Long-run Effects of Catastrophic Drought Insurance*

Christopher B. Barrett† Nathan Jensen‡ Karlijn Morsink§
Yuma Noritomo¶ Hyuk Harry Son‖

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

‡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 and the Center for the Economics Analysis of Risk at Georgia State University, USA. Email: k.morsink@uu.nl

¶Charles H. Dyson School of Applied Economics and Management, Cornell University, USA. Email: yn266@cornell.edu

‖Utrecht University School of Economics, The Netherlands and Charles H. Dyson School of Applied Economics and Management, Cornell University, USA. Email: hs924@cornell.edu

Abstract

Aggregate shocks such as droughts, floods, and natural disasters threaten households' short-run consumption and long-run human capital accumulation. Formal insurance against aggregate shocks may offer a promising tool to mitigate these negative consequences. We study the long-run impacts of catastrophic drought insurance – first introduced in 2011 – on income, productive strategies, and human capital accumulation among pastoralists in the Arid and Semi-Arid Lands in Kenya and Ethiopia. We leverage randomized premium discounts to estimate the Local Average Treatment Effect of insurance purchase on outcomes measured in a panel survey with follow-up conducted 10 years later. We show that the insurance changed productive strategies and induced an 83% reduction in the share of small animals (vs. large animals) herded. Furthermore, we observe a 5-20% increase in the share of household members who have completed education. We show that these effects arise from initial insurance coverage, not the receipt of claim payments. This suggests that reduced *ex ante* risk exposure and the behavioral change it induces – not the cash transfers resulting from the claim payment – generate the long-run effects we observe.

Keywords: index insurance, well-being, production strategies, human capital investment

1 Introduction

Households in low-income countries remain vulnerable to aggregate shocks such as droughts, floods, and natural disasters. These aggregate shocks complicate the ability for households to insure each other because they are all similarly affected at the same time. As a result, they severely threaten households' short-run consumption (Townsend, 1994); and a growing body of evidence now establishes that such shocks have negative long-run effects on indicators of lifetime well-being (Maccini and Yang, 2009; Dinkelman, 2017; Shah and Steinberg, 2017; Carrillo, 2020). Formal insurance against aggregate shocks could offer a promising tool to mitigate these negative welfare consequences of covariate shocks. To date, however, most insurance against covariate shocks introduced in low-income settings have been fraught with moral hazard, adverse selection and high transaction costs, or have remained at pilot scale due to low product quality and implementation challenges (Mobarak and Rosenzweig, 2013; Hill et al., 2019; Binswanger-Mkhize, 2012; Carter et al., 2017). A notable exception is the Index-Based Livestock Insurance (IBLI) programme, which insures livestock losses due to droughts. Since piloting in 2010 it has gradually expanded and, as of December 2022, at least 500,000 households had been insured through IBLI. Given that the programme has been running for 10 years, and was originally introduced through an experiment, this allows for the first investigation of long-run impacts of insurance against droughts.

The Index-Based Livestock Insurance (IBLI) programme in Ethiopia and Kenya offers a notable exception, however. Unlike most agricultural index insurance products, which insure against low annual crop yield realizations, IBLI insures against the loss of durable assets, livestock, similar to most commercial insurance products worldwide. IBLI relies on a satellite-based index of relative forage scarcity – specifically designed to minimize basis risk (Chantarat et al., 2013) – that targets pastoralists in the arid and semi-arid lands (ASALs). Since piloting in 2010, the program has gradually expanded and, as of December 2022, at least 561,529 households had been insured through IBLI contracts. Furthermore, the IBLI products underpin sovereign drought insurance for Kenya and Mauritania. Recent initiatives by the governments of Kenya, Ethiopia, Djibouti and Somalia, supported by the World Bank, aim to scale IBLI further to reach 1.6 million pastoralists by 2025 (The World Bank, 2022).[1]

Efforts to scale up IBLI resulted in part from a growing body of evidence that demonstrates its positive short-run impacts, generated during the initial five years of pilot implementation, 2010-2015. Using an individual-level randomized encouragement design with several rounds of longitudinal survey data collection, more than 1400 pastoralists in southern Ethiopia and northern Kenya received premium subsidies through non-transferable discount coupons. Local average treatment

[1]For more background details on IBLI, see Jensen et al. (2023).

