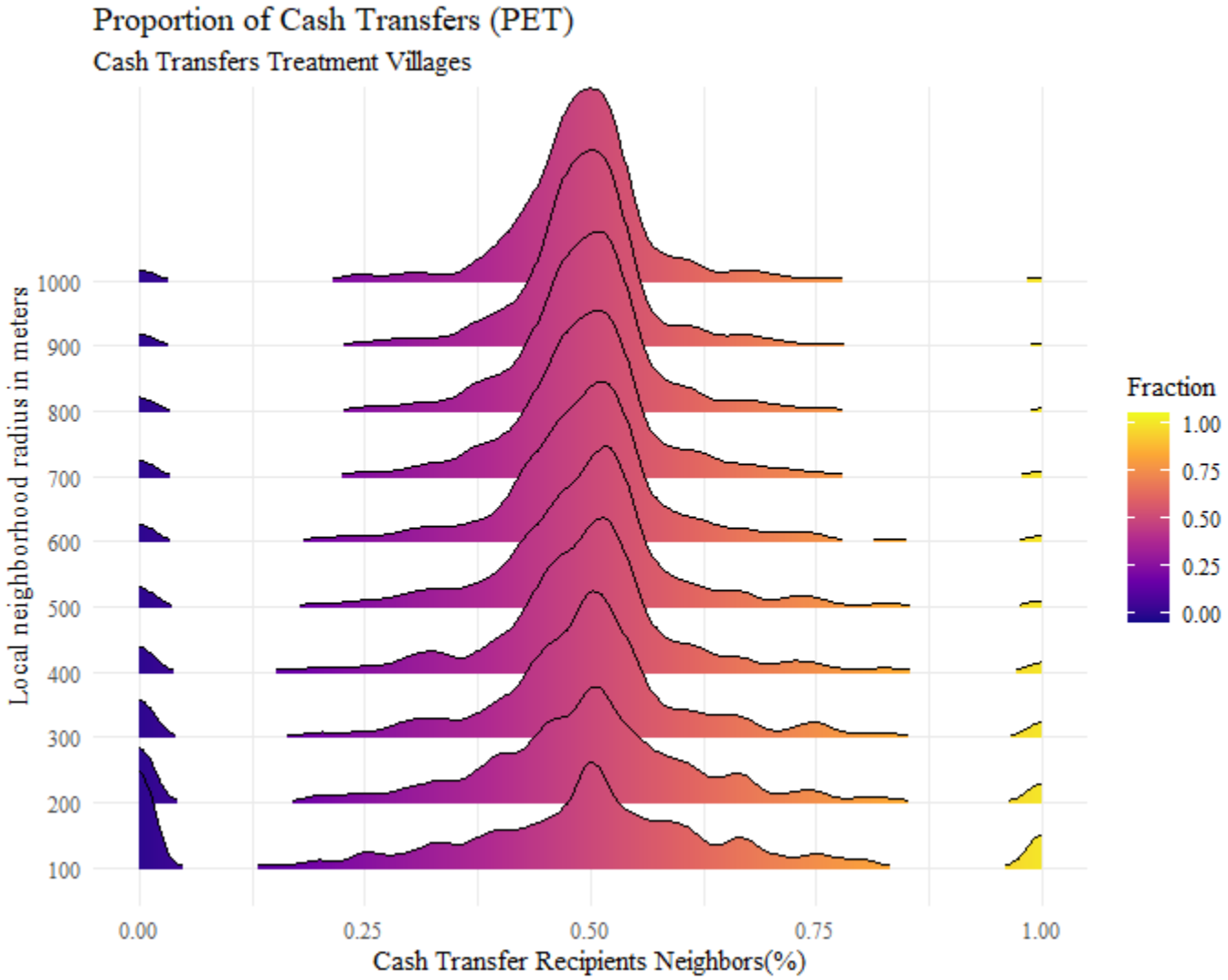
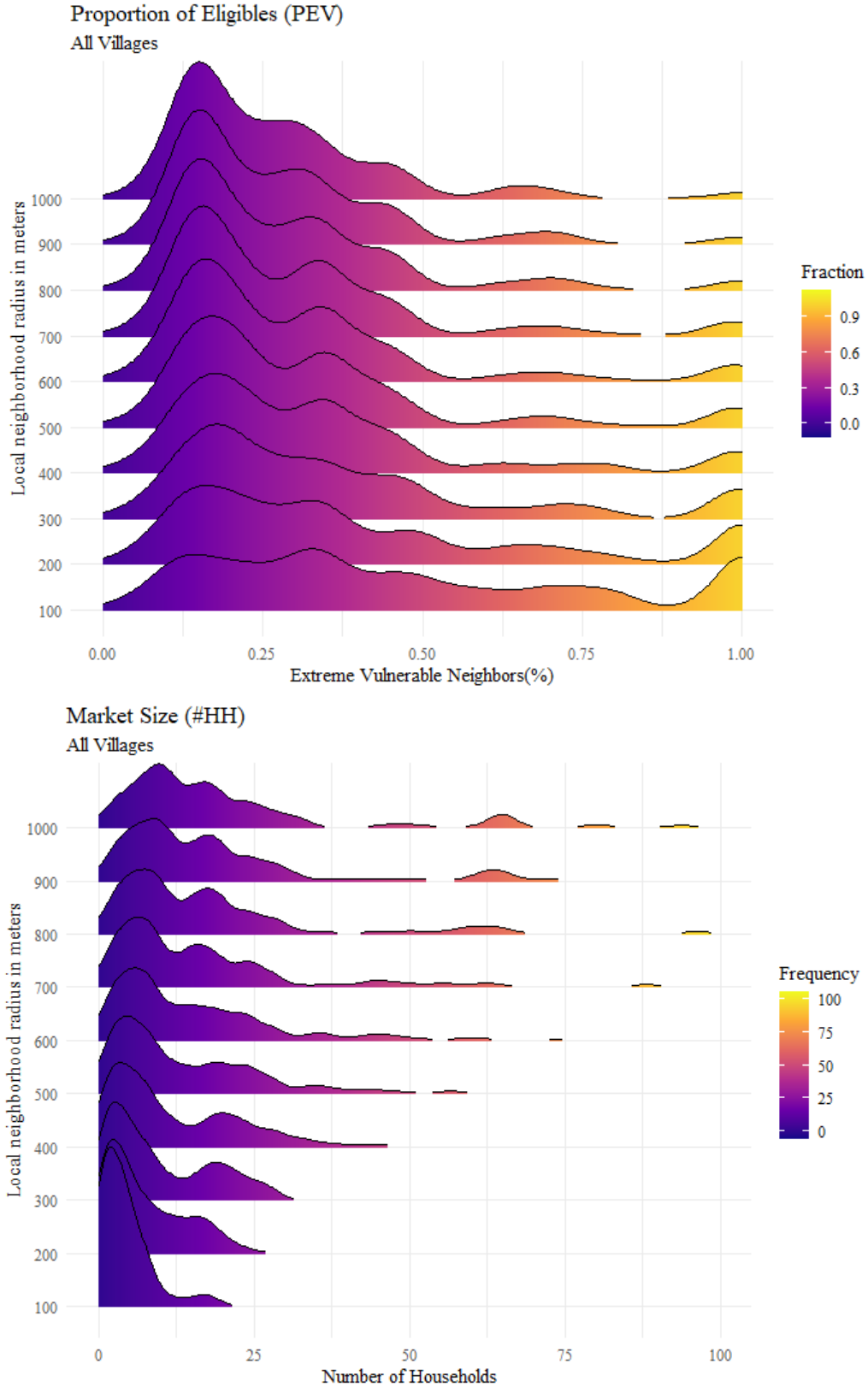
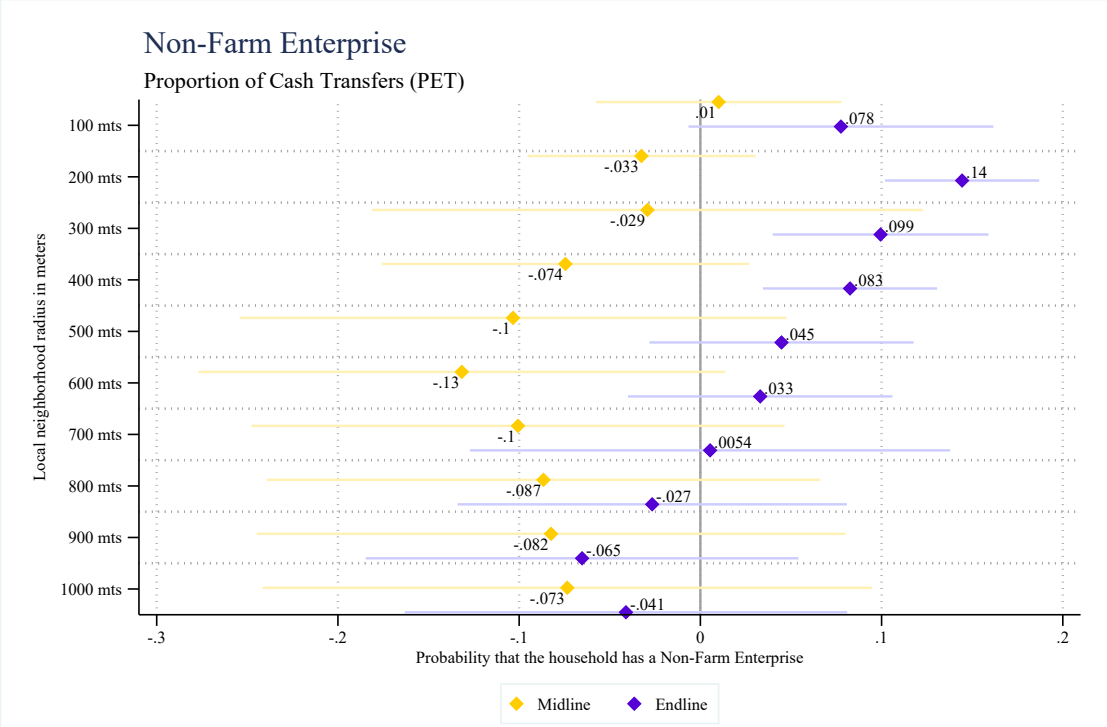


Figure B5: Local Neighborhood Market Size and Relative Poverty for radius 100m–1,000m



B3 Main Results across Different Radii

Figure B6: Proportion of Cash Transfers across Local Neighborhood



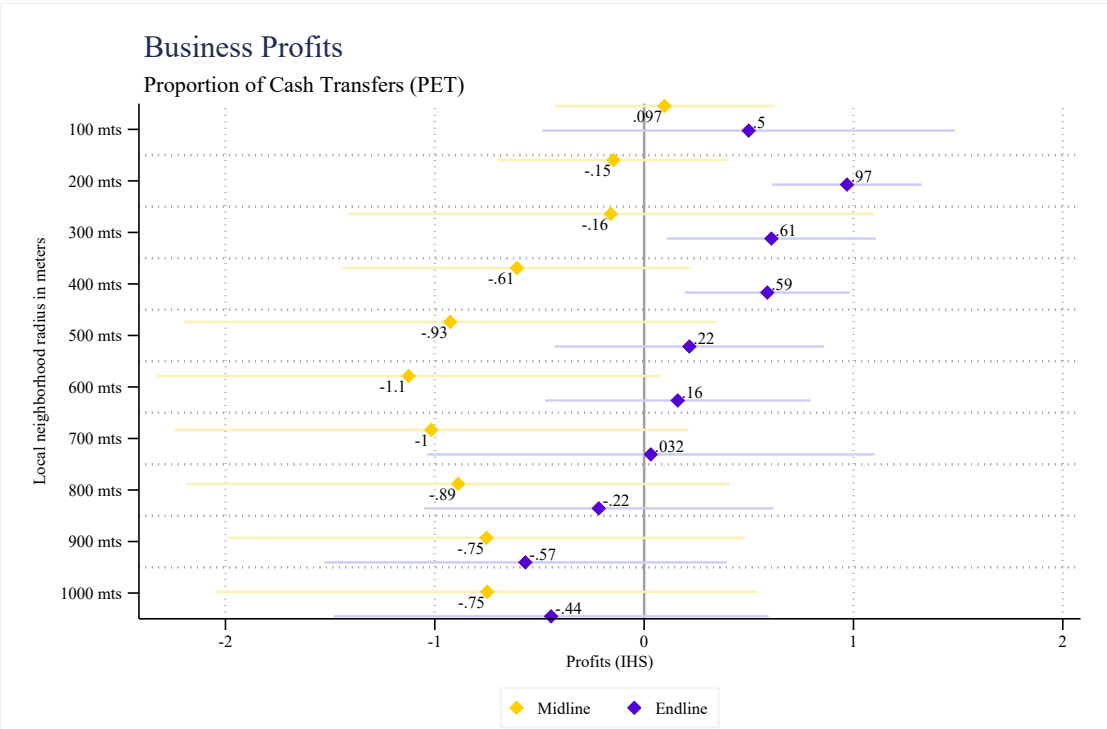


Table B3: Non-Farm Enterprise across Local Neighborhood Radius

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Non-Farm Enterprise (Yes = 1)							Profits (IHS)						
CT in CT villages Midline[A]	0.11**	0.10	0.12**	0.13**	0.15**	0.13**	0.13**	0.75**	0.64	0.82**	0.97*	1.08**	0.99**	0.95**
	[0.05]	[0.06]	[0.05]	[0.06]	[0.06]	[0.06]	[0.06]	[0.37]	[0.50]	[0.41]	[0.50]	[0.47]	[0.46]	[0.45]
CT in CT villages Endline[B]	0.18***	0.19***	0.20***	0.23***	0.24***	0.28***	0.28***	1.40***	1.44***	1.45***	1.70***	1.76***	2.05***	2.17***
	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.03]	[0.22]	[0.18]	[0.22]	[0.12]	[0.12]	[0.12]	[0.17]
NCT in CT villages Midline[C]	-0.00	-0.01	0.01	0.02	0.04	0.02	0.02	-0.07	-0.17	0.04	0.17	0.29	0.21	0.16
	[0.05]	[0.07]	[0.06]	[0.07]	[0.07]	[0.06]	[0.07]	[0.38]	[0.53]	[0.43]	[0.53]	[0.50]	[0.49]	[0.48]
NCT in CT villages Endline[D]	0.11***	0.12***	0.13***	0.16***	0.17***	0.22***	0.22***	0.90***	0.95***	0.98***	1.23***	1.30***	1.61***	1.72***
	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.03]	[0.03]	[0.16]	[0.14]	[0.18]	[0.13]	[0.14]	[0.17]	[0.23]
PET Midline[E]	-0.03	-0.03	-0.07	-0.10	-0.13*	-0.09	-0.07	-0.15	-0.16	-0.61	-0.93	-1.12*	-0.89	-0.75
	[0.03]	[0.08]	[0.05]	[0.08]	[0.07]	[0.08]	[0.09]	[0.28]	[0.64]	[0.43]	[0.65]	[0.61]	[0.66]	[0.66]
PET Endline[F]	0.14***	0.10***	0.08***	0.04	0.03	-0.03	-0.04	0.97***	0.61**	0.59***	0.22	0.16	-0.22	-0.44
	[0.02]	[0.03]	[0.02]	[0.04]	[0.04]	[0.05]	[0.06]	[0.18]	[0.25]	[0.20]	[0.33]	[0.32]	[0.43]	[0.53]
PEV Midline[G]	-0.30***	-0.29***	-0.29***	-0.30***	-0.32***	-0.33***	-0.35***	-2.34***	-2.29***	-2.23***	-2.36***	-2.49***	-2.58***	-2.79***
	[0.08]	[0.08]	[0.10]	[0.10]	[0.09]	[0.08]	[0.08]	[0.68]	[0.65]	[0.80]	[0.80]	[0.75]	[0.65]	[0.62]
PEV Endline[H]	-0.16***	-0.14***	-0.15***	-0.21***	-0.25***	-0.32***	-0.33***	-1.40***	-1.24***	-1.25***	-1.71***	-2.00***	-2.64***	-2.82***
	[0.05]	[0.04]	[0.04]	[0.03]	[0.04]	[0.03]	[0.03]	[0.49]	[0.37]	[0.35]	[0.30]	[0.33]	[0.26]	[0.27]
#HH Midline[I]	0.03	0.04	0.04*	0.04*	0.03*	0.02**	0.02*	0.09	0.24	0.28	0.24*	0.20*	0.14*	0.11
	[0.03]	[0.03]	[0.02]	[0.02]	[0.02]	[0.01]	[0.01]	[0.23]	[0.21]	[0.18]	[0.14]	[0.11]	[0.08]	[0.07]
#HH Endline[J]	0.05**	0.05***	0.04***	0.03***	0.02***	0.01***	0.01***	0.35*	0.40***	0.34***	0.24***	0.19***	0.12***	0.11***
	[0.03]	[0.02]	[0.01]	[0.01]	[0.01]	[0.00]	[0.00]	[0.21]	[0.15]	[0.12]	[0.09]	[0.06]	[0.03]	[0.03]
Midline[K]	0.31***	0.30***	0.28***	0.28***	0.28***	0.28***	0.29***	2.53***	2.37***	2.20***	2.22***	2.25***	2.24***	2.27***
	[0.06]	[0.06]	[0.06]	[0.06]	[0.05]	[0.04]	[0.04]	[0.53]	[0.47]	[0.50]	[0.46]	[0.41]	[0.35]	[0.32]
Endline[L]	0.17***	0.15***	0.15***	0.17***	0.18***	0.19***	0.19***	1.53***	1.40***	1.34***	1.47***	1.54***	1.66***	1.67***
	[0.04]	[0.04]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.39]	[0.33]	[0.29]	[0.27]	[0.26]	[0.24]	[0.23]
Constant	-0.04	-0.04	-0.04	-0.04	-0.04	-0.05*	-0.05*	-0.32	-0.31	-0.32	-0.34	-0.35	-0.37*	-0.37*
	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.26]	[0.23]	[0.22]	[0.22]	[0.21]	[0.21]	[0.21]
Observations	3498	3498	3498	3498	3498	3498	3498	3498	3498	3498	3498	3498	3498	3498
Local Neighborhood Radius(Mts)	200	300	400	500	600	800	1000	200	300	400	500	600	800	1000
Mean Pure Control														
Baseline	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Midline	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1.93	1.93	1.93	1.93	1.93	1.93	1.93
Endline	0.15	0.15	0.15	0.15	0.15	0.15	0.15	1.33	1.33	1.33	1.33	1.33	1.33	1.33
CT recipients around (%)	0.44	0.44	0.45	0.45	0.45	0.45	0.45	0.44	0.44	0.45	0.45	0.45	0.45	0.45
EVs around (%)	0.40	0.37	0.34	0.32	0.31	0.29	0.28	0.40	0.37	0.34	0.32	0.31	0.29	0.28
Households around (#)	0.74	0.99	1.19	1.37	1.53	1.83	2.12	0.74	0.99	1.19	1.37	1.53	1.83	2.12

Notes: *p < 0.05, **p < 0.01, ***p < 0.001;

(1) Outcomes are as follows: (1) "Non-Farm Enterprise" indicates if the female respondent did any non-farm enterprise activity in past 30days. (2) "Profits" is the inverse hyperbolic transformed (IHS) measure of average monthly profits (in the Appendix we also present 99th-percentile winsorized raw profits).

