Tailoring Advice and Incentives to Enhance Consumer Welfare from Catastrophic Drought Insurance *

Christopher B. Barrett[†] Tagel Gebrehiwot Gidey[‡] Nathan Jensen[§]
Karlijn Morsink[¶] Hyuk Harry Son[‖] J. Todd Swarthout[**]

July 2024

Not for circulation nor citation. For the latest draft, please click here

Abstract

Consumers often struggle to select financial products that enhance their welfare. We investigate the impact of tailored financial advice about satellite-based catastrophic drought insurance based on *real-time* consumer information combined with two types of incentives for agents that promote insurance: sales and welfare incentives. We do so in a cluster randomized control trial among 2,416 pastoral households in Ethiopia who are offered this insurance commercially. Tailored advice, when provided jointly with agent incentives that explicitly promote the advice decreases excess demand for insurance, increases adherence to advice, and increases expected consumer surplus from insurance decisions. In contrast, we find no evidence that tailored advice, when combined with standard incentives that promote sales has an impact. We show that trust in agents explains the behavioral effects: Tailored advice always reduces trust in agents, irrespective of the agents' incentive scheme. However, in a context with sales incentives, high trust in agents offsets any gains from reductions in excess purchases due to tailored advice for those with low trust in agents.

Keywords: tailored financial advice, catastrophic drought insurance, consumer welfare, agent incentives

[†]Charles H. Dyson School of Applied Economics and Management and Jeb E. Brooks School of Public Policy, Cornell University, USA, Email: cbb2@cornell.edu

[‡]Environment and Climate Research Centre, Policy Studies Institute, Addis Abeba. Email: tagelgebrehiwot@gmail.com

[§]Global Academy of Agriculture and Food Systems, University of Edinburgh, njensen@ed.ac.uk

[¶]Utrecht University School of Economics, The Netherlands. Morsink is also affiliated with the Development Economics Group at Wageningen University, The Netherlands, the Charles H. Dyson School of Applied Economics and Management, Cornell University, USA, and the Center for the Economics Analysis of Risk at Georgia State University, USA. Email: k.morsink@uu.nl

[‖]Utrecht University School of Economics, The Netherlands. Email: h.son@uu.nl

[**]Department of Economics, Experimental Economics Center, Georgia State University, USA. Email: jtswarthout@gmail.com

[0*]Data collection was made possible, in part, by support provided by the Foreign, Commonwealth & Development

1 Introduction

Consumers often struggle to select financial products that enhance their welfare (Sydnor, 2010; Abaluck and Gruber, 2011; Handel, 2013; Bhargava, Loewenstein, and Sydnor, 2017; Handel et al., 2020). The scope for better information, improved choice architectures, or behavioural nudges to improve the quality of financial decisions is limited (Handel and Kolstad, 2015; Carpenter et al., 2021; Ambuehl, Bernheim, and Lusardi, 2022; Harrison, Morsink, and Schneider, 2023). Personalized and interpersonal advice provided through independent financial advisors has the potential to enhance the quality of financial decisions by aligning consumer choices with their preferences and characteristics (Prelec and Loewenstein, 1998; Engelmann et al., 2009; Hanna and Lindamood, 2010). However, the costs of such an independent service – in the format that it is typically available – far exceed consumers' willingness or ability to pay, making it inaccessible to many, especially lower income households (Winchester and Huston, 2015; Tang and Lachance, 2012; Stolper and Walter, 2017).

Recently, administrative and personal data from consumers have been used to evaluate the quality of financial decisions and predict optimal contracts for specific consumers (Handel et al., 2020; Harrison, Morsink, and Schneider, 2023; Ghili et al., 2024). These predictions can be used to generate personalized financial advice that aims to improve the quality of financial decisions, without requiring a financial advisor to be accessed, leveraged and paid. However, whether the provision of such tailored advice – without the inter-mediation of an independent financial advisor – will improve decision quality is unclear, especially in contexts where companies' sales commissions encourage their sales agents to maximize sales and not the welfare of the consumers (Anagol, Cole, and Sarkar, 2017; Hoechle et al., 2018; Egan, 2019; Chalmers and Reuter, 2020)

We investigate to what extent tailored financial advice based on predictions of optimal contracts – using real-time consumer information – impacts consumer behaviour and expected consumer welfare from financial decisions. We also examine how these impacts interact with incentives for sales agent that either take the form of standard sales' commissions or that are aligned with the optimal financial decisions for consumers. We explore whether consumer understanding, agent efforts, or the consumer-agent relationship drive any of these outcomes.

To do so we develop and implement a method to provide individual-specific tailored advice

Office (FCDO) Project "Extreme Poverty - Building Evidence for Effective Action" (sponsored through Oxford Policy Management Limited, Award Number: POR008864), Feed the Future Innovation Lab for Markets, Risk & Resilience (Project No: 1001), Center for the Economic Analysis of Risk, Georgia State University. This research is approved by Institutional Review Board of Cornell University (Protocol ID No 2008009760, Approval date: August 10, 2021), Institutional Review Board of Georgia State University (IRB No H21294/367951, Approval date: February 3, 2021), and ILRI Institutional Research Ethics Committee (ILRI-IREC2020-53, Approval date: February 5, 2021).

about commercially available catastrophic drought insurance to low-income pastoral households in Ethiopia. The insurance aims to protect the productive assets of pastoral households – their livestock herd – from catastrophic drought. The specific insurance is a satellite-based index insurance that pays consumers indemnity when satellite measures of pasture quality drop below a historically defined threshold. Our tailored advice is based on comparisons of expected consumer surplus (ECS) from purchasing and not purchasing insurance for each potential share of their livestock herd. This calculation integrates individually elicited expected utility theory risk preferences with *real-time* livestock asset data and subjective expectations of livestock losses, insurance indemnity payments, and their correlation, collected in an incentive compatible manner. We then advise pastoral households to purchase or not purchase the insurance for the share of their herd that generates the highest ECS for their household. To provide this tailored advice, and communicate – in a simple manner – the underlying welfare framework that we use to generate it, we develop vignette-based pictorial videos with fictional pastoralists who receive different kinds of tailored advice based on their characteristics.

We combine this tailored advice intervention with a unique "welfare" incentive scheme for insurance agents that aims to enhance the welfare of consumers by aligning it with the tailored advice. Under the standard sales incentive scheme, agents earn commission on total insurance premium sales. Under our "welfare" incentive scheme, agents' incentives are maximized when consumers follow tailored advice precisely, with incentives decreasing as consumer purchase decisions deviate from the advice.

To test the effects of these interventions, we conduct a cluster randomized control trial with 2,416 pastoralists from 240 villages in southern Ethiopia. Stratified at regional level, villages are randomly assigned to one of three treatment arms: a control arm where pastoralists receive no advice and insurance agents receive standard sales incentives; one treatment arm where pastoralists receive tailored advice and insurance agents receive standard sales incentives; another treatment arm where pastoralists receive tailored advice and sales agents receive "welfare" incentives. To measure consumers' insurance purchase and insurance agents' incentives, we use administrative data from the insurance company during four sales seasons. We match this to four rounds of household surveys with incentivized lab-in-the-field experiments, which overlap with these four sales seasons. In the household survey, we collect data on pastoralists' risk attitudes, herd size, expectations of livestock losses, expectations of insurance payouts, expectations of contract nonperformance, understanding and perceived value of insurance, beliefs about agents, and the relationship between agents and pastoralists.

The financial product we focus on is Index-Based Livestock Insurance (IBLI), a satellite-based commercial index insurance using historical NDVI measures of forage quality. Previous stud-

ies highlight the positive impacts of IBLI on household outcomes in both the short and long run (Jensen, Barrett, and Mude, 2017; Matsuda, Takahashi, and Ikegami, 2019; Tafere, Barrett, and Lentz, 2019; Barrett et al., 2024). In expectation, however, the consumer welfare from IBLI is heterogeneous and depends on characteristics of the consumer and the quality of the product (Clarke, 2016; Harrison, Morsink, and Schneider, 2023), which may be evidenced by high rates of disadoption that are observed. Furthermore, IBLI is sold by sales agents who operate under sales commissions – which may be especially problematic for this low literacy population – as the agents may prioritize high take-up over consumer welfare considerations.

We find that tailored advice, when provided jointly with standard sales commission for agents, does not change consumer behaviour or expected consumer welfare. However, when coupled with "welfare" incentives for agents, it reduces insurance uptake, promotes adherence to advice not to buy insurance, and increases expected consumer surplus. Specifically, when combined with welfare incentives, tailored advice decreases insurance uptake by 1 percentage points (a 12.2 percent decrease) and increases the likelihood that individuals adhere to advice not to purchase insurance by 2.1 percentage points, a reduction of 25% in the share of individuals who buy when they shouldn't buy. In turn, this significantly increases the consumer surplus for individuals who are advised not to purchase insurance by 46%, suggesting that an important source of welfare losses is excess purchase of insurance.

We explore candidate mechanisms through which the effects could operate. First, the information contained in the tailored advice – especially the vignettes – may help consumers better understand product attributes or the potential value of the insurance, conditional on their own attitudes, beliefs, and characteristics. Therefore, we investigate the effect of our treatments on an index of IBLI knowledge questions as well as beliefs about contract non-performance, that cover both the attributes of the product as well as the procedures. We find no evidence that our interventions had a significant effect on knowledge and the perceived value of the product.

A second mechanism we explore is a potential effect on the efforts of the agents to promote the product, and the average incentives they received. To do so we designed a raffle for agents where they could win a substantial price. Their likelihood of winning the price depended on the number of raffle tickets they collected from consumers, who had received the tickets from our research team in advance. While agents collected tickets in the majority of villages, and from more then 42% of the consumers in our survey, we see no differential effort across our treatment arms. As expected, based on the existence of incentives for non-purchase in the "welfare incentive" arm, agents did earn incentives from more consumers, but the average incentive earned by agents across arms did not differ significantly. This supports the interpretation that it was not the agents' efforts that drove the differential effect across arms.

Finally, as a third mechanism, we explore the relationship between the consumers and the agents. We ask consumers questions about their beliefs about the likelihood that the agent executes the procedures (e.g., premium collection and payout delivery) correctly; the extent to which the agent operates in the interests of the consumer, and the consumers' valuation of the advice. If we analyze these as a composite trust scale, as well as independently, we observe a significant reduction in trust in agents in both arms where tailored advice is provided, and the effects across arms are similar. This suggests that the tailored advice itself, not the incentive scheme, reduces the trust in agents, which is an important result for a consumer population that is potentially vulnerable to aggressive sales tactics.

How do these reductions in trust by consumers in both arms with tailored advice translate into differential effects by the incentive scheme of the sales agent? First, consumers with below-median trust in sales agents at baseline, in the arm with sales' commissions , significantly decreases purchase but only when they are advised, in fact, to purchase insurance, but these changes do not have an effect on consumer welfare. In the arm where we provide tailored advice combined with welfare incentives, however, we observe that especially those with high trust in agents are significantly less likely to purchase insurance, and this is concentrated among those who are advised not to purchase, generating the increase in the ECS that we observe.

First, we connect to a literature in behavioural welfare economics that leverages consumer heterogeneity in evaluations of the quality of financial decisions (Harrison and Ng, 2016; Bernheim, 2021; Ghili et al., 2024; Butera et al., 2022), and specifically to a subset of this literature that investigates interventions to improve the quality of financial decisions (Carpenter et al., 2021; Allcott and Knittel, 2019; Harrison, Morsink, and Schneider, 2023)We contribute by providing financial advice based on real-time information from consumers that allows us to predict optimal contracts for specific consumers, and show this can make modest improvements to welfare.

Second, we contribute to a recent literature that uses personal and administrative data to predict optimal choices to help improve choice quality (Currie and MacLeod, 2020; Abaluck et al., 2021; Mullainathan and Obermeyer, 2022; Ghili et al., 2024). Although these tools can greatly improve decision quality in some cases (Harris and Yellen, 2024), in other contexts they do not lead to better decisions because the human agents that receive the advice choose not to adopt it (Stevenson and Doleac, 2022; Angelova, Dobbie, and Yang, 2023; Agarwal et al., 2023). We add to this literature by showing that tailored advice using real-time consumer data only marginally improves the consumer welfare from a commercial financial product if agents who promote the product are also incentivized to enhance choice quality.

2 Borena zone of Ethiopia and decisions for purchasing IBLI

The study was conducted in 240 villages located in the Borena zone of the Oromia region in Ethiopia, situated approximately 560 kilometers from the capital city of Addis Ababa. This region is characterized by arid and semi-arid lands where pastoralism is the predominant livelihood, with 79% of the sample relying on livestock herding as their primary source of income.

Pastoralism plays significant role in the African economy. The drylands of Africa are home to an estimated 268 million pastoralists. Pastoralism serves as a major source of protein for Africa's rapidly growing populations and livestock represent one of Africa's fastest growing agricultural subsectors.

For pastoralists, drought is a major threat to their livelihood. In 2023, drought-related starvation and dehydration accounted for 77% of livestock losses. Informal risk-sharing networks often relied upon by pastoralists are less effective during covariate weather shocks such as droughts. Therefore, strategies that can mitigate covariate risks, such as catastrophic droughts, can have the potential to improve the welfare of pastoralists.

