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From protection to production: The productive impacts of cash transfers and health insurance in Ghana

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Martin P. Jr. Tabe-Ojong and Emmanuel Nshakira-Rukundo*

From Protection to Production: The Productive Impacts of Cash Transfers and Health Insurance in Ghana

Abstract

We study the productive and psychological effects of LEAP 1000, a program integrating cash transfer and health insurance in Ghana. We assess impacts on livestock ownership and commercialisation, household investments (including savings) and time preferences as a measure of behavioural changes. Using a two-wave panel and applying difference-in-differences estimations, we find that the program significantly increased livestock ownership, especially small ruminant animals, and commercialisation. There are positive effects on households' investments in durable goods, starting businesses and reduction of food expenditure as a share of household budgets. Further examination of potential mechanisms reveals improvements in patience, increased future orientation, sense of happiness and social support. Additional triple difference regressions confirm that these behavioural changes contribute to program effectiveness.

JEL-Codes: I13, I15, I18, J01

Keywords: Cash transfers; health insurance; household investments; future orientations; Ghana

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1 Introduction

A growing empirical literature supports the premise that social assistance programs, especially cash transfers have lifted many households out of poverty and boosted shared prosperity (Alderman & Yemtsov, 2013; Banerjee et al., 2015; Daidone, Davis, Handa, & Winters, 2019; Fisher et al., 2017; Handa et al., 2018; Skoufias & Di Maro, 2008). Despite these advancements, it is also increasingly accepted that single social assistance interventions are not the panacea and that concerted integrated will be required to lift more people from poverty. As such, there is an increase in integrated social assistance programs that target multiple vulnerabilities. For instance, In Ethiopia, the Productive Safety Net Program (PSNP) and community-based health insurance are increasingly combined (Shigute et al., 2017; Shigute, Strupat, Burchi, Alemu, & Bedi, 2020) and in Rwanda, extremely poor households benefit from both health insurance premium waivers and are targeted for cash transfers and other interventions under the country's flagship Vision2020 Umerenge Program (VUP). Nonetheless, there is still a dearth of evidence on the progressive, additive impacts of these integrated programs on welfare and graduation from poverty. This paper is about one such program, the Ghana Livelihood Empowerment against Poverty (LEAP) 1000 program.

In this study, we investigate the productive impacts of this joint unconditional cash transfer and health insurance program on productive livelihoods. The LEAP1000 is an extension of the flagship Livelihood Empowerment Against Poverty (LEAP) cash transfer program which targets pregnant women and families with children between 0-1 years in Ghana. This extension, on top of providing households (with children under 2 years or pregnant women) with cash transfers also provided health insurance support through paying for their enrolment in the Ghana National Health Insurance Scheme. Specifically, the paper examines the association between LEAP 1000 and (1) livestock rearing; (2) livestock commercialization, and (3) non-farm employment. The paper also investigates the potential heterogeneity in different livestock types. In making investment decisions, we hypothesize that psychological factors such as future orientation as well as socio-emotional skills such as patience mediate the interplay and decision making between program participation and household investment decision in livestock. To test this hypothesis, we undertake non-parametric estimation without imposing a prior functional form to understand the role of future-orientation in livestock production. We thus explore how the different livestock types respond to future orientation.

Our analysis offers several contributions to different strands in the empirical literature on cash transfers and welfare improvements in developing countries. First, the study highlights the association of cash transfers and livestock investments as dimension of non-farm employment. Livestock investments are a common store of value, assets and capital in rural economies and therefore contribute more to building household resilience in times of income shocks and reduce poverty. We therefore establish the link from the protective to the productive importance of cash transfers and sustainable and potentially transformative investments (Devereux & Sabates-wheeler, 2004; Schuering & Loewe, 2023).

Second, we look at one of the very contested but often wrong perceptions about cash transfers – that they promote dependency and reduce productive work (Handa et al., 2018; Kalebe-Nyamongo & Marquette, 2014). This perception on welfare dependency and associated disincentive to work has mostly been promulgated by some press and media teams and this seem to be gaining public grounds (Lindert & Vincensini, 2010). Previous analysis on this relationship has previously looked at agricultural assets as part of household investments (Boone, Covarrubias, Davis, & Winters, 2013; Covarrubias, Davis, & Winters, 2012). In the regard of cash transfers and investments in livestock, our study is closely related to three studies; Asfaw, Davis, Dewbre, Handa, and Winters (2014) and Daidone et al. (2019) and Shigute et al. (2020). Using longitudinal data from Kenya, and applying a differences-in-differences coupled with matching estimator, Asfaw et al. (2014) found that positive and significant effects of the transfer on the probability of livestock ownership and the total quantity of livestock units among small households (≤5 individuals) and female headed households regarding livestock holding and formation of non-farm enterprises. Similarly, Daidone et al. (2019) found positive effects on the probability of owning livestock in Malawi, Zambia and Zimbabwe and small ruminant livestock in Ethiopia and Ghana. Our study is different from these two in two dimensions. First, in Asfaw et al. (2014), targeting was not systematic and therefore baseline differences between households receiving and those not receiving the cash transfer were large and systematic in their sample. Though they use matching to account for these differences, their causal estimates cannot account for other unobserved heterogeneity. Secondly, our study is different in the way that it looks at a combination of interventions (health insurance and cash transfers) while other studies so far have looked at only cash transfers. A closely related study is Shigute et al. (2020) who study the joint effects of cash transfers and health insurance in Ethiopia. They found that neither CBHI nor health insurance alone

increased the value of livestock but taken together, the value of livestock holding increased by 4 percent. However, in their study, though they have panel data, they are unable to control endogeneity emanating from self-selection into both health insurance and participation in the cash transfer program.

One additional value that our study contributes is the specific focus pregnant mothers and households with children under 2 years. This is very important since productive livelihoods may be gendered and negatively biased towards women and women-headed households. In this regard, understanding ways of boosting rural employment has deep implications for women who usually spend a lot of their time in less economically appreciated household activities. Our analysis provides impacts of an anti-poverty program from a gendered point of view ([Peterman, Valli, & Palermo, 2022](#)).

Adding on the above contributions, our study explores the relationship between cash transfers and psychological well-being, which is relatively understudied. Specifically, we look at the effect of the program on future-oriented behaviors elicited through a time preferences survey experiment. Beyond economic and productive impacts, cash transfers could also have large impacts on psychological well-being ([Correa, Daidone, Davis, & Sitko, 2023](#); [Handa, Martorano, Halpern, Pettifor, & Thirumurthy, 2016](#); [Handa, Seidenfeld, & Tembo, 2020](#); [Haushofer & Fehr, 2014](#); [Ibrahim et al., 2023](#); [Mani, Mullainathan, Shafir, & Zhao, 2013](#); [Molotsky & Handa, 2021](#)). These aspects have only been explicitly considered by a few studies ([Al Izzati, Suryadarma, & Suryahadi, 2023](#); [Handa et al., 2016, 2020](#); [Ibrahim et al., 2023](#); [Molotsky & Handa, 2021](#)). We examine the impacts of cash transfers on behavioral outcomes especially about the ability of households to delay present-level gratification for investments with future-oriented benefits. In addition, we also examine whether future orientation could explain the relationship between program participation and investments leading to asset accumulation. Our insights here contribute to the growing literature on the psychology of poverty that looks at behavioral drivers of poverty ([Haushofer & Fehr, 2014](#); [Ibrahim et al., 2023](#); [Molotsky & Handa, 2021](#)). Here, we test whether future orientation also follows an inverse U-shaped (non-monotonic) relationship like other behavioral constructs such as aspirations. Estimating this is informative about whether there is a threshold point beyond which future orientation leads to dis-investments in livestock as has been shown in the growing aspirations-investments literature ([Correa et al., 2023](#); [Tabe-Ojong, Heckeleei, & Rasch, 2023](#)).

Insights from this study are very informative and relevant for developing countries given the high poverty and inequality incidence. This is usually compounded with low employment rates for many individuals, especially women and youth. All these lead to high poverty both in terms of income, assets, wealth, and psychology which also reflects capability. Of course, income poverty is correlated with asset poverty as most of the income-poor lack material resources such as land and other productive resources. Given this, it may thus be relevant for policies and measures seeking to reduce poverty and improve livelihoods to focus on improving rural productivity and productive (self) employment through giving them a big push and transiting households from unpaid to paid productive activities. This would involve some form of targeting re-purposing such that cash transfers are designed from not only protective mechanisms to instead emphasize their promotive and transformative capacities. One example of this is the increasingly adopted poverty graduation programs ([Balboni, Bandiera, Burgess, Ghatak, & Heil, 2022](#)). Low wages and the mostly informal jobs in most rural areas, especially in developing countries may prevent households from undertaking savings, consequently making it difficult to purchase some productive assets such as livestock and establish small and medium size enterprises (petty business).

The rest of the paper is structured as follows. Section two presents a brief overview of the literature covering cash transfers and productive activities and thus lays the conceptual framework of the study. Section three is an overview of the LEAP 1000 cash transfer program and its evaluation design. Section four delves directly into the methods and highlights the data, measurement of various variables used in the analysis and the empirical strategy. It also contains some additional analysis and some different robustness checks. The results are then presented and discussed in section five with some triangulation carried out based on the empirical literature. The thesis concludes with a summary, policy implications and recommendations, limitations of the study and potential gaps for future analysis in section six.

2 Methodology

2.1 Ghana's LEAP 1000 Programme

The Livelihood Empowerment Against Poverty (LEAP) program which started in 2008. LEAP is Ghana's flagship poverty alleviation program and is implemented under the guidance of the Ministry of Gender, Children, and Social Protection (MoGCSP) ([Tabe-Ojong, Boakye, & Muliro, 2020](#)). The program provides cash assistance to poor and vulnerable households on a bimonthly basis.

In 2015, the Government of Ghana piloted an extension of LEAP aiming to assess the effectiveness and impact of targeting cash transfers in the first 1000 days of a child's life, hence having potential implications for in-utero and early childhood health. The pilot was called LEAP 1000. Together with the Institute of Statistical, Social and Economic Research (ISSER) of the University of Ghana and Navrongo Health Research Center (NHRC), the UNICEF Office of Research–Innocenti designed an impact evaluation to assess the multi-dimensional effects of this pilot program. Having started in 10 districts in Northern Ghana, by the end of the pilot program in December 2017, the program had scaled to all 216 districts in the country and covered approximately 8% of all LEAP beneficiaries in the country – about 213,000 households ([Peterman et al., 2022](#)).

The selection of the pilot districts was based on both income and food poverty which is highly prevalent here. In the selected districts, targeting of beneficiaries followed a demand approach whereby eligible women were encouraged to apply for the program. Selected women had to show an antenatal card if pregnant and birth certificates for those with children less than one-year-old ([Transfer Project, 2020](#)). Women who applied were then subjected to go through the LEAP proxy means test (PMT) to minimize targeting errors. Eligible women based on the PMT scores were subsequently enrolled in the program and started receiving transfers. In total, about 6124 households with eligible women had been enrolled by 2015 ([Transfer Project, 2020](#)).