(2) All regressions control for local government area (LGA) fixed effects. In columns 1 to 14 Conley standard errors that account for spatial correlation in the data are used (Conley 1999; 2008).

(3) CT in CT villages =1 if household was randomly assigned to receive cash transfers in a cash transfer program village; NCT in CT villages = 1 if household was randomly assigned to receive no cash transfers in program villages (non-beneficiaries in treatment villages); and Pure Control = 1 if household did not receive cash transfers in a non-program village where no cash transfers were ever paid (reference group in the regression). Midline and Endline are time fixed effects.

(4) In the regressions we include a set of variables to control for local neighborhood effects that includes the size of the local market (#HH), the density of cash transfers (PET) and the relative level of poverty (PEV). The local neighborhood is defined at different sizes of radii of 200 meters to 1000 meters around household i.

(5) Sample in Table B2 is a balanced panel that includes all ultra-poor households that were interviewed at baseline, midline and endline.

In Figure B6 and Table B3 we present the main results on non-farm enterprise creation and profits shown in Table 2 where the local market is defined 100m to 1000m radii. Note, the larger the radius gets the more households we are sampling from; however, we control for number of HHs (local market size) and PEV (relative poverty) in the regression analysis. We show our direct and spillover effects are stable across different radii. However, we find the result on the neighborhood density of cash transfers (PET) is robust at the 200-, 300-, and 400-meter radii only. That is, the PET coefficient is positive and statistically significant at the 200–400-meter radii. At larger radii the PET coefficient becomes imprecise and moves towards zero in absolute value, indicating that any positive local market spillovers are only identified at relatively small radii. These smaller radii may indeed constitute the boundaries of the "local market" in this study context.

B4 Stable Unit Treatment Value Assumption (SUTVA)

The stable unit treatment value assumption (SUTVA) asserts that potential outcomes for a given unit of observation remain uninfluenced by the treatment status of other units. This principle is central to our study, as we are primarily focused on analyzing the spillover effects arising solely from the cash transfer program in a locally defined neighborhood within the village and certainly not across villages which may invalidate our comparison set. In line with this, our analysis assesses the absence of cross-village spillovers emerging from the cash transfer treatment or the FNLP program that was being implemented in other villages in the region. Our investigation revolves around:

1. The constancy of potential outcomes in non-FNLP program villages (encompassing both cash transfer program and non-cash transfer [pure control] villages) in light of the random assignment to the FNLP program.

2. The potential stability of outcomes in non-cash transfer villages (pure control), irrespective of their geographical closeness to cash transfer program villages.

As shown in Table B4 we examine the impact on our main outcome of interest: non-farm enterprise activity. In Table B4 columns 1 to 4 represent our findings related to households. Columns 5 to 8 examine the outcome at the village level where we define the outcome as the percentage change in business activity in the village. We find no evidence of cross-village spillovers — there is no statistically significant relationship between non-farm enterprise activity in pure control villages and the distance to cash transfer program villages or FNLP program villages.

Table B4: Stable Unit Treatment Value Assumption Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Non-Farm Enterprise (=1)				Village Business Growth (%)			
	Midline		Endline		Baseline to Midline		Midline to Endline	
Distance to a FNLP village (Km)	0.04		0.02		-0.08		0.01	
	[0.06]		[0.03]		[0.09]		[0.06]	
Cash Transfer Program Village (=1)	0.05		0.17		-0.27		0.10	
	[0.22]		[0.13]		[0.33]		[0.25]	
Cash Transfer Program Village (=1)	-0.02		-0.00		0.09		-0.01	
*Distance to FNLP(Km)	[0.06]		[0.03]		[0.09]		[0.06]	
Distance to a CT village (Km)		0.00		0.01		-0.03		0.03
		[0.03]		[0.02]		[0.04]		[0.02]
Constant	-0.02	0.17	0.01	0.06	0.38	0.32	-0.04	-0.23
	[0.23]	[0.15]	[0.13]	[0.09]	[0.36]	[0.27]	[0.25]	[0.15]
Observations	1329	95	1250	94	51	12	51	12
Adjusted R-squared	0.10	0.05	0.09	0.17	0.20	0.04	0.02	0.20
Sample	Extremely Vulnerable Households in CT Program Villages	Extremely Vulnerable Households in Non-Program Villages (Pure Control)	Extremely Vulnerable Households in CT Program Villages	Extremely Vulnerable Households in Non-Program Villages (Pure Control)	CT Program Villages	Non-Program Villages (Pure Control)	CT Program Villages	Non-Program Villages (Pure Control)

Notes: *p < 0.05, **p < 0.01, ***p < 0.001;

(1) Outcomes are as follows: (1) "Non-Farm Enterprise" indicates if the female respondent did any non-farm enterprise activity in past 30days. (2) "Village Business Growth" indicates the change in the percentage of businesses owned by women in extremely vulnerable households in the village over time from baseline to midline and from midline to endline.

(2) All regressions control for local government area (LGA) fixed effects and are clustered at the village level.

(3) Regressions included in columns 1 to 4 have the household as the unit of analysis; whereas regressions in columns 5 to 8 have the village as the unit of analysis.

(4) Distance to a FNLP village and distance to a Cash Transfer Program Village is measured in kilometers. For the village-level regressions we measure the value from the center of the village to the center of the villages around village j. The value taken for each observation is equal to the distance to the nearest village. For household-level regressions we take the distance from the household to the center of villages around household i. As per the design of the program the minimun distance between villages is approximately 2 kilometers.

C Details on Business Activities and Financial Access

In appendix C we examine the characteristics and dynamics of female-owned businesses across treatment groups. We examine business sector, business location, funding sources, longevity, and spatial agglomeration patterns. We also examine access to finance variables to demonstrate limited access to formal financial services within the region.

C1 Business Characteristics

In Table C1 we show that businesses operated by women who received cash transfers in program villages had a higher average value of raw materials at midline compared to those operated by non-beneficiary women. Conditional on operating a business, there was no average difference in the value of raw materials between the cash transfer treatment and the pure control group (column 3) at midline or endline. The treatment encourages more women to start businesses (an extensive margin effect) rather than grow existing businesses through greater investment in raw materials or inventory.[47]

We also examine the type of business by defining the main business sector. Cooking businesses are the most common business type across all treatment categories, and trading and crop processing businesses come next. The distribution of traders and services appears to differ between program villages and the pure control group, which suggests potentially differing opportunities across the treatment categories. In terms of the location of the business, the majority of businesses operate from the homestead (73%). The remaining businesses operate in marketplaces or shops and travelling door to door. Cash transfer women are more likely to explicitly report they use their cash transfer money to start a business, whereas non-beneficiary women report using savings, taking informal loans from friends and family, and gifts to start their business. There are fewer than 100 businesses reported to be operated by husbands in the study sample. Men tend to operate trade and services businesses only and locate their business in a marketplace, shop, or travelling door to door (50%).

In Table C2 we examine new business initiation and persistence from baseline, midline, to endline across treatment groups. We observe a greater proportion of women in households who never owned a business across the three survey rounds in the pure control group than cash transfer and non-beneficiary women in program villages as was shown in Table 2. One of the most striking observations across the treatment groups is the difference in the number of households that started a new business by midline and continued to operate the business into endline. The recipients of cash transfers (CT) in program villages are significantly

[47]Note that there are very few businesses (only 21 at midline and 13 at endline) owned by women in the pure control villages.

more likely to have a business that persists into endline compared with the non-beneficiary households. Cash transfers might play an important role in not only encouraging households to start businesses but also in ensuring their sustainability over time. Cash transfer and non-beneficiary women in program villages are also 12% more likely to start a new business at endline than the pure control group. The pure control group appears to be closing businesses at a faster rate at endline than the non-beneficiary women in program villages. The persistence of business operations into endline suggests that regular financial support can help businesses maintain their operations over time.

In Table C3 we examine spatial agglomeration patterns to see if women start businesses in close proximity to other businesses in their local market. We analyze the density of businesses being created around household i at midline on the likelihood of the female starting a business and profits at endline. We show a greater density of businesses around household i at midline is positively correlated to the likelihood that household i operates a business at endline, indicating the possible importance of agglomeration forces for business entry.

In Table C4 we examine the types of businesses being created where our interest lies in assessing potential patterns of complements and substitutes of business types. We create variables for the proportion of businesses by each business type around household i within a 400 m radius and restrict this analysis to within cash transfer program villages only. We find some suggestive evidence that women start similar businesses to the businesses being started around them in their local neighborhood, with regard to cooking, oil processing, and general services although the estimates are small in magnitude.

C2 Access to Finance

In Table C5 we present variables related to access to finance such as access to bank accounts, savings, and loans at baseline, midline, and endline across the treatment groups. At baseline very few households report having a bank account or borrowing (only 2% of households report having any loan at baseline). At midline and endline the likelihood of borrowing increases slightly over time but with no treatment differential. Loans come from friends and family or other informal sources. The likelihood of cash savings is higher within program villages. The lower value of cash savings among non-beneficiary women at midline may align with reports of non-beneficiary women drawing down savings to start a business. We find no significant difference in the likelihood that the husband pays a transfer to his wife for household expenses by treatment status. The average value of the monthly transfer from the husband to wife is also similar across treatment groups. This suggests that husbands are not reducing the amount provided to their wives for household expenses after receipt of a cash transfer, and still provide for daily consumption, housing, and health costs.

Table C1: Characteristics of Businesses at Midline and Endline

	MIDLINE									ENDLINE								
	(1)	(2)	(3)							(1)	(2)	(3)						
	Cash Transfers (CT) in Program Villages	No Cash Transfers (NCT) in Program Villages	Pure Control in Non-Program Villages	T-Test difference			Normalized difference			Cash Transfers (CT) in Program Villages	No Cash Transfers (NCT) in Program Villages	Pure Control in Non-Program Villages	T-Test difference			Normalized difference		
Variable		Mean/SE		(1)-(2)	(1)-(3)	(2)-(3)	(1)-(2)	(1)-(3)	(2)-(3)		Mean/SE		(1)-(2)	(1)-(3)	(2)-(3)	(1)-(2)	(1)-(3)	(2)-(3)
Business Profits*	1235.21	1264.63	1376.19	-29.42	-140.98	-111.56	-0.03	-0.14	-0.11	1867.46	2082.47	2923.08	-215.02	-1055.62**	-840.60*	-0.13	-0.66	-0.51
	[70.27]	[89.99]	[244.55]							[103.92]	[118.93]	[456.46]						
Raw materials*	3388.38	2786.59	3454.76	601.79**	-66.38	-668.18	0.21	-0.02	-0.26	3370.04	3454.58	3362.31	-84.54	7.74	92.27	-0.03	0.00	0.03
	[213.49]	[232.75]	[603.30]							[200.74]	[228.57]	[1077.95]						
Type of Business																		
Cook	0.39	0.42	0.43	-0.03	-0.04	-0.01	-0.07	-0.08	-0.01	0.38	0.34	0.38	0.04	-0.01	-0.04	0.07	-0.02	-0.09
	[0.04]	[0.04]	[0.11]							[0.03]	[0.03]	[0.14]						
Oil Processing	0.09	0.09	0.05	0.00	0.04	0.04	0.00	0.15	0.15	0.07	0.12	0.00	-0.04	0.07	0.12	-0.14	0.29	0.37
	[0.02]	[0.03]	[0.05]							[0.02]	[0.02]	[0.00]						
Crop Proccesing	0.18	0.16	0.05	0.02	0.13	0.11	0.05	0.36	0.32	0.21	0.21	0.23	0.00	-0.02	-0.02	0.00	-0.05	-0.05
	[0.03]	[0.03]	[0.05]							[0.03]	[0.03]	[0.12]						
Trading	0.21	0.19	0.33	0.02	-0.13	-0.15**	0.05	-0.30	-0.36	0.22	0.22	0.15	0.00	0.07	0.07	0.01	0.17	0.16
	[0.03]	[0.04]	[0.11]							[0.03]	[0.03]	[0.10]						
Services	0.06	0.09	0.14	-0.03	-0.08	-0.05	-0.10	-0.31	-0.18	0.08	0.08	0.23	-0.00	-0.15*	-0.15*	-0.00	-0.51	-0.50
	[0.02]	[0.03]	[0.08]							[0.02]	[0.02]	[0.12]						
Business Location																		
Home	0.71	0.70	0.76	0.01	-0.05	-0.06	0.02	-0.12	-0.14	0.71	0.71	0.69	0.00	0.02	0.02	0.00	0.04	0.04
	[0.03]	[0.04]	[0.10]							[0.03]	[0.03]	[0.13]						
Market place	0.13	0.16	0.14	-0.03	-0.02	0.02	-0.10	-0.05	0.05	0.20	0.19	0.23	0.01	-0.03	-0.04	0.02	-0.08	-0.10
	[0.02]	[0.03]	[0.08]							[0.03]	[0.03]	[0.12]						
Shop	0.01	0.00	0.00	0.01	0.01	N/A	0.09	0.08	N/A	0.00	0.00	0.00	N/A	N/A	N/A	N/A	N/A	N/A
	[0.01]	[0.00]	[0.00]							[0.00]	[0.00]	[0.00]						
Travelling door to door	0.12	0.12	0.00	-0.00	0.12	0.12	-0.02	0.38	0.40	0.04	0.06	0.00	-0.02	0.04	0.06	-0.09	0.22	0.27
	[0.02]	[0.03]	[0.00]							[0.01]	[0.02]	[0.00]						
Other	0.01	0.00	0.10	0.01	-0.09***	-0.10***	0.09	-0.75	-0.81	0.03	0.02	0.08	0.01	-0.05	-0.06	0.06	-0.26	-0.36
	[0.01]	[0.00]	[0.07]							[0.01]	[0.01]	[0.08]						
Years of business	6.31	8.80	11.95	-2.49***	-5.64***	-3.16*	-0.43	-0.96	-0.43	6.72	6.29	8.77	0.43	-2.05	-2.48	0.07	-0.34	-0.42
	[0.36]	[0.60]	[2.18]							[0.39]	[0.41]	[2.08]						
Observations	188	123	21							228	190	13						

Notes: The values displayed are normalized differences in the means across the groups.

(1) The covariate variable location LGA is included in all estimation regressions.*Variables winsorized at the ninety-fifth percentile.

(2) Descriptive statistics on the business included in Table C1 are conditional on the business being active at midline or endline.

Table C2: Business Dynamics

	(1)	(2)	(3)						
	Cash Transfers (CT) in Program Villages	No Cash Transfers (NCT) in Program Villages	Pure Control in Non-Program Villages	T-test difference			Normalized difference		
Variable		Mean/SE		(1)-(2)	(1)-(3)	(2)-(3)	(1)-(2)	(1)-(3)	(2)-(3)
Never had a business	0.44	0.56	0.67	-0.11***	-0.23***	-0.11	-0.23	-0.45	-0.22
	[0.02]	[0.02]	[0.05]						
New business at midline but closed at endline	0.13	0.08	0.18	0.04**	-0.05	-0.09***	0.14	-0.16	-0.32
	[0.01]	[0.01]	[0.04]						
New business at midline and still active at endline	0.21	0.13	0.06	0.08***	0.15***	0.07	0.20	0.38	0.22
	[0.02]	[0.01]	[0.03]						
New business at endline	0.20	0.20	0.08	0.00	0.12**	0.12**	0.00	0.30	0.30
	[0.02]	[0.02]	[0.03]						
Business at baseline but closed after baseline	0.01	0.00	0.00	0.01	0.01	0.00	0.09	0.11	0.07
	[0.00]	[0.00]	[0.00]						
Business at baseline, active at midline but closed at endline	0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.07	0.07
	[0.00]	[0.00]	[0.00]						
Business at baseline, active at midline and endline	0.01	0.01	0.01	-0.00	-0.00	-0.00	-0.00	-0.01	-0.01
	[0.00]	[0.00]	[0.01]						
Business at baseline, closed at midline, active at endline	0.00	0.01	0.00	-0.01**	0.00	0.01	-0.13	0.05	0.12
	[0.00]	[0.00]	[0.00]						
N	544	538	84						

Notes: (1) The values displayed are normalized differences in the means across the groups. The covariate variable LGA is included in all estimation regressions.*Variables winsorized at the ninety-five percentile. *p < 0.05, **p < 0.01, ***p < 0.001

(2) Sample in Table C2 is a balanced panel that includes all ultra-poor households (Evs) that were interviewed at baseline, midline and endline and for which we have information on whether they had a business or not at the moment of the survey.

Table C3: Business Agglomeration

	(1)	(2)	(3)	(4)
	Endline			
	Non-Farm Enterprise (Yes =1)	Real Monthly Profits (IHS)	Non-Farm Enterprise (Yes =1)	Real Monthly Profits (IHS)
Cash Transfer [A]	0.20***	1.46**	0.18**	1.26**
	[0.07]	[0.59]	[0.07]	[0.57]
No Cash Transfer [B]	0.13*	0.98*	0.11	0.76
	[0.07]	[0.59]	[0.07]	[0.58]
PET[C]	0.09	0.60	0.11	0.80
	[0.10]	[0.82]	[0.10]	[0.80]
PEV[D]	-0.16*	-1.27*	-0.17**	-1.37**
	[0.08]	[0.67]	[0.08]	[0.65]
#HH[E]	0.03	0.25	-0.02	-0.16
	[0.02]	[0.17]	[0.03]	[0.29]
#Business(Midline)			0.01**	0.05**
			[0.00]	[0.02]
Constant	0.10*	0.96**	0.13**	1.21**
	[0.05]	[0.47]	[0.05]	[0.48]
Observations	1166	1166	1166	1166
Adjusted R-squared	0.10	0.09	0.11	0.10
Meters	400	400	400	400
Outcome Mean Pure Control	0.15	1.33	0.15	1.33
CT recepients around (%)	0.45	0.45	0.45	0.45
EVs around (%)	0.34	0.34	0.34	0.34
Households around(#)	1.19	1.19	1.19	1.19
Business Midline(#)	10.68	10.68	10.68	10.68
Business Endline(#)				

(1) Outcomes are as follows: (1) "Non-Farm Enterprise" indicates if the female respondent did any non-farm enterprise activity in past 30days. (2) "Profits" is the inverse hyperbolic transformed (IHS) measure of average monthly profits.

(2) Regression uses ANCOVA estimation that controls for the baseline level of the outcome variable. All regressions control for local government area (LGA) fixed effects. In columns 1 to 12, Conley standard errors that account for spatial correlation in the data are used (Conley 1999; 2008).

(3) CT in CT villages =1 if household was randomly assigned to receive cash transfers in a cash transfer program village; NCT in CT villages = 1 if household was randomly assigned to receive no cash transfers in program villages (non-beneficiaries in treatment villages); and Pure Control = 1 if household did not receive cash transfers in a non-program village where no cash transfers were ever paid (reference group in the regression). Midline and Endline are time fixed effects.

(4) All regressions include a set of variables to control for local neighborhood effects that includes the size of the local market (#HH), the density of cash transfers (PET) and the relative level of poverty (PEV) around household i in a 400m radius.

(5) Sample in Table C4 is a cross-section that includes all ultra-poor households (EVs) surveyed at both midline and endline.