IBLI is a commercial product which insures against catastrophic droughts, based on an index that is calibrated to the remote sensing data of rangeland condition, specifically the Normalized Difference Vegetation Index (NDVI).[1]

The insurance product was first introduced to the region in August 2012, after its initial pilot in neighboring Marsabit district of northern Kenya. Since then, the product coverage has expanded to more than 500,000 pastoral households in the Horn of Africa. Studies have shown that the product has positive short- and long-run impacts on household outcomes (Jensen, Barrett, and Mude, 2017; Tafere, Barrett, and Lentz, 2019; Barrett et al., 2024).

However, enhancing consumer welfare from IBLI is complex. First, in expectation, the consumer welfare from IBLI is heterogeneous (Clarke, 2016; Jensen, Barrett, and Mude, 2017; Harrison, Morsink, and Schneider, 2023). Consistent with this, the cumulative adoption rate for the product was 45%, but cumulative disadoption is 30%. Second, insurance agents, who promote and sell IBLI, earn revenue-based sales commissions. This commission structure incentivizes agents to maximize sales without considering welfare implication of the product to the individual consumer. Lastly, there is a limited understanding of the product among consumers. At baseline, the average IBLI knowledge score among our study participants was 1.7 out of 9.

[1]Normalized Difference Vegetation Index (NDVI), a reliable signal of forage availability (Meroni et al., 2014; PRINCE, 1991; Tucker et al., 1985) and is strongly correlated with livestock mortality in this region (Chantarat et al., 2013).

Enhancing the pastoralists' welfare from insurance purchases through conventional approaches such as providing additional product information is challenging due to the characteristics of the population. As one of the most remote areas with limited access to infrastructure and services, pastoralists in our study area have limited exposure to financial products. In 2024, only 33% of the pastoralists in the area owned a bank account or mobile money account. Mobile phone penetration is also low – 17% of the households owned a mobile phone, and 96% of these phones were basic or feature phone.

In addition, pastoralists from Borena zone are often characterized as low-income population with low education levels, further complicating efforts to enhance welfare through conventional means. 68.5% of the study population never attended school, 23.4% completed less than primary school, and only 20% of our survey respondents were literate in any language.

3 Experimental design

The project chronology is summarized in Figure 1. The baseline survey and lab-in-the-field experiment for pastoralists were carried out during the August-September sales season of 2021. The midline 1 survey and experiment, along with the first intervention, took place during the January-February sales season of 2022. Subsequently, the midline 2 survey and experiment, along with the second intervention, were conducted during the August-September sales season of 2022. Lastly, the endline survey and experiment, along with the first intervention, were conducted in the January-February sales season of 2023.

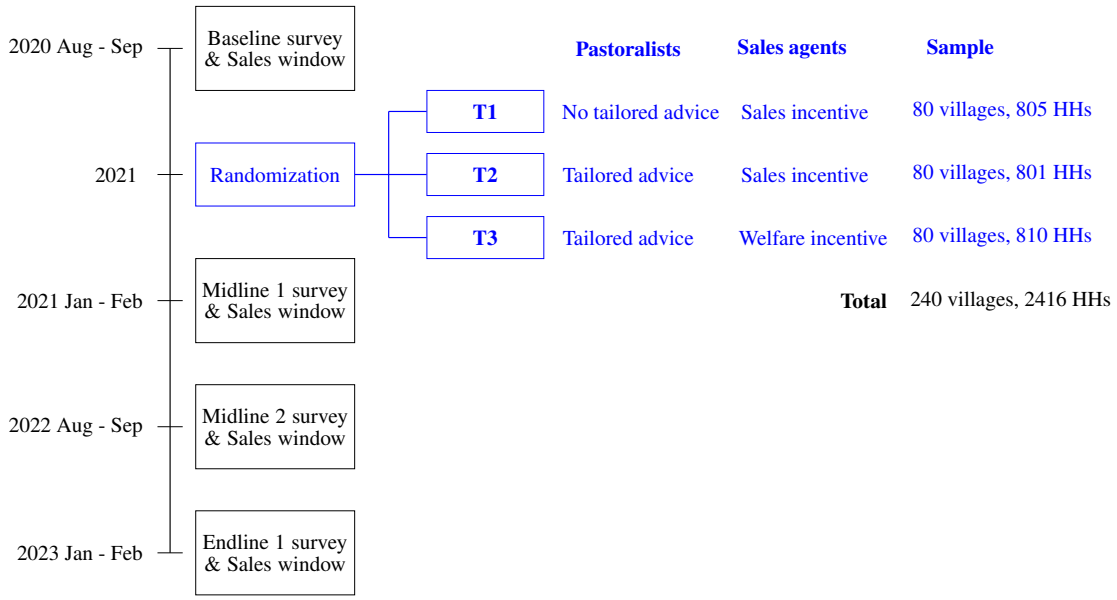
Training sessions for insurance agents were scheduled a week prior to each sales window. As the intervention commenced during the midline 1 phase, the midline 1 survey round (January - February 2022 sales window) served as the baseline for the sales agents.

During each visit, insurance agents provided IBLI information session to the respondents. This session disseminated information on product characteristics including premium rates, index design, registration and claim payment procedures, and historical claim payments within the index unit relevant to the village. Following the research team's visits, insurance agents carried out sales promotion activities in each village independently, and pastoralists subsequently made their purchase decisions.

Figure 1 also displays the sample composition in each treatment category. We stratified the 240 villages by 80 kebeles and randomly assigned villages into three groups:

- Control: No tailored advice for pastoralists + Sales incentive for insurance agents (Status

Figure 1: Experimental Timeline and Sample Composition by Treatment Category



quo)

- T1: Tailored advice for pastoralists + Sales incentive for insurance agents
- T2: Tailored advice for pastoralists + Welfare incentive for insurance agents

4 Intervention

To pastoralists in Advice+Sales and Advice+Welfare villages, we provided tailored advice based on an Expected Utility Theory (EUT) model of expected consumer surplus (ECS) from buying or not buying IBLI, building upon the approach developed by Harrison, Morsink, and Schneider (2023). We integrated information about product characteristics such as premium rates and maximum payout rates with individually estimated risk preferences elicited at baseline, as well as real-time data on the herder's current herd size and subjective expectations about livestock losses and the index being triggered.

Before each data collection round, we computed the ECS from purchasing IBLI for each potential share of each animal species in the herd. Following the setup from Clarke (2016), a herder deciding whether to purchase insurance faces three types of uncertainties. First, the herder's livestock might die with probability p. Second, the index might be triggered with probability q. Third, it is possible that an index is not triggered but a loss occurs, known as basis risk, with probability r.

Hence, there are four possible states for this pastoralist: s_1 (No herd loss, index not triggered), s_2 (No herd loss, index triggered), s_3 (Herd loss, index not triggered), s_4 (Herd loss, index triggered).

In each state, the consumer behaves consistently with EUT and has a CRRA utility function. We calculate the certainty equivalent of the decision to purchase insurance (CE_{buy}) and not to purchase insurance (CE_{nobuy}). Then ECS from purchasing insurance is represented by the difference between the two certainty equivalents; $CE_{buy} - CE_{nobuy}$. The procedure for the ECS calculation is explained in detail in Appendix A.

Based on this calculation, we recommend the pastoralists to purchase IBLI for the share of their herd that maximizes ECS, based on the following criteria: If the calculated ECS significantly differs from the ECS of not purchasing insurance, we identify the share that yields the highest ECS. If this share equals 0, we advise the herder against purchasing insurance. Conversely, if this share exceeds 0, we recommend purchasing insurance. When advising the purchase of insurance, we also offer the recommended number of animals to insure, based on the share that generates the highest expected consumer surplus. In cases where there is no significant difference, we inform the herder that our advice is inconclusive.

We also showed a 15-minute video about the welfare framework of this tailored advice before the survey for the treatment group starts. The video presented the stories of three fictional pastoralists who receive one of the three types of advice – to purchase, not to purchase, or inconclusive advice. It explains the information we use to generate the tailored advice: risk attitude, the index unit where the pastoral household resides, the historical average IBLI payment probability in the Index Unit, subjective expectations of the likelihood that an IBLI payout will be triggered, and subjective expectations of the probability of livestock survival. The video was recorded in the local language, and used pictures of the fictional pastoralists as well as the number of animals, as demonstrated in Figure B1. In this video, we explicitly described that if the pastoralist doesn't answer truthfully or believes that the framework insufficiently reflects their assessment of the value of IBLI, the herder should not consider accepting the advice.

For insurance agents, standard sales incentives were applied to the sales from Control and Advice+Sales villages. It offers 8% commission of the total insurance premium sales in the current sales season to the agents. The amount of incentive increases as sales volume grows, with the upper bound set at $33 per sales season per agent.

For Advice+Welfare villages, we designed an incentive structure for the sales agents to incentivize them to promote the insurance decisions that maximize ECS of herders, based on the tailored advice, rather than maximizing sales. Therefore, with this incentive scheme which we call "welfare" incentive, the amount of incentive is maximized if the herder follows their tailored advice

exactly with a declining payment schedule either side. To attribute any effects on sales agents' behavior to the incentive structure rather than the amount of the incentive, the average expected incentive for an agent in a village with welfare incentives was set so that it equalized the expected agent commissions across treatment arms.

5 Data, Balance, and Empirical strategy

5.1 Data Sources

We use multiple sources of data in our study, including administrative data from the insurance company, data from the surveys of household and insurance agents, and data from lab-in-the-field experiments designed to elicit risk preferences.

We obtained administrative data from insurance companies, comprising household-level insurance sales for each sales season and the corresponding incentives received by insurance sales agents. It also includes the information on the raffle tickets collected from study participants. We devised raffle tickets to gauge the efforts of sales agents in promoting insurance. These raffle tickets were distributed to survey respondents during the survey. Insurance agents collected these tickets during their promotion/sales visits and submitted them to the company upon the report of the sales. At the conclusion of each sales season, raffle draws were conducted without replacement, with the prize of USD 138 for the winners.[2] Consequently, the more households a sales agent visited during the sales window for promotion, the higher their chances of winning the raffle.

Another data source is surveys of pastoralists and sales agents conducted prior to each sales window, encompassing four rounds: Baseline, midline 1, midline 2, and endline which aimed to capture demographic information and provide input for calculating expected consumer surplus. In addition to household demographics such as age, gender, marital status, education, religion, and household size, we gathered data on herd size, livestock management (including losses, sales, intake, and expenditure), and awareness of and knowledge about IBLI.

Lab-in-the-field experiments were conducted to elicit risk preferences, which we utilized as an input for expected consumer surplus calculation.

[2] 15 raffles were drawn after the midline 1 round, and 30 raffles were drawn after the midline 2 and endline rounds.

5.2 Sample, Summary statistics, and Balance

Our sample is drawn from 240 villages across 80 kebeles in the Borana zone, each with primary cooperatives capable of selling IBLI products. Households were randomly sampled from household lists, with 10 to 16 households chosen from each village, resulting in a total of 2,416 sample households per round.

Each insurance agent was assigned to a kebele for their operation. Since our study covers 80 kebeles in 13 woredas, we have 80 agents, each serving three study villages per kebele. Thus, the unit of analysis for the agents' activities is 240 agent-villages.

Table 1 reports baseline characteristics of herders and balance checks for the randomization. Columns (1)-(3) display summary statistics of key variables for the control group, Advice+Sales group, and Advice+Welfare group. The average age of respondents is 43 years, with 38 percent being female and 87 percent married. Educational attainment is low, with 19 to 22 percent literate in any language and an average of 1.3 to 1.4 years of education.

At baseline, the average herd size was 12.7 to 13.5 Tropical Livestock Units (TLUs)[3], with 1.8 to 1.9 TLUs were lost in the past 12 months. Pastoralists spent 5,235 to 5,618 Ethiopian Birr (equivalent to 112 USD) on livestock input in the past 12 months. Experience with IBLI is limited: 31 to 34 percent of pastoralists have heard of IBLI, an average knowledge score is 1.7 out of 9, and 8.6 to 10 percent of pastoralists have ever purchased IBLI prior to our experiment.

Herder characteristics are balanced across treatment arms. Columns (4) to (6) of Table 1 show tests of differences in means between the treatment arms. The differences are not jointly statistically significant, with p-values of 0.44, 0.46, and 0.46 for control vs. Advice+Sales incentive villages and Advice+Welfare incentive villages, and between the treatment villages. Normalized differences are below the 0.25 threshold in all cases. Of the 42 differences examined, four are statistically significant – three at the ten percent level, and one at the five percent level.

There was no attrition at the household level; all 2,416 households were followed through four rounds. There were minimal changes in respondents within the households: from our baseline sample, 6.8% changed the respondent in midline 1, 0.5% in midline 2, 0.04% in endline. These changes were not diffential across treatment arms. Table B1 shows sample attrition across treatment arms.

Table 2 provides baseline characteristics of insurance agents and balance checks for the randomization using midline 1 data. Columns (1) to (3) show summary statistics of key variables for

[3]Tropical Livestock Units (TLUs) integrate cattle, camels, sheep, and goats into a single unit. 1 TLU is equivalent to 0.7 camels, 1 cow, or 10 shoats.