The payments to households were different based on the number of eligible women as shown in Table 1. One unique attribute of the LEAP 1000 pilot program is its 'cash plus' nature where it opens access to free health insurance coverage to beneficiaries, giving all beneficiaries access to in-patient, out-patient, dental health and maternal health services ([LEAP 1000 Evaluation Team, 2018](#)). Health insurance access was operationalised through the Ghana

Table 1: Amount of cash transfer per household

Household size	Transfer amount in Ghana ¢
One eligible member	64
Two eligible members	76
Three eligible members	88
Four eligible members	106

Source: [Transfer Project \(2020\)](#)

National Health Insurance Scheme (NHIS). The pilot therefore set off one of the few 'cash plus' interventions, thus creating opportunity for assessing potential complementarities and interdependencies between various social protection instruments.

2.2 Baseline and Endline Household Surveys

The data used in the study are from the UNICEF Office of Research, Innocenti impact evaluation and was collected by Institute of Statistical, Social and Economic Research (ISSER) of the University of Ghana together with UNICEF under the auspices of the Transfer Project ([LEAP 1000 Evaluation Team, 2018](#)). Prior to the intervention, ethics approvals were acquired from the Institutional Review Boards at the University of North Carolina Chapel Hill, the Navrongo Health Research Centre Institutional Review Board (NHRCIRB) and the University of Ghana. The study was registered under the Registry for International Development Impact Evaluations (RIDIE study ID no. 55942496d53af).

The data have previously been used to study the effect of the intervention on intimate partner violence ([PETERMAN et al., 2022](#)), enrolment in health insurance ([Otieno et al., 2022](#); [Palermo et al., 2019](#)), child nutrition ([de Groot, Yablonski, & Valli, 2022](#)), birth weight ([Quinones, Lin, et al., 2023](#); [Quinones, Mendola, et al., 2023](#)), community social support ([de Milliano, Barrington, Angeles, & Gbedemah, 2021](#)) and on stress using the enhanced life distress index ([Maara et al., 2023](#)). A summary of these evaluation studies emanating from the LEAP 1000 program is presented in Supplementary Table A2. None of these studies assess the implications of the intervention on household investment choices and engagement in economic activities. In addition, almost all of them assess only intention to treat effects. We therefore extend on these studies by assessing the effect of the intervention on household investments. By conditioning on eligible woman's health insurance status, we implement treatment on the treated estimations.

The LEAP 1000 program was designed as a quasi-experimental intervention with effects studied from a two-wave panel dataset collected in 2015 and 2017 to assess the causal effects. The quasi-experimental design exploited a proxy means test for targeting that was based on household poverty-related characteristics. Accordingly, using data collected at enrolment, the programme determined which households fell below the PMT threshold to receive the cash transfer while those above the threshold did not. Just over 8000 households applied to the program and after eligibility cutoffs, 3619 households were eligible for the cash transfer while the rest were above the threshold and hence not eligible. For the purposes of the impact evaluation, a sample of 2500 households was computed based on appropriate sample calculations for nutritional outcomes. As such, half the sample (1250 households) were treated. At baseline, conducted between July and September 2015, 2497 households were surveyed, of which 1262 were households that received cash payments (treated) and 1235 received no payments since they were above the cut-off hence control household. Baseline analysis shown in Table 4 indicated that treatment and control households these households were similar and balanced at baseline. In 2017, the follow-up survey successfully reached 2331 households.

Attrition: With the 2017 follow-up reaching 2,331 households, there was an attrition of about 6.64 percent of the baseline sample. However, in our analysis, there was differential attrition in some household characteristics such as household size, age of eligible woman, mothers primary education status, household electricity, household safe water access and whether an interpreter was used. Analysis of attrition is in Table A3 in the Supplementary Materials. To alleviate concerns of differential attrition, we conducted sensitivity analysis in which we included inverse probability attrition weights in the model. Results in Supplementary Tables A4 and A5 show that the results are almost identical. Table 2 shows the sample and baseline and endline and attrition sub-sample.

Table 2: Baseline and endline sample size by treatment group and attrition

	2015	2017	Attrition	
			Attrited	% attrited
Treatment	1262	1185	77	6.1%
Control	1235	1146	89	7.2%
Total	2497	2331	166	6.6%

Source: [Transfer Project \(2020\)](#)

2.3 Outcomes

We seek to assess the effect LEAP 1000 household investments in two dimensions: (a) livestock investments and (b) participation / investments in non-farm livelihood activities. For livestock, we further have three different measures including livestock ownership as an indicator variable, flock size and the tropical livestock units (TLU). While the indicator variable can be looked upon as an extensive measure of livestock ownership, flock size and tropical livestock units (TLU) are more intensive measures (Tabe-Ojong, Heckelei, & Rasch, 2023). The indicator variable is a binary variable indicating livestock ownership as a dummy (yes or no). Households in the study area in Ghana are keeping both large ruminants (cattle, donkey), small ruminants (sheep, goats) and different kinds of poultry. Flock size considers the actual number of all these livestock owned. This is arguably a better measurement of ownership than the indicator variable as it captures the number of livestock that households are keeping. However, this measure has some disadvantages as it essentially considers all the different livestock as equal (Tabe-Ojong, Heckelei, & Rasch, 2023). Of course, owning 30 large ruminants such as cattle is better than owning 30 goats or poultry, but this measure does not consider these nuances. To enable comparison between households, we also use the TLU which apportions units to the different livestock considering their live weight. For instance, one cow is equivalent to 0.70 livestock units, sheep and goats are equivalent to 0.10 livestock units and poultry 0.01 livestock units. We also capture livestock commercialization as an indicator variable where we dis-aggregate them as both households that are buying and selling livestock. We also captured the sales and purchase value of these livestock.

For non-farm investments, we consider participation in non-farm livelihood activities in various dimensions. First, we assess investments in household durable goods. Durable goods are a measure of household wealth accumulation and also act as savings vehicles. Using the household consumption module, we isolate non-food consumption of item purchases in the last 12 months. Second, we look at business enterprise ownership. Households in the study area are typically rural households and participate in many non-farm livelihood activities such as petty trading, home production activities, handicrafts, community service, shop keeping, small scale manufacturing and participation in various small and medium size enterprises. Third, we look at household's involvement in financial markets through savings and borrowing. We therefore assessed if a household has some savings and if it took a loan in the the last 12 months. Finally,

we look at household share of food expenditure. On average, poor households spend a majority of their income on food. We therefore posit that reducing the share of food as a proportion of household expenditure was a measure of economic progress.

2.4 Hypothesising Pathways

We hypothesise five pathways in which the effect of the intervention on household investments / economic outcomes is likely to go through. First, we suggest that the combination of cash transfers and health insurance are likely to increase future orientated thinking, planning and acting. This might be done through reducing impatience, increasing future preferences and increasing the belief that life will be better in future. We therefore assessed the intervention's effect on a number of future-oriented measures. First, we assessed time preferences as a measure of future orientation, impatience, and the waiting threshold. We define future orientation as the ability of individuals to evade more certain present gains in favour of better uncertain future gains. Our measures of future preferences were two; namely (a) impatience and (b) future orientation. The measures emanated from a time preferences elicitation where individuals were presented with a hypothetical situation in which they had to choose between a certain amount of money now or a slightly higher amount of money at a future period. The questions were posed in a manner that assesses preferences and their consistency ¹. The full time preference elicitation model is shown in Supplementary Table A1.

Previous studies have established that these hypothetical questions elicit reliable measures of time preferences (Chuang & Schechter, 2015; Suarez & Cameron, 2020). Our measure of patience is closely similar to Suarez and Cameron (2020) and other previous studies assessing the effect of cash transfers on time preferences (Handa et al., 2016, 2020; Ibrahim et al., 2023). In these elicitations, individuals who select the present option are highlighted as the least patient hence most impatient while those who select a future option have higher levels of patience. Our measure of patience therefore ranges from 1-7 with 1 being the least patient (most impatient) and 7 being the most patient (least impatient). This ordinal scale is based on different thresholds and a combination of the responses, but this essentially relates to 7 if someone always chooses the future and 1 if someone always chooses the present.

¹For instance, where the future option is selected, the next question presents the respondent with an option that penalises the future by reducing the interest rate and hence potential gains. If a respondent still chooses the future option, they reveal consistent future orientation.

One key difference with [Chuang and Schechter \(2015\)](#) and [Suarez and Cameron \(2020\)](#) is that our pattern of survey administration is also able to reveal inconsistent preferences in three ways. First, as can be seen from question 3 in Supplementary Table [A1](#), individuals who have a very high future orientation are still asked whether they still select a future option even when the future is negatively weighted. Second, unlike in other studies the administration of LEAP questions does not follow a linear pattern but more a non-linear pattern and hence able to elicit consistent preferences and not just future discount rates more objectively. Third, because of the non-linear ordering of the questions, we can observe individuals with time-inconsistent time preferences. While time-inconsistent time preferences might emanate from hyperbolic discounting where individuals apply a lower marginal rate of substitution to future consumption/preferences, inconsistency might also be as a result of psychological phenomena that include over estimations of the future or biased inertia ([Caillaud & Jullien, 2000](#)). An example of these is when an individual chooses option 1 in question 4 but option 2 in question 5.

Reducing impatience and increasing future oriented choices are the first two measured of future preferences. A third one we tested was the belief that due to receiving cash and health insurance support, individuals believed that life would be better in future. The surveys posed a question “Do you think your life will be better in [...] from now?” with binary responses for 1 year, 3 years and 5 years. The last two hypotheses were happiness and social support. To assess individuals’ happiness, the survey asked a basic question how individuals felt they were happy or not. The question of cash transfers and life satisfaction is increasingly studied, showing positive causal linkages between cash transfers and happiness ([McGuire, Kaiser, & Bach-Mortensen, 2022](#); [Natali, Handa, Peterman, Seidenfeld, & Tembo, 2018](#)). Finally, we hypothesised that the intervention would improve social support as economic support improves. To assess social support, we used the modified Medical Outcome Study Social Support Survey (MOS-SSS) tool ([Moser, Stuck, Silliman, Ganz, & Clough-Gorr, 2012](#)). The mMOS-SSS measures both the functional and emotional dimensions of how an individual feels supported in their community. The tool has been shown to have key implications for both clinical and social outcomes. In general, there is not much evidence on the relationship of cash transfers and social support. Adjacent studies have looked at effects of cash transfers on psychological outcomes such as stress ([Haushofer, Chemin, Jang, & Abraham, 2020](#); [Hidrobo, Karachiwalla, & Roy, 2023](#); [Maara et al., 2023](#)). The findings are rather mixed. For instance, [Haushofer et al.](#)

(2020) and [Maara et al. \(2023\)](#) find no effects of cash transfers on stress in Kenya, Ghana and Tanzania but [Maara et al. \(2023\)](#) find significant effects in Malawi and [Hidrobo et al. \(2023\)](#) in Mali.

2.5 Empirical Strategy

Given that households with eligible women were not randomly assigned to getting cash payments but rather signed up and were enrolled based on eligible thresholds, employing a quasi-experimental design such as the discontinuity design (RDD) seems most appropriate ([Transfer Project, 2020](#)). RDD is a quasi-experimental method that relies on threshold or cutoff values in determining differences between treatment and control households. In our case, the cutoff is based on the PMT score which is exogenously determined. The main identifying assumption of the RDD is because households around the eligibility threshold are “as good as if they were randomly” assigned to the treatment and control groups given that they would potentially be similar.