effects (LATE) estimates show that IBLI helped pastoralists maintain production and income levels, reduced distress livestock sales, minimized herd losses, prevented meal skipping, and lowered child labor (Jensen, Barrett, and Mude, 2017; Janzen and Carter, 2019; Matsuda, Takahashi, and Ikegami, 2019; Son, 2023). Irrespective of the actual occurrence of droughts to trigger indemnity payments, the *ex ante* protection IBLI provided also led to increased productive investments in veterinary expenditures and children's education, as well as greater milk production and subjective well-being (Jensen, Barrett, and Mude, 2017; Matsuda, Takahashi, and Ikegami, 2019; Tafere, Barrett, and Lentz, 2019; Son, 2023). A cost benefit analysis comparing IBLI's impacts per unit of public cost to that of the Hunger and Safety Net Programme, a cash transfer program launched in the same part of northern Kenya around the same time, finds that the programs produce similar average benefits per total program costs, but IBLI produces far greater marginal benefits per beneficiary because most of the public costs of IBLI are fixed and sunk, in contrast to the considerable ongoing, variable costs of cash transfers (Jensen, Barrett, and Mude, 2017).

Given considerable evidence of negative long-run well-being effects caused by catastrophic covariate shocks in general, and the specific findings of IBLI's positive short-run impacts on some important outcomes, we hypothesize that IBLI improves long-run well-being outcomes. To test this hypothesis we collected another round of survey data from the original Ethiopia and Kenya sample households exactly 10 years after the baseline data were collected in each country. Following a pre-analysis plan,[2] we estimate IBLI's long-run impacts on several well-being outcomes, instrumenting for IBLI purchases with the number of seasons the pastoralist received a randomized discount coupon. Our pre-specified primary outcomes of interest are household-level total herd size, cash earnings, herd composition, and educational attainment; secondary outcomes of interest are herd management expenditures, annual milk income, livestock loss, distress sale of livestock, share of children working, and IBLI uptake in the last 12 months.

The long-run effects of IBLI are striking. Several key short-run effects observed during the experiment period disappear over time. Specifically, we find no significant decadal effect of IBLI on total herd size, annual cash earnings, herd management expenditures, livestock loss, distress sales of livestock, nor in IBLI purchases over the last 12 months. We do, however, see herd composition shift significantly away from goats towards larger animals (especially camels), yielding a marginally insignificant doubling of annual milk income with the transition towards more productive species. We also find a substantial and significant increase in educational attainment and a marginally insignificant decrease in the likelihood that children work, either full-time or part-time. For example, the share of household members who have completed age-appropriate years of education ten years later, from 5% in the control group to 15% among households purchasing IBLI.

[2]See AEARCTR-0011184 in the AEA registry.

These long-run outcomes are closely related. The drought risk coverage IBLI provides induces an observed change in pastoralists' production strategies, away from herding small ruminants towards herding larger livestock that are less liquid but more productive and drought resistant assets. Furthermore, because children's marginal productivity is much higher herding small animals such as goats than large livestock like camels, the induced herd composition change reduces the demand for child labor, inducing pastoral households that take up IBLI to invest more in their children's education. This could arise because the promise of indemnity payments in the event of drought reduces households' demand for precautionary savings in the form of liquid goats, or because IBLI exposure increases the salience of drought risk, inducing a shift towards camels that results in reduced demand for child labor and thus improved educational attainment. We cannot distinguish between these complementary mechanisms in the data. The striking long-run effect of IBLI, however, is that insurance against catastrophic risk induces human capital gains, complementing the broader finding in the literature that exposure to uninsured catastrophic natural disaster risk leads to human capital losses.