Table C4: Type of business

	(1)	(2)	(3)	(4)	(5)	(6)
	Endline					
	Cook	Oil Proccesing	Crop Proccesing	Trading	Services	Other
Cash Transfer [A]	0.047	-0.035	0.026	0.010	0.007	0.007
	[0.04]	[0.03]	[0.04]	[0.04]	[0.02]	[0.02]
PET[C]	0.355	0.015	0.285**	0.082	0.060	0.004
	[0.22]	[0.10]	[0.12]	[0.13]	[0.05]	[0.09]
PEV[D]	0.230	-0.141*	-0.072	-0.049	0.166	-0.132***
	[0.17]	[0.08]	[0.10]	[0.09]	[0.10]	[0.05]
#HH[E]	-0.028	-0.002	-0.013	0.047*	0.037	-0.019
	[0.04]	[0.02]	[0.03]	[0.03]	[0.02]	[0.01]
Business around household i at Midline (#)						
Cook	0.012**	-0.006***	0.001	-0.001	-0.003	0.003
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Oil Processing	-0.004	0.018**	0.027**	0.009	0.008	-0.002
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
Crop Processing	0.001	0.001	-0.010	-0.006	-0.008	-0.001
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
Trading	-0.000	0.006	0.009	-0.006	0.001	0.001
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.00]
Services	-0.008	-0.014	-0.031**	-0.019	0.022**	0.004
	[0.02]	[0.01]	[0.01]	[0.02]	[0.01]	[0.01]
Other	0.014	0.009	0.003	-0.005	-0.018**	0.002
	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.00]
Constant	-0.056	0.091	-0.001	0.005	-0.101**	0.054
	[0.13]	[0.07]	[0.08]	[0.10]	[0.05]	[0.04]
Observations	311	311	311	311	311	311
Adjusted R-squared	0.04	0.06	0.03	0.03	0.11	0.02
Meters	400	400	400	400	400	400
Outcome Mean Pure Control	0.18	0.09	0.15	0.13	0.05	0.02
Average CT recepients around (%)	0.48	0.48	0.48	0.48	0.48	0.48
Average EVs around (%)	0.27	0.27	0.27	0.27	0.27	0.27
Average HH around(#)	1.64	1.64	1.64	1.64	1.64	1.64

(1) CT in CT villages =1 if household was randomly assigned to receive cash transfers in a cash transfer program village; NCT in CT villages = 1 if household was randomly assigned to receive no cash transfers in program villages (non-beneficiaries in treatment villages); and Pure Control = 1 if household did not receive cash transfers in a non-program village where no cash transfers were ever paid (reference group in the regression). Midline and Endline are time fixed effects.

(2) All regressions include a set of variables to control for local neighborhood effects that includes the size of the local market (#HH), the density of cash transfers (PET) and the relative level of poverty (PEV) around household i in a 400m radius.

Table C5: Access to Finance

	(1)		(2)		(3)				
	Cash Transfer in Program Villages		Non-CT in Program Villages		Pure Control in Non-Program Villages		t-test difference		
Variable	N	Mean/SE	N	Mean/SE	N	Mean/SE	(1)-(2)	(1)-(3)	(2)-(3)
Baseline									
Household has any loan (Yes=1)	544	0.03	538	0.03	84	0.02	-0.00	0.01	0.01
		[0.01]		[0.01]		[0.02]			
Household has any bank account (Yes=1)	544	0.02	538	0.02	84	0.00	0.01	0.02	0.02
		[0.01]		[0.01]		[0.00]			
Total amount of loans (Naira)†	544	188.42	538	171.00	84	214.29	17.42	-25.87	-43.28
		[51.91]		[48.31]		[151.56]			
Midline									
Any loan (either wife and husband)	544	0.14	538	0.14	84	0.10	-0.00	0.04	0.05
		[0.01]		[0.02]		[0.03]			
Any cash savings (either wife and husband)	544	0.48	538	0.41	84	0.38	0.07**	0.10	0.03
		[0.02]		[0.02]		[0.05]			
Cash savings (Wife)±	544	714.56	538	428.18	84	632.08	286.38***	82.48	-203.90**
		[61.13]		[48.33]		[161.88]			
Cash savings (Husband)±	340	988.82	357	759.03	48	679.58	229.80	309.24	79.44
		[106.16]		[92.37]		[250.14]			
Endline									
Any loan(either wife and husband)	544	0.10	538	0.09	84	0.11	0.01	-0.00	-0.01
		[0.01]		[0.01]		[0.03]			
Any cash savings (either wife and husband)	544	0.43	538	0.38	84	0.30	0.05	0.13**	0.09
		[0.02]		[0.02]		[0.05]			
Cash savings (Wife)±	544	598.55	538	544.83	84	301.79	53.72	296.76	243.05
		[57.39]		[54.17]		[102.66]			
Cash savings (Husband)±	358	621.94	361	672.99	46	384.78	-51.05	237.16	288.21
		[82.37]		[87.66]		[184.52]			
Transfers from the husband to wife (if married)									
Any monetary transfer from husband (Yes=1)	470	0.57	484	0.55	70	0.46	0.02	0.11	0.09
		[0.02]		[0.02]		[0.06]			
Total amount of monthly transfer (Naira)	267	2227.57	267	2216.34	32	2359.38	11.22	-131.81	-143.03
		[151.54]		[133.17]		[414.45]			
Use of transfer money from husband									
Daily consumption	267	0.75	267	0.84	32	0.84	-0.09**	-0.09	-0.00
		[0.03]		[0.02]		[0.07]			
Housing	267	0.12	267	0.12	32	0.31	0.00	-0.20***	-0.20***
		[0.02]		[0.02]		[0.08]			
Business	267	0.08	267	0.06	32	0.00	0.01	0.08	0.06
		[0.02]		[0.01]		[0.00]			
Education	267	0.00	267	0.00	32	0.00	0.00	0.00	0.00
		[0.00]		[0.00]		[0.00]			
Health	267	0.09	267	0.05	32	0.00	0.04*	0.09**	0.05
		[0.02]		[0.01]		[0.00]			
Savings	267	0.11	267	0.04	32	0.00	0.07***	0.11**	0.04
		[0.02]		[0.01]		[0.00]			

(1) The covariate variable location LGA is included in all estimation regressions.
(2) The value displayed for t-tests are the differences in the means across the groups.
(3) † variables in levels winsorized at the ninety-fifth percentile.
(4) Transfer froms husband to wife conditional on being married or having a partner.

D Regression Discontinuity Design (RDD) Details

In our empirical analysis we leverage a distinct discontinuity in village eligibility for the cash transfer program. The cash transfer program's assignment at the village level adhered to a definitive rule of at least 18 extremely vulnerable households (EVs) residing in the village. Since the villages in the study sample could be located in difficult-to-reach and remote locations, and in order to minimize implementing costs, the implementing partner requested to exclude villages with too few eligible households. As only the EV households or "ultra-poor" were to be targeted for receiving cash transfers, and villages that had fewer than 18 EV households were deemed ineligible for delivery of cash transfer benefits.[48] Villages with under 18 EV households might either be smaller in population size or relatively better off if they possess fewer ultra-poor households compared to other villages in the respective ward. Of the 52 villages assigned to the non-FNLP category (where no FNLP activities were conducted), the cash transfer program was introduced to 40 villages meeting the 18 EVs cutoff criterion. The remaining 12 villages did not receive any cash transfer programming. Importantly, there was no potential for manipulation of this assignment criterion by either program administrators or beneficiaries.

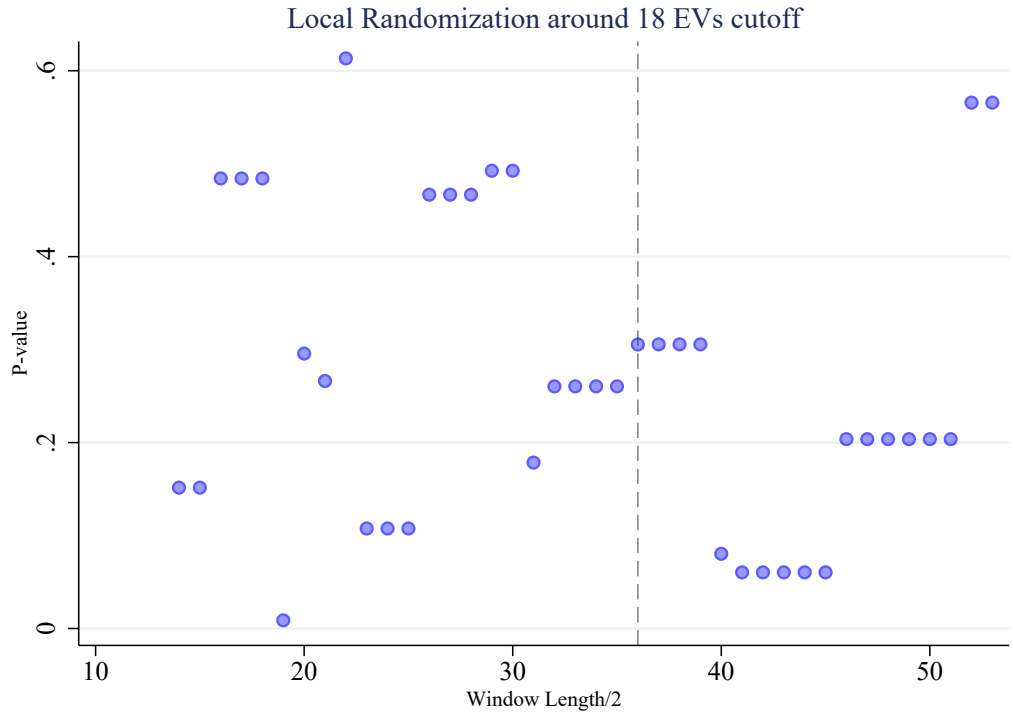
Our regression discontinuity (RD) approach hinges on the discontinuity at the 18 EV cutoff to formulate a comparison group. In this context, 110 households spread across the 12 aforementioned villages constitute the control group in non-beneficiary villages. Although these 110 households were recognized as extremely vulnerable and were therefore theoretically eligible for cash transfers, their village did not qualify for program receipt. Around the cutoff, the number of EVs within a village is comparable.

Since the assignment variable is discrete, we use a local randomization-based RD design method as proposed by Cattaneo et al. (2016) rather than conventional nonparametric local polynomial techniques that rely on large-sample approximations. Cattaneo et al. (2016) propose a data-driven, finite-sample, method to find a bandwidth or "window" around the cutoff where the local randomization assumption is assumed to hold. In the following RD approach we use only observations that are between $c-h$ and $c+h$, where h is the bandwidth that determines the size of the neighborhood around the cutoff, c, and the sample for which the empirical RD analysis is conducted. In a smaller bandwidth around the cutoff, units above and below are more likely to be comparable. In the RD approach we test for the assumption of local randomization close to the cutoff point, that is, villages closest to the 18 EV cutoff threshold can be analogized as part of a local randomized experiment.

[48] The number of EVs in a village is determined by the ranking of the PPI score stratified within a particular ward. There are 52 villages across 8 wards in the 2 LGAs.

To specify the bandwidth, h, we find the largest window in which a vector of baseline covariates are found to be balanced based on a joint test using a large-sample approximation of Hotelling's T-squared statistic (following Cattaneo et al. (2016)). In our methodology, we employ a linear local regression function to determine a bandwidth for the RD analysis. Our study primarily focuses on female entrepreneurship and the initiation of businesses among ultra-poor households. Therefore, we include both microenterprise and measures of poverty indicators from our baseline data to identify the optimal bandwidth, in line with Cattaneo et al. (2016). The resulting bandwidth, as suggested by this method, spans from [0; 36] — effectively 18 units around the cutoff — encompassing 421 observations (110 below and 311 above the cutoff threshold). As illustrated in figure D1, a bandwidth of $+/-18$ around the cutoff renders local randomization a viable assumption. However, it is noteworthy that the process of optimal bandwidth selection presents inherent challenges, often demanding a balance between precision and bias. The adoption of a $+/-18$ bandwidth around the cutoff trims our sample size by an estimated 60%. This reduction in sample disproportionately affects the program villages but retains all of the households in the pure control villages, which is important since we have fewer pure control observations.

Figure D1: Balance Test for Different Windows around 18 EV Cutoff



In Table D1, we present a balance check across treatment arms for the RDD˙18 restricted sample. The overall F-test of joint significance shows that the groups are comparable across a range of characteristics. However, upon closer examination at the individual level (see

Table D1), there appear to be slight imbalances in several covariates, such as marital status, the number of household members, and the number of agriculture plots.

To address these covariate imbalances, we employ propensity score matching for multiple treatments and combine it with weighting techniques to enhance pre-treatment balance within the sample, as described in previous studies (Imai and Ratkovic, 2013; McCaffrey et al., 2013; Lopez and Gutman, 2017).

Our approach applies maximum likelihood estimation via the multinomial probit method, which produces inverse probability weights (IPW) to be used in the regression analysis. Examining the predictors influencing treatment status, Table D2 displays the outcomes of the multinomial probit regression. Two variables–household size and the number of agricultural plots–are considered consequential predictors. Derived from the inverse probability of each treatment, the weights are quantified as 1/p[treatment 0], 1/p[treatment 1], 1/p[treatment 2]. This systematic weighting technique brings a closer alignment in distributions.

Subsequent to these adjustments, we attained a balance that aligns with the stipulated threshold, showcasing noticeable enhancement post-conditioning. Figure D2 provides a clear visualization of the standardized mean differences pre- and post-weighting. This is done through pairwise comparison across treatment statuses for all covariates incorporated in the predictive model. Notably, the dotted lines in the graph symbolize the preset threshold. If the majority or all of the post-adjustment points fall within this threshold it stands as strong evidence of having achieved balance.

Finally, to assess treatment effects in the RDD sample, we analyze equations from section 5, spanning from (4) to (6), using data from select windows around the cutoff at 18, where local randomization holds. In all main tables, we incorporate the results for RDD in the final columns. The observed effects across various outcomes are consistent, regardless of whether we employ a bandwidth of 18 or examine the entire sample of villages.

Table D1: Randomization Balance Check

	(1)	(2)	(3)						
	Cash Transfers (CT) in Program Villages	No Cash Transfers (NCT) in Program Villages	Pure Control in Non-Program Villages	T-Test difference			Normalized difference		
Variable	Mean/SE			(1)-(2)	(1)-(3)	(2)-(3)	(1)-(2)	(1)-(3)	(2)-(3)
Demographic Characteristics of Household Head									
Age (Years)	44.45	44.99	44.69	-0.53	-0.24	0.29	-0.03	-0.01	0.02
	(1.17)	(1.23)	(1.64)						
Marital Status									
Married Polygamous (Yes=1)	0.08	0.09	0.08	-0.01	-0.00	0.01	-0.02	-0.00	0.02
	(0.02)	(0.02)	(0.03)						
Divorced/Widowed (Yes=1)	0.11	0.09	0.10	0.02	0.01	-0.00	0.05	0.03	-0.02
	(0.02)	(0.02)	(0.02)						
Never married (Yes=1)	0.02	0.02	0.01	-0.00	0.01	0.01	-0.01	0.06	0.06
	(0.01)	(0.01)	(0.01)						
Literacy (Can you read or write in any language(Yes=1	0.29	0.31	0.22	-0.02	0.07	0.09	-0.04	0.15	0.20
	(0.03)	(0.03)	(0.05)						
Household Characteristics									
Number of household members	4.70	4.74	4.55	-0.04	0.14	0.18	-0.02	0.06	0.08
	(0.18)	(0.16)	(0.20)						
Number of HH members(Age under 15)	2.14	2.19	2.24	-0.05	-0.09	-0.04	-0.05	-0.10	-0.05
	(0.07)	(0.06)	(0.10)						
Number of agriculture plots (0-7)	0.70	0.70	0.60	0.01	0.10	0.10	0.01	0.15	0.14
	(0.04)	(0.05)	(0.08)						
Farm size less than 1 hectare(=1)	0.84	0.85	0.83	-0.01	0.01	0.02	-0.02	0.03	0.05
	(0.02)	(0.02)	(0.04)						
Number of enterprises own by the household (0-5)	62.26	63.98	47.98	-1.72	14.27*	15.99*	-0.02	0.18*	0.21*
	(5.80)	(5.52)	(6.03)						
Daily adult equivalent expentitures (Naira)†	0.93	0.93	0.96	0.01	-0.02	-0.03	0.02	-0.10	-0.12
	(0.02)	(0.02)	(0.02)						
Poverty line low 190 at baseline	4.06	4.12	4.35	-0.07	-0.29	-0.22	-0.03	-0.12	-0.10
	(0.17)	(0.15)	(0.23)						
Food Insecurity Index (0-6)	0.13	0.13	0.11	0.00	0.02	0.02	0.00	0.05	0.05
	(0.03)	(0.02)	(0.05)						
Primary Female Characteristics									
Farming work (=1 if anyone in the household)	0.47	0.48	0.53	-0.01	-0.07	-0.05	-0.03	-0.13	-0.10
	(0.03)	(0.03)	(0.05)						
Modified A-WEAI Score (0-1)	0.35	0.36	0.36	-0.00	-0.00	-0.00	-0.01	-0.01	-0.00
	(0.01)	(0.01)	(0.02)						
Empowered (=1 if adequacy in modified A-WEIA)	0.15	0.10	0.11	0.05	0.04	-0.01	0.15	0.12	-0.03
	(0.02)	(0.02)	(0.03)						
Decision Making Index (0-6)	0.49	0.55	0.50	-0.06	-0.01	0.05	-0.07	-0.01	0.06
	(0.05)	(0.05)	(0.09)						
NonFarm Enterprise (Yes=1)	0.03	0.03	0.04	-0.00	-0.01	-0.01	-0.00	-0.08	-0.08
	(0.01)	(0.01)	(0.03)						
Female any economic activity in past year(Yes=1)	0.37	0.46	0.38	-0.09*	-0.01	0.08	-0.18*	-0.03	0.15
	(0.03)	(0.03)	(0.05)						
F-test of joint significance (p-value)				0.78	0.40	0.36	0.78	0.40	0.36
Number of observations	231	242	105	473	336	347	473	336	347