Table 1: Balance of Baseline Variables of Herders Across Treatment Groups

	Summary statistics			Balance		
	Control	Advice + Sales	Advice + Welfare	Advice + Sales vs. Control	Advice + Welfare vs. Control	Advice + Welfare vs. Advice + Welfare
	(1)	(2)	(3)	(4)	(5)	(6)
Respondent age in years	43.3	43.7	43.4	0.439	0.084	-0.369
	[16.1]	[16.4]	[16.4]	(0.757)	(0.704)	(0.632)
				{0.027}	{0.008}	{-0.019}
Female respondent	0.378	0.376	0.385	-0.002	0.008	0.010
	[0.485]	[0.485]	[0.487]	(0.022)	(0.021)	(0.019)
				{-0.004}	{0.016}	{0.019}
Married respondent(=1)	0.870	0.879	0.874	0.009	0.005	-0.004
	[0.337]	[0.326]	[0.332]	(0.014)	(0.015)	(0.012)
				{0.028}	{0.013}	{-0.015}
N of household members	5.78	5.81	5.82	0.040	0.058	0.017
	[2.30]	[2.31]	[2.20]	(0.094)	(0.092)	(0.073)
				{0.017}	{0.022}	{0.005}
Literate in any language (=1)	0.194	0.222	0.215	0.029	0.023	-0.006
	[0.396]	[0.416]	[0.411]	(0.020)	(0.019)	(0.017)
				{0.069}	{0.051}	{-0.018}
Years of education	1.32	1.39	1.45	0.077	0.139	0.060
	[3.20]	[3.21]	[3.27]	(0.162)	(0.155)	(0.128)
				{0.024}	{0.041}	{0.017}
Traditional religion (=1)	0.655	0.658	0.664	0.003	0.008	0.004
	[0.476]	[0.475]	[0.473]	(0.017)	(0.018)	(0.016)
				{0.007}	{0.020}	{0.013}
Livestock owned or herded (TLU)	13.5	12.7	13.3	-0.855	-0.189	0.664
	[20.8]	[15.2]	[21.8]	(0.779)	(0.890)	(0.743)
				{-0.048}	{-0.010}	{0.034}
Annual livestock loss (TLU)	1.91	1.94	1.75	0.037	-0.166	-0.193
	[5.02]	[4.43]	[3.29]	(0.221)	(0.219)	(0.171)
				{0.008}	{-0.038}	{-0.051}
Annual livestock input expenditure (ETB)	5618.3	5235.0	5427.8	-387.9	-205.4	189.4
	[10287.6]	[8558.1]	[10665.8]	(395.7)	(403.4)	(353.4)
				{-0.041}	{-0.018}	{0.020}
Has land cultivation right (=1)	0.474	0.494	0.505	0.022	0.035*	0.013
	[0.500]	[0.500]	[0.500]	(0.021)	(0.021)	(0.019)
				{0.041}	{0.063}	{0.021}
Heard of IBLI (=1)	0.338	0.342	0.307	0.004	-0.032*	-0.035**
	[0.473]	[0.475]	[0.462]	(0.018)	(0.019)	(0.015)
				{0.009}	{-0.065}	{-0.074}
IBLI knowledge score (1-9, 9 Highest)	1.68	1.75	1.57	0.072	-0.106	-0.176*
	[2.90]	[2.98]	[2.81]	(0.126)	(0.118)	(0.098)
				{0.023}	{-0.037}	{-0.060}
Ever purchased IBLI (=1)	0.086	0.100	0.091	0.014	0.006	-0.008
	[0.280]	[0.300]	[0.288]	(0.015)	(0.015)	(0.012)
				{0.049}	{0.020}	{-0.029}
P-value of Joint F-test:				0.442	0.455	0.455

Standard deviations are in brackets, and standard errors, clustered at the village level, are in parentheses, and the normalized differences are in the curly brackets.

Columns (1) to (3) report the average of the baseline characteristics of pastoralists in control villages, Advice+Sales incentive villages, and Advice+Welfare incentive villages, respectively. Columns (4) to (6) report mean and normalized differences between the Advice+Sales villages and the control villages, between the Advice+Welfare villages and the control villages, and between the Advice+Sales villages and Advice+Welfare incentive villages respectively. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele fixed effects.

Traditional religion equals 1 if the household's main religion is "Wakefata" a local traditional religion. Livestock owned or herded is the sum of the animals owned or herded by the household at baseline, aggregated using tropical livestock unit. Tropical Livestock Units (TLUs) integrate cattle, camels, sheep, and goats into a single unit. 1 TLU is equivalent to 0.7 camels, 1 cow, or 10 shoats. Annual livestock loss is the sum of animals lost in the past 12 months aggregated using TLU. Annual Livestock input expenditure includes expenditures on water for animals, animal feed or fodder, veterinarian services, transportation costs, livestock tax, salary/wage for labor.

the control group, Advice+Sales group, Advice+Welfare group. The agents rated herders' average IBLI knowledge per village at 6 out of 10 and their overall expectation of the index being triggered at 5.4 out of 10. The average experience as a sales agent was 3.4 years, and 13 to 15 percent had not visited the study villages before. These agents, being from the local community, were well connected with the residents: 38 to 41 percent had a family member in each village, 10 to 13 percent received transfers from respondents in the past 12 months, and 15 to 19 percent gave transfers to respondents.

Insurance agents' characteristics are balanced across treatment arms. Columns (4) to (6) of Table 2 show tests of differences of sales agents' characteristics in means between the treatment and the control villages. Differences are not jointly statistically significant, normalized differences are below the 0.25 threshold in all cases, and none of the 21 differences examined are statistically significant.

In addition to the balance of covariates, we also investigate whether the probability of a pastoralist receiving the advice to purchase insurance is similar across treatment arms. For this purpose, we generated tailored advice for the control group after data collection. Table B2 shows that 82 percent of the control group would have received the advice to purchase insurance, similar to the treatment groups (Column (1)). Similarly, the number of animals advised to insure was also not statistically different between treatment arms (Column (2)).

5.3 Empirical strategy

To estimate the impacts of the the tailored advice and the sales agent incentives, we use the following equation:

$$y_{(a)izkt} = \beta_0 + \beta_1 T1_{zk} + \beta_2 T2_{zk} + \delta_{kt} + \varepsilon_{(a)izkt} \tag{1}$$

where $y_{(a)izkt}$ is the outcome of interest for herder (or sales agent) i in village z of kebele k in survey round t, for animal species a in some specifications. $T1_{zk}$, $T2_{zk}$ are indicators for a village z in kebele k being assigned to T1 (Advice+Sales incentives group) or T2 (Advice+Welfare incentives) villages, respectively. δ_{kt} is a kebele $\times$ survey round-fixed effect. Standard errors, $\varepsilon_{(a)ikzt}$, are clustered at the village level, which is the level of randomization, following Abadie et al. (2022). We also report p-values from randomization inference, following Athey and Imbens (2017).

Some variables are measured at herder $\times$ animal species level: The tailored advice was generated separately for each animal type. Insurance purchase decision is also made separately for each animal species. Subjective expectations for the livestock survival for upcoming and subsequent seasons were also measured for each animal. Therefore, for these outcome variables, we also es-

Table 2: Balance of Baseline Variables of Sales Agents Across Treatment Groups

	Summary statistics			Balance		
	Control	Advice + Sales	Advice + Welfare	Advice + Sales vs. Control	Advice + Welfare vs. Control	Advice + Welfare vs. Advice + Welfare
	(1)	(2)	(3)	(4)	(5)	(6)
Agents' impression on herders' IBLI knowledge	6.03	6.08	5.83	0.053	-0.201	-0.254
	[2.15]	[2.04]	[2.09]	(0.161)	(0.177)	(0.164)
				{0.025}	{-0.095}	{-0.123}
Agent's expectations about the index triggered	5.40	5.29	5.44	-0.112	0.038	0.150
	[3.33]	[3.27]	[3.01]	(0.304)	(0.278)	(0.292)
				{-0.034}	{0.012}	{0.048}
Years worked as insurance agent in the village	3.35	3.39	3.36	0.037	0.012	-0.025
	[3.10]	[3.08]	[3.14]	(0.095)	(0.128)	(0.135)
				{0.012}	{0.004}	{-0.008}
Never visited this village before (=1)	0.150	0.150	0.125	0.000	-0.025	-0.025
	[0.359]	[0.359]	[0.333]	(0.028)	(0.022)	(0.025)
				{0}	{-0.072}	{-0.072}
Have a family member in this village (=1)	0.380	0.375	0.412	-0.006	0.031	0.038
	[0.488]	[0.487]	[0.495]	(0.063)	(0.066)	(0.066)
				{-0.010}	{0.067}	{0.076}
Received something from respondents (=1)	0.100	0.100	0.125	0.000	0.025	0.025
	[0.302]	[0.302]	[0.333]	(0.040)	(0.045)	(0.045)
				{0}	{0.079}	{0.079}
Gave something to respondents (=1)	0.188	0.188	0.150	0.000	-0.037	-0.037
	[0.393]	[0.393]	[0.359]	(0.046)	(0.047)	(0.044)
				{0}	{-0.100}	{-0.100}
P-value of Joint F-test:				0.999	0.182	0.224

Standard deviations are in brackets, and standard errors, clustered at the village level, are in parentheses, and the normalized differences are in the curly brackets.

Columns (1) to (3) report the average of the baseline characteristics of sales agents in control villages, Advice+Sales incentive villages, and Advice+Welfare incentive villages, respectively. Columns (4) to (6) report mean and normalized differences between the Advice+Sales group, Advice+Welfare group and the control group, and between the Advice+Sales villages and Advice+Welfare incentive villages respectively. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele fixed effects.

Agents' impression of herders' IBLI knowledge is the average of the agents' belief about the share of herders who correctly answered each IBLI knowledge question. Agents answered on a scale of 10: 0 is the least likely (0-10%), 10 being the most likely (91-100%). Agents' expectations about the index triggered are the agents' subjective beliefs about the overall probability of the index being triggered in the village. Agents answered on a scale of 10: 0 is the least likely (0-10%), 10 being the most likely (91-100%).

timate the effects at herder×animal species level. Subscript a is used to denote the animal species in these specifications.

In that regard, β_1 represents the impacts of the tailored advice with agents receiving sales incentive relative to the control group, β_2 represents the impact of tailored advice with agents receiving welfare-aligned incentives relative to the control group. We also test and present the difference between β_1 and β_2 statistically.

6 Results

6.1 IBLI purchase

We first examine the impact of tailored advice on insurance uptake. Table 3 displays the results of estimating Eq. (1) on the insurance uptake at the extensive margin (Column (1)) and at the intensive margin (Columns (2) and (3)). The results indicate that the tailored advice alone does not have a substantial impact on insurance purchase. In contrast, when sales agents received incentives aligned with the tailored advice, the impact of tailored advice was substantial, leading to a one percentage point decrease in insurance purchase, statistically significant at the five percent level. This translated to a 12.2 percent decrease in insurance uptake compared to the control group's average take-up rate of 8 percent. We also reject the hypothesis that the effects on the two groups are the same at the 10 percent significance level, with p-values from the equality test to be 0.06.

The effects on the number of animals insured, not conditional on the purchase, were not statistically significant, but they exhibited a similar direction of effect to that observed in the extensive margin. In Column (2), negative point estimates were observed for both arms, with larger point estimates observed when the sales agents received incentives aligned with the tailored advice. However, these estimates were not statistically significant.

The effects on the number of animals insured, conditional on the purchase, were not statistically significant either, and the sign of the coefficients is positive. (Column (3)). The effect of the tailored advice coupled with agent incentives aligned with the advice is estimated to be 0.354, marginally insignificant with the p-value of 0.16.

Table 3: IBLI Purchase

	IBLI purchase=1	N of animals insured	N of animals insured | Purchase=1
	(1)	(2)	(3)
Advice+Sales vs. Control	-0.003	-0.012	0.002
	(0.439)	(0.640)	(0.992)
	[0.511]	[0.696]	[0.993]
Advice+Welfare vs. Control	-0.010**	-0.022	0.354
	(0.0277)	(0.409)	(0.156)
	[0.0700]	[0.548]	[0.316]
Advice+Sales vs. Advice+Welfare	-0.006*	-0.009	0.352
	(0.0617)	(0.649)	(0.140)
	[0.0800]	[0.590]	[0.230]
N	26744	26744	1909
Control Mean	0.0818	0.312	3.812

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele $\times$ round fixed effects.

Column (1) presents the impact on the insurance take-up at the extensive margin, denoted as one if a pastoralist purchased insurance in each sales season, and zero otherwise. Columns (2) and (3) depict the impact at the intensive margin of insurance take-up. The intensive margin refers to the number of animals insured in each sales season. In Column (2), the number of insured animals is recorded, with the count treated as zero if a pastoralist did not purchase insurance. Column (3) presents the number of animals insured, conditional on a pastoralist purchasing insurance.

The number of observations in Columns (1) and (2) is 26,744, calculated as (2,416 x 4 animal species x 3 rounds) - 562 (control households randomized to additional treatment at endline). In Column (3), the number of insured animals, conditional on purchasing insurance, is estimated with 1,909 households, as 1,915 households purchased insurance, and 6 singleton observations were dropped to avoid biases in the standard error.