We thus build on a literature on the long-run impacts of covariate weather shocks, which largely focuses on effects on human capital accumulation (Alderman, Hoddinott, and Kinsey, 2006; Maccini and Yang, 2009; Dinkelman, 2017; Shah and Steinberg, 2017; Carrillo, 2020). Prior work studies households that lacked formal insurance against covariate weather shocks, finding negative effects on height (Alderman, Hoddinott, and Kinsey, 2006), education completion (Alderman, Hoddinott, and Kinsey, 2006; Maccini and Yang, 2009; Shah and Steinberg, 2017; Carrillo, 2020), health (Maccini and Yang, 2009; Dinkelman, 2017; Carrillo, 2020), assets (Maccini and Yang, 2009), and labour market outcomes (Carrillo, 2020). Maccini and Yang (2009) provide suggestive evidence that these effects arise due to reduced nutrient intake at the time of shocks, while Shah and Steinberg (2017) relate outcomes to changes in the marginal productivity of child labor during shocks. We demonstrate that children in households with insurance against catastrophic weather shocks accumulate considerably more education 10 years later than households without insurance do. Importantly, we also find that these impacts result not so much from the *ex post* protective effect of indemnity payments that compensate for losses incurred but more from the *ex ante* protective effects manifest in induced changes in households' herd composition, away from small animals (goats and sheep) typically kept for financial liquidity purposes and herded by children, to large animals (in particular, camels) that are lumpier productive assets, generating greater milk volumes and more resilient to droughts but typically managed by adult men better able to control livestock weighing hundreds of kilograms, with the result that the induced change in production strategies reduces the demand for child labor, resulting in greater educational attainment. These changes are driven by reduced need for precautionary liquid savings, increased desire to invest in more drought resilient species, or both. We do not find that indemnity payments appreciably affect outcomes, so the impacts seem to arise through induced change in *ex ante* risk exposure. Nor do we find long-run impacts on investment in assets, suggesting that the observed impacts do not arise because uninsured catastrophic loss reduces overall investment (Boucher, Carter, and Guirkinger, 2008; Karlan et al., 2014; Emerick et al., 2016; Hill et al., 2019; Boucher et al., 2021; Stoeffler et al., 2022).

We also connect to a nascent literature on the long-run impacts of development interventions (see Bouguen et al. (2019) for a review). One strand of this literature focuses on human capital interventions, such as de-worming, nutritional supplementation and prenatal interventions, sometimes combined with asset transfers, skills training or other economic interventions. These appear particularly effective at boosting long-run economic outcomes (Hoddinott et al., 2008; Banerjee, Duflo, and Kremer, 2016; Baird et al., 2016; Bandiera et al., 2017; Charpak et al., 2017; Barham, Macours, and Maluccio, 2017; Bettinger et al., 2018; Blattman, Fiala, and Martinez, 2020; Gray-Lobe, Pathak, and Walters, 2023). This may arise because human capital is a durable asset readily re-allocable across sectors in response to changing economic conditions. If people understand this, then human capital may also respond to other, non-human capital interventions too, as we find. Another subliterature on the long-run effects of unconditional cash transfers and grant assistance programs consistently finds short-run effects, particularly on accumulation of assets, that dissipate over time, fading out in the long-run (Araujo, Bosch, and Schady, 2017; Baird, McIntosh, and Özler, 2019; Blattman, Dercon, and Franklin, 2022; Blattman, Fiala, and Martinez, 2020), like some of our asset stock and cash income outcomes. We bridge these two literatures by exploring the long-run impacts of an intervention to insure against catastrophic covariate shocks, demonstrating the long-run importance to human capital formation of risk mitigation.

2 Context and Index-Based Livestock Insurance

Residents in the arid and semi-arid lands of northern Kenya and southern Ethiopia, where this study takes place, heavily depend on extensive livestock grazing - pastoralism - as the most productive livelihood strategy on infertile drylands. As a result, greater herd size is associated with both higher per capita income and lower income variation (McPeak, Little, and Doss, 2011). Low-input pastoralism is vulnerable to drought catastrophic drought shocks; drought-related starvation and dehydration account for 47% of the livestock losses in the region (Jensen, Barrett, and Mude, 2016). Following droughts pastoralists rebuild herds slowly, relying largely on biological reproduction supported by complex systems of inter-household livestock gifts and loans (McPeak and Barrett, 2001; Lybbert et al., 2004; McPeak, Little, and Doss, 2011; Takahashi, Barrett, and Ikegami, 2019). But informal insurance networks have been fraying in the region, in part because of seemingly more frequent and severe droughts that tax all households at the same time (McPeak, Little, and Doss, 2011; Huysentruyt, Barrett, and McPEAK, 2009). Furthermore, those who cannot maintain a herd size sufficient to remain migratory fall into poverty traps and commonly get excluded from social insurance mechanisms (Lybbert et al., 2004). Investing in veterinary services is an effective strategy for reducing livestock mortality and for maintaining herd lactation rates (Admassu et al., 2005; Homewood et al., 2006; Sieff, 1999; Santos and Barrett, 2011). But the supply of veterinary services and treatments is uneven over space and time in the region (McPeak, Little, and Doss, 2011). Livestock markets could theoretically offer a mechanism for mitigating shocks, buying in good seasons and selling in bad ones. Unfortunately, because droughts often take place over large regions, many households suffer the same drought and respond similarly, leading prices to collapse with animal productivity and survival rates, thus markets aggravate rather than mitigate wealth risk in this context (Barrett et al., 2003). Prior to IBLI, financial services, in particular formal credit and insurance, were largely unavailable in these areas. As a result, herd accumulation has long been the key risk management strategy for ensuring that households can rebuild assets after catastrophic shocks, for the simple reason that greater pre-drought herd size is associated with increased post-drought herd size (Barrett and Swallow, 2006; Lybbert et al., 2004; McPeak, 2005; Cissé and Barrett, 2018).