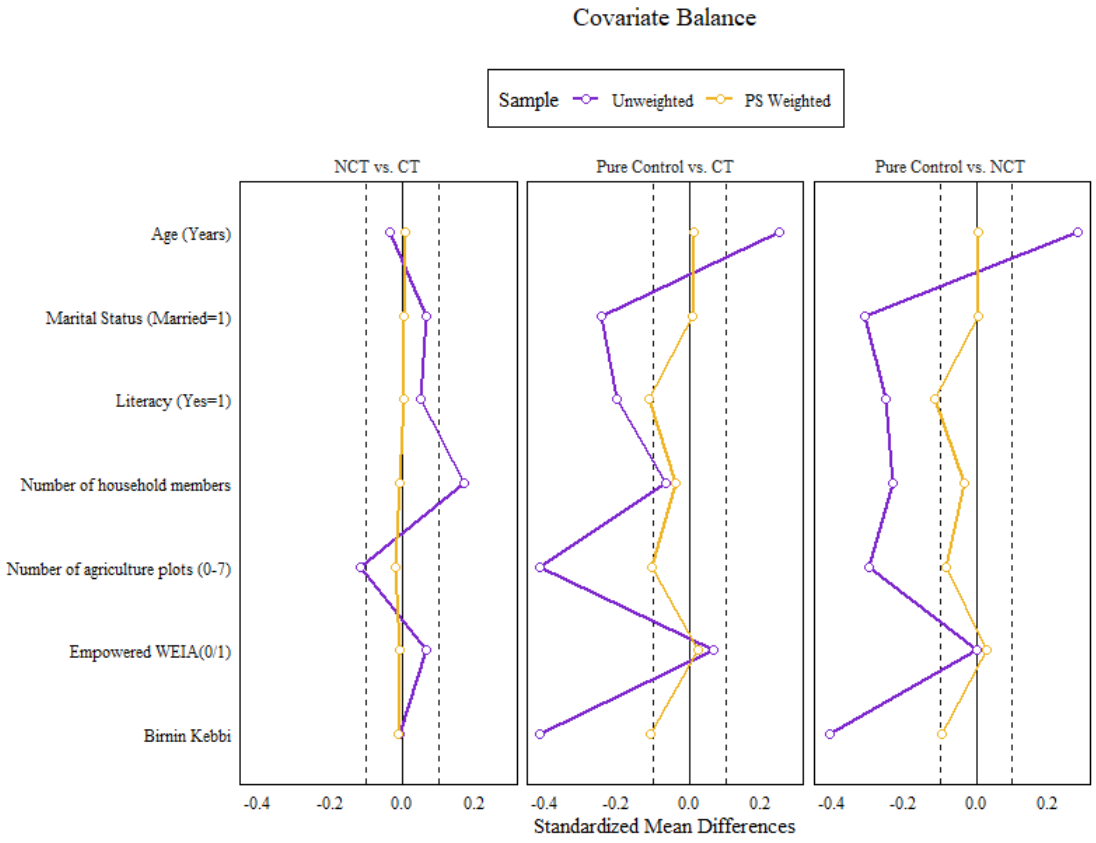
Notes: The values displayed are normalized differences in the means across the groups. As a rule of thumb differences of 0.25 or less are taken to indicate good balance (see Imbens and Rubin, 2015). Table includes variables measured during the baseline survey only. Bottom row presents the F-statistic of joint significance of the t-tests of all variables tested for baseline balance. The value displayed for F-tests are p-values. The covariate variable local government area (LGA) is included in all estimation regressions. Sample in this table comprises those observations part of the RDD18 bandwidth selection. A-WEAI is a modified index of the Abbreviated Women's Empowerment in Agriculture Index. †Value variables are winsorized at the ninety-five percentile. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table D2: Multinomial Probit over Treatment Status

	(1)	(2)	(3)
	Pure Control in Non-Program Villages	Cash Transfers (CT) in Program Villages	No Cash Transfers (NCT) in Program Villages
Age (Years)	0.002	-0.001	-0.001
	[0.00]	[0.00]	[0.00]
Marital Status (Married=1)	-0.042	0.003	0.039
	[0.07]	[0.05]	[0.06]
Literacy (Can you read or write in any language=1)	-0.033	-0.01	0.043
	[0.08]	[0.06]	[0.06]
Number of household members	0.004	-0.018**	0.014*
	[0.01]	[0.01]	[0.01]
Number of agriculture plots (0-7)	-0.073**	0.092***	-0.019
	[0.04]	[0.03]	[0.03]
Modified A-WEAI Score (0-1)	0.077	-0.096	0.019
	[0.12]	[0.12]	[0.11]
Birnin Kebbi	-0.104	0.056	0.049
	[0.12]	[0.06]	[0.07]
Observations	604	604	604

Notes: *p < 0.05, **p < 0.01, ***p < 0.001. (1) Base category of analysis is pure control households in non-program villages (2) Values displayed are marginal effects. (3) We include control variables that were imbalanced at baseline.

Figure D2: Balance Improvements across Multiple Treatments



E Main Results Extended

E1 Inclusion of VV and ML

Indirect effects on very vulnerable (VV) and market-limited (ML) households are presented in this section. These households were identified as vulnerable but were not eligible for the cash transfer program because they were not considered ultra-poor.[49] Therefore, we assess whether there were spillover effects to the VV and ML households from residing in a village where cash transfers were paid.

In Table E1 we examine the effects on women's participation in non-farm enterprise activity and monthly business profits. Columns 1 and 2 display results for very vulnerable and market-limited (VV and ML) households residing in cash transfer program villages compared to those in non-program villages. We find a significant and positive effect on enterprise creation compared to pure control households. However, after controlling for local market conditions in columns 3 and 4, these effects remain positive but are no longer statistically significant at the endline period.

E2 Fiscal Multiplier

We define the partial income multiplier directly linked to female entrepreneurial activity as the ratio of (1) the change in total (aggregate) business income attributed to the cash transfer program compared with (2) the total cost of resources transferred to the study communities. To estimate the change in total business income, we divide female-led household enterprises in program villages into two categories: whether the business belongs to an EV or a VV and ML (VVML) household. We then calculate the change in total earnings in each business category over two time spans: the period from baseline to midline and then from midline to endline.

Table E2 lists the parameters used in this calculation starting with the rate of households operating a female-led business. At baseline, the rate of micro-entrepreneurship was low, ranging from 1 percent to 3 percent, depending on household type and whether belonging to a program or comparison village. Households in comparison villages saw a substantial rise in entrepreneurial activity by the time of the midline survey, with about 9 percent of either EV or VVML households operating a business. However the rates in program villages rose to even higher levels of 24 percent for EV households and 14 percent for VVML households. At endline, households in comparison villages show little change in entrepreneurship from midline (7 percent of EV and 11 percent of VVML households) while in program villages the

[49] For additional information on vulnerability categorization, please refer to section 3.2.1.

Table E1: Inclusion of Other Vulnerable Households (VVs and MLs) in the Village

	(1)	(2)	(3)	(4)
	Non-Farm Enterprise	Profits (IHS)	Non-Farm Enterprise	Profits (IHS)
VVML in CT villages*Midline [A]	0.08*	0.54	0.11*	0.61
	[0.05]	[0.34]	[0.06]	[0.41]
VVML in CT villages*Endline [B]	0.14***	0.79***	0.05	0.19
	[0.05]	[0.28]	[0.06]	[0.37]
PET Midline[C]			-0.08	-0.37
			[0.07]	[0.54]
PET Endline[D]			0.07	0.59
			[0.09]	[0.66]
PEV Midline[E]			-0.38***	-2.71***
			[0.04]	[0.25]
PEV Endline[F]			-0.07	-0.73
			[0.08]	[0.66]
#HH Midline[G]			0.07***	0.48***
			[0.01]	[0.10]
#HH Endline[H]			0.09***	0.58***
			[0.01]	[0.11]
Midline [I]	0.19***	1.37***	0.18***	1.34***
	[0.04]	[0.31]	[0.04]	[0.29]
Endline [J]	0.26***	2.24***	0.20***	1.86***
	[0.04]	[0.30]	[0.04]	[0.27]
Constant	-0.07*	-0.52*	-0.04	-0.31
	[0.04]	[0.31]	[0.03]	[0.22]
Observations				
Local neighborhood radius (Mts)	1326	1326	1326	1326
Meters	400	400	400	400
Mean Pure Control				
Baseline	0.03	19.48	0.03	19.48
Midline	0.16	170.91	0.16	170.91
Endline	0.23	451.60	0.23	451.60
CT recipients around (%)	0.39	0.39	0.39	0.39
EVs around (%)	0.20	0.20	0.20	0.20
Households around (#)	1.38	1.38	1.38	1.38

Notes: *p < 0.05, **p < 0.01, ***p < 0.001;

(1) Outcomes are as follows: (1) "Non-Farm Enterprise" indicates if the female respondent did any non-farm enterprise activity in past 30days. (2) "Profits" is the inverse hyperbolic transformed (IHS) measure of average monthly profits (in the Appendix we also present 99th-percentile winsorized level of profits).

(2) Sample in Table E1 is a balanced panel that includes all very vulnerable (VV) and market limited (ML) households that were interviewed at baseline, midline and endline. VV and ML households were classified as vulnerable in their village but not eligible for the cash transfer program as only the ultra-poor or extremely vulnerable (EV) households were deemed eligible.

(3) VVML in CT villages =1 if household is located in a cash transfer program village and it is categorized as very vulnerable and market limited. Pure Control are VVML households in non-program villages i.e. villages where no cash transfers were paid.

(4) In columns 3 to 4 we include a set of variables to control for local neighborhood effects that includes the size of the local market (#HH), the density of cash transfers (PET) and the relative level of poverty (PEV). #HH is the total number of households in the local area rescaled by a factor of 100.

Table E2: Fiscal Multiplier Estimates

EV households (16 percent of total population) **VV+ML households (71 percent of total population)**				
		Rate of female micro-entrepreneurship per household		
		Baseline	Midline	Endline
EV households	Program villages	0.029	0.238	0.314
	Comparison villages	0.008	0.092	0.071
VV+ML households	Program villages	0.015	0.139	0.182
	Comparison villages	0.013	0.095	0.114
		Mean monthly profits conditional on any enterprise		
		Baseline	Midline	Endline
EV businesses	Program villages	1124.8	1060.8	1343.6
	Comparison villages	1124.8	1438.3	2075.1
VV+ML businesses	Program villages	2397.3	1329.5	1643.6
	Comparison villages	2397.3	1242.2	2616.5
		Mean monthly earnings per 1000 total households, unconditional on business operation		
		Baseline	Midline	Endline
Earnings from EVs	Program villages	5003.2	39357.4	65737.8
	Comparison villages	1463.4	20583.6	22947.4
Earnings from VV+MLs	Program villages	25074.2	130113.9	211200.9
	Comparison villages	21478.2	83466.8	210979.2
		Total gain in earnings for two periods of study relative to comparisons (scaled to 1000 total hhs)		
		Baseline to midline	Midline to endline	Total
Differential earnings in EVs		228509	471007	699516
Differential earnings in VV+MLs		645765	-40492	605273
Transfer Multiplier Estimate		**Total gain in earnings over study period per 1000 total households**		
		1304789		
		Total real value of CT program transfer per 1000 total households		
		4094525		
		Estimated multiplier:		
		0.32		

Notes : All monetary values in 2015 Naira.

Table E3: Conditional Profits Estimates

	EV	**VVML**
	(1)	(2)
	Real Profits Conditional (W/90)	Real Profits Conditional (W/90)
CT villages x Midline [A]	-377.54	87.30
	[539.87]	[635.21]
CT villages x Endline [B]	-731.53**	-972.94*
	[372.29]	[508.08]
Midline [C]	313.48	-1155.15*
	[603.21]	[636.33]
Endline [D]	950.27**	219.21
	[434.46]	[575.20]
Constant	1124.83***	2397.32***
	[278.08]	[359.00]
Observations	777	302
Mean pure control Baseline	500.00	1500.00
Mean pure control Midline	1498.45	1224.18
Mean pure control Endline	2162.54	2596.53
Sample	EV	VV&ML

Notes: *p < 0.05, **p < 0.01, ***p < 0.001;

(1) Outcome is real average monthly profits conditional on having an enterprise, and are presented at the 90th-percentile winsorized levels.

(2) CT villages =1 if household was is in a cash transfer program village. Midline and Endline are time fixed effects.

entrepreneurship rates continue to increase to 31 percent for EV and 18 percent for VVML households.

Table E2 also presents estimated mean monthly profits of female-led entrepreneurs. All monetary values are converted to 2015 naira real levels. The mean values are taken from regressions on profits in levels, winsorized at the 90th percentile, separately for EV and VVML households. These regressions are summarized in Table E3. As discussed in section 6.1, the profit levels of female-businesses in program villages decline vis-a-vis both baseline profits as well as the profits in comparison villages at follow-up periods, indicative that the higher degree of competition in program villages likely reduced economic rents or excessive profits.

Table E2 then estimates mean monthly earnings across all households (whether business operators or not) scaled to a population of 1,000 households. The proportion of EV households, at 15.6 percent, and VVML households, 60.5 percent reflect the proportion in the underlying population. The remaining 13.9 percent of households were deemed "market ready" by the program and were not assessed as part of the study. In our calculation we assume that there are no spillover affects to this segment of the population. This assumption arguably contributes to an underestimate of the true income multiplier as there are observed positive spillovers to the adjacent VVML segment of the population, and any spillover to the "market ready" segment would also likely be positive.

The gain in total earnings due to the program is then determined by the difference in monthly earnings for two periods — baseline to midline (a 15 month span) and midline to endline (12 months) — between program and control households. This total gain is estimated to be approximately 1.4 million Naira.

This gain is compared to the total amount of cash transferred. The total sum of transferred resources is estimated by the stipulated transfer schedule. A total of 75,000 Naira were transferred over the 15 month program period. When all payments are deflated to June 2015 Naira values, the transfer value per household totals 62,181. This total is then scaled to population of 1,000 households (with 7.8 percent of those households receiving the transfer).

The ratio of total gain in program villages to the total cost of transferred funds equals 0.32, the estimate of the partial income multiplier from the increase in female entrepreneurship.

E3 Local Prices

In Table E4 we analyze the nominal prices of livestock and food expenditures across non-program villages and cash transfer program villages with all values reported in Nigerian naira. We show prices at midline and endline. The results suggest higher average nominal prices of goats in program villages at midline. However, there is no longer any price difference at endline. Overall, the local prices of commonly purchased livestock assets and food expenditures do not appear to differ across program and non-program villages. A possible reason we do not observe local price inflation from increased demand from the cash transfer into the local economy is the potential countering effect of an increase in the supply both of whatever services the new businesses are providing (chiefly, prepared food) and an increase in yields so potentially food supply has gone up, which would work to lower prices.

Table E4: Local Prices

		(1)		(2)		
		Non-Program Villages		Cash Transfer Program Villages	T-Test difference	Normalized difference
Variable	N	Mean/SE	N	Mean/SE	(1)-(2)	(1)-(2)
Midline						
Goat Price	87	6222.68 [334.07]	943	7366.02 [108.22]	-1143.34***	-0.34
Chicken Price	79	803.12 [49.97]	760	796.98 [16.76]	6.14	0.01
Sheep Price	37	11337.84 [1088.78]	443	14110.77 [364.33]	-2772.93	-0.36
Total Food Expenditures	212	1966.32 [150.92]	1829	2224.23 [57.51]	-257.91	-0.11
Endline						
Goat Price	119	7489.80 [261.34]	1105	7413.83 [103.55]	75.97	0.02
Chicken Price	118	851.75 [33.01]	1011	866.21 [12.73]	-14.45	-0.04
Sheep Price	63	14546.41 [998.43]	586	14206.76 [307.82]	339.65	0.05
Total Food Expenditures	212	4070.85 [285.87]	1829	3873.63 [85.31]	197.22	0.05

Notes: Prices are reported in Nigeria Naira the local currency which gives the average nominal price of a goat, chicken and sheep, and the average spent on food in the last 7days in program and non-program villages. Values are conditional on those households reporting to own the specific animal asset at the time of the midline and endline survey. The values displayed are normalized differences in the means across the groups. The value displayed for F-tests are p-values. The covariate variable location LGA is included in all estimation regressions. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

F Results on Secondary Outcomes

In appendix F we conduct robustness checks presenting analysis on level values for when the inverse hyperbolic sine (IHS) transformation is used in the main tables. We also explore impact results on a number of additional outcomes including the effects on economic activities of husbands, farming inputs, components of consumption and assets, time use, and gender attitudes and perceived community norms around women's work out of the home.

F1 Female Enterprise Profits and Raw Materials in Levels

In Table F1 we show our treatment results presented in Table 2 are robust to using the levels of monthly profits in Nigerian naira winsorized at the ninety-fifth percentile. Column 1 presents the unconditional real profits earned by female respondents in the past month which are positive and significant. On the other hand, conditional profits are negative, suggesting potential competition effects whereby the higher number of businesses may drive average monthly profits lower in program villages. Table F1 suggests results are achieved at the extensive margin (more businesses are started with cash transfers) rather than at the intensive margin (higher profits among existing businesses). The raw materials outcome is the average monthly naira amount spent on raw materials for the business which is positive and significant at endline. This suggests that households in program villages are indeed investing more in their non-farm enterprise activities than pure control households in non-program villages.

F2 Labor Supply of Female Respondent and Husband

In Tables F2 and F3 we show treatment effects on types of economic activity. Column 1 suggests that women in program villages are more likely to do any work by endline than women in the pure control group. There appears to be evidence of more women active in non-farm enterprise alone or in combination with farming activity (see columns 3 to 6). Among husbands results suggest that at midline some husbands in program villages switch out of farming and into non-farm enterprise activity.[50] This result is reversed by the time of endline. As was observed for female business activities, the proportion of eligible transfers (PET) for male non-farm enterprise activity is positive and significant at endline. We find no evidence of a treatment impact on the profits earned by businesses owned by husbands.

[50]Men were mostly active in farming and livestock activities at baseline (90% of husbands were reported to be active in farming in the past 12 months).

F3 Wage Employment

Table F4 demonstrates the low levels of wage employment in the sample. We find no impact of the cash treatment on the likelihood of having a wage or salaried job at midline or endline.

F4 Agricultural Outcomes — Yields and Inputs in Levels

In Table F5 we present the level effects for the outcomes presented in Table 3. We show results in Table 3 are largely robust when using the level value in Nigerian naira for agricultural yield and total expenditures on agricultural inputs. We find positive treatment effects on the value of agricultural yields and expenditures on inputs. We find unconditional and conditional agricultural yields to be positive for households in program villages.

F5 Agricultural Inputs

In terms of non-labor inputs, in Table F6 we show evidence of higher expenditures in inorganic and organic fertilizers. While the total area cultivated does not change, the greater use of labor and fertilizer inputs leads to higher agricultural yields. The results hold even after accounting for local market conditions. The results suggest that gains from the cash transfer program spillover to non-program households in the local market.

Table F7 investigates labor inputs on the farm, both at the extensive and intensive margin. Labor inputs are categorized into family (any household member, head of household, and spouse of head) and hired labor (men, women, and children). Cash transfer treatment households report a higher likelihood of using family and hired labor during the last agriculture season, compared to pure control households. After controlling for the local market conditions only the result on family labor remains significant. Non-beneficiary households in program villages report higher family labor. The total number of days worked by family labor is higher than in non-program villages. We find no significant impacts on access to extension services or on wages to hired workers. In Table F8 we show that most of the additional harvest is consumed or used as payment for labor, rather than sold for income.

F6 Consumption — Levels of Non-food and Food Expenditures

In Table F9 we show the breakdown of the consumption index presented in Table 4. We present both the IHS transformation and value levels winsorized at the 95th percentile. We show a decomposition of the consumption measure into specific components, including the value of non-food expenditures, food from purchases, and food from own production. Interestingly, cash transfer beneficiaries increase expenditures on both non-food and food items, but do not increase food consumption from own production at midline as a result of

cash receipt - by endline the increase is no longer statistically significant while the non-food increase is of a relatively greater magnitude. Non-beneficiary households in program villages increase expenditures on food, whereas we find no evidence of an impact on non-food items.