6.2 Adherence to the tailored advice

We also examine whether, and to what extent the herders followed the advice. The first measure is whether the direction of the herder's decision is in line with the advice. In other words, it is an indicator equals one if the herder purchased insurance when the advice was to purchase, and did not purchase insurance when the advice was not to purchase. The second measure is how close the actual decision was to the advice, which is measured by the absolute value of the difference between the advised number of animals to insure and the actual number of insured animals. Both measures were divided into three cases; i) any type of advice (Columns (1) and (2)), ii) advice to purchase insurance (Columns (3) and (4)), and iii) advice not to purchase insurance (Columns (5) and (6)) [4]

To compare the herders' purchase decisions relative to the tailored advice across treatment arms, we generated hypothetical advice for pastoralists from control villages, that they would have received if they were provided advice. Using this, we first document that on average, 26.3 percent of the pastoralists makes a decision that is consistent with the tailored advice even without receiving the advice. More specifically, 12.5 percent of the pastoralists purchase insurance when purchasing the insurance is the ECS-maximizing decision for them based on our model. Moreover, 91.5 percent of the pastoralists do not purchase insurance when not purchasing the insurance is the ECS-maximizing decision for them based on our model.

Results in Table 4 indicate that when tailored advice is paired with welfare incentives for insurance agents, pastoralists are more likely to adhere to the non-purchase advice. When paired with sales incentive, on the other hand, tailored advice does not significantly influence pastoralists' tendency to follow the advice.

When we do not separate the type of advice, neither of the treatment seem to have substantial effects on the adherence to the advice, both the direction and the degree. (Columns (1) and (2)). Similarly, when the pastoralists are advised to purchase insurance, both measures of adherence to the advice are statistically insignificant in both treatment arms.

However, when advised against purchasing insurance, pastoralists in the Advice+Welfare villages are more likely to comply (Column (5)). The Advice+Welfare group shows a 2.1 percentage point increase in adherence, representing a 2.3 percent rise relative to the control group mean. The control group mean of 91.5% means that without any treatment, 8.5 percent of the pastoralists purchase insurance when not purchasing the insurance maximizes their welfare. Then the 2.1 percentage point increase in the adherence to the non-purchase advice among the Advice+Welfare

[4] We exclude the cases where we refrained from offering the advice.

villages is translated to 25 percent decrease in such cases.

On the other hand, we do not find statistically significant effect of tailored advice combined with sales incentives for agents. We also reject the hypothesis of equal impacts at the ten percent significance level, with p-values from the equality test to be 0.09. Furthermore, the number of animals insured aligns more closely with the advised amount in the Advice+Welfare group, with a statistically significant decrease of 47.8 percent compared to the control group mean. We also reject the hypothesis of equal impacts at the five percent significance level, with p-values from the equality test to be 0.014. The number of insured animals do not differ statistically significantly in both arms (Column (6)).

The result is also consistent with what we found about the IBLI purchase. When pastoralists from the Advice+Welfare villages receive advice not to purchase, they are more likely to follow the advice, leading to a decrease in the purchase of IBLI policies in Advice+Welfare group.

Table 4: Adherence to the advice

	Any advice		Advised to purchase		Advised not to purchase	
	Adhere to advice=1	|Purchase - Advice|	Adhere to advice=1	|Purchase - Advice|	Adhere to advice=1	|Purchase - Advice|
	(1)	(2)	(3)	(4)	(5)	(6)
Advice+Sales vs. Control	-0.006	-0.009	-0.008	0.018	0.006	0.011
	(0.441)	(0.967)	(0.270)	(0.942)	(0.517)	(0.816)
	[0.552]	[0.972]	[0.347]	[0.955]	[0.562]	[0.842]
Advice+Welfare vs. Control	0.001	-0.043	-0.011	0.043	0.021**	-0.048
	(0.905)	(0.840)	(0.128)	(0.862)	(0.0232)	(0.264)
	[0.910]	[0.870]	[0.225]	[0.878]	[0.0610]	[0.394]
Advice+Sales vs. Advice+Welfare	0.007	-0.035	-0.003	0.025	0.015*	-0.059
	(0.306)	(0.851)	(0.583)	(0.909)	(0.0889)	(0.137)
	[0.455]	[0.787]	[0.559]	[0.862]	[0.0570]	[0.238]
N	17064	17064	14123	14123	2914	2914
Control Mean	0.263	5.307	0.125	6.391	0.915	0.209

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele $\times$ round fixed effects.

Columns (1) and (2) compare the adherence to advice across treatment arms, irrespective of whether the advice pertains to purchasing insurance or refraining from it. Column (1) represents adherence to the advice, while Column (2) indicates the absolute difference in the number of insured animals. Columns (3) and (4) display estimates for advice recommending the purchase of insurance, while Columns (5) and (6) show estimates for advice advising against purchasing insurance.

The number of observations in Columns (1) and (2) is 17,064, which is the number of herders received any tailored advice across midline 1, 2 and endline. The number of observations in Columns (3) and (4) is 14,539, which is the number of herders who received advice to buy insurance across midline 1, 2 and endline. The number of observations in Columns (5) and (6) is 2,499, which is the number of herders who received advice not to buy insurance across midline 1, 2 and endline (2,525) after dropping 26 singleton observations.

6.3 Expected Consumer Surplus

To understand if tailored advice combined with agents' incentive schemes impacts consumer welfare from insurance purchases, we measure welfare gains relative to the maximum possible welfare. Specifically, we calculate the difference between the Expected Consumer Surplus (ECS) from the actual insurance decision and the maximum ECS, conditional on the pastoralist's herd size, subjective expectations about the index being triggered, and livestock survival probability. For robustness, we also measure welfare gains relative to the ECS from the advice given, i.e., the difference between the ECS from the actual insurance decision and the ECS based on the advised number of animals to insure. These two measures are similar to each other, as shown by Figure B3.

We investigate consumer welfare in three scenarios: overall consumer welfare, welfare when the consumers are advised to purchase insurance, and welfare when they are advised against purchasing insurance. The results in Table 5 show that the tailored advice, when combined with welfare incentives for agents, increase welfare gain when the herders are advised against purchasing insurance.

When examining overall consumer welfare, tailored advice, regardless of the incentive scheme for agents, did not have substantial effects on relative welfare gains. However, all estimated coefficients were positive, and the magnitude of the coefficients was larger in the Advice+Welfare group: the estimated coefficient for this group was 13.5 with a p-value of 0.143. The difference between the two treatment groups had an estimated coefficient of 13.4, with a p-value of 0.13. Similarly, relative welfare gains were statistically indistinguishable across treatment arms when pastoralists were advised to purchase insurance.

When pastoralists were advised against purchasing insurance, the relative welfare gain was higher in the Advice+Welfare group, with the estimated coefficient statistically significant at the 10 percent level. In contrast, the effect for the Advice+Sales village pastoralists was negative but statistically insignificant. These results are robust when the unit of analysis is changed to the household level (Table B5).

We also investigated welfare gains relative to the ECS from the advice given. Table B6 and B7 show a similar pattern to the welfare gains relative to the maximum ECS, indicating an increase in welfare gains for households in Advice+Welfare villages, statistically significant at the 10 percent level, but no statistically significant effects on other outcomes.

These results align with observed behavioral changes: Pastoralists receiving tailored advice from agents operating with welfare incentives are less likely to purchase insurance, partly due

to a greater tendency to follow advice not to purchase. Consequently, welfare for this group of pastoralists increased.

Table 5: Expected Consumer Surplus Relative to Maximum Expected Consumer Surplus

	Any Advice	Advice: Purchase insurance	Advice: Do not purchase insurance
	(1)	(2)	(3)
Advice+Sales vs. Control	0.082	-1.378	-1.665
	(0.993)	(0.895)	(0.645)
	[0.995]	[0.911]	[0.761]
Advice+Welfare vs. Control	13.511	10.387	6.565*
	(0.143)	(0.324)	(0.0611)
	[0.252]	[0.454]	[0.143]
Advice+Sales vs. Advice+Welfare	13.429	11.765	8.230**
	(0.132)	(0.239)	(0.0488)
	[0.168]	[0.255]	[0.118]
N	16630	14135	2470
Control Mean	-243.1	-283.8	-14.44

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele $\times$ round fixed effects.

Column (1) uses the full sample of household $\times$ animal species which ECS can be generated. Column (2) and (3) uses the sample who received advice to insure animal and advice not to insure animal, repectively.

The number of observations in Columns (1) is 16,630, which is the number of herders that maximum ECS was calculated across midline 1, 2 and endline. The number of observations in Columns (2) is 14,153, which is the number of herders who received advice to buy insurance across midline 1, 2 and endline. The number of observations in Columns (3) is 2,470, which is the number of herders who received advice not to buy insurance across midline 1, 2 and endline (2,525) after dropping 55 singleton observations.

7 Mechanisms

7.1 Understanding and perceived value of insurance

The effects of tailored advice and agents' incentive schemes may have been driven by changes in pastoralists' understanding or perceived value of the product. We assessed IBLI knowledge through 10 questions about product attributes and hypothetical insurance payout scenarios. Perceived value of the product were measured by directly asking whether IBLI is considered worthwhile for everyone.

Table B8 illustrates that neither tailored advice nor agent incentive schemes had an impact on pastoralists' understanding or perceived value of the product. Table B9 further indicates that neither treatment significantly affected responses to individual knowledge questions. However, pastoralists in the Advice+Sales group did show a decrease in correct answers regarding the index used for payments and the third payout scenario.

7.2 Subjective expectations about product performance

We also investigated the effects on pastoralists' subjective expectations regarding the performance of IBLI in general. We asked about their beliefs concerning the likelihood of the index being triggered, severe drought occurrences, and various scenarios involving the index and livestock survival.

Our findings indicate that neither tailored advice nor the incentive scheme substantially altered pastoralists' beliefs, except for their beliefs regarding animal survival during droughts. Column (5) of Table B10 shows that pastoralists who received tailored advice were more likely to believe that their animals are less likely to die when the index is triggered, with an increase of 3.2 to 3.6 percent, which is statistically significant at the ten to five percent level.

7.3 Insurance agents' effort

If the welfare incentive scheme incentivized insurance agents to exert more effort, it could potentially lead to increased adherence to advice and improved consumer welfare in Advice+Welfare villages. We quantify agents' efforts by examining the number of raffle tickets collected and the share of herders from whom agents collected raffle tickets. Additionally, we assess the effects on agents' incentives, including the amount earned and the share of herders on which incentives were

earned, as indirect measures of agents' efforts, although it is influenced by both agents' actions and herders' responses.

Table B12 presents the estimated effects of tailored advice and incentive schemes on agents' effort. Firstly, we find that regardless of the incentive schemes, tailored advice does not impact the number of villages raffle tickets are collected from, or the number of raffle tickets collected by the agents in each village (Columns (1) and (2)). The estimated coefficients are statistically and economically insignificant.

However, when tailored advice is coupled with aligned welfare incentives, it increases the share of herders within a village for whom an agent earns an incentive by 3.6 percentage points, significant at the ten percent level (Column 3). This aligns with the observation that pastoralists in Advice+Welfare villages are more likely to adhere to the non-purchase advice, showing a 17 percent increase compared to the 25 percent increase in adherence to non-purchase advice. In contrast, sales incentives combined with tailored advice do not affect this share. The difference between these two groups is statistically significant at the five percent level. Lastly, we do not observe a statistically significant difference in the amount of sales agents' incentives across treatment arms (Column 4).

In summary, these results suggest that insurance agents exerted similar levels of effort to reach pastoralists across different arms. Tailored advice increased the likelihood of achieving incentive-inducing sales per agent, particularly when the incentive scheme was aligned with tailored advice. However, it did not result in increased total incentives earned, implying that the effort of insurance agents is not likely the primary channel affecting outcomes.

7.4 Trust in insurance agents

Next, we investigate whether pastoralists' trust in insurance agents is influenced by tailored advice. We measure trust using a composite trust scale, which averages responses to four questions assessing various aspects of pastoralists' perceptions. These questions gauge whether agents act in the pastoralists' best interest, the perceived importance of agents' advice, trust in agents to handle premium payments, and trust in agents to deliver payouts if the index triggers. Responses are scored on a scale from 0 to 10, with a higher score indicating greater trust.

We observe that receiving tailored advice, irrespective of the incentive schemes, decreases trust in insurance agents. As shown in Table 6, column (1) reveals that the Advice+Sales group experiences a reduction in the insurance agent trust scale by 0.14, while the Advice+Welfare group sees a decrease of 0.13, both statistically significant at the five percent level. Columns (2) to (5) further

illustrate these negative effects of both treatments on three out of the four dimensions of trust in sales agents. Regarding the indicator on whether pastoralists believe payouts will be delivered to them if issued, the estimated coefficients are negative, although not statistically significant, with magnitudes similar to those observed in other trust variables.