A team of researchers therefore designed an index insurance contract, IBLI, to offer another means to manage catastrophic drought risk. Forage availability offers a key signal of drought in rangelands, so IBLI was designed around near-real-time measures of the Normalized Difference Vegetation Index (NDVI), a reliable signal of forage availability (Meroni et al., 2014; PRINCE, 1991; Tucker et al., 1985) shown to be correlated with livestock mortality in this region (Chantarat et al., 2013). NDVI is generated and provided freely every ten days by the United States Geological Survey (USGS) from global satellite data. IBLI uses an index that aggregates NDVI data within geographically defined index units and two annual seasons. Historic NDVI data for each insurance unit were used to develop a statistical distribution of drought outcomes to underpin insurers and reinsurers determining a strike level below which indemnity payments would be made and a corresponding insurance premium rate (Chantarat et al., 2013; Vrieling et al., 2016). While the specifics of the IBLI policy and the index that underpins it have evolved over time and differ slightly between the Ethiopia and Kenya sites, the core is uniform: it is an NDVI-based catastrophic drought index insurance product sold to individual pastoralists by private insurance companies in the region, that generates an indemnity payment in seasons when the purchaser's index unit exhibits pasture quality below a known, low level - e.g., the 20th percentile.

The first IBLI pilot was launched in Marsabit County, in northern Kenya, in 2010 as a purely commercial index insurance product sold directly to individual pastoral household, with UAP insurance as local underwriter, SwissRe as re-insurer, and Equity Bank as the insurance agent.[3] This was followed by the introduction of a similar product by Oromia Insurance Company (OIC) in the neighboring Borana region of southern Ethiopia in 2012, as well as expanded IBLI availability into additional counties in northern Kenya. The randomized experiment on which our work relies ran in Marsabit and Borana. In 2013, Takaful Insurance of Africa (TIA) entered the IBLI market and launched a Sharia-compliant version as a purely commercial enterprise, implemented in areas outside of the study region. In 2015, after the randomized intervention we use to identify IBLI's effects, the IBLI product was changed to make payments earlier in the seasonal cycle in response to requests by pastoralists who noted that earlier payments could be used to support their animals through the drought, thereby avoiding their loss. This change from post-drought to pre- or mid-drought payouts was made possible by the reasonably predictable rate of forage degradation during the dry seasons after the stochastic accumulation during the rainy season. The insurance companies switched over to exclusively selling the asset protection contract by the August/September sales season in 2015. Also in 2015, the Government of Kenya added IBLI to its social protection programming by launching the Kenya Livestock Insurance Programme (KLIP), which used public resources to purchase individual IBLI policies on behalf of vulnerable pastoralists. By 2017, KLIP annually purchased IBLI on behalf of over 18,000 pastoralists across seven counties. In a similar fashion, several other organizations such as the World Food Programme and the International Committee for the Red Cross have used IBLI to support their programming elsewhere in Ethiopia and Zambia.

3 Study design

Figure C1 shows the evolution of IBLI sales in our study regions between 2010 and 2022. Note the sharp falloff in sales in Borana and Marsabit after the research team left and ceased providing the insurers and their agents with technical and last mile logistical support. If the documented short-run impacts of IBLI discussed previously arise solely while insurance coverage is in force, then one would not expect the short-run impacts observed during the experimental period (Jensen, Barrett, and Mude, 2017; Janzen and Carter, 2019; Takahashi, Barrett, and Ikegami, 2019) to persist in the long-run. The protection of income and consumption provided during the time of active insurance coverage, 2010-2015, would have longer-run effects only through some combination of induced investment or changes in production strategies, or because indemnity payments shielded insured

[3] See Jensen et al. (2023) for richer details on the background, history and impacts of IBLI.

households from the adverse consequences of severe droughts, one of which struck Kenya in 2011-12, inducing IBLI indemnity payments. We therefore pre-specified such outcomes as primary outcomes of interest: herd size, household cash income, herd composition, and education in the household. We pre-specified as secondary outcomes of interest other previously-demonstrated short-run impacts of IBLI: herd management expenditure, annual milk income, livestock loss, distress sale of livestock, share of children working, and IBLI uptake in the last 12 months.