F7 Assets, Health, and Education Investments

Table F10 presents the impact results on assets, health, and education investments at midline and endline. Assets is a standardized index that aggregates across the value of animals and livestock, farming assets, and household assets owned by the household at the time of the survey.[51] Value of investments made in health and education is the amount reported to be spent by the household on health expenditures and school fees over a six-month recall period prior to the survey round. Columns 1 to 3 present the results for the full sample specification with local market controls. We find the cash transfer program had a positive effect on assets for cash transfer beneficiary households at midline and endline.[52] On average, households assigned to a cash transfer increased assets by 0.54 standard deviations at midline and 0.23 standard deviations at endline, relative to the pure control group households. In columns 4 to 6 for the RDD estimation the coefficients are still positive, however, results are noisier and are no longer significant. We find some evidence of increased investment in health-related expenditures. Among untreated households in program villages we find a 0.40 standard deviation increase in the asset index at midline, but results do not persist into endline.

F7.1 Asset Investments — Breakdown into Types of Investment

In Table F11 we show a breakdown of the assets index. We present both the IHS transformation and value levels winsorized at 95th percentile. We show that cash transfer households are increasing their investments across all types: animals, farming, and household assets.[53] The most common animal investments are purchases of small animals such as goats, sheep and chickens. Most common farming asset purchases include small tools such as hoes, sickles, and cutlasses; and household asset purchases include mats, mattresses, and beds. For untreated households in program villages there is greater investment in farming and household assets but not in animal or livestock investments.

[51] Assets at baseline was captured using an aggregated value of all assets owned by the household, whereas at follow-up the question was far more granular, where each asset item owned was valued and then summed across multiple types of assets including animal assets, farming assets, and household assets.

[52] In Table F11 we show that cash transfer recipients most often make animal investments and purchase small animals such as goats, sheep, and chickens. Access to savings through financial institutions in the region is limited and therefore investments in small livestock may represent a relatively liquid savings device.

[53] Among cash transfer treatment households the investments in animal assets is larger in magnitude than any other types of asset purchases made. On average, households assigned to a cash transfer acquire more than double the value of animal assets than the pure control households in non-program villages.

Table F1: Non-farm Enterprise Outcomes Profits and Raw Materials (Levels)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Real Profits (W/95)	Real Profits Conditional (W/95)	Raw materials (W/95)	Raw materials Conditional (W/95)	Real Profits (W/95)	Real Profits Conditional (W/95)	Raw materials (W/95)	Raw materials Conditional (W/95)
	Full Sample (CTs and NCTs) in Program Villages				*RDD 18 (CTs and NCTs) in Program Villages*			
CT in CT villages Midline[A]	107.20**	-165.35	421.16	131.34	124.32	-149.73	486.63	1062.65
	[52.34]	[147.51]	[390.29]	[1141.65]	[104.00]	[181.32]	[562.46]	[1091.28]
CT in CT villages Endline[B]	175.84***	-850.00***	803.06***	1008.95***	65.53	-884.05***	626.66***	1635.42***
	[58.85]	[153.15]	[81.32]	[326.35]	[63.77]	[171.04]	[118.24]	[371.30]
NCT in CT villages Midline[C]	2.89	-326.16**	-87.46	-530.04	16.89	-263.03	-66.12	294.58
	[55.87]	[148.11]	[348.72]	[1100.28]	[100.02]	[189.67]	[476.38]	[967.70]
NCT in CT villages Endline[D]	146.50***	-714.32***	624.27***	1120.16***	53.10*	-654.54***	500.05***	2244.49***
	[44.42]	[186.08]	[91.93]	[267.49]	[28.36]	[156.28]	[132.67]	[413.92]
PET Midline[E]	-112.37	-8.24	-213.93	544.49	-72.80	-75.59	-23.64	-747.10
	[79.03]	[194.72]	[441.44]	[1737.71]	[162.30]	[264.75]	[685.21]	[1469.83]
PET Endline[F]	31.89	173.50	73.96	-1441.43***	45.39	222.64	-154.83	-2938.65***
	[53.31]	[186.70]	[258.80]	[458.45]	[73.95]	[306.39]	[246.73]	[445.51]
PEV Midline[G]	-381.65**	-895.32**	-1076.50**	-712.97*	-508.74**	-1535.96***	-1261.89***	-1381.55**
	[175.51]	[385.97]	[426.75]	[372.83]	[239.35]	[508.03]	[379.11]	[551.55]
PEV Endline[H]	-306.16***	-754.13**	-919.63***	-1646.26**	-256.03*	-871.35	-478.60**	-1720.74***
	[115.10]	[379.44]	[355.57]	[837.75]	[140.60]	[601.69]	[217.82]	[549.00]
#HH Midline[I]	32.59	-19.42	105.46	-123.43*	32.98	-84.48	75.25	-192.82
	[28.76]	[53.25]	[79.75]	[72.80]	[43.81]	[78.39]	[95.00]	[127.79]
#HH Endline[J]	66.65**	-20.75	187.04**	68.55	83.66**	80.39	368.39***	271.37
	[33.35]	[92.22]	[78.23]	[120.32]	[36.44]	[61.34]	[110.05]	[.]
Midline[K]	346.82***	389.83	1042.10***	681.65**	409.90***	1266.35***	1179.75***	-1861.53***
	[108.62]	[374.04]	[217.24]	[271.74]	[112.02]	[402.80]	[171.80]	[307.42]
Endline[L]	287.01***	1169.28***	612.65***	729.76*	372.25***	1670.26***	584.89***	-2275.85***
	[70.03]	[143.68]	[143.28]	[372.57]	[96.54]	[133.40]	[162.15]	[493.64]
Observations	3498	777	3498	745	1401	308	1401	298
Meters	400	400	400	400	400	400	400	400
Mean Pure Control								
Baseline	5.95	500.00	0.00	0.01	5.95	500.00	0.00	0.01
Midline	290.56	1564.34	863.69	3454.76	290.56	1564.34	863.69	3454.76
Endline	269.15	2364.63	520.36	3362.31	269.15	2364.63	520.36	3362.31
CT recipients around (%)	0.45	0.45	0.45	0.45	0.40	0.40	0.40	0.40
EVs around (%)	0.34	0.34	0.34	0.34	0.30	0.30	0.30	0.30
Households around(#)	1.19	1.19	1.19	1.19	0.78	0.78	0.78	0.78

Notes: *p < 0.05, **p < 0.01, ***p < 0.001;

(1) Profit and raw materials outcomes, conditional and unconditional, are present to the 95th-percentile winsorized levels.

(2) Regression uses ordinary least squares (OLS) for panel data. All regressions control for location i.e. local government area (LGA) fixed effects. In columns 1 to 8 Conley standard errors that account for spatial correlation in the data are used (Conley 1999; 2008).

(3) CT in CT villages =1 if household was randomly assigned to receive cash transfers in a cash transfer program village; NCT in CT villages = 1 if household was randomly assigned to receive no cash transfers in program villages (non-beneficiaries in treatment villages); and Pure Control = 1 if household did not receive cash transfers in a non-program village where no cash transfers were ever paid (reference group in the regression). Midline and Endline are time fixed effects.

(4) The regression discontinuity (RD) estimation is presented in columns 5 and 8 that exploits the sharp discontinuity at the 18 EV cutoff that determined village-level program eligibility to receive cash transfers.We estimate the local average treatment effect (LATE) for the panel sample using only observations close to the cutoff. In Table 2 column 11 and 12 the bandwidth is defined as +/- 18 EVs around the cutoff i.e. any villages with 0 to 36 EVs are included in the estimation (note minimum number of EVs in a village is 4). Bandwidth was selected using rdwinselect command on Stata (see Cattaneo et al. 2016 and Appendix for further information).

(5) Sample in Table F1 is a balanced panel that includes all ultra-poor households that were interviewed at baseline, midline and endline. Primary female in the household is the respondent.

Table F2: Wife's Labor Supply (Past Month)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Any work (Farming=1 or NonFarming=1)	Farming Work(=1)	Non-Farm Enterprise(=1)	Only farming(=1)	Only non-farming business(=1)	Farming and non-farming business (Both=1)	Any work (Farming=1 or NonFarming=1)	Farming Work(=1)	Non-Farm Enterprise(=1)	Only farming(=1)	Only non-farming business(=1)	Farming and non-farming business (Both=1)
	Full Sample (CTs and NCTs) in Program Villages						*RDD 18 (CTs and NCTs) in Program Villages*					
CT in CT villages Midline[A]	0.06	-0.05	0.12**	-0.05	0.12**	0.00	0.07	-0.04	0.07	-0.00	0.11	-0.04***
	[0.07]	[0.03]	[0.05]	[0.03]	[0.06]	[0.01]	[0.07]	[0.03]	[0.07]	[0.03]	[0.08]	[0.01]
CT in CT villages Endline[B]	0.14***	0.00	0.20***	-0.05	0.14***	0.06***	0.06*	-0.03	0.13***	-0.07*	0.09***	0.04**
	[0.03]	[0.03]	[0.02]	[0.04]	[0.02]	[0.01]	[0.04]	[0.03]	[0.04]	[0.04]	[0.03]	[0.02]
NCT in CT villages Midline[C]	-0.07	-0.10**	0.01	-0.08*	0.04	-0.03***	-0.07	-0.10***	-0.02	-0.05	0.03	-0.05***
	[0.08]	[0.04]	[0.06]	[0.04]	[0.06]	[0.01]	[0.10]	[0.04]	[0.08]	[0.04]	[0.08]	[0.01]
NCT in CT villages Endline[D]	0.10***	0.01	0.13***	-0.04	0.09***	0.05***	0.02	0.02	0.07***	-0.05	0.00	0.07***
	[0.03]	[0.04]	[0.02]	[0.05]	[0.02]	[0.02]	[0.03]	[0.03]	[0.02]	[0.04]	[0.02]	[0.02]
PET Midline[E]	-0.02	0.09*	-0.07	0.05	-0.12*	0.04**	-0.01	0.05	0.05	-0.05	-0.06	0.11***
	[0.07]	[0.05]	[0.05]	[0.04]	[0.06]	[0.02]	[0.08]	[0.08]	[0.10]	[0.06]	[0.11]	[0.02]
PET Endline[F]	0.08***	0.02	0.08***	0.00	0.07***	0.02	0.16***	0.01	0.14***	0.02	0.15***	-0.01
	[0.03]	[0.04]	[0.02]	[0.05]	[0.02]	[0.02]	[0.04]	[0.05]	[0.03]	[0.04]	[0.05]	[0.03]
PEV Midline[G]	-0.15	0.09***	-0.29***	0.14***	-0.24***	-0.05***	-0.10	0.06	-0.24**	0.14**	-0.16*	-0.08***
	[0.10]	[0.02]	[0.10]	[0.03]	[0.09]	[0.01]	[0.15]	[0.08]	[0.10]	[0.07]	[0.09]	[0.02]
PEV Endline[H]	-0.05	0.07**	-0.15***	0.10***	-0.12**	-0.03	0.14***	0.06	0.01	0.13**	0.08**	-0.07**
	[0.05]	[0.04]	[0.04]	[0.04]	[0.06]	[0.03]	[0.04]	[0.06]	[0.04]	[0.06]	[0.03]	[0.03]
#HH Midline[I]	0.01	-0.04	0.04*	-0.03	0.05**	-0.00	0.02	-0.04	0.04*	-0.02	0.06***	-0.03***
	[0.01]	[0.03]	[0.02]	[0.03]	[0.02]	[0.01]	[0.02]	[0.03]	[0.02]	[0.03]	[0.02]	[0.01]
#HH Endline[J]	-0.04	-0.10***	0.04***	-0.08***	0.06***	-0.02**	0.01	-0.07**	0.06**	-0.05*	0.09***	-0.03
	[0.03]	[0.03]	[0.01]	[0.03]	[0.01]	[0.01]	[0.03]	[0.04]	[0.02]	[0.03]	[0.02]	[0.02]
Midline[K]	0.49***	0.28***	0.28***	0.21***	0.21***	0.07***	0.47***	0.27***	0.28***	0.18**	0.19***	0.09***
	[0.03]	[0.07]	[0.06]	[0.07]	[0.05]	[0.01]	[0.04]	[0.07]	[0.06]	[0.07]	[0.05]	[0.01]
Endline[L]	0.48***	0.35***	0.15***	0.33***	0.13***	0.02**	0.40***	0.33***	0.12***	0.28***	0.08**	0.04**
	[0.05]	[0.09]	[0.03]	[0.08]	[0.04]	[0.01]	[0.06]	[0.09]	[0.03]	[0.08]	[0.04]	[0.02]
Constant	0.17***	0.22***	-0.04	0.21***	-0.05	0.01	0.18***	0.25***	-0.06*	0.25***	-0.07*	0.00
	[0.03]	[0.05]	[0.03]	[0.05]	[0.03]	[0.01]	[0.04]	[0.08]	[0.04]	[0.07]	[0.04]	[0.01]
Observations	3498	3498	3498	3498	3498	3498	1401	1401	1401	1401	1401	1401
Meters	400	400	400	400	400	400	400	400	400	400	400	400
Mean Pure Control												
Baseline	0.13	0.12	0.01	0.12	0.01	0.00	0.13	0.12	0.01	0.12	0.01	0.00
Midline	0.60	0.40	0.25	0.35	0.19	0.06	0.60	0.40	0.25	0.35	0.19	0.06
Endline	0.58	0.44	0.15	0.43	0.14	0.01	0.58	0.44	0.15	0.43	0.14	0.01
CT recipients around (%)	0.45	0.45	0.45	0.45	0.45	0.45	0.40	0.40	0.40	0.40	0.40	0.40
EVs around (%)	0.34	0.34	0.34	0.34	0.34	0.34	0.30	0.30	0.30	0.30	0.30	0.30
Households around (#)	1.19	1.19	1.19	1.19	1.19	1.19	0.78	0.78	0.78	0.78	0.78	0.78

Notes: *p < 0.05, **p < 0.01, ***p < 0.001;

(1) Regression uses ordinary least squares (OLS) for panel data. All regressions control for location i.e. local government area (LGA) fixed effects. In columns 1 to 8 Conley standard errors that account for spatial correlation in the data are used (Conley 1999; 2008).

(2) CT in CT villages =1 if household was randomly assigned to receive cash transfers in a cash transfer program village; NCT in CT villages = 1 if household was randomly assigned to receive no cash transfers in program villages (non-beneficiaries in treatment villages); and Pure Control = 1 if household did not receive cash transfers in a non-program village where no cash transfers were ever paid (reference group in the regression). Midline and Endline are time fixed effects.

(3) Sample in Table F2 is a balanced panel that includes all ultra-poor households that were interviewed at baseline, midline and endline. Primary female in the household is the respondent.

Table F3: Husband's Labor Supply (Past Month)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Any work (Farming=1 or NonFarming =1)	Farming Work(=1)	Non-Farm Enterprise(= 1)	Only farming(=1)	Only non-farming business(=1)	Farming and non-farming business (Both=1)	Any work (Farming=1 or NonFarming =1)	Farming Work(=1)	Non-Farm Enterprise(= 1)	Only farming(=1)	Only non-farming business(=1)	Farming and non-farming business (Both=1)
	Full Sample (CTs and NCTs) in Program Villages						*RDD 18 (CTs and NCTs) in Program Villages*					
CT in CT villages Midline[A]	-0.05***	-0.09***	0.05*	-0.09***	0.04***	0.01	0.01	-0.08***	0.05**	-0.04	0.09***	-0.04
	[0.02]	[0.02]	[0.02]	[0.03]	[0.01]	[0.03]	[0.02]	[0.02]	[0.02]	[0.03]	[0.02]	[0.03]
CT in CT villages Endline[B]	0.00	0.04	-0.05**	0.05	-0.03	-0.01	0.02	0.03	-0.06***	0.08**	-0.02	-0.05**
	[0.03]	[0.05]	[0.02]	[0.05]	[0.02]	[0.02]	[0.03]	[0.04]	[0.02]	[0.04]	[0.01]	[0.02]
NCT in CT villages Midline[C]	-0.06***	-0.11***	0.04**	-0.10***	0.05***	-0.01	0.01	-0.10***	0.06***	-0.06*	0.10***	-0.04*
	[0.02]	[0.02]	[0.02]	[0.03]	[0.01]	[0.02]	[0.02]	[0.02]	[0.02]	[0.03]	[0.02]	[0.02]
NCT in CT villages Endline[D]	0.01	0.05	-0.04***	0.06*	-0.04*	-0.01	0.01	0.02	-0.05***	0.06***	-0.02	-0.03
	[0.02]	[0.04]	[0.02]	[0.03]	[0.02]	[0.02]	[0.02]	[0.03]	[0.02]	[0.02]	[0.01]	[0.02]
PET Midline[E]	0.10***	0.15***	-0.05	0.15***	-0.05**	-0.00	0.06**	0.18***	-0.07	0.12***	-0.12***	0.05
	[0.03]	[0.02]	[0.06]	[0.05]	[0.02]	[0.04]	[0.03]	[0.03]	[0.05]	[0.04]	[0.03]	[0.05]
PET Endline[F]	-0.01	-0.00	0.05***	-0.05***	-0.00	0.05**	0.01**	0.05***	0.05	-0.04	-0.04*	0.09***
	[0.01]	[0.02]	[0.02]	[0.01]	[0.00]	[0.02]	[0.00]	[0.02]	[0.04]	[0.04]	[0.02]	[0.03]
PEV Midline[G]	0.02	0.08***	-0.06	0.08***	-0.06***	-0.00	-0.08	0.04	0.08***	-0.16***	-0.12***	0.20***
	[0.03]	[0.02]	[0.05]	[0.03]	[0.02]	[0.03]	[0.06]	[0.05]	[0.03]	[0.06]	[0.02]	[0.02]
PEV Endline[H]	-0.08***	-0.10***	-0.05***	-0.04	0.02***	-0.06***	0.03**	0.05*	-0.08**	0.11**	-0.02	-0.06***
	[0.02]	[0.02]	[0.01]	[0.02]	[0.01]	[0.01]	[0.01]	[0.03]	[0.04]	[0.05]	[0.02]	[0.02]
#HH Midline[I]	0.01	0.02	-0.01	0.02	-0.01**	0.00	-0.05***	-0.01	-0.02	-0.03*	-0.05***	0.03
	[0.01]	[0.01]	[0.02]	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.02]	[0.02]	[0.01]	[0.02]
#HH Endline[J]	-0.00	-0.03***	0.03***	-0.03***	0.02***	0.01	-0.01***	-0.03***	0.01	-0.02	0.02	-0.01
	[0.01]	[0.01]	[0.01]	[0.01]	[0.00]	[0.01]	[0.00]	[0.01]	[0.01]	[0.01]	[.]	[0.01]
Midline[K]	0.39***	0.45***	0.09**	0.31***	0.03***	0.06*	0.38***	0.41***	0.02	0.36***	0.06***	-0.03
	[0.02]	[0.02]	[0.04]	[0.04]	[0.01]	[0.03]	[0.01]	[0.01]	[0.04]	[0.03]	[0.01]	[0.04]
Endline[L]	0.45***	0.52***	0.08***	0.37***	0.01	0.07***	0.36***	0.43***	0.07***	0.29***	0.01	0.05**
	[0.02]	[0.04]	[0.02]	[0.02]	[0.02]	[0.03]	[0.02]	[0.05]	[0.02]	[0.04]	[0.02]	[0.03]
Constant	0.54***	0.45***	0.03**	0.51***	0.01***	0.02*	0.61***	0.51***	0.06***	0.55***	0.01***	0.04*
	[0.02]	[0.02]	[0.01]	[0.02]	[0.00]	[0.01]	[0.01]	[0.01]	[0.02]	[0.02]	[0.00]	[0.02]
Observations	2485	2676	2485	2485	2485	2485	1030	1091	1030	1030	1030	1030
Meters	400	400	400	400	400	400	400	400	400	400	400	400
Mean Pure Control												
Baseline	0.53	0.44	0.03	0.50	0.00	0.03	0.53	0.44	0.03	0.50	0.00	0.03
Midline	0.94	0.92	0.10	0.83	0.02	0.08	0.94	0.92	0.10	0.83	0.02	0.08
Endline	0.96	0.91	0.13	0.83	0.04	0.09	0.96	0.91	0.13	0.83	0.04	0.09
CT recipients around (%)	0.45	0.45	0.45	0.45	0.45	0.45	0.40	0.40	0.40	0.40	0.40	0.40
EVs around (%)	0.34	0.34	0.34	0.34	0.34	0.34	0.30	0.30	0.30	0.30	0.30	0.30
Households around (#)	1.19	1.19	1.19	1.19	1.19	1.19	0.78	0.78	0.78	0.78	0.78	0.78

Notes: *p < 0.05, **p < 0.01, ***p < 0.001;

(1) Regression uses ordinary least squares (OLS) for panel data. All regressions control for location i.e. local government area (LGA) fixed effects. In columns 1 to 8 Conley standard errors that account for spatial correlation in the data are used (Conley 1999; 2008).