Table 6: Trust in insurance agents

	Composite trust scale	Agents advise in my best interests	Agents' advice is important	Agents deliver premium to insurer	I will receive entitled payment
	(1)	(2)	(3)	(4)	(5)
Advice+Sales vs. Control	-0.138**	-0.151**	-0.169**	-0.145*	-0.087
	(0.0376)	(0.0479)	(0.0204)	(0.0729)	(0.235)
	[0.0930]	[0.0980]	[0.0600]	[0.145]	[0.302]
Advice+Welfare vs. Control	-0.133**	-0.159**	-0.118*	-0.147*	-0.111
	(0.0372)	(0.0305)	(0.0893)	(0.0667)	(0.142)
	[0.0680]	[0.0440]	[0.119]	[0.123]	[0.243]
Advice+Sales vs. Advice+Welfare	0.005	-0.007	0.052	-0.001	-0.024
	(0.931)	(0.900)	(0.388)	(0.984)	(0.701)
	[0.969]	[0.920]	[0.884]	[0.985]	[0.657]
N	4270	4270	4270	4270	4270
Control Mean	5.598	5.650	5.665	5.622	5.455

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele $\times$ round fixed effects.

All outcome variables measured on a scale of 0 to 10, where 10 indicates the strongest trust in agent. Outcome variable of column (1) is the composite trust scale – the average score of the four following variables. Outcome variable of column (2) is to what extent pastoralists agree that the sales agents advise in their best interest. Outcome of column (3) is to what extent pastoralists agree that the sales agents' financial advice is important for them. Outcome of column (4) is to what extent the pastoralist think that the agent will deliver the paid premium to the insurer. Outcome of column (4) is to what extent the pastoralist think that they will receive the insurance payout if it occurs.

The number of observations for all columns is 4,270, calculated as (2,416 x 2 rounds) - 562 (control households randomized to additional treatment at endline). We use two rounds – midline 2 and endline for this analyses, as these outcomes were measured between the video treatment and the advice in midline 1.

7.5 Heterogeneous effects by trust

We further investigate the role of trust in understanding the effect of tailored advice. To do so, we estimate the following equation:

$$\begin{aligned} y_{(a)izkt} =& \alpha_0 + \alpha_1 \cdot T1_{zk} + \alpha_2 \cdot T2_{zk} + \alpha_3 \cdot \text{High Trust}_{izk} + \alpha_4 \cdot T1_{zk} \times \text{High Trust}_{izk} \\ &+ \alpha_5 T2_{zk} \times \text{High Trust}_{izk} + \delta_{kt} + \varepsilon_{(a)izkt} \end{aligned} \tag{2}$$

where High Trust$_{izkt}$ equals one if a herder i in village z of kebele k's composite trust score was higher than median value: 5 out of 10. All other variables are defined as the same as Equation 1. Coefficient α_4 and α_5 denotes the differential effect of tailored advice combined with sales incentives, and tailored advice with welfare incentives across herders with high and low trust in insurance agents.

We find that the average effects for herders in Advice+Welfare villages were concentrated among those with high trust in agents. In contrast, for herders in Advice+Sales villages, the effects were concentrated among those with low trust in agents. However, these effects were offset by opposite effects among herders with high trust in agents.

First, Column 1 of Table B13 shows that the decrease in IBLI purchase among pastoralists in Advice+Welfare villages is driven by the herders with high trust in agents: The estimated coefficients for the pastoralists with low trust in agents is negative but small and statistically insignificant. It also indicates that in Advice+Sales villages, herders with low trust in agents decreased their IBLI purchases statistically significantly, and significantly more than herders with high trust in agents. We do not find hetergeneous effects on the intensive margin of the insurance purchase.

Second, Table B14 shows that in Advice+Welfare villages, the increased adherence to the non-purchase advice was concentrated among the herders with high trust in agents, consistent with the decreased IBLI purchase in this group of herders. We also find that in Advice+Sales villages, herders with low trust in agents decrease the adherence to the purchase advice, which is offset by the herders with high trust in agents. This is also consistent with the decrease in IBLI purchase in herders with low trust in agents.

Lastly, Table B15 confirms that the decrease in IBLI purchase, driven by increased adherence to the non-purchase advice among herders with high trust in agents from Advice+Welfare villages, led to an increase in consumer welfare. However, in the Advice+Sales villages, the differential effects between the herders with low and high trust in agents are not observed in this case.

8 Conclusion

Improving the quality of financial decisions remains a challenging topic of research. Financial advice may help guide the financial decisions, as the abundance of data and technology enables the prediction of the optimal decisions. However, assessing whether such advice effectively enhances decision-making quality is nuanced, particularly in contexts where agents prioritize sales incentives over consumer welfare.

In this paper, we explore the impact of tailored financial advice and its interaction with agents' incentives on pastoralists' behavior and welfare in southern Ethiopia – a region with limited financial service exposure and low educational attainment. Our study focuses on Index-Based Livestock Insurance (IBLI), an insurance product with heterogeneous expected consumer welfare, and evaluates two interventions: personalized tailored financial advice for pastoralists based on their expected consumer surplus (ECS) using *real-time* herd size, subjective survival expectations, and index trigger inputs; and a "welfare" incentive scheme for insurance agents aimed at aligning agents' actions with the advice provided.

We find that tailoring financial advice based on *real-time* information can indeed enhance financial decision-making and increase consumer surplus. This improvement, however, exhibits only when agents' incentives are aligned with the advice, ensuring agents do not indiscriminately promote financial products. This combination of interventions led to a 12 percent reduction in insurance purchases, driven by a 25 percent decrease among herders purchasing insurance against their welfare – suggesting a decrease in excess demand. Notably, these behavioral changes correlate with a 46 percent increase in ECS relative to the optimal ECS.

Our analysis reveals trust in agents explains the behavioral effect. Tailored advice consistently diminishes trust in agents across different incentive structures. However, the influence of trust varies significantly depending on whether agents are driven by sales incentives or welfare incentives.

In contexts where agents operate under sales incentives, high levels of trust in agents tend to offset any negative impact stemming from reductions in necessary purchases that individuals with low trust in agents experience. On the other hand, when agents are motivated by welfare incentives, we observe no significant differential effect based on the level of trust in agents.

These findings underscore the importance of tailoring financial advice rather than providing generic information. Additionally, they emphasize the critical role of aligning agents' incentives with the welfare implications of financial decisions. Moreover, our study highlights the intricate relationship between trust, incentive structures, and the effectiveness of tailored financial advice in

influencing consumer behavior and welfare outcomes. Given the heterogeneous welfare implications and notable disadoption rates of the product, our results can inform strategies for extending these products to underserved populations effectively.

References

Abadie, Alberto, Susan Athey, Guido W Imbens, and Jeffrey M Wooldridge (Oct. 6, 2022). "When Should You Adjust Standard Errors for Clustering?*". *The Quarterly Journal of Economics*, qjac038.

Abaluck, Jason, Mauricio Caceres Bravo, Peter Hull, and Amanda Starc (Aug. 1, 2021). "Mortality Effects and Choice Across Private Health Insurance Plans*". *The Quarterly Journal of Economics* 136.3, pp. 1557–1610.

Abaluck, Jason and Jonathan Gruber (June 2011). "Choice Inconsistencies among the Elderly: Evidence from Plan Choice in the Medicare Part D Program". *American Economic Review* 101.4, pp. 1180–1210.

Agarwal, Nikhil, Alex Moehring, Pranav Rajpurkar, and Tobias Salz (July 2023). *Combining Human Expertise with Artificial Intelligence: Experimental Evidence from Radiology*.

Allcott, Hunt and Christopher Knittel (Feb. 2019). "Are Consumers Poorly Informed about Fuel Economy? Evidence from Two Experiments". *American Economic Journal: Economic Policy* 11.1, pp. 1–37.

Ambuehl, Sandro, B. Douglas Bernheim, and Annamaria Lusardi (Nov. 2022). "Evaluating Deliberative Competence: A Simple Method with an Application to Financial Choice". *American Economic Review* 112.11, pp. 3584–3626.

Anagol, Santosh, Shawn Cole, and Shayak Sarkar (Mar. 1, 2017). "Understanding the Advice of Commissions-Motivated Agents: Evidence from the Indian Life Insurance Market". *The Review of Economics and Statistics* 99.1, pp. 1–15.

Angelova, Victoria, Will S. Dobbie, and Crystal Yang (Sept. 2023). *Algorithmic Recommendations and Human Discretion*.

Athey, S. and G. W. Imbens (Jan. 1, 2017). "The Econometrics of Randomized Experimentsa". In: *Handbook of Economic Field Experiments*. Ed. by Abhijit Vinayak Banerjee and Esther Duflo. Vol. 1. Handbook of Field Experiments. North-Holland, pp. 73–140.

Barrett, Christopher B., Nathaniel Jensen, Karlijn Morsink, Yuma Noritomo, and Hyuk Son (2024). "Long-run Effects of Catastrophic Drought Insurance". Working Paper.

Bernheim, B. Douglas (Oct. 2, 2021). "In defense of behavioral welfare economics". *Journal of Economic Methodology*.

Bhargava, Saurabh, George Loewenstein, and Justin Sydnor (Aug. 1, 2017). "Choose to Lose: Health Plan Choices from a Menu with Dominated Option*". *The Quarterly Journal of Economics* 132.3, pp. 1319–1372.

Butera, Luigi, Robert Metcalfe, William Morrison, and Dmitry Taubinsky (Jan. 2022). "Measuring the Welfare Effects of Shame and Pride". *American Economic Review* 112.1, pp. 122–168.

Carpenter, Jeffrey, Emiliano Huet-Vaughn, Peter Hans Matthews, Andrea Robbett, Dustin Beckett, and Julian Jamison (Mar. 1, 2021). "Choice Architecture to Improve Financial Decision Making". *The Review of Economics and Statistics* 103.1, pp. 102–118.

Chalmers, John and Jonathan Reuter (Nov. 1, 2020). "Is conflicted investment advice better than no advice?" *Journal of Financial Economics* 138.2, pp. 366–387.

Chantarat, Sommarat, Andrew G. Mude, Christopher B. Barrett, and Michael R. Carter (2013). "Designing Index-Based Livestock Insurance for Managing Asset Risk in Northern Kenya". *Journal of Risk and Insurance* 80.1. Pp. 205–237.

Clarke, Daniel J. (Feb. 2016). "A Theory of Rational Demand for Index Insurance". *American Economic Journal: Microeconomics* 8.1, pp. 283–306.

Currie, Janet M. and W. Bentley MacLeod (2020). "Understanding Doctor Decision Making: The Case of Depression Treatment". *Econometrica* 88.3. Pp. 847–878.

Egan, Mark (2019). "Brokers versus Retail Investors: Conflicting Interests and Dominated Products". *The Journal of Finance* 74.3. Pp. 1217–1260.

Engelmann, Jan B., C. Monica Capra, Charles Noussair, and Gregory S. Berns (2009). "Expert Financial Advice Neurobiologically "Offloads" Financial Decision-Making under Risk". *PLOS ONE* 4.3. e4957.

Ghili, Soheil, Ben Handel, Igal Hendel, and Michael D Whinston (Mar. 1, 2024). "Optimal Long-Term Health Insurance Contracts: Characterization, Computation, and Welfare Effects". *The Review of Economic Studies* 91.2, pp. 1085–1121.

Handel, Benjamin R. (Dec. 2013). "Adverse Selection and Inertia in Health Insurance Markets: When Nudging Hurts". *American Economic Review* 103.7, pp. 2643–2682.

Handel, Benjamin R. and Jonathan T. Kolstad (Aug. 2015). "Health Insurance for "Humans": Information Frictions, Plan Choice, and Consumer Welfare". *American Economic Review* 105.8, pp. 2449–2500.

Handel, Benjamin R., Jonathan T. Kolstad, Thomas Minten, and Johannes Spinnewijn (Sept. 2020). *The Social Determinants of Choice Quality: Evidence from Health Insurance in the Netherlands*.

Hanna, Sherman D. and Suzanne Lindamood (July 18, 2010). *Quantifying the Economic Benefits of Personal Financial Planning*. Rochester, NY.

Harris, Adam and Maggie Yellen (2024). "Human Decision-Making with Machine Prediction: Evidence from Predictive Maintenance in Trucking".

Harrison, Glenn, Karlijn Morsink, and Mark Schneider (2023). "Do No Harm? The Welfare Consequences of Behavioural Interventions". Working Paper, p. 105.

Harrison, Glenn W. and Jia Min Ng (2016). "Evaluating the Expected Welfare Gain from Insurance". *Journal of Risk and Insurance* 83.1. Pp. 91–120.

Hoechle, Daniel, Stefan Ruenzi, Nic Schaub, and Markus Schmid (2018). "Financial Advice and Bank Profits". *The Review of Financial Studies* 31.11. Pp. 4447–4492.

Jensen, Nathaniel D., Christopher B. Barrett, and Andrew G. Mude (Nov. 1, 2017). "Cash transfers and index insurance: A comparative impact analysis from northern Kenya". *Journal of Development Economics* 129, pp. 14–28.

Matsuda, Ayako, Kazushi Takahashi, and Munenobu Ikegami (July 1, 2019). "Direct and indirect impact of index-based livestock insurance in Southern Ethiopia". *The Geneva Papers on Risk and Insurance - Issues and Practice* 44.3, pp. 481–502.

Meroni, Michele, Michel M. Verstraete, Felix Rembold, Ferdinando Urbano, and François Kayitakire (Apr. 3, 2014). "A phenology-based method to derive biomass production anomalies for food security monitoring in the Horn of Africa". *International Journal of Remote Sensing* 35.7. Pp. 2472–2492.