To study IBLI's long-run effects, we leverage the original randomized encouragement experiments of insurance premium subsidy discount coupons to 1,439 pastoralists from 17 locations in Borana Zone in Ethiopia and 16 locations in Marsabit County in Kenya. The 33 study locations (16 in Kenya, 17 in Ethiopia) were selected strategically to ensure representation across environmental conditions and remoteness. Household selection within those locations was random within strata, using household rosters obtained from government administrative offices, stratified through community engagement into three categories according to household herd size, so as to ensure adequate sample inclusion of both small and large herds. The sample size in each site was proportional to its total population, resulting in 924 households sampled in Kenya, and 515 households in Ethiopia, for a total of 1,439 pastoralist households. The baseline in Kenya took place in 2009 and in 2012 in Ethiopia, before IBLI became available. IBLI launched with the first follow-up survey round after the baseline in each location. Panel surveys of the same households were then conducted annually for three rounds in Ethiopia and four rounds in Kenya, up to 2015. Individuals in the sample were randomly assigned to receive premium subsidies through discount coupons that were distributed just prior to a sales season. These randomized discount coupons were non-transferable, expired at the end of the sales season, and were re-randomized and provided in six sales seasons between 2010 and 2015. The coupons provided households with a discount on the insurance premium for a maximum of 15 TLU. In each location in each round, 60 percent of the sample households randomly received a discount coupon providing a premium discount of 10-60 percent, at 10 percent intervals.[4] During the experiment, low NDVI readings arising from drought triggered the index four times in Kenya and one time in Ethiopia, resulting in indemnity payments. No surveys nor experiments were conducted in these sites after 2015 until we conducted follow-up surveys in both countries with original panel households in 2020 in Kenya and in 2022 in Ethiopia to investigate IBLI's long-run impacts exactly ten years after the original baseline. Figure 1 shows the timeline of the original pilots, discount coupon treatments, as well as the timing of the latest rounds of survey in each country. Of the original 1,439 baseline pastoralists, we managed to re-survey 82%

[4] Additional details on the original research design, sample, survey tools and discount coupons can be found at ILRI's data portal: `https://data.ilri.org/portal/dataset/ibli-marsabit-r1` and `https://data.mel.cgiar.org/dataset.xhtml?persistentId=hdl:20.500.11766.1/FK2/S19DC6` for Kenya and `https://data.ilri.org/portal/dataset/ibli-borena-r1` for Ethiopia.

ten years later. We explore attrition patterns below.

3.1 Econometric Strategy

Equation (1) models the long-run impacts of past and current insurance purchases, where y_{ijt} is outcome y for individual i, who lives in location j.[5] $t = 0$ refers to the baseline period, before any insurance was sold in location j, $t = 1$ refers to the first period when insurance was sold in location j, and $t = T$ is the final survey period. I_{ij1} refers to insurance purchase by individual i in the first sales period. y_{ij0} represents the household's initial value for outcome y at baseline. X_{ij0} reflects a vector of household characteristics at baseline, and D_{ij} is a vector of the number of sales seasons during which the household received randomized IBLI premium discount coupons.

$$y_{ijT} = f(I_{ij1},...,I_{ijT},y_{ij0},X_{ij0},D_{ij}) \tag{1}$$

To causally identify the long-run impacts of insurance, we estimate the LATE of insurance purchase for our pre-specified outcomes, instrumenting for insurance purchase by the number of seasons in which the pastoralist received a discount coupon. As pre-specified, we restrict the analysis to discount coupons and insurance purchases in the first three sales seasons, as this provides a strong instrument (see Section 5). This approach does not, therefore, identify the effect of any changes in behavior during the period with randomized discount coupons in sales seasons 4 to 6, for which we control, nor does it consider any impacts of purchases between 2015 and the final survey round that may have occurred after the randomized encouragement experiment ended. We discuss these dynamics and potential mechanisms driving long-run impacts in Section 6.