Despite the suitability of the RDD to estimate the association between LEAP 1000 and productive livelihoods, we rather employ the difference in difference (DiD) approach following [de Groot et al. \(2022\)](#) and [Peterman et al. \(2022\)](#). The choice of a simple DiD is informed by the fact that households were sampled by the cut-off point of the PMT scores for evaluation purposes. This makes the threshold of the distribution of households in the sample very narrow and mostly around the PMT score. Given that in almost all household characteristics there was no statistically discernible difference between control and treated households (see Table 4), appearing above or below the threshold was almost as random.

2.5.1 Intention to Treat Effects

The comprehensive package of the intervention was that households could receive the cash transfer and also free enrolment in health insurance. However, as other studies have shown ([Otieno et al., 2022](#); [Palermo et al., 2019](#)), health insurance enrolment was not universal. Therefore, treatment assignment was not perfect. About 34% of individuals who were assigned to the treatment did not take up the health insurance. For this reason, we start by assessing the intention to treat effects, where we assessed the treatment effects on simply being assigned to the treatment group irrespective of whether the recipient fully complied or not. We therefore estimate the following regression.

$$Y_{ijt} = \beta_0 + T_t\beta_1 + LEAP_{ijt}\beta_2 + LEAP_{ijt} * T_t\beta_3 + \hat{X}_{ijt}\beta_4 + \varsigma_j + \varepsilon_{ijt}. \quad (1)$$

Where Y_{ijt} is the main outcome of interest of woman i living in community j at a point in time t measured as described above. We have several outcomes pertaining to productive livelihoods such as livestock ownership (cows, goats, sheep, poultry), non-farm enterprise (petty trader, crafts, and other local economic activities), and livestock commercialization. We also have some psychological factors pertaining to the impatience and future orientation. T_t is a time dummy that takes the value of 1 for households in year 2017 and 0 otherwise. $LEAP_{ij}$ refers to households that are eligible and receive a cash transfer and 0 otherwise. $LEAP_{ij} * T_t$ is the interaction terms between the cash transfer (LEAP 1000) and time. \hat{X}_{ijt} is a vector of control variables used to improve the precision of the model. It refers to other individual and household characteristics as well as the PMT scores of the households. We include controls such as age and educational level, household size, marital status and the PMT scores of the households. ς_j refers to time invariant unobserved heterogeneity (it captures individual, household and community level fixed effects) and ε_{ijt} is the stochastic error term.

Our coefficient of interest β_3 is the interaction between cash transfer ($LEAP_{ij}$) and time (T_t). Our estimates can be referred to as the intent to treat (ITT) effects since we rely on treatment assignment. This is because at baseline, just about 46% of treatment households had signed up for health insurance ([Peterman et al., 2022](#)) implying that compliance to the insurance component of the programme was low. This makes our estimates likely conservative and should be looked upon as a lower bound of the combined effect of cash transfers and health insurance in Ghana. We cluster our standard errors at the community level.

The validity of the difference in difference estimator relies on two common assumptions, that is the parallel trend assumption. The parallel trend assumption requires that treatment and control groups must be similar and have the same trends at baseline. This assumption makes it possible to attribute any change at the endline to the treatment. In other words, any change in the control group after treatment provides a good approximation of an expected change in the treatment group if they did not receive the treatment. We do not have pre-baseline data to test this assumption, but we can rely on mean differences of the outcomes and control variables

at baseline to give us an indication of the similarity between treated and control households at baseline. At baseline, we observe that the treatment and control groups are sufficiently similar as depicted by the balance pairwise regressions in Table 4.

2.5.2 Treatment on the Treated Effects

As previously stated, take up of the full treatment package (i.e receiving the cash transfer and taking up health insurance) was not perfect. About 34% of women assigned to the treatment group did not take up health insurance. Overall, the programme had positive effects on health insurance take-up, increasing it by about 15 percent (Palermo et al., 2019). However, services access and services readiness (Otieno et al., 2022) as well as additional non-premium feeds such as card processing Palermo et al. (2019) were found to limit enrolment. This therefore implies that we can assess both the intention to treat effects on treatment assignment and the treated on the treated (TOT) effects conditional on taking up the full treatment package. To assess the treatment on the treated effects, we therefore run the following regression.

$$Y_{ijt} = \beta_0 + T_t\beta_1 + LEAP_{ijt}\beta_2 + LEAP_{ijt} * T_t\rho_3 + \hat{X}_{ijt}\beta_4 + \varsigma_j + \varepsilon_{ijt}. \quad (2)$$

The model terms are all similar to Model 1 however, in the case of this TOT, the coefficient of interest is ρ_3 which is the interaction of the full treatment package and wave. The TOT model is implemented on a smaller since individuals who only partially took the treatment drop out the analysis.

3 Results

3.1 Descriptive Characteristics

Outcomes: We present the means and the standard errors for outcome variables in Table 3. About 52% of the households own livestock and the mean total livestock units is about 3.2². About 11% of households had cattle at baseline and 31% had goats. Twenty-one percent had sheep, 45% have poultry. In terms of financial related outcomes, the baseline levels of business

²We use Njuki et al. (2011) formula to compute tropical livestock units. In general, a cow is 1 tlu, sheep and goats are 0.02 tlu, pigs are 0.3 tlu, poultry and rabbits are 0.04 tlu, donkeys and horses are 0.8 tlu and camels are 1.1 tlu

ownership were about 22% and only about 8 percent of the households had some savings. 49% of the households had taken a loan in the last 12 months and investment in durable household good was about 580 Ghanaian Cedis in the last 12 months. Households are generally poor. They spend about 87% of their household expenditure on food. We look at baseline levels of psychological and cognitive pathway outcomes including impatience, future orientations happiness and the modified Medical Outcomes Survey of Social Support (mMOSSS). On a scale of 1-7 where 7 shows highly impatient and 1 shows more patient, average levels of impatience were about 4.3. About 43% of the sample were future oriented. Future orientation was assessed as preference a future options in a time preference elicitation experiment. About 79% of the sample were generally happy and the overall MOSS score was about 0.01. We observed significant differences in a number of baseline outcomes for which the proxy means test weighting were not able to alleviate. Overall, households in the control group were more likely to own cattle. Households in the control group were also more likely to have some savings. In addition, in terms of social support, control group households were more likely to have stronger social support than treatment households.

Figure 1 is a density distribution graph for future orientation. As we observe in Table 3, we do not observe any key differences at baseline between treatment and control group in future orientations. This is also visible in the baseline graph (left side). However, a closer visual inspection at the endline graph shows a shift in future orientations. First, at lower levels of patience/ future orientations, we observe a higher concentration of control group respondents with the visible difference in the distribution curves. Second, we observe that at higher levels of future orientations, the treatment group curve is higher than the control group curve. Third, we observe an overall shift in future orientation, the

Controls: The sample is of female respondents because only women were entitled and eligible to participate in the program. We use a set of controls similar to other studies assessing the effect of the LEAP 1000 program (e.g (Peterman et al., 2022) and (de Groot et al., 2022)) by controlling for individual, households and community characteristics. In particulate, at the individual level, we control for age of the eligible woman, marriage status (whether in a monogamous marriage or polygamous marriage). Education status of the eligible woman. At the household level, we include controls for the spouse such as age of the household head, education status of the household head, household size, whether a household had electricity,

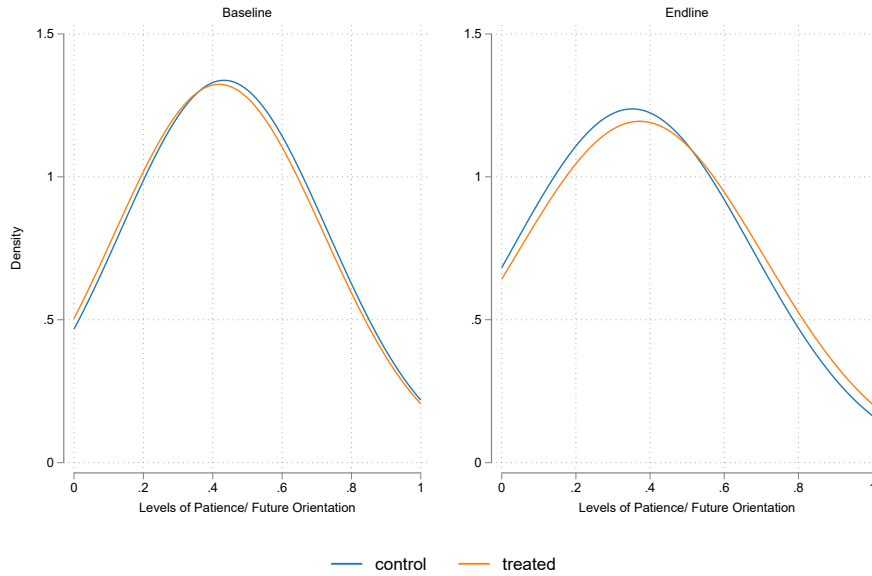
Table 3: Descriptive results of outcomes at baseline

Variable	Overall mean		(1)	(2)	(1)-(2)
	Mean	SD	Comparison Mean/(SE)	Treatment Mean/(SE)	Pairwise t-test Mean difference
Livestock ownership (1/0)	0.52	0.50	0.512 (0.015)	0.531 (0.015)	-0.019
Herd size (number)	3.16	12.99	3.303 (0.474)	3.023 (0.265)	0.280
Total livestock units (TLU)	1.52	7.31	1.539 (0.241)	1.492 (0.186)	0.047
Has cattle	0.11	0.31	0.110 (0.009)	0.106 (0.009)	0.004**
Has Goats	0.31	0.46	0.299 (0.014)	0.318 (0.014)	-0.019
Has sheep	0.21	0.41	0.209 (0.012)	0.214 (0.012)	-0.006
Has poultry	0.45	0.50	0.441 (0.015)	0.451 (0.014)	-0.010
Large ruminants	0.13	0.34	0.134 (0.010)	0.135 (0.010)	-0.002*
Small ruminants	0.37	0.48	0.363 (0.014)	0.386 (0.014)	-0.023
Durable investments	576.43	609.40	575.668 (17.645)	577.162 (18.043)	-1.494
Has a business	0.22	0.41	0.223 (0.012)	0.208 (0.012)	0.015
Has savings	0.08	0.27	0.091 (0.008)	0.071 (0.007)	0.020*
Taken a loan	0.49	0.50	0.474 (0.015)	0.496 (0.015)	-0.022
Food consumption (% of household)	0.87	0.09	0.867 (0.003)	0.872 (0.003)	-0.005
Impatience (ordinal)	4.27	1.89	4.215 (0.056)	4.328 (0.055)	-0.114
Future orientation (0-1)	0.43	0.30	0.433 (0.009)	0.418 (0.009)	0.014
Happiness	0.79	0.41	0.805 (0.012)	0.770 (0.012)	0.035
zMOSSS	0.01	0.99	0.046 (0.029)	-0.018 (0.029)	0.064**
N	2331		1146	1185	
F-test of joint significance (F-stat)					1.613**
F-test, number of observations					2331

Pairwise and F-test regressions control for the proxy means test. Significance: ***=.01, **=.05, *=.1

safe drinking water, housing quality (which combines the number of rooms, quality of the floor, roof and walls). We also include a control for interpreter use in survey administration. We include language and community fixed effects. Table 4 shows that controlling for the proxy means tests, there was no significant differences between households treated and those in the control group.