Mullainathan, Sendhil and Ziad Obermeyer (May 1, 2022). "Diagnosing Physician Error: A Machine Learning Approach to Low-Value Health Care*". *The Quarterly Journal of Economics* 137.2, pp. 679–727.

Prelec, Drazen and George Loewenstein (Feb. 1998). "The Red and the Black: Mental Accounting of Savings and Debt". *Marketing Science* 17.1. Pp. 4–28.

PRINCE, S. D. (June 1, 1991). "Satellite remote sensing of primary production: comparison of results for Sahelian grasslands 1981-1988". *International Journal of Remote Sensing* 12.6. Pp. 1301–1311.

Stevenson, Megan T. and Jennifer L. Doleac (2022). "Algorithmic Risk Assessment in the Hands of Humans". *American Economic Journal: Economic Policy*.

Stolper, Oscar A. and Andreas Walter (July 1, 2017). "Financial literacy, financial advice, and financial behavior". *Journal of Business Economics* 87.5, pp. 581–643.

Sydnor, Justin (Oct. 2010). "(Over)insuring Modest Risks". *American Economic Journal: Applied Economics* 2.4, pp. 177–199.

Tafere, Kibrom, Christopher B. Barrett, and Erin Lentz (Apr. 1, 2019). "Insuring Well-Being? Buyer's Remorse and Peace of Mind Effects From Insurance". *American Journal of Agricultural Economics* 101.3. Pp. 627–650.

Tang, Ning and Marie-Eve Lachance (July 1, 2012). "FINANCIAL ADVICE: WHAT ABOUT LOWINCOME CONSUMERS?" *Journal of Personal Finance* 11.2. Pp. 121–158.

Tucker, C. J., C. L. Vanpraet, M. J. Sharman, and G. Van Ittersum (June 1, 1985). "Satellite remote sensing of total herbaceous biomass production in the senegalese sahel: 1980–1984". *Remote Sensing of Environment* 17.3, pp. 233–249.

Winchester, Danielle D. and Sandra J. Huston (Sept. 1, 2015). "All Financial Advice for the Middle Class is Not Equal". *Journal of Consumer Policy* 38.3, pp. 247–264.

Appendix

A Calculation of Expected Consumer Surplus

We calculate the expected consumer surplus of a pastoral household with the assumption that the individuals behave consistently with expected utility theory framework.

Our starting point is the set up from Clarke (2016). A pastoral household with livestock herd value H bears the risk of livestock loss L, with probability p. The household makes a decision on whether or not to purchase insurance. The amount of insurance premium is denoted as R. When the index is triggered with probability q, the consumer will receive payout I. The household also faces a basis risk with probability r, which reflects a joint probability that the index is not triggered but a herd loss occurs.

Without insurance, a herder faces two states of the world – no herd loss, or herd loss. But when they purchase insurance, there are four states of the world for the pastoralist:

- s_1: (No herd loss, Index not triggered),
- s_2: (No herd loss, Index triggered),
- s_3: (Herd loss, Index not triggered),
- s_4: (Herd loss, Index triggered)

In each state, we assume that the consumers have a CRRA utility function:

$$u(X) = \begin{cases} \frac{x_{iazkt}^{1-\theta}}{1-\theta} & \theta \neq 1 \\ ln(x_{iazkt}) & \theta = 1 \end{cases} \tag{3}$$

where x_{iazkt} is the outcome in each state, for household i with livestock species a in village z in kebele k in round t, and θ is the relative risk aversion parameter of individual j in household i, who is responsible for herd management.

The consumer maximizes the expected utility from the decision given by:

$$EU = pr(s_1) \cdot u_{s_1} + pr(s_2) \cdot u_{s_2} + pr(s_3) \cdot u_{s_3} + pr(s_4) \cdot u_{s_4} \tag{4}$$

To calculate the expected utility, we need payoffs and probabilities for each state. Table A1

presents the payoffs in each state, with (Panel B) or without insurance (Panel A), while Panel C presents the probabilities for each state.

Table A1: Payoffs and probabilities for each state without insurance

Panel A: Payoffs without insurance			
	Index not triggered	Index triggered	
No herd loss	H	H	
Herd loss	$H-L$	$W-L$	
Panel B: Payoffs with insurance			
	Index not triggered	Index triggered	
No herd loss	$H-R$	$H-R+I$	
Herd loss	$H-L-R$	$W-L-Y+I$	
Panel C: Probabilities for each state			
	Index not triggered	Index triggered	
No herd loss	$1-q-r$	$q+r-p$	$1-p$
Herd loss	r	$p-r$	p
	$1-q$	q	

Notes: H denotes total livestock value, L value of lost animal, R the amount of insurance premium paid, and I indemnity payout, p subjective expectation of livestock survival, q subjective expectation of IBLI index trigger, r joint probability that the index is not triggered but a loss occurs.

Then, using these probabilities and payoffs for each state, we calculate the expected utility and certainty equivalent of each decision: buy or not to buy insurance.

For purchasing insurance:

- $EU_{buy} = (1-q-r)\cdot u(H-R) + r\cdot u(H-L-R) + (q+r-p)\cdot(H-R+I) + (p-r)\cdot u(H-L-R+I)$
- $CE_{buy} = (EU_{buy} - \theta EU_{buy})^{\frac{1}{1-\theta}}$

For not purchasing insurance:

- $EU_{nobuy} = (1-q-r)\cdot u(H) + r\cdot u(H-L) + (q+r-p)\cdot(H) + (p-r)\cdot u(H-L)$
- $CE_{nobuy} = (EU_{nobuy} - \theta EU_{nobuy})^{\frac{1}{1-\theta}}$

The expected consumer surplus (ECS) of insuring different number of animals is then quantified by subtracting the certainty equivalent of not purchasing any insurance policies from the certainty equivalent of insuring animals:

- $ECS_{buy} = CE_{buy} - CE_{nobuy}$

A.1 Tailored advice

To generate the advice in real-time, we computed ECS of the clients before the survey visits. The parameters for ECS calculation includes relative risk aversion parameter (θ from Equation 3), herders' beliefs about the probability of index will be triggered (q from Table A1), about livestock loss (p from Table A1) in the next herding season(s), and about the basis risk (r from Table A1. We elicit risk preference parameter θ via risky lottery choice exercises at baseline, and use the estimated risk preferences as our priors [5] and use it throughout all survey rounds. We have two versions of ps – probabilities of livestock loss in the upcoming season and the subsequent season.To allow real-time provision of the advice, we restricted choices of probabilities: we choose to use values of ps and q which range from 5 percent to 95 percent at 10 percentage point interval. Since there are three probabilities that takes 10 potential values, we have 1000 combinations of these probabilities for the ECS calculation.

For each combination of the parameters, we compute ECS for insuring a range of number of animals from zero to a species-specific maximum based on the previous round of data collected.[6] The number that produces highest positive ECS is chosen for the advice. When the selected number of animal is strictly greater than zero, then we advise the herder to insure the animal. When the selected number equals to zero, then the advice is not to insure the animal. However, when the difference in CE is not substantial between buying and not buying insurance, then we did not provide advice. We then convert the advised number of animals to insure to the share of animals to insure.

During the survey, p and q are collected by asking the following questions:

> for p: "How many of your N [animal species] do you think will still be alive by the end of [the next herding season]?"

[5] Risky lottery exercises are described in Appendix section **??**

[6] For camels, we set the maximum as 3, for cattle 5, for goats 8, and for sheep 5, which are based on median number of animals for each animal species from the the data collected.

for q: "How likely do you think it is, from 0-10% being least likely and 91-100% being most likely, that IBLI payments will be made in your IBLI index unit during [the next herding season]?"

We use the estimate of the basis risk from Jensen, Barrett, and Mude (2017), combined with p and q to determine r.[7]

We match the survey responses with the computed ECS-maximizing share of animals to offer the tailored advice in real-time.

Since herders make insurance purchase decision for each animal species, the ECS (and the tailored advice) is calculated for each animal species, resulting in 4 advice if the herder has all four animal types.

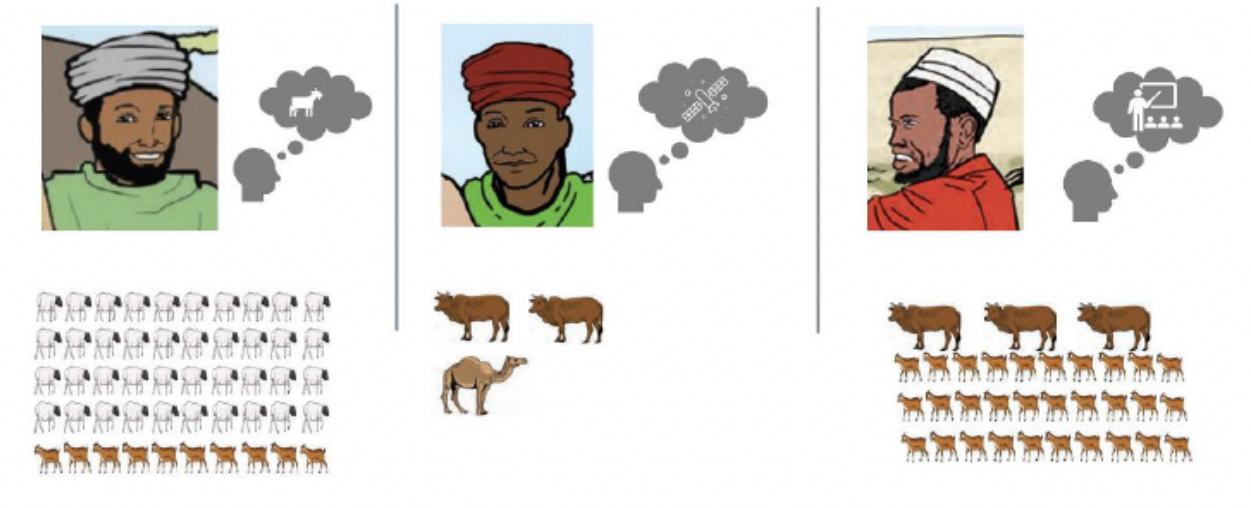
A.2 Consumer welfare

We compute the consumer welfare using the same structure. For the consumer welfare, we use actual herd size as an input. Secondly, the consumer welfare from the product is defined by the difference of the certainty equivalent from herder's decision and the certainty equivalent from the maximum ECS generating decision.

[7]The estimate of basis risk from Jensen, Barrett, and Mude (2017) was around 0.3.