(2) CT in CT villages =1 if household was randomly assigned to receive cash transfers in a cash transfer program village; NCT in CT villages = 1 if household was randomly assigned to receive no cash transfers in program villages (non-beneficiaries in treatment villages); and Pure Control = 1 if household did not receive cash transfers in a non-program village where no cash transfers were ever paid (reference group in the regression). Midline and Endline are time fixed effects.

(3) Sample in Table F3 is a balanced panel that includes all ultra-poor households that were interviewed at baseline, midline and endline. Primary female in the household is the respondent.

Table F4: Wage Employment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Wage Work (Yes=1)				Wage Work (Yes=1)			
	Full Sample (CTs and NCTs) in Program Villages		RDD 18 (CTs and NCTs) in Program Villages		Full Sample (CTs and NCTs) in Program Villages		RDD 18 (CTs and NCTs) in Program Villages	
CT in CT villages [A]	0.03	0.03	0.01	0.05	-0.01	0.05	-0.00	0.04
	[0.02]	[0.02]	[0.03]	[0.04]	[0.01]	[0.04]	[0.00]	[0.05]
NCT in CT villages [B]	0.02	0.02	-0.00	0.05	-0.00	0.03	0.00	0.04
	[0.03]	[0.03]	[0.03]	[0.04]	[0.00]	[0.04]	[0.00]	[0.05]
PET[C]	0.01	0.01	0.02	-0.06	0.02	-0.04	0.00	-0.04
	[0.05]	[0.05]	[0.06]	[0.07]	[0.01]	[0.05]	[0.00]	[0.06]
PEV[D]	-0.04	-0.04	-0.03	0.05	0.02	0.08	0.00	-0.01
	[0.03]	[0.03]	[0.04]	[0.08]	[0.01]	[0.05]	[0.00]	[0.06]
#HH[E]	-0.00	-0.00	-0.02	0.02	0.00	0.00	-0.00	-0.04**
	[0.01]	[0.01]	[0.01]	[0.03]	[0.00]	[0.01]	[0.00]	[0.02]
Constant	0.02	0.02	0.01	-0.03	-0.00	-0.01	-0.00	0.03
	[0.01]	[0.01]	[0.02]	[0.03]	[0.00]	[0.03]	[0.00]	[0.03]
Observations	1166	1166	467	301	1166	764	467	322
Adjusted R-squared	0.01	0.01	0.02	0.04	0.00	0.01	0.01	0.02
Meters	400	400	400	400	400	400	400	400
Outcome Mean Pure Control	0.01	0.01	0.01	0.00	0.00	0.02	0.00	0.02
CT recepients around (%)	0.45	0.45	0.40	0.40	0.45	0.45	0.40	0.40
EVs around (%)	0.34	0.34	0.30	0.30	0.34	0.34	0.30	0.30
HH around(#)	1.19	1.19	0.78	0.78	1.19	1.19	0.78	0.78

(1) Sample in Table F4 includes all ultra-poor households that were interviewed in one of the follow-up surveys. Wage work is a binary indicator if the respondent worked in wage or salaried employment in the past 30 days.
(2) Table F4 includes answers from primary female respondent and her husband.
(3) The regression discontinuity (RD) estimation exploits the sharp discontinuity at the 18 EV cutoff that determined village-level program eligibility to receive cash transfers.We estimate the local average treatment effect (LATE) using only observations close to the cutoff +/- 18 EVs.

Table F5: Agricultural Outcomes (Levels)

	(1)	(2)	(3)	(4)	(5)	(6)
	Agriculture Yields (W/95)	Agriculture Yields Conditional (W/95)	Total spend on inputs real (W/95)	Agriculture Yields (W/95)	Agriculture Yields Conditional (W/95)	Total spend on inputs real (W/95)
Sample	*Full Sample (CTs and NCTs) in Program Villages*			*RDD 18 (CTs and NCTs) in Program Villages*		
CT in CT villages [A]	889421.22**	710692.72	678.12**	1.06e+06***	3356.84	549.68*
	[379120.68]	[1.07e+06]	[291.71]	[348170.33]	[830426.42]	[296.65]
NCT in CT villages [B]	990429.71**	1.04e+06	742.81**	1.33e+06***	2.65e+06*	766.99***
	[391704.45]	[997640.63]	[308.09]	[380396.29]	[1.49e+06]	[286.67]
PET[C]	-7.58e+05*	-2.58e+05	101.60	-8.24e+05*	880922.46	-84.52
	[449474.36]	[1.45e+06]	[481.51]	[474506.71]	[1.55e+06]	[463.95]
PEV[D]	-1.26e+06***	-1.30e+06	-50.84	-1.91e+06***	-3.41e+06**	248.25
	[456807.36]	[1.17e+06]	[406.71]	[679528.65]	[1.44e+06]	[497.83]
#HH[E]	-1.89e+05*	16995.95	-94.31	-1.55e+05	-1.57e+06**	-312.54**
	[110239.73]	[435378.21]	[124.47]	[231995.08]	[740654.28]	[134.95]
Constant	1.60e+06***	1.84e+06**	-19.18	1.60e+06***	2.79e+06***	-36.91
	[358170.80]	[722850.29]	[238.34]	[370489.88]	[880581.01]	[256.60]
Observations	1166	303	1166	467	134	467
Adjusted R-squared	0.02	0.01	0.05	0.05	0.06	0.07
Meters	400	400	400	400	400	400
Outcome Mean Pure Control	1133713.78	2237611.17	275.93	1133713.78	2237611.17	275.93
CT recipients around (%)	0.45	0.45	0.45	0.40	0.40	0.40
EVs around (%)	0.34	0.34	0.34	0.30	0.30	0.30
Households around(#)	1.19	1.19	1.19	0.78	0.78	0.78

Notes: *p < 0.05, **p < 0.01, ***p < 0.001

(1) Sample in Table F3 is a balanced panel that includes all ultra-poor households that were interviewed at baseline and endline.

(2) Table F5 includes anwers from primary male respondent in household.

(3)Regression utilizes ANCOVA estimation to control for the baseline level of the outcome. However, the total number of inputs was measured differently at baseline. Therefore, in this instance, we control for the number of crops, which is the most standardized version across surveys.

2008). The regression discontinuity (RD) estimation is presented in columns 4 to 6 that exploits the sharp discontinuity at the 18 EV cutoff that determined village-level program eligibility to receive cash transfers.We estimate the local average treatment effect (LATE) for the panel sample using only observations close to the cutoff.

Table F6: Agricultural Non-labor Inputs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Ttl area cultivated (W/95)	Total labor on all household plots (Days/HA)	Attended extension training(=1)	Total spend organic fertilizer/ha (IHS)	Total spend inorganic fertilizer/ha (IHS)	Total spend seed fertilizer/ha (IHS)	Total wage pay to hired workers/ha (IHS)	Endline:Ttl area cultivated (W/95)	Total labor on all household plots (Days/HA)	Attended extension training(=1)	Total spend organic fertilizer/ha (IHS)	Total spend inorganic fertilizer/ha (IHS)	Total spend seed fertilizer/ha (IHS)	Total wage pay to hired workers/ha (IHS)
	Full Sample (CTs and NCTs) in Program Villages							*RDD 18 (CTs and NCTs) in Program Villages*						
CT in CT villages [A]	0.23	30.80	0.08	1.25***	0.57**	0.35	0.22	0.37	31.36	0.05	1.31**	0.52	0.39	0.06
	[0.36]	[18.77]	[0.08]	[0.45]	[0.25]	[0.24]	[0.25]	[0.37]	[28.86]	[0.09]	[0.55]	[0.34]	[0.32]	[0.20]
NCT in CT villages [B]	0.15	31.21*	0.11	1.31***	0.64**	0.37	0.28	0.22	27.33	0.10	1.41**	0.97**	0.55*	-0.03
	[0.36]	[17.14]	[0.08]	[0.47]	[0.30]	[0.25]	[0.27]	[0.36]	[21.96]	[0.10]	[0.58]	[0.41]	[0.32]	[0.25]
PET[C]	-0.46	-17.34	-0.10	-0.04	0.22	-0.57	0.11	-0.35	-9.42	-0.04	-0.31	-0.45	-0.71*	0.67
	[0.40]	[27.45]	[0.10]	[0.72]	[0.44]	[0.36]	[0.45]	[0.56]	[32.82]	[0.13]	[0.91]	[0.47]	[0.43]	[0.43]
PEV[D]	-0.47	7.55	-0.08	-0.59	-0.13	0.52	-0.21	0.66	-0.51	0.14	0.13	0.69	0.33	0.02
	[0.33]	[26.92]	[0.08]	[0.54]	[0.44]	[0.33]	[0.33]	[0.78]	[50.69]	[0.15]	[0.98]	[0.94]	[0.58]	[0.50]
#HH[E]	-0.07	-7.51	0.02	-0.38**	-0.25**	0.08	-0.03	0.05	-27.95*	0.07	-0.46*	-0.19	0.03	-0.28**
	[0.09]	[9.29]	[0.02]	[0.17]	[0.10]	[0.08]	[0.10]	[0.21]	[14.56]	[0.04]	[0.24]	[0.17]	[0.10]	[0.11]
Constant	1.21***	11.93	0.14**	0.14	-0.03	0.01	0.06	1.00***	21.26	0.13	0.02	-0.36	0.10	0.04
	[0.31]	[9.77]	[0.06]	[0.35]	[0.15]	[0.15]	[0.20]	[0.32]	[16.27]	[0.08]	[0.52]	[0.25]	[0.20]	[0.20]
Observations	1166	1166	1166	1166	1166	1166	1166	467	467	467	467	467	467	467
Adjusted R-squared	0.03	0.03	0.02	0.07	0.03	0.02	0.02	0.07	0.03	0.02	0.09	0.06	0.03	0.04
Meters	400	400	400	400	400	400	400	400	400	400	400	400	400	400
Outcome Mean Pure Control	1.22	24.30	0.17	0.41	0.09	0.14	0.22	1.22	24.30	0.17	0.41	0.09	0.14	0.22
CT recipients around (%)	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Average EVs around (%)	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Households around(#)	1.19	1.19	1.19	1.19	1.19	1.19	1.19	0.78	0.78	0.78	0.78	0.78	0.78	0.78

Notes: *p < 0.05, **p < 0.01, ***p < 0.001

(1) Sample in Table F6 is a balanced panel that includes all ultra-poor households that were interviewed at baseline and endline.

(2) Table F6 includes anwers from primary male respondent in household.

(3)Regression utilizes ANCOVA estimation to control for the baseline level of the outcome. However, the total number of inputs was measured differently at baseline. Therefore, in this instance, we control for the number of crops, which is the most standardized version across surveys.

(4) All regressions control for location i.e. local government area (LGA) fixed effects andconley standard errors that account for spatial correlation in the data are used (Conley 1999; 2008). The regression discontinuity (RD) estimation is presented in columns 8 to 14 that exploits the sharp discontinuity at the 18 EV cutoff that determined village-level program eligibility to receive cash transfers.We estimate the local average treatment effect (LATE) for the panel sample using only observations close to the cutoff.

Table F7: Agricultural Labor Inputs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Any family labor in the plot	Any hired labor in the plot	Ttl days worked by hmem/ha in the last season	Ttl number of days/men hired/ha (W/95)	Ttl number of days/women hired/ha (W/95)	Ttl number of days/child hired/ha (W/95)	Any family labor in the plot	Any hired labor in the plot	Ttl days worked by hmem/ha in the last season	Ttl number of days/men hired/ha (W/95)	Ttl number of days/women hired/ha (W/95)	Ttl number of days/child hired/ha (W/95)
	Full Sample (CTs and NCTs) in Program Villages						*RDD 18 (CTs and NCTs) in Program Villages*					
CT in CT villages [A]	0.16**	0.04	30.96*	-0.32	0.18	-0.01	0.19**	-0.01	34.52	-2.46*	-0.12	-0.58*
	[0.07]	[0.04]	[18.54]	[1.03]	[0.18]	[0.26]	[0.08]	[0.05]	[28.57]	[1.29]	[0.09]	[0.31]
NCT in CT villages [B]	0.14*	0.05	29.71*	0.94	0.18	0.37	0.18**	-0.03	28.99	-1.38	-0.09	-0.19
	[0.07]	[0.05]	[16.87]	[1.16]	[0.22]	[0.44]	[0.08]	[0.05]	[21.79]	[1.10]	[0.08]	[0.22]
PET[C]	0.06	0.04	-19.38	1.64	-0.23	0.62	0.06	0.14**	-13.93	3.68**	0.13	0.70*
	[0.11]	[0.06]	[26.75]	[1.79]	[0.30]	[0.50]	[0.12]	[0.07]	[32.73]	[1.73]	[0.10]	[0.41]
PEV[D]	-0.07	0.04	2.87	4.36*	0.49	-0.16	-0.03	0.28***	-12.52	10.04*	0.27	1.69
	[0.12]	[0.06]	[25.69]	[2.47]	[0.39]	[0.82]	[0.15]	[0.11]	[47.25]	[5.40]	[0.29]	[1.08]
#HH[E]	-0.08***	-0.01	-8.87	1.15	0.15	0.06	-0.16***	-0.03	-28.79**	0.86	0.03	-0.04
	[0.03]	[0.02]	[8.45]	[1.04]	[0.13]	[0.29]	[0.04]	[0.03]	[14.10]	[1.29]	[0.03]	[0.12]
Constant	0.21***	-0.01	13.38	-1.56	-0.08	0.18	0.28***	-0.07*	25.06	-3.30*	-0.04	-0.47
	[0.06]	[0.03]	[9.27]	[1.10]	[0.12]	[0.38]	[0.07]	[0.04]	[15.38]	[1.80]	[0.06]	[0.32]
Observations	1166	1166	1166	1166	1166	1166	467	467	467	467	467	467
Adjusted R-squared	0.19	0.06	0.03	0.01	0.01	0.01	0.26	0.10	0.03	0.07	0.03	0.07
Meters	400	400	400	400	400	400	400	400	400	400	400	400
Outcome Mean Pure Control	0.26	0.05	23.51	0.66	0.04	0.09	0.26	0.05	23.51	0.66	0.04	0.09
CT recipients around (%)	0.45	0.45	0.45	0.45	0.45	0.45	0.40	0.40	0.40	0.40	0.40	0.40
Average EVs around (%)	0.34	0.34	0.34	0.34	0.34	0.34	0.30	0.30	0.30	0.30	0.30	0.30
Households around(#)	1.19	1.19	1.19	1.19	1.19	1.19	0.78	0.78	0.78	0.78	0.78	0.78

Notes: *p < 0.05, **p < 0.01, ***p < 0.001

(1) Sample in Table F7 is a balanced panel that includes all ultra-poor households that were interviewed at baseline and endline.

(2) Table F7 includes anwers from primary male respondent in household.

(3) Regression utilizes ANCOVA estimation to control for the baseline level of the outcome. However, the measures related to inputs were measured differently at baseline. Therefore, in this instance, we control for the number of crops, which is the most standardized version across surveys.

(4) All regressions control for location i.e. local government area (LGA) fixed effects andconley standard errors that account for spatial correlation in the data are used (Conley 1999; 2008). The regression discontinuity (RD) estimation is presented in columns 7 to 12 that exploits the sharp discontinuity at the 18 EV cutoff that determined village-level program eligibility to receive cash transfers.We estimate the local average treatment effect (LATE) for the panel sample using only observations close to the cutoff.

Table F8: Use of Agricultural Value Harvested

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Harvested value per hectare that was					Harvested value per hectare that was				
	Sold (W/95)	Consumed(W/95)	Used as payment for labor (W/95)	Stored for next season(W/95)	Post-harvest lost per hectare (W/95)	Sold (W/95)	Consumed(W/95)	Used as payment for labor (W/95)	Stored for next season(W/95)	Post-harvest lost per hectare (W/95)
SAMPLE	*Full Sample (CTs and NCTs) in Program Villages*					*RDD 18 (CTs and NCTs) in Program Villages*				
CT in CT villages [A]	51031.92**	218272.92***	4013.99	17017.07**	1389.31	70157.86**	235530.05***	3613.09	8522.55	-645.51
	[20345.23]	[77419.83]	[4870.20]	[8057.86]	[1074.68]	[27922.07]	[88526.68]	[5411.13]	[7531.48]	[831.19]
NCT in CT villages [B]	57360.21***	231338.74***	3931.85	19359.33**	1863.41*	76196.71**	271232.55***	2855.41	13454.35	372.91
	[21600.61]	[79309.30]	[4918.42]	[8412.03]	[1109.41]	[31360.64]	[88490.74]	[5452.33]	[8279.48]	[990.51]
PET[C]	-41258.40	-2.68e+05***	588.38	-23402.63**	-602.71	-53494.84	-2.63e+05*	898.40	-13369.43	1764.59
	[32829.72]	[96194.88]	[6180.95]	[9413.05]	[1540.18]	[49593.08]	[136671.47]	[8579.37]	[12469.44]	[1693.93]
PEV[D]	-25510.03	-1.35e+05	-9664.03**	-14803.83*	-2381.27**	-49932.12	154709.10	-4845.18	13340.77	-2248.24
	[26887.08]	[93218.11]	[4506.25]	[8101.04]	[1206.99]	[63277.82]	[214877.57]	[8696.19]	[21434.65]	[1724.28]
#HH[E]	-6237.65	-18751.81	-3233.06***	-3590.27	-556.19*	-9690.61	8955.43	-1863.37	3215.66	-712.84*
	[5509.32]	[24857.77]	[967.28]	[2437.31]	[296.17]	[9834.36]	[38835.69]	[1533.15]	[4345.20]	[399.99]
Constant	52612.27***	317259.84***	10486.77***	18622.28***	1965.15***	78964.50***	262300.08***	8913.12**	11869.43*	2039.73**
	[13823.57]	[63051.47]	[3678.44]	[6349.46]	[743.43]	[22165.52]	[67255.98]	[3684.05]	[6865.00]	[977.52]
Observations	1166	1166	1166	1166	1166	467	467	467	467	467
Adjusted R-squared	0.04	0.01	0.02	0.01	0.01	0.10	0.06	0.01	0.02	0.01
Meters	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00
Outcome Mean Pure Control	29537.89	267758.25	6613.23	14394.96	1332.64	29537.89	267758.25	6613.23	14394.96	1332.64
Average CT recepients around (%)	0.45	0.45	0.45	0.45	0.45	0.40	0.40	0.40	0.40	0.40
Average EVs around (%)	0.34	0.34	0.34	0.34	0.34	0.30	0.30	0.30	0.30	0.30
Average HH around(#)	1.19	1.19	1.19	1.19	1.19	0.78	0.78	0.78	0.78	0.78

Notes: *p < 0.05, **p < 0.01, ***p < 0.001

(1) Sample in Table F8 is a balanced panel that includes all ultra-poor households that were interviewed at baseline and endline.