Figure 1: Differences in expressed future orientations between baseline and endline



3.2 Empirical Results

3.2.1 Effect of LEAP 1000 on household livestock investments

We now delve into the causal effects of the LEAP 1000 program. We begin with investments in livestock. Table 5 below shows the effects of livestock investments. We divide the table into two panels. Panel 1 presents the ITT results and Panel 2 presents the TOT results. We observe that between baseline and endline, the probability of owning livestock increased by 6.2 percentage points or about 12 percent in the treated households compared to the control households. However, while there were positive coefficients observed in flock (number of animals owned) and their equivalent in total livestock units, we did not observe these effects to be significant.

Looking at how households participated in livestock commercialisation, we observed that treated households were likely to participate in livestock purchases and selling. The probability of purchasing livestock increased by about 5.2 percentage points, equivalent to about 20 percent of the control mean. Livestock sales also increased by about 2.4 percentage points in the treated households, equivalent to about 25.4 percent of the control mean. Note that livestock commercialisation was observed only at endline.

Looking at the TOT results in Panel 2, we observe that individuals who adhered to the treatment as per the design were more likely to have higher treatment effects than the average individual. We observe that the probability of livestock ownership increased by 8.4 percentage

Table 4: Summary and baseline balance measures of control variables

Variable	(1) Comparison		(2) Treatment		(1)-(2) Pairwise t-test	
	N	Mean/(SE)	N	Mean/(SE)	N	P-value
Household size (number)	1146	6.347 (0.074)	1185	6.959 (0.078)	2331	0.125
Age of household head	1146	38.142 (0.362)	1185	40.451 (0.359)	2331	0.655
Eligible woman age	1146	28.614 (0.198)	1185	30.302 (0.196)	2331	0.600
Married Polygamous	1146	0.293 (0.013)	1185	0.305 (0.013)	2331	0.825
Married Monogamous	1146	0.647 (0.014)	1185	0.641 (0.014)	2331	0.586
Father Primary Education	1146	0.217 (0.012)	1185	0.183 (0.011)	2331	0.630
Mother Primary Education	1146	0.244 (0.013)	1185	0.245 (0.012)	2331	0.335
Household has electricity	1146	0.312 (0.014)	1185	0.263 (0.013)	2331	0.878
Poor quality housing	1146	0.532 (0.015)	1185	0.513 (0.015)	2331	0.528
Household has safe water	1146	0.576 (0.015)	1185	0.604 (0.014)	2331	0.826
Interpreter used	1146	0.087 (0.008)	1185	0.109 (0.009)	2331	0.946
F-test of joint significance (F-stat)						0.803
F-test, number of observations						2331

Pairwise and F-test regressions control for the proxy means test. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

points or about 16 percent of baseline levels. In addition the probability of livestock purchases increased by 8.5 percentage points, or about 33 percent of baseline levels. Finally, the probability of livestock sales remains more or less unchanged but an increase in the side of standard errors reduce the significance levels from 5% to 10%.

Next, we explore some heterogeneities in the type of livestock households are more likely to invest in. Table 6 below shows livestock investments by the type of livestock households were investing in. The findings indicate the households were more likely to invest in goats, poultry and small ruminant animals. The probability of investing in goats increased by 5.5 percentage points or about 16 percent of baseline mean. The probability of investment in poultry increased by close to 7 percentage points or about 14.5 percent of baseline mean. Even when there was a

Table 5: Effects on household livestock investments

VARIABLES	(1) Livestock	(2) Flock	(3) TLU	(4) Buying	(5) Sale
Panel 1: Intention to Treat Effects					
LEAP 1000 x wave	0.062** (0.028)	0.377 (0.513)	0.157 (0.264)	0.052** (0.021)	0.024** (0.012)
Constant	0.270*** (0.078)	-0.435 (1.217)	-0.554 (0.754)	0.044 (0.039)	-0.038 (0.032)
Observations	4,590	4,590	4,590	4,590	4,590
R-squared	0.090	0.040	0.035	0.227	0.077
Control Mean	0.512	3.303	1.539	0.260	0.094
% Control Mean	0.121	0.114	0.102	0.199	0.254
Panel 2: Treatment on the Treated effects					
LEAP x wave	0.084*** (0.030)	0.331 (0.537)	0.098 (0.279)	0.085*** (0.026)	0.023* (0.014)
Constant	0.268*** (0.075)	-0.761 (1.194)	-0.806 (0.726)	0.045 (0.039)	-0.019 (0.031)
Observations	4,232	4,232	4,232	4,232	4,232
R-squared	0.089	0.040	0.035	0.251	0.074
% Control Mean	0.164	0.100	0.064	0.326	0.240

All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

substantially high ownership of sheep and cows, 23 percent and 9 percent respectively, we did not observe any significant causal associations of the cash transfer on the probability of owning these types of livestock

We further divided the livestock into two groups, namely; large ruminant animals and small ruminant animals. Large ruminant animals. Large ruminants were either cattle or donkey while small ruminants were goats, sheep and pigs.³ We observed a significant casual association of the cash transfer on small ruminants but not large ruminants. Investments in small ruminant animals increased by 5.5 percentage points or about 13 percent of baseline levels.

In the second panel of Table 6, we show the TOT results for the heterogeneity of livestock investments. TOT results indicate that the probability of investing in cattle also increases by about 3 percentage points. Given the low baseline mean of about 9.2 percent of households

³Technically, pigs are not ruminating animals and therefore are their own category of pigs/swine. However, for computational simplicity, we included pigs in small ruminant category. Their inclusion does not change the inference of the results in any manner

Table 6: Heterogeneity in household livestock investments

VARIABLES	(1) Cattle	(2) Goats	(3) Sheep	(4) Poultry	(5) Large ruminants	(6) Small ruminants
Panel 1: Intention to Treat Effects						
LEAP 1000 x wave	0.024 (0.015)	0.055** (0.027)	0.000 (0.023)	0.069** (0.028)	0.013 (0.015)	0.055** (0.027)
Constant	-0.014 (0.048)	0.169** (0.071)	0.042 (0.060)	0.162** (0.081)	0.064 (0.053)	0.191** (0.074)
Observations	4,590	4,590	4,590	4,590	4,590	4,590
R-squared	0.083	0.084	0.071	0.100	0.106	0.095
Baseline Control Mean	0.0916	0.338	0.234	0.476	0.118	0.432
%of Baseline Control Mean	0.259	0.163	0.000296	0.145	0.111	0.128
Panel 2: Treatment on the Treated Effects						
LEAP x wave	0.029* (0.015)	0.076*** (0.029)	0.011 (0.024)	0.094*** (0.029)	0.013 (0.016)	0.078*** (0.028)
Constant	-0.018 (0.047)	0.158** (0.070)	0.039 (0.060)	0.159** (0.080)	0.063 (0.052)	0.190*** (0.072)
Observations	4,232	4,232	4,232	4,232	4,232	4,232
R-squared	0.084	0.087	0.069	0.097	0.105	0.098
Baseline Control Mean	0.0916	0.338	0.234	0.476	0.118	0.432
%of Baseline Control Mean	0.320	0.224	0.0451	0.197	0.114	0.181

All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Robust standard errors in parenthesis. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

holding cattle investments, a 3 percentage point increase was equivalent to about 32 percent. The probability of investing in goats increased by 7.6 percentage points and that of investing in poultry increased by about 9.4 percentage points. Overall, the probability of investing in small ruminant animals increased by 7.8 percentage points or about 18 percent of baseline mean.

These insights on the positive relationship between LEAP 1000 and the ownership of small ruminant livestock such as goats, and poultry are intuitive and expected given the size of the transfers. Whereas the transfer enables some substantial investments, these might not be as large as investing in cattle. Beyond this, it could also be the case that goats and poultry are easily marketed, that is they can be bought easily but can also be easily sold to improve the liquidity base of households. Moreover, these categories of livestock, especially poultry, are easy to manage as they require minimum attention and households can be involved in other gainful employment options when investing in these livestock.

In some cases, keeping poultry is in line with the small scale agricultural production systems of rural households. since most poultry is usually produced in farmyards. For instance in Tanzania, poultry production is well integrated in vegetable production in the form of a feedback loop (Habiyaemye, Tabe-Ojong, Ochieng, & Chagomoka, 2019). In these vegetable-cum poultry production systems, poultry rely on and are usually fed with agricultural products

from farms and their litter which comprises excreta and spilled feed is used as a form of organic manure in these vegetable production systems. This sort of a circular production system is less costly but also environmentally friendly since households do not engage in the use of chemical production methods using inorganic fertilizers which may be costly for them. It has even been established that the use of these kinds of organic nature from livestock is associated with food security in rural settings in Cameroon (Tabe-Ojong, René, Nzié, & Fabinin, 2023).

3.2.2 Effect of LEAP 1000 on Household Investments

Next we explore how the LEAP 1000 influenced households' investment in non-farm activities. For this group of outcomes, we looked at the value investments in durable goods in the last 12 months, household ownership of a business enterprise, savings, loans and the amount of household budget allocated to food in the last 30 days. Table 7 shows the results. We observe that while the trend of household investment in durable goods declined by more than half of baseline values, the programme had a positive and significant effect of about 63 Ghanaian Cedis, equivalent to about 15 percent of the baseline levels. We observe a positive effect on the probability of starting a business, growing by about 3 percentage points. However, this effect was only shy of significance by a small margin ($p\text{-value} = 0.115$). However, the non-statistically significant effect was economically sound, increasing the probability of owning a business by 11.6 percent of baseline levels.

Model 3 in Panel 1 shows the effect of the cash transfer on savings. The probability of having some savings increased by 11.4 percentage points of 42 percent of the baseline mean. In addition, while the transfer did not have a statistically significant effect of on household taking loans, the coefficient was large, showing a 8 percent decline from baseline level. Finally, we looked at household expenditure on food as a share of total household budgets. We observe that the proportion of food as a share of household expenditure reduced by 9 percentage points.