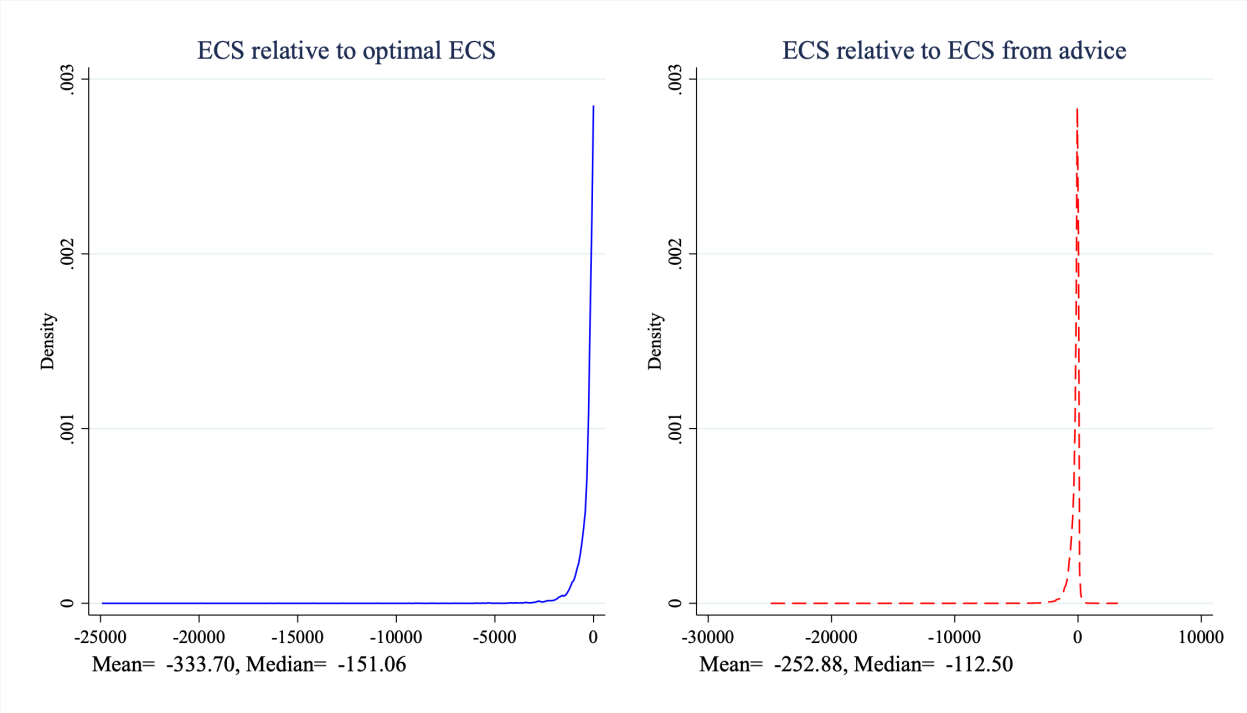
B Additional Figures and Tables

Figure B1: Example video screen



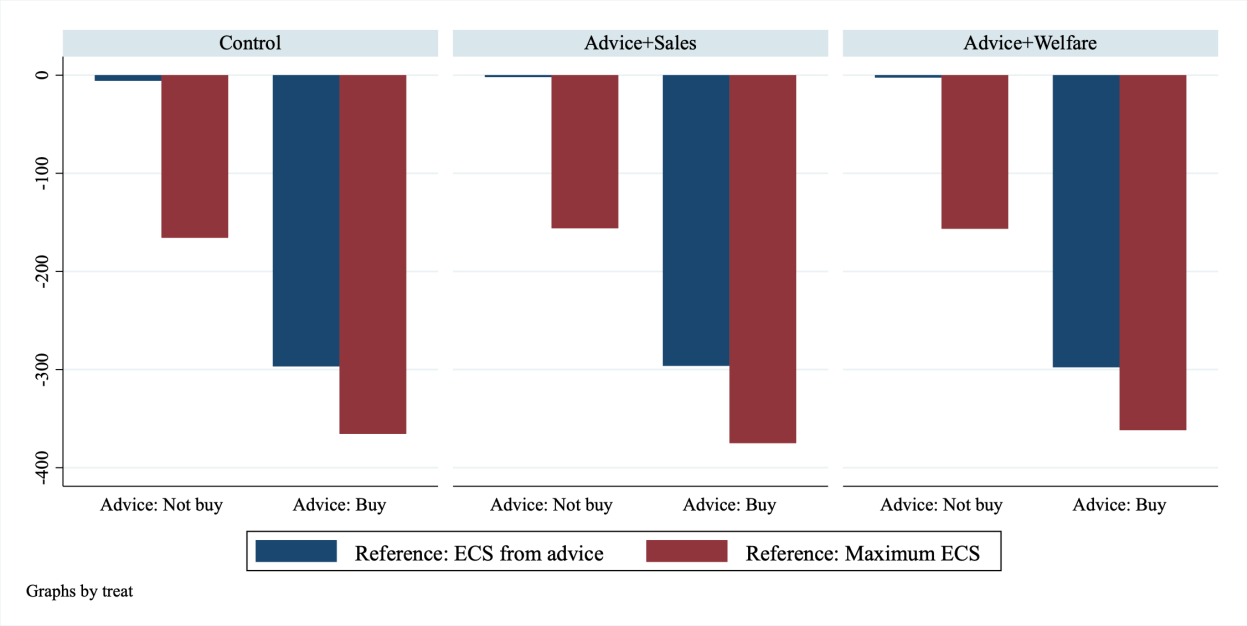
Notes:

Figure B2: Distribution of Expected consumer surplus



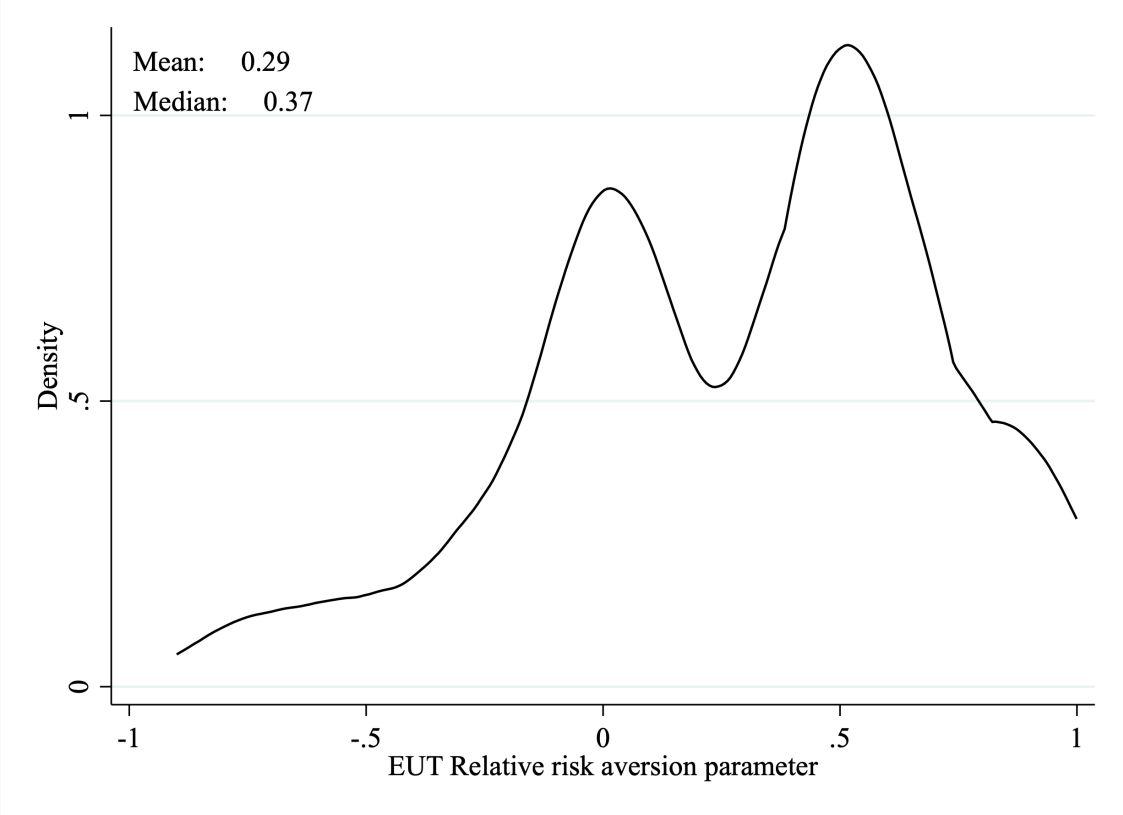
Notes: This figure presents distributions of the two measures of consumer welfare: i) Expected consumer surplus relative to the optimal ECS, and ii) ECS relative to the ECS from advice.

Figure B3: Comparison between the two welfare measures



Notes: The figure plots the average value of the two welfare measures by type of advice herders received and treatment arms. Navy bar indicates the average welfare gain relative to the ECS from advice, and the crimson bar indicates the average welfare gain relative to the maximum ECS.

Figure B4: Distribution of Relative Risk Aversion Parameter



Notes: The figure plots distribution of the EUT risk aversion parameter at baseline. Vertical axis indicates the density while horizontal axis indicates the risk averstion parameter value.

Table B1: Respondent Changes within Households across Rounds

	Midline 1	Midline 2	Endline
	(1)	(2)	(3)
Households changed respondents			
Number of households	165	11	1
% of households	6.8	0.5	0.04

Table B2: Tailored Advice

	Advice to purchase	Advised N of animals
	(1)	(2)
Advice+Sales vs. Control	-0.003	-0.017
	(0.626)	(0.939)
	[0.719]	[0.948]
Advice+Welfare vs. Control	-0.006	-0.018
	(0.353)	(0.939)
	[0.486]	[0.956]
Advice+Sales vs. Advice+Welfare	-0.003	-0.001
	(0.650)	(0.996)
	[0.507]	[0.997]
N	17064	15325
Control Mean	0.825	6.221

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele $\times$ fixed effects.

Column (1) presents the difference in probability of receiving an advice to purchase insurance across the treatment arms. The variable equals to one if the pastoralist received the advice to purchase insurance. Columns (2) depicts the differences in the number of animals to insure across the treatment arms.

Table B3: Self-reported herd size

	Before video	After video	Update after video
	(1)	(2)	(3)
Advice+Sales vs. Control	0.126	0.150	-0.001
	(0.556)	(0.482)	(0.709)
	[0.646]	[0.572]	[0.781]
Advice+Welfare vs. Control	0.193	0.213	0.000
	(0.375)	(0.326)	(0.903)
	[0.459]	[0.413]	[0.942]
Advice+Sales vs. Advice+Welfare	0.067	0.063	0.001
	(0.734)	(0.749)	(0.517)
	[0.597]	[0.634]	[0.530]
N	26744	26744	26744
Control Mean	4.706	4.681	0.0189

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele $\times$ fixed effects.

Column (1) presents the difference in probability of receiving an advice to purchase insurance across the treatment arms. The variable equals to one if the pastoralist received the advice to purchase insurance. Columns (2) depicts the differences in the number of animals to insure across the treatment arms.

Table B4: IBLI Purchase, measured at HH level

	IBLI purchase=1	TLU insured	TLU insured | Purchase=1
	(1)	(2)	(3)
Advice+Sales vs. Control	-0.013	0.014	0.030
	(0.254)	(0.824)	(0.891)
	[0.353]	[0.866]	[0.919]
Advice+Welfare vs. Control	-0.019*	-0.062	-0.187
	(0.0734)	(0.290)	(0.391)
	[0.126]	[0.336]	[0.521]
Advice+Sales vs. Advice+Welfare	-0.007	-0.076	-0.217
	(0.445)	(0.137)	(0.393)
	[0.304]	[0.239]	[0.281]
N	6686	6686	1295
Control Mean	0.219	0.610	2.792

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele $\times$ fixed effects.

Column (1) presents the impact on the insurance take-up at the extensive margin, denoted as one if a pastoralist purchased insurance in each sales season, and zero otherwise. Columns (2) and (3) depict the impact at the intensive margin of insurance take-up. The intensive margin refers to the number of animals insured in each sales season. In Column (2), the number of insured animals is recorded, with the count treated as zero if a pastoralist did not purchase insurance. Column (3) presents the number of animals insured, conditional on a pastoralist purchasing insurance.

Table B5: Consumer welfare gain relative to the maximum ECS at HH level

	Any Advice	Advice: Purchase insurance	Advice: Do not purchase insurance
	(1)	(2)	(3)
Advice+Sales vs. Control	-25.299	-24.665	-0.634
	(0.312)	(0.323)	(0.685)
	[0.400]	[0.408]	[0.777]
Advice+Welfare vs. Control	-5.533	-7.989	2.456*
	(0.828)	(0.754)	(0.0727)
	[0.868]	[0.815]	[0.0740]
Advice+Sales vs. Advice+Welfare	19.766	16.676	3.090**
	(0.434)	(0.510)	(0.0371)
	[0.533]	[0.562]	[0.0720]
N	6686	6686	6686
Control Mean	-587.7	-582.4	-5.270

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele $\times$ fixed effects.

Table B6: Consumer welfare gain relative to the ECS from the advice

	Any Advice	Advice: Purchase insurance	Advice: Do not purchase insurance
	(1)	(2)	(3)
Advice+Sales vs. Control	9.158	10.205	1.505
	(0.194)	(0.208)	(0.551)
	[0.288]	[0.304]	[0.672]
Advice+Welfare vs. Control	6.952	4.193	3.796
	(0.307)	(0.589)	(0.141)
	[0.422]	[0.685]	[0.218]
Advice+Sales vs. Advice+Welfare	-2.207	-6.012	2.291
	(0.732)	(0.391)	(0.186)
	[0.769]	[0.627]	[0.178]
N	15241	12746	2470
Control Mean	-181.2	-215.5	-9.994

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele $\times$ fixed effects.

Table B7: Consumer Welfare Gains Relative to the ECS from the Advice at HH level

	Any Advice	Advice: Purchase insurance	Advice: Do not purchase insurance
	(1)	(2)	(3)
Advice+Sales vs. Control	4.631	3.852	0.779
	(0.794)	(0.828)	(0.467)
	[0.827]	[0.865]	[0.620]
Advice+Welfare vs. Control	-6.916	-8.750	1.834*
	(0.696)	(0.620)	(0.0654)
	[0.746]	[0.676]	[0.121]
Advice+Sales vs. Advice+Welfare	-11.547	-12.602	1.055
	(0.497)	(0.459)	(0.148)
	[0.422]	[0.392]	[0.113]
N	6686	6686	6686
Control Mean	-395.8	-392.1	-3.646

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele $\times$ fixed effects.

Table B8: Understanding and Perceived Value of Insurance

	IBLI knowledge score (0-10)	Everyone should buy IBLI if affordable (=1)
	(1)	(2)
Advice+Sales vs. Control	-0.081	-0.005
	(0.287)	(0.675)
	[0.358]	[0.715]
Advice+Welfare vs. Control	-0.009	0.005
	(0.904)	(0.671)
	[0.914]	[0.691]
Advice+Sales vs. Advice+Welfare	0.072	0.011
	(0.286)	(0.337)
	[0.548]	[0.389]
N	4270	4270
Control Mean	4.210	0.673

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele $\times$ fixed effects.

Column (1) presents the difference in probability of receiving an advice to purchase insurance across the treatment arms. The variable equals to one if the pastoralist received the advice to purchase insurance. Columns (2) depicts the differences in the number of animals to insure across the treatment arms.

The number of observations for all columns is 4,270, calculated as (2,416 x 2 rounds) - 562 (control households randomized to additional treatment at endline).