(2) Table F8 includes anwers from primary male respondent in household.

(3) Used of harvest value was not measure at baseline. For this reason we control by total value harvested across all regressions include in this table.

(4) All regressions control for location i.e. local government area (LGA) fixed effects andconley standard errors that account for spatial correlation in the data are used (Conley 1999; 2008). The regression discontinuity (RD) estimation is presented in columns 8 to 14 that exploits the sharp discontinuity at the 18 EV cutoff that determined village-level program eligibility to receive cash transfers.We estimate the local average treatment effect (LATE) for the panel sample using only observations close to the cutoff.

Table F9: Consumption - Breakdown Non-Food and Food

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Consumption : Real Non-Food expenditures(IHS)	Consumption : Real Food expenditures (IHS)	Consumption : Real Non-Food expenditures(W/95)	Consumption : Real Food expenditures (IHS)	Consumption : Real Non-Food expenditures(IHS)	Consumption : Real Food expenditures (IHS)	Consumption : Real Non-Food expenditures(W/95)	Consumption : Real Food expenditures (IHS)
	Full Sample (CTs and NCTs) in Program Villages				*RDD 18 (CTs and NCTs) in Program Villages*			
CT in CT villages Midline[A]	0.40*	0.26***	24.87*	210.45**	0.45*	0.39***	53.73***	382.41***
	[0.23]	[0.07]	[14.44]	[85.56]	[0.25]	[0.11]	[14.53]	[128.19]
CT in CT villages Endline[B]	0.19	0.06	8.85	-125.81	-0.04	-0.05	-3.82	-286.00**
	[0.12]	[0.23]	[7.23]	[79.54]	[0.09]	[0.18]	[6.20]	[117.95]
NCT in CT villages Midline[C]	0.25	-0.05	16.62	-14.80	0.30	0.16	47.09***	210.58
	[0.22]	[0.07]	[14.53]	[75.99]	[0.24]	[0.11]	[16.11]	[136.88]
NCT in CT villages Endline[D]	0.10	0.07	2.92	-116.60	-0.10	-0.13	-10.32	-277.98***
	[0.13]	[0.19]	[9.52]	[73.64]	[0.15]	[0.18]	[12.58]	[97.63]
PET Midline[E]	0.26*	0.15*	7.53	19.15	0.21	-0.09	-37.18**	-138.11
	[0.15]	[0.09]	[10.50]	[91.87]	[0.24]	[0.12]	[16.09]	[134.51]
PET Endline[F]	0.08	0.03	3.86	144.51***	0.25**	0.30***	17.72**	333.60***
	[0.09]	[0.10]	[5.48]	[43.11]	[0.11]	[0.11]	[8.60]	[72.15]
PEV Midline[G]	-0.48***	-0.77***	-37.33***	-539.56***	-0.59	-0.84***	-35.20	-762.09***
	[0.13]	[0.03]	[10.15]	[40.03]	[0.40]	[0.05]	[39.02]	[86.12]
PEV Endline[H]	-0.29**	-0.77***	-12.04	-208.31**	-0.38***	0.05	-30.37***	-9.44
	[0.12]	[0.22]	[8.51]	[103.97]	[0.08]	[0.10]	[6.28]	[122.08]
#HH Midline[I]	-0.02	-0.09***	-2.70	-16.43	-0.29***	-0.19***	-26.48***	-241.14***
	[0.06]	[0.02]	[3.14]	[20.80]	[0.06]	[0.03]	[4.27]	[18.58]
#HH Endline[J]	-0.00	-0.08	2.43	51.70	0.00	0.07	-1.74	90.24**
	[0.04]	[0.06]	[3.17]	[38.61]	[0.05]	[0.05]	[4.09]	[45.95]
Midline[K]	1.23***	-0.23***	28.27***	-163.65***	1.29***	-0.17*	37.26***	-33.62
	[0.14]	[0.06]	[7.89]	[45.85]	[0.14]	[0.09]	[11.69]	[.]
Endline[L]	1.27***	-0.00	-1.79	-36.43	1.20***	-0.40***	5.92***	-122.78
	[0.13]	[0.08]	[7.18]	[24.42]	[0.10]	[0.14]	[1.17]	[.]
Constant	2.96***	7.67***	57.87***	1280.80***	3.08***	7.68***	58.22***	1279.65***
	[0.10]	[0.04]	[6.05]	[35.07]	[0.11]	[0.04]	[3.93]	[31.79]
Observations	3493	3498	3493	3498	1401	1401	1401	1401
Meters	400	400	400	400	400	400	400	400
Mean Pure Control								
Baseline	3.49	7.83	72.59	1442.99	3.49	7.83	72.59	1442.99
Midline	4.28	7.24	89.66	1003.16	4.28	7.24	89.66	1003.16
Endline	4.37	7.47	68.09	1244.32	4.37	7.47	68.09	1244.32
CT recipients around (%)	0.45	0.45	0.45	0.45	0.40	0.40	0.40	0.40
EVs around (%)	0.34	0.34	0.34	0.34	0.30	0.30	0.30	0.30
Households around(#)	1.19	1.19	1.19	1.19	0.78	0.78	0.78	0.78

Notes: *p < 0.05, **p < 0.01, ***p < 0.001

(1) Outcomes are as follow: Non food and food consumption is converted to the last 7 days adult-equivalent measure and inflation-adjusted. Food consumption includes expenditures and own consumption . Variables are presented as the inverse hyperbolic sine (IHS) transformed and as levles winsorized at 95%.

(2) Sample in Table F9 is a balanced panel that includes all ultra-poor households that were interviewed at baseline and endline.

(3) Table F9 includes anwers from primary female respondent in household.

(4) Regression uses ordinary least squares (OLS) for panel data. All regressions control for location i.e. local government area (LGA) fixed effects. Conley standard errors that account for spatial correlation in the data are

(5) The regression discontinuity (RD) estimation is presented in columns 5 and 8 that exploits the sharp discontinuity at the 18 EV cutoff that determined village-level program eligibility to receive cash transfers.We estimate the local average treatment effect (LATE) for the panel sample using only observations close to the cutoff. In Table 2 column 11 and 12 the bandwidth is defined as +/- 18 EVs around the cutoff i.e. any villages with 0 to 36 EVs are included in the estimation (note minimum number of EVs in a village is 4). Bandwidth was selected using rdwinselect command on Stata (see Cattaneo et al. 2016 and Appendix for further information).

Table F10: Impact on Investments in Assets, Health, and Education

	Panel A: Midline					
	Full Sample (CTs and NCTs) in Program			*RDD 18 (CTs and NCTs) in Program Villages*		
	(1)	(2)	(3)	(4)	(5)	(6)
		Expenditures (IHS)			Expenditures (IHS)	
	Assets Index	Health	Education	Assets Index	Health	Education
CT in CT villages [A]	0.54***	1.46	0.39	0.47**	2.38**	1.05
	[0.19]	[1.05]	[0.88]	[0.24]	[1.12]	[1.05]
NCT in CT villages [B]	0.39**	1.42	0.01	0.41*	2.31**	0.94
	[0.19]	[1.08]	[0.91]	[0.25]	[1.16]	[1.08]
PET[C]	-0.15	-0.98	0.31	-0.25	-2.19	-1.16
	[0.26]	[1.06]	[0.95]	[0.38]	[1.52]	[1.20]
PEV[D]	-0.41**	-1.44	0.40	0.06	-1.99	2.47
	[0.19]	[0.93]	[0.76]	[0.42]	[2.15]	[1.60]
#HH[E]	-0.05	-0.19	0.06	-0.06	-0.92**	-0.31
	[0.04]	[0.23]	[0.22]	[0.10]	[0.45]	[0.39]
Constant	-0.14	5.49***	2.11***	-0.30*	6.13***	1.65*
	[0.15]	[0.95]	[0.76]	[0.18]	[1.00]	[0.87]
Observations	1166	1166	1166	467	467	467
Adjusted R-squared	0.07	0.01	0.02	0.13	0.03	0.04
Meters	400.00	400.00	400.00	400.00	400.00	400.00
Outcome Mean Pure Control	-0.13	5.23	2.53	-0.13	5.23	2.53
CT recepients around (%)	0.45	0.45	0.45	0.40	0.40	0.40
EVs around (%)	0.34	0.34	0.34	0.30	0.30	0.30
HH around(#)	1.19	1.19	1.19	0.78	0.78	0.78
	Panel B					
	(1)	(2)	(3)	(4)	(5)	(6)
		Expenditures (IHS)			Expenditures (IHS)	
	Assets Index	Health	Education	Assets Index	Health	Education
CT in CT villages [A]	0.21*	1.52**	0.73	0.10	2.07**	1.38*
	[0.12]	[0.74]	[0.72]	[0.14]	[0.84]	[0.77]
NCT in CT villages [B]	0.06	1.47**	1.10	-0.02	2.12**	2.05**
	[0.13]	[0.74]	[0.75]	[0.15]	[0.83]	[0.81]
PET[C]	0.01	-0.85	0.73	0.13	-1.99	-0.98
	[0.14]	[0.89]	[0.87]	[0.18]	[1.28]	[1.06]
PEV[D]	0.06	-0.63	0.59	0.24	-1.82	-0.46
	[0.12]	[0.84]	[0.81]	[0.26]	[1.30]	[1.40]
#HH[E]	0.01	-0.17	0.16	0.03	-0.37	0.16
	[0.03]	[0.19]	[0.17]	[0.07]	[0.35]	[0.32]
Constant	0.25**	6.94***	1.87***	0.21*	7.72***	2.25***
	[0.11]	[0.62]	[0.60]	[0.12]	[0.65]	[0.73]
Observations	1166	1166	1166	467	467	467
Adjusted R-squared	0.05	0.01	0.01	0.05	0.03	0.03
Meters	400	400	400	400	400	400
Outcome Mean Pure Control	0.34	6.68	1.95	0.34	6.68	1.95
CT recepients around (%)	0.45	0.45	0.45	0.40	0.40	0.40
EVs around (%)	0.34	0.34	0.34	0.30	0.30	0.30
HH around(#)	1.19	1.19	1.19	0.78	0.78	0.78

(1) Outcome variables are as follows: (1) "Assets Index" is a standardized weighted index, following Anderson (2008) that aggregates across different types of asset investments: animals and livestock, farming assets and household assets owned by the household expressed using the inverse hyperbolic sine (IHS) transformation. (2)"Expenditures on Health" is the IHS transformed amount spent by the household on health expenditures over a six month recall period. (3) "Expenditures on Education" is the IHS transformed amount spent by the household on school fees over a six month recall period. The point estimates presented in this table require an adjustment to be interpreted as a percentage change following Bellemare and Wichman (2020).

2) Asset values were measured differently at baseline to the follow-up surveys so in Table 5 the regression uses OLS estimation and presents results as a cross-section with midline in Panel A and endline in Panel B not controlling by value at baseline. All regressions control for location i.e. local government area (LGA) fixed effects. In columns 1 to 6 standard errors are clustered at the village level; and in columns 7 to 12 Conley standard errors that account for spatial correlation in the data are used (Conley 1999; 2008).

3) CT in CT villages =1 if household was randomly assigned to receive cash transfers in a cash transfer program village; NCT in CT villages = 1 if household was randomly assigned to receive no cash transfers in program villages; and Pure Control = 1 if household did not receive cash transfers in a non-program village.

(4) In Table 5 columns 7 to 12 we include a set of variables to control for local neighborhood effects that includes the size of the local market (#HH), the density of cash transfers (PET) and the relative level of poverty (PEV) in a 400 meter radius. #HH is the total number of households in the local area rescaled by a factor of 100. PET is a vector for the proportion of cash transfer households in the local area equivalent to the total number of cash transfer households over the number of eligible households around household i in a 400m radius. PEV is the proportion of extremely vulnerable households out of the total number of households in the neighborhood.

(5) Sample in Table 5 is a cross-section of all ultra-poor households that were interviewed at both midline and endline.

(6) The regression discontinuity (RD) estimation is presented in Table 5 columns 10 to 12 that exploits the sharp discontinuity at the 18 EV cutoff that determined villagelevel program eligibility to receive cash transfers.We estimate the local average treatment effect (LATE) using only observations close to the cutoff +/- 18 EVs.

Table F11: Assets

PANEL A: Midline												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Animal Assets	Farming Assets	Household Assets	Animal Assets	Farming Assets	Household Assets	Animal Assets	Farming Assets	Household Assets	Animal Assets	Farming Assets	Household Assets
		(IHS)			(Winsorized)			(IHS)			(Winsorized)	
SAMPLE	*Full Sample (CTs and NCTs) in Program Villages*						*RDD 18 (CTs and NCTs) in Program Villages*					
CT in CT villages [A]	1.54*	1.96**	1.68**	6598.78	2951.60***	5711.06**	1.99*	1.45	1.03	6607.99	3142.42***	5959.50*
	[0.93]	[0.84]	[0.71]	[6341.90]	[741.94]	[2544.29]	[1.04]	[1.03]	[0.85]	[7825.46]	[936.30]	[3046.53]
NCT in CT villages [B]	0.06	2.04**	1.52**	2716.80	2600.15***	4431.90*	1.04	1.79*	1.08	2373.18	2867.96***	4680.91
	[0.98]	[0.86]	[0.74]	[6851.18]	[778.03]	[2625.83]	[1.17]	[1.05]	[0.86]	[8956.01]	[985.18]	[3192.53]
PET[C]	0.85	-1.20	-1.02	-5136.10	-2075.11*	-4102.21	-0.56	-0.89	-0.93	-10452.83	-2691.28*	-5148.26
	[1.31]	[0.99]	[0.83]	[8521.36]	[1189.25]	[3018.65]	[1.75]	[1.47]	[1.15]	[10863.61]	[1429.63]	[4132.41]
PEV[D]	-1.04	-1.09	-1.80***	-1429.21	-908.43	-6742.70**	-1.59	2.01	0.04	2081.23	1270.79	52.07
	[1.16]	[0.73]	[0.62]	[7202.03]	[932.21]	[2632.90]	[2.42]	[1.31]	[1.27]	[17016.88]	[1347.42]	[5677.98]
#HH[E]	0.02	-0.29*	-0.17	109.84	-28.56	6.05	-0.63	0.09	-0.08	-7096.26*	5.54	-3442.92***
	[0.24]	[0.16]	[0.15]	[1709.38]	[244.56]	[985.87]	[0.54]	[0.35]	[0.27]	[4252.45]	[459.88]	[1239.40]
Constant	5.01***	5.27***	7.10***	15466.87***	809.45	5390.48**	5.40***	4.05***	6.39***	18911.74***	264.40	5381.05**
	[0.76]	[0.73]	[0.60]	[5128.56]	[520.60]	[2191.59]	[0.95]	[0.86]	[0.64]	[6995.16]	[615.57]	[2443.54]
Observations	1166	1166	1166	1166	1166	1166	467	467	467	467	467	467
Adjusted R-squared	0.06	0.01	0.09	0.02	0.04	0.13	0.07	0.04	0.18	0.05	0.07	0.13
Meters	400	400	400	400	400	400	400.00	400.00	400.00	400.00	400.00	400.00
Outcome Mean Pure Control	5.36	4.93	7.15	18214.88	1135.71	7277.98	5.36	4.93	7.15	18214.88	1135.71	7277.98
CT recipients around (%)	0.45	0.45	0.45	0.45	0.45	0.45	0.40	0.40	0.40	0.40	0.40	0.40
EVs around (%)	0.34	0.34	0.34	0.34	0.34	0.34	0.30	0.30	0.30	0.30	0.30	0.30
Households around(#)	1.19	1.19	1.19	1.19	1.19	1.19	0.78	0.78	0.78	0.78	0.78	0.78
PANEL B: Endline												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Animal Assets	Farming Assets	Household Assets	Animal Assets	Farming Assets	Household Assets	Animal Assets	Farming Assets	Household Assets	Animal Assets	Farming Assets	Household Assets
		(IHS)			(Winsorized)			(IHS)			(Winsorized)	
	Full Sample (CTs and NCTs) in Program Villages						*RDD 18 (CTs and NCTs) in Program Villages*					
CT in CT villages [A]	1.64	0.57	0.27	6416.16	1195.52	906.82	0.61	0.17	0.36	-3091.80	1026.07	248.40
	[1.02]	[0.40]	[0.38]	[13025.46]	[889.79]	[3116.76]	[1.15]	[0.52]	[0.39]	[15590.79]	[1152.50]	[3413.06]
NCT in CT villages [B]	0.05	0.52	0.20	-5531.90	1211.76	-229.77	-1.01	0.35	0.38	-10142.24	1665.70	376.39
	[1.08]	[0.42]	[0.39]	[13442.88]	[937.19]	[3331.63]	[1.30]	[0.52]	[0.39]	[16508.19]	[1218.14]	[3662.56]
PET[C]	-0.65	0.22	0.51	-16156.28	-1029.66	2930.51	0.42	0.91	0.26	-6638.12	-1183.59	-1322.44
	[1.25]	[0.49]	[0.37]	[16532.56]	[1224.39]	[3805.65]	[1.57]	[0.73]	[0.37]	[21576.55]	[1768.91]	[4009.98]
PEV[D]	0.63	-0.36	0.43	9759.50	514.31	1386.31	2.08	0.26	0.41	23481.92	2407.00	7189.83
	[1.12]	[0.46]	[0.31]	[13681.06]	[1152.77]	[3375.79]	[1.95]	[1.03]	[0.64]	[34790.41]	[3002.13]	[6746.27]
#HH[E]	0.21	-0.29**	0.17*	428.90	17.37	1833.13*	0.47	-0.22	0.04	4431.47	516.74	1496.68
	[0.24]	[0.12]	[0.09]	[3068.33]	[242.03]	[939.28]	[0.49]	[0.29]	[0.25]	[7342.46]	[479.12]	[1652.55]
Constant	5.97***	7.96***	8.18***	39216.50***	3094.48***	7468.62***	5.42***	7.98***	8.29***	37391.95***	2956.93***	6628.61**
Observations	1166	1166	1166	1166	1166	1166	467	467	467	467	467	467
Adjusted R-squared	0.05	0.01	0.09	0.02	0.01	0.07	0.06	0.05	0.07	0.01	0.03	0.08
Meters	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00
Outcome Mean Pure Control	6.73	7.70	8.67	45391.67	3414.17	11341.07	6.73	7.70	8.67	45391.67	3414.17	11341.07
CT recipients around (%)	0.45	0.45	0.45	0.45	0.45	0.45	0.40	0.40	0.40	0.40	0.40	0.40
EVs around (%)	0.34	0.34	0.34	0.34	0.34	0.34	0.30	0.30	0.30	0.30	0.30	0.30
Households around(#)	1.19	1.19	1.19	1.19	1.19	1.19	0.78	0.78	0.78	0.78	0.78	0.78

Notes: *p < 0.05, **p < 0.01, ***p < 0.001

(1) Sample in Table F11 includes all ultra-poor households that were interviewed in one of the follow ups.