Turning to the TOT results in Panel 2 of Table 7, we observed that investment in durable goods was much higher, about 74 cedis or about 18 percent of the baseline investment. We also observe that for this group, the likelihood of starting a business was higher, and statistically significant, increasing by 3.7 percentage points or about 14 percent of baseline levels. The treatment on the treated coefficient of savings was more or less similar to the ITT coefficient,

Table 7: Intention to treat effects of LEAP 1000 on household non-agricultural enterprises

VARIABLES	(1) Durables	(2) Has business	(3) Savings	(4) Loans	(5) Food proportion
Panel 1: Intention to Treat Effects					
LEAP 1000 x wave	62.758** (26.943)	0.030 (0.019)	0.114*** (0.023)	-0.042 (0.030)	-0.009** (0.005)
Constant	-82.001 (77.819)	0.031 (0.058)	0.003 (0.077)	0.248*** (0.076)	0.904*** (0.011)
Observations	4,590	4,590	4,576	4,590	4,590
R-squared	0.213	0.088	0.151	0.080	0.156
Baseline Control Mean	420.5	0.256	0.273	0.517	0.875
%of Baseline Control Mean	0.149	0.116	0.420	-0.0813	-0.0108
Panel 2: Treatment on the Treated Effects					
LEAP x wave	74.144** (29.045)	0.037* (0.022)	0.113*** (0.027)	-0.022 (0.033)	-0.010** (0.005)
Constant	-3.141 (70.326)	0.036 (0.059)	0.102 (0.079)	0.263*** (0.079)	0.896*** (0.012)
Observations	4,232	4,232	4,222	4,232	4,232
R-squared	0.207	0.081	0.151	0.083	0.157
Baseline Control Mean	420.5	0.256	0.273	0.517	0.875
%of Baseline Control Mean	0.176	0.143	0.413	-0.0425	-0.0110

All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Robust standard errors in parenthesis. Significance levels correspond wit*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

of about 11.3 percentage points but the share of food as a proportion of total household consumption expenditure was higher, about a 10 percentage point reduction. Altogether, LEAP 1000 had significant effects on non-agricultural enterprises.

3.3 Pathways

3.3.1 Some Non-Parametric Associations

We posit that psychological factors mediate the effect of LEAP 1000 on the various productive outcomes. The hypothesized mediators are (1) impatience, (2) future orientations, (3) happiness and (4) social support. To begin testing this hypothesis, we conduct simple semi-parametric local polynomial correlations of each two of the hypothesized mediators, namely, future orientations and social support. Figure 2 shows the relationship between future orientations with livestock-related outcomes. In all the sub-figures, there is an increasing trend in each

outcome as future orientation increases. Furthermore, we observe that for livestock ownership, ownership of large ruminants and small ruminants, the highest levels of ownership are observed among individuals with the highest levels of future orientations.

Figure 2: Association of future orientations with livestock investments

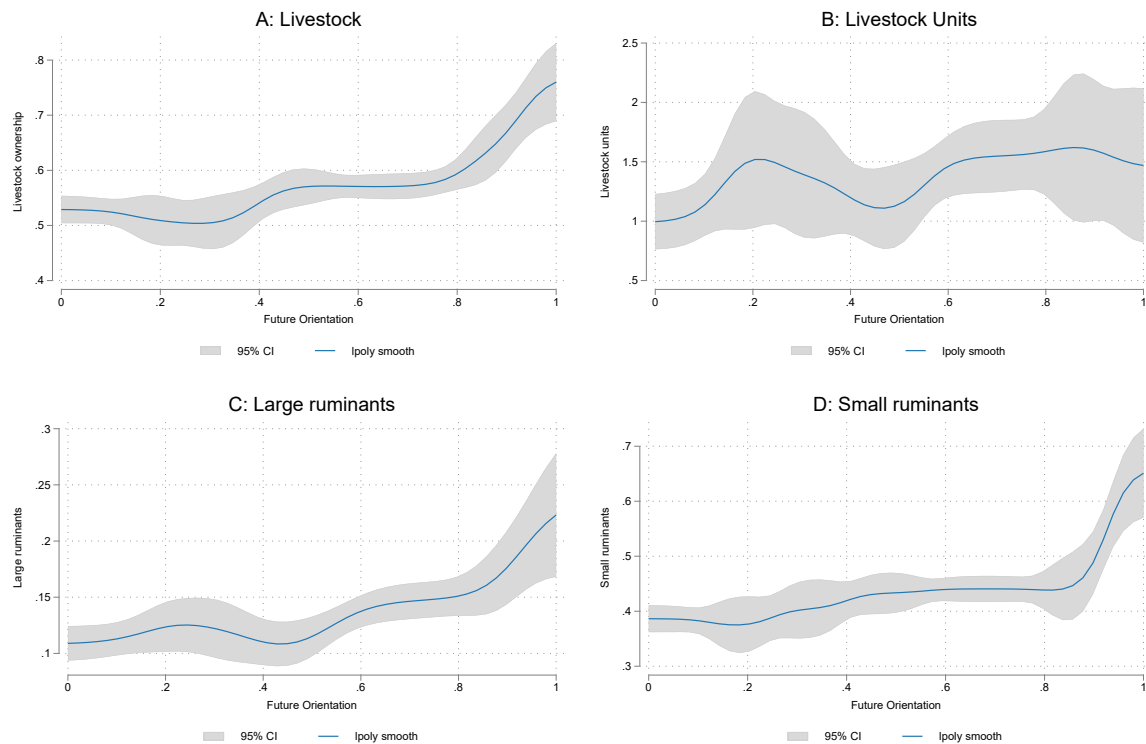
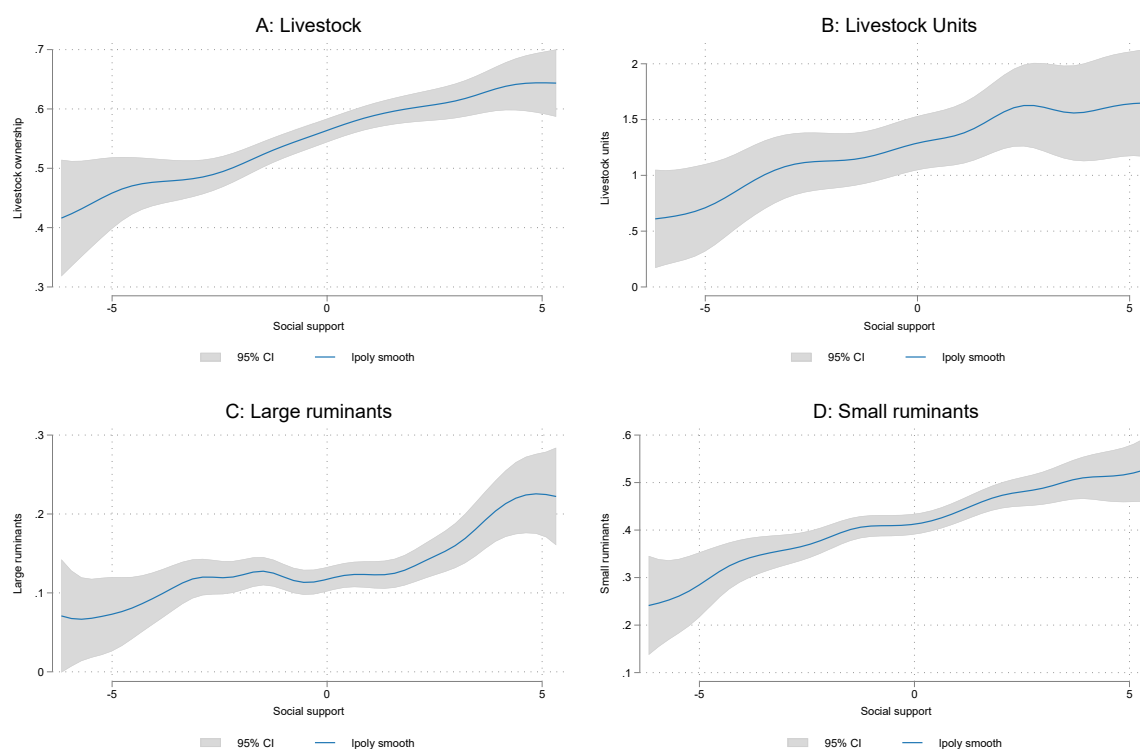


Figure 3, we show the relationship between social support measured by the mMOSS-SSS and livestock investments. The mMOSS-SSS index ranges from -5 to 5. In all the livestock related outcomes, we observe that an increase in social support is correlated with livestock investments whether measured by the extensive margin of livestock ownership or the intensive margin on the number of total livestock units owned by the household. The relationship seems stronger in small ruminants where it increases from about 25 percent among households with low expression of social support to about 52 percent in households with a high sense of social support.

Next, we explore how these two potential mediators influence household investments in non-farm activities. Figure 4 shows the association of future orientations and investments in durable goods, businesses, savings and food as a proportion of household expenditure. The relationships here are less clear than livestock investments. Among durable goods and owning a business, there is a slight increase in the outcomes as future orientations increase. However,

Figure 3: Association of social support (mMOS-SSS) and Livestock



these outcomes attenuate sharply at the top quartile of future orientations. Regarding savings and food share, future orientations seem to influence savings and food share only in the 80th percentile of future orientations.

Figure 5 shows the relationship between social support and non-farm investments. Investments in durable goods and savings seems to correlate with social support. Social support does not seem to influence changes in food share as a proportion of household expenditure. In the middle ranges of the social support, the probability of owning a business seems to increase. Overall, these descriptive results show that these potential mediators have valid and potentially statistically strong associations with household investments. In the next section, we we assess empirically how LEAP 1000 influence future orientations and then how these future orientations potentially affect household investments through their interaction with the intervention.