Table B9: Understanding of Insurance: All Questions Separated

	Premiium payment frequency (=1)	Refund premium in case there is no drought	Format of receiving payment	IBLI covered risks	Payout-triggering measure-ments	Index upon which com-pensation is made	Payout delivering orgniza-tions	Payout scenario 1	Payout scenario 2	Payout scenario 3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Advice+Sales vs. Control	0.019	-0.015	0.005	-0.009	-0.002	-0.033**	0.009	-0.010	-0.015	-0.029**
	(0.117)	(0.361)	(0.654)	(0.498)	(0.905)	(0.0277)	(0.510)	(0.442)	(0.271)	(0.0363)
	[0.166]	[0.419]	[0.687]	[0.529]	[0.921]	[0.0670]	[0.546]	[0.515]	[0.360]	[0.0710]
Advice+Welfare vs. Control	0.014	-0.021	0.013	0.007	0.007	-0.021	0.018	-0.000	-0.015	-0.012
	(0.253)	(0.194)	(0.275)	(0.642)	(0.601)	(0.158)	(0.216)	(0.989)	(0.301)	(0.426)
	[0.321]	[0.264]	[0.359]	[0.715]	[0.652]	[0.233]	[0.315]	[0.987]	[0.371]	[0.505]
Advice+Sales vs. Advice+Welfare	-0.005	-0.006	0.008	0.016	0.009	0.012	0.008	0.010	0.001	0.018
	(0.632)	(0.677)	(0.415)	(0.158)	(0.462)	(0.383)	(0.447)	(0.400)	(0.951)	(0.169)
	[0.778]	[0.535]	[0.293]	[0.419]	[0.426]	[0.820]	[0.355]	[0.510]	[0.946]	[0.685]
N	4270	4270	4270	4270	4270	4270	4270	4270	4270	4270
Control Mean	0.279	0.573	0.841	0.692	0.614	0.527	0.662	0.650	0.703	0.564

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele $\times$ fixed effects.

All outcome variables equals 1 if the answers to the following questions were correct. Questions for each outcome variables are as follows. Column 1: How often does an IBLI client have to pay a premium in order to remain insured?; Column 2: If you did not receive indemnity payout (compensation) from the livestock insurance, would you expect to receive your premium back?; Column 3: When you receive an indemnity payment (compensation) in what form do you expect to receive it in?; Column 4: Which of the following risks related to livestock does IBLI cover?; Column 5: Based on your understanding of the livestock insurance, what measurements trigger an insurance payout?; Column 6: Based on your understanding of IBLI, what does the index upon which compensation is made, represent?; Column 7: What institution will provide you payout in the upcoming season if there is a payout? Column 8: The forage in his region was normal in 2021 but Boru lost 8 cattle due to disease outbreak. Will he receive indemnity payout?; Column 9: The forage in his area was very bad, indicated by a black reading of IBLI index. But all of Diba's cattle survived. Will he receive indemnity payout?; Coluimn 10: The forage in his region was normal in 2021 but he lost 3 cattle. Will he receive indemnity payout?

The number of observations for all columns is 4,270, calculated as (2,416 x 2 rounds) - 562 (control households randomized to additional treatment at endline).

Table B10: Subjective Expectations about Product Performance

	Index triggered	Severe Drought	Severe drought but index not triggered	No severe drought but index triggered	Index triggered but no animal die	Index not triggered but animals die	Index triggered payments arrive too late
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Advice+Sales vs. Control	-0.017	-0.028	0.048	-0.011	0.136*	0.051	0.040
	(0.837)	(0.677)	(0.515)	(0.888)	(0.0614)	(0.420)	(0.584)
	[0.858]	[0.734]	[0.552]	[0.911]	[0.106]	[0.436]	[0.641]
Advice+Welfare vs. Control	-0.103	-0.046	0.038	-0.085	0.157**	0.006	-0.038
	(0.184)	(0.501)	(0.607)	(0.226)	(0.0333)	(0.932)	(0.589)
	[0.253]	[0.615]	[0.634]	[0.285]	[0.0810]	[0.943]	[0.605]
Advice+Sales vs. Advice+Welfare	-0.086	-0.017	-0.010	-0.074	0.021	-0.045	-0.077
	(0.168)	(0.780)	(0.876)	(0.188)	(0.692)	(0.433)	(0.164)
	[0.194]	[0.688]	[0.862]	[0.207]	[0.741]	[0.556]	[0.371]
N	4270	4270	4270	4270	4270	4270	4270
Control Mean	5.195	6.731	5.964	4.322	4.411	5.984	5.736

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele $\times$ fixed effects.

Column (1) presents the difference in probability of receiving an advice to purchase insurance across the treatment arms. The variable equals to one if the pastoralist received the advice to purchase insurance. Columns (2) depicts the differences in the number of animals to insure across the treatment arms.

The number of observations for all columns is 4,270, calculated as (2,416 x 2 rounds) - 562 (control households randomized to additional treatment at endline).

Table B11: Subjective Expectations about Livestock Survival for Each Season

	LRLD	SRSD
	(1)	(2)
Advice+Sales vs. Control	0.030	0.074
	(0.671)	(0.272)
	[0.728]	[0.391]
Advice+Welfare vs. Control	0.016	0.045
	(0.819)	(0.481)
	[0.893]	[0.556]
Advice+Sales vs. Advice+Welfare	-0.014	-0.028
	(0.841)	(0.602)
	[0.790]	[0.580]
N	11016	11016
Control Mean	7.591	7.909

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele $\times$ fixed effects.

Column (1) presents the difference in probability of receiving an advice to purchase insurance across the treatment arms. The variable equals to one if the pastoralist received the advice to purchase insurance. Columns (2) depicts the differences in the number of animals to insure across the treatment arms.

Table B12: Insurance Agents' Effort

	Raffle		Incentives	
	Raffle ticket was collected in a village (=1)	Share of herders an agent collected raffle tickets from	Share of herders an agent earned incentive on	Sales agent incentives (ETB)
	(1)	(2)	(3)	(4)
Advice+Sales vs. Control	0.008	-0.071	-1.026	18.420
	(0.547)	(0.948)	(0.566)	(0.291)
	[0.787]	[0.944]	[0.506]	[0.307]
Advice+Welfare vs. Control	-0.008	0.072	3.642*	28.957
	(0.505)	(0.946)	(0.0944)	(0.104)
	[0.728]	[0.948]	[0.122]	[0.127]
Advice+Sales vs. Advice+Welfare	-0.017	0.142	4.668**	10.537
	(0.204)	(0.886)	(0.0260)	(0.549)
	[0.358]	[0.794]	[0.0570]	[0.305]
N	720	720	720	720
Control Mean	0.537	42.47	20.26	117.5

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele $\times$ fixed effects.

Column (1) presents an indicator equals one if an agent collected at least one raffle ticket from a village. Column (2) displays the share of herders an agent collected raffle tickets from. Column (3) presents the outcome variable, which equals one if an agent earned incentive in a village. Column (4) displays the proportion of pastoralists whose insurance purchase decision resulted in agents' incentives. Column (5) shows the total amount of incentives earned by agents during the sales season.

The number of observations for all columns are 720 – calculated by 240 villages $\times$ 3 rounds.

Table B13: Heterogeneous effects by trust on IBLI purchase

	IBLI purchase=1	N of animals insured	N of animals insured (Purchase=1)
	(1)	(2)	(3)
Advice+Sales	-0.011**	-0.012	0.302
	(0.0463)	(0.686)	(0.476)
	[0.0830]	[0.756]	[0.517]
Advice+Welfare	-0.006	-0.004	0.324
	(0.265)	(0.865)	(0.221)
	[0.245]	[0.878]	[0.280]
Advice+Sales × High trust in agent	0.013**	0.003	-0.418
	(0.0420)	(0.941)	(0.430)
	[0.0630]	[0.953]	[0.484]
Advice+Welfare × High trust in agent	-0.006	-0.027	0.054
	(0.335)	(0.457)	(0.871)
	[0.322]	[0.454]	[0.881]
Coefficient: Advice+Sales + Advice+Sales × High trust	0.0018	-0.0095	-0.12
p-value: Advice+Sales + Advice+Sales × High trust	0.74	0.77	0.66
Coefficient: Advice+Welfare + Advice+Welfare × High trust	-0.012	-0.031	0.38
p-value: Advice+Welfare + Advice+Welfare × High trust	0.022	0.36	0.21
N	26744	26744	1909
Control Mean	0.0818	0.312	3.812

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele × fixed effects.

All outcome variables are standardized using the mean and the standard deviation of the control group for each round. Outcome variable of column (1) is the composite trust scale – the average score of the four following variables. Outcome variable of column (2) is to what extent pastoralists agree that the sales agents advise in their best interest. Outcome of column (3) is to what extent pastoralists agree that the sales agents' financial advice is important for them. Outcome of column (4) is to what extent the pastoralist think that the agent will deliver the paid premium to the insurer. Outcome of column (4) is to what extent the pastoralist think that they will receive the insurance payout if it occurs.

The number of observations for all columns is 4,270, calculated as (2,416 x 2 rounds) - 562 (control households randomized to additional treatment at endline).

Table B14: Heterogeneous effects by trust on adherence to the advice

	Any advice		Advised to purchase		Advised not to purchase	
	Adhere to advice=1	|Purchase - Advice|	Adhere to advice=1	|Purchase - Advice|	Adhere to advice=1	|Purchase - Advice|
	(1)	(2)	(3)	(4)	(5)	(6)
Advice+Sales	-0.008	-0.034	-0.022**	-0.041	0.007	0.044
	(0.592)	(0.903)	(0.0185)	(0.908)	(0.636)	(0.620)
	[0.582]	[0.888]	[0.0400]	[0.904]	[0.652]	[0.690]
Advice+Welfare	0.020	0.292	-0.011	0.611	0.011	-0.018
	(0.174)	(0.415)	(0.247)	(0.166)	(0.417)	(0.786)
	[0.208]	[0.491]	[0.254]	[0.251]	[0.432]	[0.831]
Advice+Sales × High trust in agent	-0.002	0.121	0.023**	0.138	-0.003	-0.061
	(0.914)	(0.774)	(0.0472)	(0.786)	(0.881)	(0.580)
	[0.918]	[0.758]	[0.0670]	[0.774]	[0.885]	[0.678]
Advice+Welfare × High trust in agent	-0.033	-0.499	0.000	-0.869*	0.018	-0.050
	(0.108)	(0.272)	(0.984)	(0.0975)	(0.363)	(0.503)
	[0.102]	[0.326]	[0.985]	[0.130]	[0.356]	[0.515]
Coefficient: Advice+Sales + Advice+Sales × High trust	-0.0098	0.087	0.00080	0.097	0.0043	-0.017
p-value: Advice+Sales + Advice+Sales × High trust	0.42	0.77	0.93	0.78	0.71	0.76
Coefficient: Advice+Welfare + Advice+Welfare × High trust	-0.013	-0.21	-0.011	-0.26	0.029	-0.069
p-value: Advice+Welfare + Advice+Welfare × High trust	0.24	0.44	0.21	0.38	0.033	0.17
N	17064	17064	14123	14123	2914	2914
Control Mean	0.263	5.307	0.125	6.391	0.915	0.209

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele × fixed effects.

The number of observations in Columns (1) and (2) is 17,064, which is the number of herders received any tailored advice across midline 1, 2 and endline. The number of observations in Columns (3) and (4) is 14,539, which is the number of herders who received advice to buy insurance across midline 1, 2 and endline. The number of observations in Columns (5) and (6) is 2,499, which is the number of herders who received advice not to buy insurance across midline 1, 2 and endline (2,525) after dropping 26 singleton observations.

Table B15: Heterogeneous effects by trust on consumer welfare gains relative to maximum ECS

	Any Advice	Advice: Purchase insurance	Advice: Do not purchase insurance
	(1)	(2)	(3)
Advice+Sales	13.542	7.594	-4.149
	(0.332)	(0.653)	(0.543)
	[0.347]	[0.656]	[0.634]
Advice+Welfare	23.514	12.501	6.607
	(0.107)	(0.473)	(0.245)
	[0.158]	[0.537]	[0.207]
Advice+Sales × High trust in agent	-20.580	-12.089	5.809
	(0.238)	(0.554)	(0.534)
	[0.237]	[0.567]	[0.587]
Advice+Welfare × High trust in agent	-18.083	-6.032	2.040
	(0.311)	(0.771)	(0.792)
	[0.348]	[0.781]	[0.767]
Coefficient: Advice+Sales + Advice+Sales × High trust	-7.04	-4.49	1.66
p-value: Advice+Sales + Advice+Sales × High trust	0.46	0.68	0.74
Coefficient: Advice+Welfare + Advice+Welfare × High trust	5.43	6.47	8.65
p-value: Advice+Welfare + Advice+Welfare × High trust	0.57	0.56	0.081
N	16947	13726	2878
Control Mean	-233.5	-284.5	-20.72

All columns present coefficient estimates, p-values calculated with standard errors clustered clustered at the village level (in parentheses), and randomization inference p-value (in bracket). * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include kebele × fixed effects.

Column (1) uses the full sample of household × animal species which ECS can be generated. Column (2) and (3) uses the sample who received advice to insure animal and advice not to insure animal, repectively.

The number of observations in Columns (1) is 16,630, which is the number of herders that maximum ECS was calculated across midline 1, 2 and endline. The number of observations in Columns (2) is 14,153, which is the number of herders who received advice to buy insurance across midline 1, 2 and endline. The number of observations in Columns (3) is 2,470, which is the number of herders who received advice not to buy insurance across midline 1, 2 and endline (2,525) after dropping 55 singleton observations.