(2) Table F11 includes anwers from primary female respondent in household.

(3) Assets outcomes are present as inverse hyperbolic transformed (IHS) and to the 95th-percentile winsorized levels.

(4) Asset values were measured differently at baseline to the follow-up surveys so in this table the regression uses OLS estimation and presents results as a cross-section with midline in Panel A and endline in Panel B not controlling by value at baseline. All regressions control for location i.e. local government area (LGA) fixed effects. Conley standard errors that account for spatial correlation in the data are used (Conley 1999; 2008).

(5) The regression discontinuity (RD) estimation is presented in this table in columns 7 to 12 that exploits the sharp discontinuity at the 18 EV cutoff that determined village-level program eligibility to receive cash transfers.We estimate the local average treatment effect (LATE) using only observations close to the cutoff +/- 18 EVs.

Table F12: Time Use

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Time spent on activity on a typical day…											
	Care (children, ill household members)	Domestic tasks	Non-farm business activities	Paid work or activities outside of household	Tasks on family farm, home garden, cattle herding	Leisure	Care (children, ill household members)	Domestic tasks	Non-farm business activities	Paid work or activities outside of household	Tasks on family farm, home garden, cattle herding	Leisure
	Full Sample (CTs and NCTs) in Program Villages						*RDD 18 (CTs and NCTs) in Program Villages*					
CT in CT villages [A]	-0.61	0.12	0.87***	0.15	-0.73**	0.45	-1.12**	0.13	0.70*	0.10	-0.85**	1.32*
	[0.38]	[0.28]	[0.33]	[0.18]	[0.37]	[0.63]	[0.44]	[0.31]	[0.40]	[0.23]	[0.42]	[0.68]
NCT in CT villages [B]	-0.51	0.05	0.60*	0.09	-0.60	0.65	-0.95**	0.03	0.52	0.21	-0.74*	1.15*
	[0.39]	[0.29]	[0.34]	[0.19]	[0.38]	[0.65]	[0.45]	[0.31]	[0.37]	[0.22]	[0.44]	[0.64]
PET[C]	0.10	0.27	0.40	0.19	0.12	-1.49*	0.45	0.46	0.31	0.26	0.32	-1.77*
	[0.49]	[0.37]	[0.52]	[0.28]	[0.41]	[0.81]	[0.60]	[0.44]	[0.60]	[0.35]	[0.52]	[1.06]
PEV[D]	0.36	-0.65**	-0.60*	-0.12	0.63**	0.42	2.26***	0.55	-0.48	-0.58	0.29	-0.75
	[0.40]	[0.29]	[0.32]	[0.23]	[0.31]	[0.55]	[0.81]	[0.49]	[0.67]	[0.45]	[0.61]	[1.00]
#HH[E]	-0.07	-0.17**	-0.01	-0.00	0.10	0.10	0.11	-0.05	-0.21	-0.17	0.17	0.30
	[0.11]	[0.07]	[0.09]	[0.07]	[0.11]	[0.19]	[0.23]	[0.20]	[0.18]	[0.11]	[0.14]	[0.43]
Constant	4.07***	3.55***	1.11***	0.64***	1.97***	11.44***	3.77***	3.22***	1.18***	0.86***	2.14***	10.96***
	[0.30]	[0.23]	[0.22]	[0.14]	[0.31]	[0.49]	[0.41]	[0.28]	[0.29]	[0.20]	[0.34]	[0.50]
Observations	1136	1136	1136	1136	1136	1136	454	454	454	454	454	454
Adjusted R-squared	0.01	0.01	0.03	0	0.12	0.02	0.04	0.04	0.06	0.02	0.14	0.03
Meters	400	400	400	400	400	400	400	400	400	400	400	400
Outcome Mean Pure Control	4.12	3.23	1.11	0.61	1.87	11.74	4.12	3.23	1.11	0.61	1.87	11.74
CT recipients around (%)	0.45	0.45	0.45	0.45	0.45	0.45	0.40	0.40	0.40	0.40	0.40	0.40
EVs around (%)	0.34	0.34	0.34	0.34	0.34	0.34	0.30	0.30	0.30	0.30	0.30	0.30
Households around(#)	1.19	1.19	1.19	1.19	1.19	1.19	0.78	0.78	0.78	0.78	0.78	0.78

Notes: *p < 0.05, **p < 0.01, ***p < 0.001

(1) Sample in Table F7 includes all ultra-poor households that were interviewed in baseline and midline.

(2) Table F7 includes anwers from primary female respondent in household.

(3) Regression utilizes ANCOVA estimation to control for the baseline level of the outcome.Conley standard errors that account for spatial correlation in the data are used (Conley 1999; 2008).

(4) The regression discontinuity (RD) estimation is presented in this table in columns 7 to 12 that exploits the sharp discontinuity at the 18 EV cutoff that determined village-level program eligibility to receive cash transfers.We estimate the local average treatment effect (LATE) using only observations close to the cutoff +/- 18 EVs.

Table F13: Gender Attitudes and Norms Reported by Female Respondents

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Personal Attitudes		*Perceived Community Norms*			*Personal Attitudes*		*Perceived Community Norms*		
	Gender Equitable Attitudes (Index)	Women should not go out to work (Yes = 1)	% Who speak badly of a woman who works in the fields	% Who believe a man is a bad provider if his wife working for pay	% Who speak badly of a woman who travels out village	Gender Equitable Attitudes (Index)	Women should not go out to work (Yes = 1)	% Who speak badly of a woman who works in the fields	% Who believe a man is a bad provider if his wife working for pay	% Who speak badly of a woman who travels out village
	Full Sample (CTs and NCTs) in Program Villages					*RDD 18 (CTs and NCTs) in Program Villages*				
CT in CT villages [A]	-0.03	-0.02	5.75	1.38	2.54	-0.36	-0.02	5.49	-2.56	-0.13
	[0.22]	[0.09]	[4.48]	[5.69]	[5.81]	[0.23]	[0.09]	[5.14]	[5.97]	[5.93]
NCT in CT villages [B]	-0.08	-0.03	7.93*	2.20	3.37	-0.36	-0.05	6.75	-1.32	1.37
	[0.22]	[0.09]	[4.58]	[5.85]	[6.10]	[0.24]	[0.09]	[5.27]	[6.33]	[6.43]
PET[C]	0.03	-0.01	4.29	4.73	3.41	0.66**	-0.13	2.91	10.19*	9.81
	[0.23]	[0.11]	[5.83]	[5.28]	[5.83]	[0.29]	[0.13]	[6.81]	[5.90]	[7.65]
PEV[D]	-0.06	0.12*	-1.60	-2.59	-4.75	0.11	0.28**	16.64*	10.80	7.19
	[0.19]	[0.07]	[6.20]	[6.65]	[7.12]	[0.39]	[0.14]	[8.80]	[10.05]	[11.58]
#HH[E]	-0.02	0.04	-0.73	0.07	1.16	0.08	0.04	-1.12	-2.50	-2.62
	[0.05]	[0.02]	[1.39]	[1.47]	[1.35]	[0.09]	[0.04]	[2.47]	[2.84]	[3.15]
Constant	0.06	0.22***	33.57***	38.31***	37.02***	-0.05	0.18**	28.18***	34.96***	33.84***
	[0.20]	[0.07]	[3.68]	[5.26]	[5.31]	[0.23]	[0.07]	[4.62]	[5.89]	[5.78]
Observations	1166	1166	1166	1166	1166	467	467	467	467	467
Adjusted R-squared	0.00	0.04	0.02	0.01	0.02	0.02	0.07	0.06	0.05	0.04
Meters	400	400	400	400	400	400	400	400	400	400
Outcome Mean Pure Control	0.05	0.32	34.88	39.76	38.21	0.05	0.32	34.88	39.76	38.21
CT recipients around (%)	0.45	0.45	0.45	0.45	0.45	0.40	0.40	0.40	0.40	0.40
EVs around (%)	0.34	0.34	0.34	0.34	0.34	0.30	0.30	0.30	0.30	0.30
Households around(#)	1.19	1.19	1.19	1.19	1.19	0.78	0.78	0.78	0.78	0.78

Notes: *p < 0.05, **p < 0.01, ***p < 0.001;

(1) Outcomes are as follows: (1) "Gender Equitable Attitudes index" is standardized weighted index as described in Anderson (2008) constructed from 8 different categorical attitude questions that individually rank from 1 to 5, with 5 being the most gender progressive. (2) "Women should not go out to work" is a dummy variable equal to 1 if the respondent personally believes women should not go out of the home to work. (3) Perceived Norms measure perceptions of what the respondent thinks their community thinks around women's work and mobility. Respondents had to indicate out of ten neighbors in their community: what share would speak badly of a woman who works in the fields; what share believe that a man is a bad provider if his wife is working for pay; and what share would speak badly of a woman who travels outside the village alone (recoded as a percentage 0-100%).

(2) Regression uses OLS estimation. All regressions control for local government area (LGA) fixed effects. In columns 1 to 10 standard errors are clustered at the village level; and in columns 11 to 15 Conley standard errors that account for spatial correlation in the data are used (Conley 1999; 2008).

(3) CT in CT villages =1 if household was randomly assigned to receive cash transfers in a cash transfer program village; NCT in CT villages = 1 if household was randomly assigned to receive no cash transfers in program villages (non-beneficiaries in treatment villages); and Pure Control = 1 if household did not receive cash transfers in a non-program village where no cash transfers were ever paid.

(4) In Table 8 columns 11 to 15 we include a set of variables to control for local neighborhood effects that includes the size of the local market (#HH), the density of cash transfers (PET) and the relative level of poverty (PEV) in a 400 meter radius. #HH is the total number of households in the local area rescaled by a factor of 100. PET is a vector for the proportion of cash transfer households in the local area equivalent to the total number of cash transfer households over the number of eligible households around household i in a 400m radius. PEV is the proportion of extremely vulnerable households out of the total number of households in the local neighborhood.

(5) Attitudes and norms outcomes are measured at endline only. Table 8 shows impacts at endline and the sample is a cross-section that includes all ultra-poor households surveyed at both midline and endline. This sample includes responses from the primary female respondent.

Table F14: Gender Attitudes and Norms Reported by Husbands

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Personal Attitudes		*Perceived Community Norms*			*Personal Attitudes*		*Perceived Community Norms*		
	Gender Equitable Attitudes (Index)	Women should not go out to work (Yes = 1)	% Who speak badly of a woman who works in the fields	% Who believe a man is a bad provider if his wife working for pay	% Who speak badly of a woman who travels out village	Gender Equitable Attitudes (Index)	Women should not go out to work (Yes = 1)	% Who speak badly of a woman who works in the fields	% Who believe a man is a bad provider if his wife working for pay	% Who speak badly of a woman who travels out village
	Full Sample (CTs and NCTs) in Program Villages					*RDD 18 (CTs and NCTs) in Program Villages*				
CT in CT villages [A]	0.32*	-0.06	6.82	8.07	5.35	0.11	0.02	10.31	18.25**	11.75*
	[0.19]	[0.11]	[7.11]	[7.14]	[5.93]	[0.20]	[0.12]	[7.87]	[7.84]	[6.66]
NCT in CT villages [B]	0.27	-0.04	5.26	5.70	3.09	0.15	-0.02	11.87	16.81**	12.26*
	[0.21]	[0.11]	[7.30]	[7.23]	[5.98]	[0.25]	[0.12]	[8.29]	[7.77]	[6.74]
PET[C]	-0.35	-0.14	6.75	0.45	1.54	-0.12	-0.28*	7.23	-5.57	-4.63
	[0.27]	[0.13]	[6.51]	[6.79]	[6.37]	[0.32]	[0.15]	[9.50]	[9.42]	[8.61]
PEV[D]	-0.00	0.12	-3.58	-0.33	0.53	0.27	0.25	2.40	-14.73	-14.77
	[0.25]	[0.11]	[4.67]	[5.00]	[4.64]	[0.25]	[0.16]	[11.56]	[9.67]	[9.04]
#HH[E]	-0.02	0.03	-0.31	-0.40	0.75	0.09	0.10**	-2.09	-5.98**	-3.26
	[0.05]	[0.03]	[1.25]	[1.48]	[1.16]	[0.07]	[0.04]	[3.00]	[3.03]	[2.87]
Constant	-0.13	0.28***	25.30***	28.55***	29.47***	-0.25*	0.26**	22.46***	34.08***	35.24***
	[0.14]	[0.09]	[6.06]	[6.13]	[4.88]	[0.14]	[0.11]	[6.17]	[6.30]	[5.47]
Observations	764	764	764	764	764	322	322	322	322	322
Adjusted R-squared	0.01	0.08	0.10	0.08	0.07	0.01	0.06	0.11	0.07	0.05
Meters	400	400	400	400	400	400	400	400	400	400
Outcome Mean Pure Control	-0.15	0.39	28.70	32.17	33.48	-0.15	0.39	28.70	32.17	33.48
CT recipients around (%)	0.45	0.45	0.45	0.45	0.45	0.41	0.41	0.41	0.41	0.41
EVs around (%)	0.35	0.35	0.35	0.35	0.35	0.31	0.31	0.31	0.31	0.31
Households around(#)	1.12	1.12	1.12	1.12	1.12	0.76	0.76	0.76	0.76	0.76

Notes: *p < 0.05, **p < 0.01, ***p < 0.001;

(1) Outcomes are as follows: (1) "Gender Equitable Attitudes index" is standardized weighted index as described in Anderson (2008) constructed from 8 different categorical attitude questions that individually rank from 1 to 5, with 5 being the most gender progressive. (2) "Women should not go out to work" is a dummy variable equal to 1 if the respondent personally believes women should not go out of the home to work. (3) Perceived Norms measure perceptions of what the respondent thinks their community thinks around women's work and mobility. Respondents had to indicate out of ten neighbors in their community: what share would speak badly of a woman who works in the fields; what share believe that a man is a bad provider if his wife is working for pay; and what share would speak badly of a woman who travels outside the village alone (recoded as a percentage 0-100%).

(2) Regression uses OLS estimation. All regressions control for local government area (LGA) fixed effects. In columns 1 to 10 standard errors are clustered at the village level; and in columns 11 to 15 Conley standard errors that account for spatial correlation in the data are used (Conley 1999; 2008).

(3) CT in CT villages =1 if household was randomly assigned to receive cash transfers in a cash transfer program village; NCT in CT villages = 1 if household was randomly assigned to receive no cash transfers in program villages (non-beneficiaries in treatment villages); and Pure Control = 1 if household did not receive cash transfers in a non-program village where no cash transfers were ever paid.

(4) In Table 8 columns 11 to 15 we include a set of variables to control for local neighborhood effects that includes the size of the local market (#HH), the density of cash transfers (PET) and the relative level of poverty (PEV) in a 400 meter radius. #HH is the total number of households in the local area rescaled by a factor of 100. PET is a vector for the proportion of cash transfer households in the local area equivalent to the total number of cash transfer households over the number of eligible households around household i in a 400m radius. PEV is the proportion of extremely vulnerable households out of the total number of households in the local neighborhood.

(5) Attitudes and norms outcomes are measured at endline only. Table 8 shows impacts at endline and the sample is a cross-section that includes all ultra-poor households surveyed at both midline and endline. This sample includes responses from the primary male respondent.

F.8 Time Use

In Table F12 we show the treatment and spillover effects on time use patterns across various activities in a typical day. The time use module in the endline survey asked the respondent to distribute 24 pebbles corresponding to 24 hours in a day across various activities.[54] We find that women assigned to receive a cash transfer and non-beneficiary women in their village confirm an increase in the number of hours spent on non-farm activities. Both types of households appear to compensate this time by switching hours out of domestic care work and family farming into non-farm enterprise activity. For the RDD specification we also find a significant increase in the time spent on leisure activities at endline.

F.9 Gender Attitudes and Norms

In the main results we have shown that one year after the cash transfer program ends, there were large gains in female non-farm enterprise activity and other downstream outcomes related to household and individual welfare. In the following we examine whether there is any evidence of an impact of the gender attitudes or perceived norms around female work out of the home among the study sample.

In Table F13 we examine the responses given by the female respondents and in Table F14 the response of their husbands. In Table F13 column 1 the dependent variable is an index of gender equitable attitudes where a higher value is more equitable. In column 2 we elicit beliefs regarding the appropriateness of women's work outside of the home for pay (coded as 0/1, where 1 is the respondent believes women *cannot* work outside the home; and 0 if respondent believes women can work outside the home). In Table F13 columns 3–5 we examine perceived community norms around women's work, i.e., men's and women's beliefs regarding the strength of community attitudes for or against female labor.[55]

Table F13 finds no evidence of an impact of the cash treatment on the gender attitudes of the female respondent. In Table F14, however, we find cash treatment husbands have more gender equitable attitudes than pure control households. In terms of female labor, we find no evidence of a change in beliefs that women have a right to work out of the home. In column 2, the mean among pure control households suggests that on average 32% of women

[54] At baseline we also collected time use data using a modified version of the A-WEAI. However, the time wheel and pebble method at endline was easier for the respondents to be able to understand and recall.

[55] Beliefs and norms constructs were measured at endline and follow Bicchieri (2016). Respondents indicate out of ten neighbors in their community, how many would speak badly of a woman who works in the fields; how many believe that a man is a bad provider if his wife is working for pay; and how many would speak badly of a woman who travels outside the village alone. These norm constructs give us a measure of the injunctive norm on the acceptability of women's work out of the home and mobility (coded as a percentage 0%–100%).

and 39% of men still personally believe that women should *not* go out of the home to work at endline.

Despite the treatment impacts on non-farm enterprise activity among women, we find no evidence of an impact on the personal attitudes towards women working outside of the home in the region. We may reconcile this finding with the female labor supply response of the program by considering the fact that the majority (70%) of women in our study sample choose to locate their business in or near their homestead. Women may be acting strategically by breaking norms around work itself but do not seem to challenge norms around working outside of the home or likely restrictions on their mobility. In addition, childcare and other domestic responsibilities may limit a woman's ability to seek work far from home.

In terms of perceived community norms on women's work and mobility in columns 3–5, we find, on average, women believe 34.9% of their neighbors would speak badly of a woman who works in the fields, 39.8% would judge a man is a bad provider if his wife is working for pay, and 39.4% would judge a woman if she travels out of the village alone. While men and women differ in their personal beliefs around the acceptability of female labor out of the home (approximately a 10% gender gap), men and women have similar perceptions of community norms around women working. In the RDD sample among households in program villages, husbands perceive a larger proportion of their community would judge both women and men badly for women working, relative to pure control households. More precisely, the receipt of a cash transfer leads to an increase in the perception of approximately 10 additional persons judging cash transfer women badly for working in the fields out of 100 in the community. This suggests a more conservative shift in the gender norms toward women working out of the home, at least among husbands in program villages.