Figure 4: Association between future orientations and non-farm investments

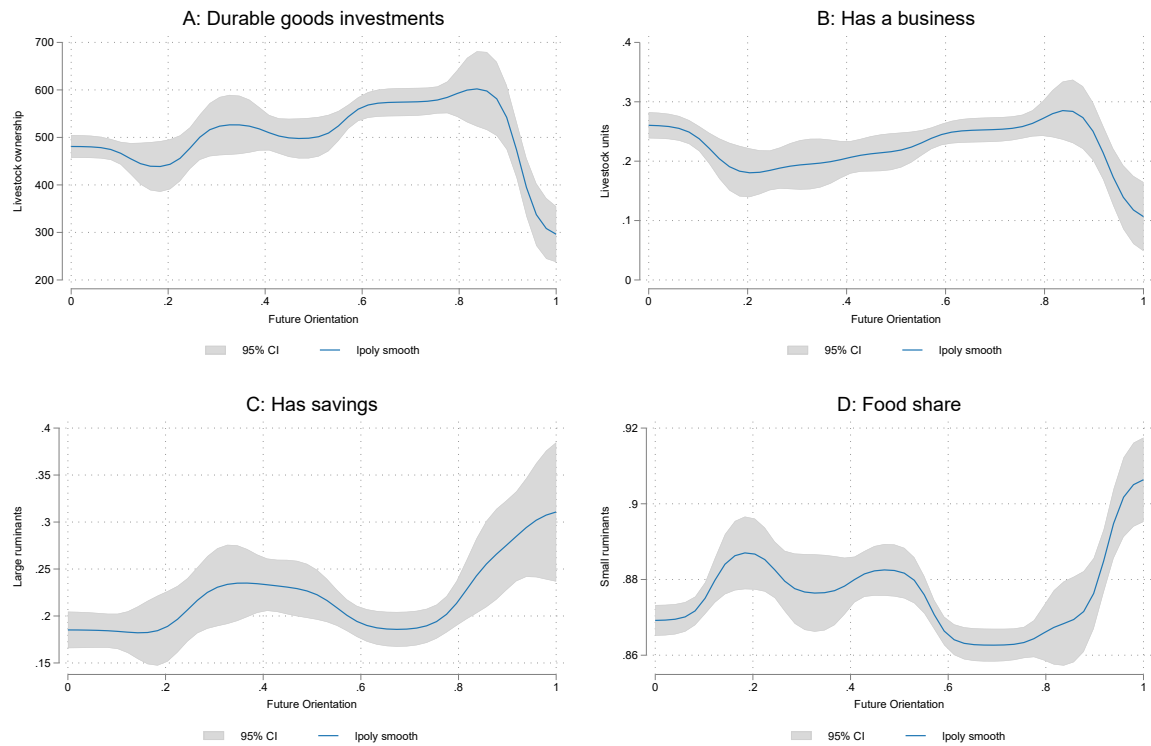
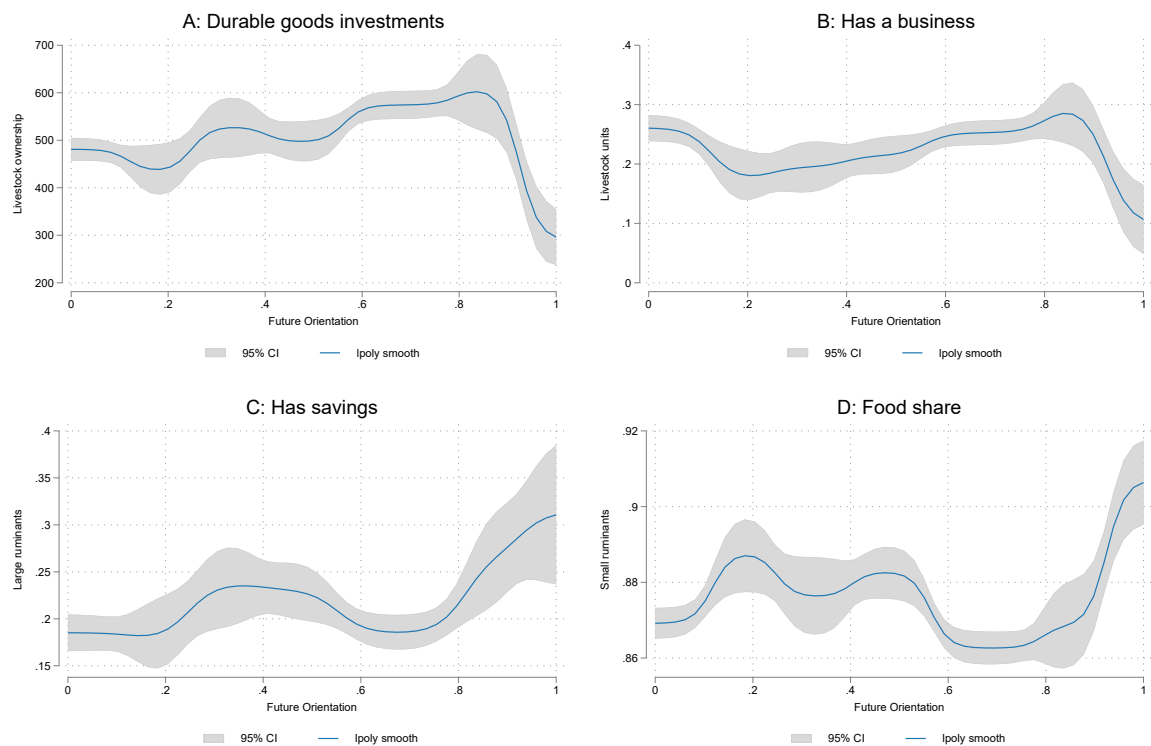


Figure 5: Association between mMOS-SSS and household non-farm investments



3.3.2 Effect of LEAP 1000 on Future Orientations

In emerging studies, researchers have started to inquire how cash transfers interventions influence internal constraints such as aspirations (Junior, Katz, & Ahn, 2016; Kosec & Mo, 2017; Suarez & Cameron, 2020). Moreover, Tabe-Ojong, Heckelei, and Rasch (2023) also show that individuals with higher aspirations are more likely to invest in assets such as livestock. We therefore use this as a starting point to assess if the LEAP 1000 influenced individuals future orientations.

We assessed future orientations in a number of ways. First, we use a standard time preferences elicitation survey experiment to assess how individuals prefer a given amount of money now compared to an increased amount of money in future. In this experiment, individuals who prefer the money in the current period are more present oriented and therefore less future oriented. The opposite is true for future orientation. The time preference elicitation had six question. We rank their responses such that individuals who have present preferences are have a higher rank than those who reveal future preferences have a lower rank and therefore more patient. Secondly, we look assess the proportion with which an individual chooses a future preference out of the six times the question is posed. Individuals who choose a future preference all the time are more future oriented and the opposite is true for present orientation. These results are shown in Models 1 and 2 in Table 8 below, with Panel 1 and Panel 2 for ITT and TOT respectively.

In these results, there is indication that the intervention did reduce impatience and also increased future orientations. In the ITT results, we observed that impatience reduced by 0.1 standard deviations, which was equivalent to reducing impatience by about 10%. TOT results in Panel 2 of Table 8 are more or less the same, showing a 11% reduction in the levels of impatience. Changing the dimension of analysis to future orientation, we observed a positive effects of the cash transfer on future orientations. In the ITT results, this relationship if non statistically significant. However, conditioning on the full treatment package, this relationship increases in magnitude and significance, showing that the full package of cash transfers and health insurance increased future orientation by 3.3 percentage points or about 9 percent of the baseline levels.

Secondly, the survey posed a question of future expectations gauging how respondents would have thought of how their lives would turn out better or worse over a given timescale. Three timescales were elicited, corresponding to 1 year, 3 years and five years. To all the three

Table 8: Effects of the cash transfers on future orientations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Impatience	Future orient	Life better in ... years			Happiness	mMOSSS
			1	3	5		
Panel 1: Intention to Treat Effects							
LEAP 1000 x wave	-0.101* (0.057)	0.029 (0.019)	0.027 (0.021)	0.025 (0.019)	0.004 (0.019)	0.043** (0.020)	0.150** (0.058)
Constant	0.395** (0.159)	0.303*** (0.052)	0.642*** (0.054)	0.862*** (0.051)	0.925*** (0.062)	0.779*** (0.042)	-0.264 (0.201)
Observations	4,576	4,576	4,576	4,576	4,576	4,590	4,576
R-squared	0.091	0.092	0.095	0.081	0.087	0.088	0.050
Baseline Control Mean	1.012	0.352	0.874	0.951	0.964	0.875	-0.0480
%of Baseline Control Mean	-0.099	0.083	0.031	0.027	0.005	0.049	-3.133
Panel 2: Treatment on the Treated Effects							
LEAP 1000 x wave	-0.109* (0.060)	0.033* (0.020)	0.039* (0.022)	0.026 (0.020)	0.005 (0.019)	0.034 (0.021)	0.089 (0.062)
Constant	-0.327 (0.220)	0.487*** (0.072)	0.776*** (0.078)	0.837*** (0.066)	0.794*** (0.077)	0.798*** (0.044)	-0.747** (0.295)
Observations	4,222	4,222	4,222	4,222	4,222	4,232	4,222
R-squared	0.088	0.091	0.087	0.079	0.084	0.082	0.052
%of Baseline Control Mean	-0.108	0.094	0.044	0.028	0.005	0.039	-1.853

All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Robust standard errors in parenthesis. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

elicitations, we observed a positive association between future expectations and the program. However, only a 1-year time frame with full treatment package (TOT effects) do we observe a statistically significant effect. The findings here show that to some extent, the LEAP 1000 increased future expectations but these are short-lived and do not extend to the medium term time-frame.

Finally, we looked at happiness and social support. Our results show a significant ITT effect of LEAP 1000 on happiness. We find that happiness increases by about 4.3 percentage points or about 0.12 standard deviations. Looking at the TOT estimates, our results attenuated in both the point estimates and significance levels, becoming insignificant. However, we also believe that happiness, especially that assessed on a single point in time, might be sensitive to physical health. We therefore conduct additional analysis which excludes individuals who were unhealthy (reported being ill) in the last 14 days. Results shown in the Supplementary Materials in Table A6 indicate that indeed, happiness increases but even in this sub-sample, it is smaller in magnitude and levels of significance.

Finally, we look at social support. ITT effects shown in Model 7 of the first panel of the Table 8 indicate the the intervention had a positive and statistically significant effect on perceived social support, increasing it by 0.15 standard deviations. However, conditioning on taking to full treatment package, the TOT effects in Panel 2 reveal that the relationship was positive but not statistically significant. We can postulate that in general cash transfers seem to have a positive effect on perceived social support but insurance potentially crowds-out social support as some dimensions of community social support are covered by formal insurance. Given that mMOS-SSS captures both the functional and emotional social support, we can explore it further to assess which components of social support are more likely affected. Results in Supplementary Table A7 shows that the more sensitive component of social support is emotional support. Here, we observe that the cash transfer had significant effects by both ITT an TOT measures. Conditional on full treatment uptake, the intervention increased social support by 0.115 standard deviations. Overall, it seems that health insurance likely reduces community social support but not in margins large enough to full crowd it out.

3.3.3 How do Future Orientations Influence Household Investments? Triple Difference Regressions

To ascertain that these suggested pathways are valid routes in which the intervention passes, we conducted triple difference regressions to study how each of these future orientations, proxied by the various pathways outcomes, affect household investments. Our motivation for the triple difference estimator is that if we believe that these future orientations factors influence how households make investment decisions, then they introduce positive spillovers such an increase in psychological well-being (or decrease, depending on the context) increases household propensity to invest and related investment outcomes. These are differential effects based on these psychological factors. We therefore implement the following basic triple differences model ⁴.

$$Y_{ijt} = \beta_0 + T_t\beta_1 + LEAP_{ijt}\beta_2 + LEAP_{ijt} * T_t\rho_3 + \lambda_4 LEAP_{ijt} * T_t * Future_{ijt} + \varsigma_j + \varepsilon_{ijt}. \quad (3)$$

⁴For simplicity purposes, we use the intention to treat model for the triple differences, yet the triple differences results based on the treatment on the treated are also available

In Model 3 above, the coefficient of interest is the λ_4 which is the triple difference interaction. The rest of the terms are the same as in Model 1. Note that the future orientation indicators changes accordingly. The ordinal scale for impatience is a 1-7 scale and it enters as a continuous variable. Future orientation is a 0-1 scale which also enters as continuous variable. Happiness is a binary variable while the mMOS-SSS is an continuous index variable.

Effect of Impatience: Table 9 shows results of the effect of LEAP 1000 on livestock investments varying by the levels of impatience. We observed that overall, accounting for impatience, the cash transfer increased the probability of investing in livestock by 8.2 percentage points and the probability of buying livestock by 12.4 percentage points. More more we also observed that the probability of investing in small ruminant animals increased by 8.8 percentage points. We observed that increasing levels of impatience had negative effects across most of the outcomes. The effects were however statistically significant only for buying livestock. We found that an increase in level of impatience (on a 1-7 scale) led to reduction in the probability of buying livestock by about 1.6 percentage points. Given that the baseline control mean was 26 percent, this effect translated into reducing the probability of livestock purchase by 6.2 percent.

Table 9: Effect of LEAP 1000 and Impatience on Livestock Investments

VARIABLES	(1) Livestock	(2) Herd size	(3) TLU	(4) Large ruminants	(5) Small ruminants	(6) Buying	(7) Selling
LEAP 1000 x wave	0.082* (0.048)	0.165 (0.647)	0.107 (0.397)	0.032 (0.032)	0.088* (0.046)	0.124*** (0.044)	0.036 (0.027)
LEAP 1000 x wave x Impatience (ordinal)	-0.006 (0.008)	0.030 (0.100)	-0.001 (0.065)	-0.005 (0.005)	-0.008 (0.008)	-0.016** (0.007)	-0.003 (0.005)
Constant	0.434*** (0.083)	0.146 (1.442)	-0.096 (0.920)	-0.020 (0.054)	0.157** (0.074)	0.037 (0.046)	-0.010 (0.038)
Observations	4,576	4,576	4,576	4,576	4,576	4,576	4,576
Number of hhid	2,331	2,331	2,331	2,331	2,331	2,331	2,331
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Robust standard errors in parenthesis. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 10 shows the results of LEAP 1000 on household investments when accounting for impatience. We found that the program increased investments in durable goods by more than 50 percent of the control mean (Ghana Cedis 221). Furthermore, we observed significant effects of the intervention on savings (22 percentage points) and reducing the share of food as a proportion of household budgets. The triple difference coefficient was 2.3 percentage points

for savings and 0.3 percentage points for food share. The implication here was that impatience attenuated the probability of savings by 2.3 percentage points and also increased expenditure on food as a share of household budgets by 0.3 percent.

Table 10: Effect LEAP 1000 and Impatience on Household Investments

VARIABLES	(1) Durables	(2) Business	(3) Savings	(4) Loans	(5) Food share
LEAP 1000 x wave	221.081*** (47.203)	0.021 (0.045)	0.221*** (0.047)	-0.027 (0.052)	-0.025*** (0.008)
LEAP 1000 x wave x Impatience (ordinal)	-33.601*** (8.413)	0.002 (0.008)	-0.023*** (0.008)	-0.003 (0.009)	0.003** (0.001)
Constant	169.186* (90.387)	0.256*** (0.061)	0.005 (0.056)	0.141 (0.089)	0.908*** (0.013)
Observations	4,576	4,576	4,576	4,576	4,576
Number of hhid	2,331	2,331	2,331	2,331	2,331
Additional controls	Yes	Yes	Yes	Yes	Yes

All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Robust standard errors in parenthesis. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Effect of Future Orientations: Next, we look at the effect of the intervention by future orientations. Starting with livestock investments, we observe mostly null results of the effect of future orientations on livestock investments. One key coefficient that is different from the rest is the effect of future orientations on buying livestock. We observe that as recipients' future orientations increase, they are likely to increase their probability of purchasing livestock by about 11 percentage points. The probabilities of other outcomes are also positive but with large standard errors which render them statistically not significant. Investment in livestock is largely for insurance purposes and as stores of cultural and financial value. We therefore observe that future orientations are likely drive these investment choices

Table 12 shows the effect of LEAP on households investments conditioning on levels of future orientations. The results indicate that by and large, increasing future orientations expanded the effect of the LEAP 1000 on households financial investments. We observe that the effect of LEAP 1000 on investments in durable assets while considering increasing future orientations was about 4 times higher than when future orientations were no considered (see Model 1 in Table 7). When considering increasing future orientations, LEAP 1000 increased

Table 11: Effect of LEAP 1000 and Future Orientations on Livestock Investments

VARIABLES	(1) Livestock	(2) Herdsize	(3) TLU	(4) Large ruminants	(5) Small ruminants	(6) Buying	(7) Selling
LEAP 1000 x wave	0.038 (0.031)	0.359 (0.591)	0.094 (0.313)	-0.001 (0.018)	0.029 (0.031)	0.010 (0.024)	0.019 (0.017)
LEAP 1000 x wave x Future orientation	0.050 (0.045)	-0.136 (0.688)	0.030 (0.455)	0.025 (0.032)	0.054 (0.046)	0.106** (0.046)	0.013 (0.032)
Constant	0.348*** (0.078)	-0.844 (1.236)	-0.469 (0.842)	-0.062 (0.056)	0.068 (0.076)	-0.026 (0.047)	-0.003 (0.034)
Observations	4,576	4,576	4,576	4,576	4,576	4,576	4,576
Number of hhid	2,331	2,331	2,331	2,331	2,331	2,331	2,331
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Robust standard errors in parenthesis. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

investment in durable assets by about 57 percent. Furthermore, we observe that increasing future orientations increased the probability of saving by 14 percentage points and reduced expenditure on food as a proportion of household investments by about 2 percentage points.

Table 12: Effect of LEAP on and Future Orientation on Household Investments

VARIABLES	(1) Durables	(2) Business	(3) Savings	(4) Loans	(5) Food share
LEAP 1000 x wave	-23.649 (29.990)	0.033 (0.025)	0.061** (0.028)	-0.049 (0.034)	-0.003 (0.005)
LEAP 1000 x wave x Future orientation	239.007*** (41.394)	-0.012 (0.050)	0.140*** (0.050)	0.018 (0.047)	-0.017** (0.007)
Constant	158.768* (89.286)	0.228*** (0.064)	-0.062 (0.052)	0.149* (0.084)	0.903*** (0.012)
Observations	4,576	4,576	4,576	4,576	4,576
Number of hhid	2,331	2,331	2,331	2,331	2,331
Additional controls	Yes	Yes	Yes	Yes	Yes

All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Robust standard errors in parenthesis. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Effect of Happiness: Looking at how happiness mediates the relationship between LEAP 1000 and livestock, we find (results in Table 13) that happiness generally does not influence livestock investments. While the majority of the outcomes have a positive sign, non of the outcomes come close to any level of statistical significance. We then look at the effects of happiness on household financial investments.

Table 13: Effect of LEAP 1000 and Happiness on Livestock Investments

VARIABLES	(1) Livestock	(2) Herdsize	(3) TLU	(4) Large ruminants	(5) Small ruminants	(6) Buying	(7) Selling
LEAP 1000 x wave	0.044 (0.045)	0.084 (0.565)	0.134 (0.287)	0.019 (0.027)	0.040 (0.048)	0.007 (0.036)	0.033 (0.032)
LEAP 1000 x wave x Happiness	0.020 (0.043)	0.328 (0.287)	0.021 (0.144)	-0.008 (0.026)	0.016 (0.047)	0.050 (0.036)	-0.010 (0.034)
Constant	0.377*** (0.079)	-0.483 (1.285)	-0.324 (0.817)	-0.046 (0.054)	0.102 (0.074)	-0.011 (0.046)	-0.008 (0.035)
Observations	4,590	4,590	4,590	4,590	4,590	4,590	4,590
Number of hhid	2,331	2,331	2,331	2,331	2,331	2,331	2,331
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Robust standard errors in parenthesis. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Results in Table 14 show the effects of the intervention on household financial investments. We observe that happiness indeed too mediates investments in durables, starting businesses, savings, taking loans and even spending on food. We observe that by individuals shifting from not happy to happy, the effect of LEAP 1000 in investments in durable assets increased by 92 Cedis. By individuals becoming happy, the effect of LEAP 1000 on having a business increased by 8.4 percentage points. Similarly, the probability of having savings increased by 17.2 percentage points. The probability of taking a loan reduced by 11 percentage points and the expenditure on food as a share of household expenditure reduced by about 1.4 percentage points. Comparing the results in Table 14 and those in Table 7, we observe that considering the influence of happiness, the effect of the intervention was always higher than when happiness was not considered. For instance, the probability of starting in a business was more than twice higher, the probability of having savings was 53 percent higher, the probability of taking a loan was 1.6 times lower and the expenditure on food as a share of household expenditure was 36 percent lower. By and large, we are therefore confident that happiness mediates the effect of LEAP 1000 on household investments

Effect of Social Support: Finally, we look at how social support mediates the effect of LEAP 1000. Table 15 shows the effect of the intervention on livestock investments. We find that considering an increase in social support measured by the modified Medical Outcomes Study of Social Support Survey (mMOS-SSS), the effect of LEAP 1000 on livestock investments, herd size and livestock commercialisation. We find that the probability of investing in livestock

Table 14: Effect of LEAP 1000 and Happiness on Household Financial Investments

VARIABLES	(1) Durables	(2) Business	(3) Savings	(4) Loans	(5) Food share
LEAP 1000 x wave	-19.306 (55.998)	-0.045 (0.035)	-0.038 (0.044)	0.053 (0.053)	0.002 (0.007)
LEAP 1000 x wave x Happiness	92.930* (51.756)	0.084** (0.036)	0.172*** (0.047)	-0.107** (0.047)	-0.014** (0.006)
Constant	148.969 (90.800)	0.237*** (0.060)	-0.040 (0.053)	0.159* (0.083)	0.904*** (0.013)
Observations	4,590	4,590	4,576	4,590	4,590
Number of hhid	2,331	2,331	2,331	2,331	2,331
Additional controls	Yes	Yes	Yes	Yes	Yes

All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Robust standard errors in parenthesis. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

increased by 5.9 percentage points. We also observe that while not considering social support we do not observe a statistically significant effect of the intervention on herd size (see Model 2 of Table 5), considering social support, the effect of the intervention on herd size increases by 0.44 animal heads. The effect of LEAP 1000 on livestock investments was concentrated on small ruminant animals where a coefficient of 7.4 percentage points was observed. Finally, regarding livestock purchases, our triple difference coefficient shows that considering an increase in social support, the probability of livestock purchase increased by 4.7 percentage points. Interestingly, we do not observe a significant influence of social support on LEAP 1000's effect on livestock sales, implying that social support was more likely to induce people into accumulation action rather than commercialisation of a depletion nature.

Finally, Table 16 shows results of the intervention on household investments when social support was considered. The results show that social support mediated the effect of the program on durable goods investments, having a business, having some savings, and reducing the share of food as a proportion of household expenditure. More precisely, considering social support, the effect of LEAP on household investment in durable goods was Ghanaian Cedis 76, about 17 percent higher (see Model 1 in Table 7) than when social support was not considered. Similarly, social support contributed to the intervention's impact in increasing the probability of starting a business by about 2.7 percentage points. Regarding savings, we observe that against a base rate of about 11 percentage points when social support was not in the model, social support

Table 15: Effect of LEAP 1000 and Social Support on Livestock Investments

VARIABLES	(1) Livestock	(2) Herdsize	(3) TLU	(4) Large ruminants	(5) Small ruminants	(6) Buying	(7) Selling
LEAP 1000 x wave	0.056** (0.027)	0.316 (0.514)	0.112 (0.263)	0.009 (0.016)	0.048* (0.026)	0.049** (0.021)	0.023** (0.012)
LEAP 1000 x wave x mMOSS-SSS	0.059*** (0.015)	0.440*** (0.136)	0.075 (0.095)	0.013 (0.010)	0.074*** (0.015)	0.047*** (0.015)	0.009 (0.010)
Constant	0.384*** (0.078)	-0.443 (1.303)	-0.317 (0.857)	-0.046 (0.054)	0.108 (0.073)	0.001 (0.044)	-0.006 (0.035)
Observations	4,576	4,576	4,576	4,576	4,576	4,576	4,576
Number of hhid	2,331	2,331	2,331	2,331	2,331	2,331	2,331
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Robust standard errors in parenthesis. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

contributed to an additional 3.3 percentage points on the effect of the intervention on savings probabilities. Finally, treated respondents who had increasing levels of social support reduced their expenditure on food as a share of household consumption by 9 percentage points.

Table 16: Effect of LEAP 1000 and Social Support on Household Investments

VARIABLES	(1) Durables	(2) Business	(3) Savings	(4) Loans	(5) Food share
LEAP 1000 x wave	61.459** (26.866)	0.028 (0.019)	0.113*** (0.023)	-0.041 (0.030)	-0.009** (0.005)
LEAP 1000 x wave x mMOSS-SSS	75.658*** (19.530)	0.027* (0.014)	0.033** (0.016)	-0.024 (0.016)	-0.009*** (0.003)
Constant	164.944* (88.646)	0.243*** (0.062)	-0.031 (0.053)	0.148* (0.083)	0.902*** (0.012)
Observations	4,576	4,576	4,576	4,576	4,576
Number of hhid	2,331	2,331	2,331	2,331	2,331
Additional controls	Yes	Yes	Yes	Yes	Yes

All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Robust standard errors in parenthesis. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

4 Conclusion

In Malawi and Zambia, [De Hoop, Groppo, and Handa \(2020\)](#) studied the effect of the cash transfer programs on among other outcomes livestock ownership and sales. They observed that in both countries, the probability of livestock ownership increased, 34 percent and 27 percent in

Malawi and Zambia respectively and the probability of selling livestock increased by 8 percent and 7 percent in Malawi and Zambia respectively. However, they also observed that these effects were for small ruminants animals (goats in particular) and poultry. In addition, their study also found extensive margin effects and limited intensive margin effects.

With respect to livestock production, our research contributes to an increasing body of literature that assess cash transfers and livestock investments ([Asfaw et al., 2014](#); [Daidone et al., 2019](#); [Shigute et al., 2020](#); [Todd, Winters, & Hertz, 2010](#)). These studies assessed programs that cover large scale transfer programs in sub-Saharan Africa (Ethiopia, Ghana, Kenya, Lesotho, Malawi, Zambia, and Zimbabwe). A number of differences are however registered between these studies and ours. First, our study exclusively focuses on poor women as a specifically vulnerable sub-group distinct from the average households cash transfers usually target. In this case, we contribute a small group of studies that more specifically study effects among poor women. For instance, [Mussa, Agegnehu, and Nshakira-Rukundo \(2022\)](#) and [Mussa, Agegnehu, and Nshakira-Rukundo \(2024\)](#) who look at combination of health insurance and cash transfers on female headed households in Ethiopia. Because of this more distinct sub-sample of the population, it is like that our results might be different from those in existing literature.

Although the insights from Ghana are based on the LEAP program, it is important to mention that our analysis is about the LEAP 1000 program which is more recent and targeting women. This is made even more explicit by the different results we obtain. While we show a positive association between LEAP 1000 and livestock production, the LEAP program was not able to detect any discernible association. Over all the evaluations done in the seven countries, there is significant heterogeneity in that while cash transfers are associated with livestock investments in Malawi, Zambia, Lesotho, and Zimbabwe, there were no statistically significant effects regarding Ghana, Kenya or Ethiopia ([Daidone et al., 2019](#)).

Appendix

Table A1: Future oriented time preferences

Suppose someone you trust gives you some money.
 You can choose to receive GH¢100 now or an amount at a later date.
 What would you choose? Select the first option or the second option

1	GH¢100 now or GH¢100 in one month	1= 100 GH¢Now 2= 100 GH¢in 1 month
2	GH¢100 now or GH¢300 in one month	1= 100 GH¢Now 2= 300 GH¢in 1 month
3	GH¢100 now or GH¢75 in one month	1= 100 GH¢Now 2= 75 GH¢in 1 month
4	GH¢100 now or GH¢200 in one month	1= 100 GH¢Now 2= 200 GH¢in 1 month
5	GH¢100 now or GH¢150 in one month	1= 100 GH¢Now 2= 150 GH¢in 1 month
6	GH¢100 now or GH ¢250 in one month	1= 100 GH¢Now 2= 250 GH¢in 1 month

Source: [Transfer Project \(2020\)](#)

Table A2: Summary of empirical studies assessing the effects of LEAP 1000 in Ghana

Paper	Outcome	Method	Summary Findings
Palermo et al. (2019)	Enrolment in health insurance	Difference in differences, intention to treat effects; longitudinal qualitative analysis	Health insurance enrolment increased by 14% for adults and 15 % for children.
Otieno et al. (2022)	Effect of service availability on health insurance enrolment	Difference in differences, triple differences	Households in LEAP 1000 with higher levels of service availability had a 15% increase in the probability of enrolling in health insurance
de Groot et al. (2022)	Child nutrition (height for age and weight for age z-scores)	Difference in differences, intention to treat effects	No significant treatment effect on nutritional outcomes. Increase in household food security but reductions in child meal frequency
Quinones, Mendola, et al. (2023)	Average birth weight, low birth weight	Difference in differences	Low birth weight reduced by 3.5%, average birth weight increased by 94 grams overall
Quinones, Lin, et al. (2023)	Birth weight	Structural equation modelling	1 month increase in the exposure to LEAP was associated with increasing birth weight by 9 grams and a 7% reduction in probability of low birth weight. Mediating effect of household food security and mothers' agency was not statistically significant
Peterman et al. (2022)	Intimate partner violence	Difference in differences	No effects on the probability of experiencing intimate partner violence, reduction in the frequency of experiencing emotional or physical violence
de Milliano et al. (2021)	Social support	Difference in differences	increased social support, both emotional and instrumental social support. Increased participation in social support groups
LaPointe et al. (2024)	Low birth weight	Difference in differences	Among control households, increased weekly temperatures were associated with higher odds of low birth weight. Cash transfer mitigated the effect of temperature on low birth weight
Maara et al. (2023)	Self-perceived stress	Difference in differences	No significant effect of LEAP 1000 on self perceived stress
Novignon et al. (2022)	Sickness and health seeking	Difference in differences	Increased the probability of seeking care by 11 % moderate reduction in health expenditures

Table A3: Analysis of attrition from sample

Variable	N	(1) 0 Mean/(SE)	N	(2) 1 Mean/(SE)	(1)-(2) Pairwise t-test N	P-value
Household size (number)	166	5.861 (0.177)	2331	6.658 (0.054)	2497	0.000***
Age of household head	166	39.488 (1.275)	2331	39.316 (0.256)	2497	0.877
Eligible woman age	166	27.042 (0.495)	2331	29.472 (0.141)	2497	0.000***
Married Polygamous	166	0.235 (0.033)	2331	0.299 (0.009)	2497	0.164
Married Monogamous	166	0.627 (0.038)	2331	0.644 (0.010)	2497	0.486
Father Primary Education	166	0.181 (0.030)	2331	0.200 (0.008)	2497	0.298
Mother Primary Education	166	0.404 (0.038)	2331	0.245 (0.009)	2497	0.000***
Household has electricity	166	0.169 (0.029)	2331	0.287 (0.009)	2497	0.011**
Poor quality housing	166	0.596 (0.038)	2331	0.523 (0.010)	2497	0.103
Household has safe water	166	0.741 (0.034)	2331	0.590 (0.010)	2497	0.001***
Interpreter used	166	0.072 (0.020)	2331	0.098 (0.006)	2497	0.015**
F-test of joint significance (F-stat)					6.363***	
F-test, number of observations					2497	

Pairwise regressions control for the Proxy Means Test, language of interview and community fixed effects. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

References

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- Alderman, H., & Yemtsov, R. (2013). How Can Safety Nets Contribute to Economic Growth ? *The World Bank Economic Review*, 28(1), 1–20.

Table A4: Main livestock outcomes with attrition weights

VARIABLES	(1) Livestock	(2) Flock	(3) TLU	(4) Buying	(5) Sale
wave	0.080*** (0.029)	-0.494 (0.573)	-0.353 (0.267)	0.326*** (0.025)	0.094*** (0.012)
LEAP 1000 x Wave	0.066** (0.028)	0.397 (0.500)	0.161 (0.258)	0.053** (0.021)	0.025** (0.012)
Constant	0.094 (0.100)	0.425 (1.277)	-0.177 (0.750)	-0.042 (0.077)	-0.076 (0.048)
Observations	4,590	4,590	4,590	4,590	4,590
R-squared	0.090	0.039	0.035	0.227	0.076
Baseline Control Mean	0.512	3.303	1.539	0.260	0.0942
%of Baseline Control Mean	0.129	0.120	0.105	0.203	0.264

Sample size is only for individuals who did not report any sickness in the last 14 days. All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Robust standard errors in parenthesis. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A5: Main household investment outcomes with attrition weights

VARIABLES	(1) Durables	(2) Has business	(3) Savings	(4) Loans	(5) Food proportion
wave	-224.721*** (32.980)	-0.032 (0.021)	0.168*** (0.022)	0.104*** (0.030)	0.017*** (0.006)
LEAP 1000 x Wave	63.531** (26.505)	0.030 (0.019)	0.114*** (0.023)	-0.040 (0.030)	-0.010** (0.005)
Constant	260.335*** (92.368)	0.234*** (0.089)	-0.239*** (0.086)	0.422*** (0.107)	0.824*** (0.015)
Observations	4,590	4,590	4,576	4,590	4,590
R-squared	0.211	0.086	0.151	0.080	0.155
Baseline Control Mean	420.5	0.256	0.273	0.517	0.875
%of Baseline Control Mean	0.151	0.116	0.418	-0.0776	-0.0110

Sample size is only for individuals who did not report any sickness in the last 14 days. All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Robust standard errors in parenthesis. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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Table A6: Future oriented time preferences

VARIABLES	(1) Happiness
LEAP 1000 x wave	0.046* (0.027)
Constant	0.798*** (0.064)
Observations	3,028
R-squared	0.079

Sample size is only for individuals who did not report any sickness in the last 14 days. All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Robust standard errors in parenthesis. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A7: Effects on Social Support

VARIABLES	(1) Overall	(2) Instrumental	(3) Emotional
Intention to Treat			
LEAP 1000 x wave	0.150** (0.058)	0.107* (0.057)	0.168*** (0.058)
Constant	-0.263 (0.197)	-0.019 (0.246)	-0.473*** (0.175)
Observations	4,576	4,576	4,576
R-squared	0.050	0.047	0.054
Treatment on the Treated			
LEAP 1000 x wave	0.089 (0.062)	0.048 (0.060)	0.115* (0.062)
Constant	-0.747** (0.295)	-0.582** (0.264)	-0.780** (0.327)
Observations	4,222	4,222	4,222
R-squared	0.052	0.048	0.057

All regressions control for the variables included in Table 4, community fixed effects and language fixed effects. Robust standard errors in parenthesis. Significance levels correspond with *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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