Equations (2) to (5) describe the outcome equation and instrumental variable (IV) equations. We use an Analysis of Covariance specification to estimate the LATE of IBLI purchase on long-run outcome y in Equation (2), instrumenting for insurance purchase using the discount coupons received by households in each of the first three sales seasons in Equation (3). Equation (4) generates a binary variable that takes the value one if individual i purchased insurance during any of the first three sales seasons. Equation (5) aggregates the discount coupon receipts (Z) of an individual household i in location j in sales peiod t over the first three seasons ($t = 1,2,3$), yielding our instrument (D_{ij}). We use discount coupon distribution during the initial three seasons only, however, we do control for insurance purchases in sales seasons 4, 5, and 6 ($I_{ij4}^{t=6}$). In our specification we also include location fixed effects to control for time-invariant location-level unobservables. Note that

[5] Location refers to 16 sublocations in Kenya and 17 kebeles in Ethiopia. Locations are nested within distinct index units within which NDVI measures generate an index that determines whether an indemnity payment occurs.

Figure 1: Panel Timeline

Year/Season	Kenya Survey	Kenya Policy	Ethiopia Survey	Ethiopia Policy
2009 Oct-Nov	R1			
2010 Jan-Feb		Coupon1		
2010 Oct-Nov	R2			
2011 Jan-Feb		Coupon2		
2011 Aug-Sep		Coupon3		
2011 Oct-Nov	R3	Payout1		
2012 Mar-Apr		Payout2	R1	
2012 Aug-Sep		Coupon4		Coupon1
2012 Oct-Nov	R4			
2013 Jan-Feb		Coupon5		Coupon2
2013 Apr			R2	
2013 Aug-Sep		Coupon6		Coupon3
2013 Oct-Nov	R5			
2014 Jan-Feb				Coupon4
2014 Mar-Apr		Payout4	R3	
2014 Aug-Sep				Coupon5
2014 Oct-Nov		Payout5		
2014 Nov				Payout1
2015 Jan-Feb		Contract Shift		Coupon 6
2015 Mar			R4	
2015 Aug				Contract Shift
2015 Oct-Nov	R6			
2020 Aug-Sep	R7			
2022 Jan-Feb			R5	

Notes: The IBLI contract underwent changes from asset replacement to asset protection in January 2015 for Kenya and in August 2015 for Ethiopia.

because households never migrate on their own, rather traveling together for security and other purposes, the location fixed effects effectively cover broader grazing ranges used by the households in each community j (McPeak, Little, and Doss, 2011; Huysentruyt, Barrett, and McPEAK, 2009). Robust standard errors are used following Abadie et al. (2022) and de Chaisemartin and Ramirez-Cuellar (2022).

$$y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D_{ij} + \beta_4 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT} \tag{2}$$

$$I_{ij} = \alpha_0 + \alpha_1 D_{ij} + \alpha_2 y_{ij0} + \alpha_3 X_{ij0} + +\rho_j + \mu_{ij} \tag{3}$$

$$I_{ij} = \begin{cases} 1 \text{ if there exists } t \in \{1,2,3\} \text{ such that } I_{ijt} > 0 \\ 0 \text{ otherwise} \end{cases} \tag{4}$$

$$D_{ij} = \sum_{t=1}^{t=3} Z_{ijt}^{D} \text{ where } Z_{ijt}^{D} = 1 \text{ if } D_{ijt} > 0 \tag{5}$$

4 Descriptive Statistics, Balance, and Attrition

Table 1 presents the mean and standard deviation of pre-specified balance variables, and baseline values of our pre-specified primary and secondary outcomes in each country, and pooled, for the non-attrited sample of households (see below for attrition analysis). Table C2 presents the values of our pre-specified primary and secondary outcomes at endline, 10-years after the baseline.

At baseline, in our non-attrited sample, 68% of households is male-headed, and the average household head is 49 years old. Households consist of 4-5 adults on average, with each adult having half a dependent on average. In Kenya, only 18% of households own or farm agricultural land, while 65% of households in Ethiopia do. Most Ethiopian households (77%) are fully settled, while only 24% of Kenyan households are. This difference almost surely arises because Borana has a long-established complex of deep wells that offer year-round water access, while our Kenya sites lack similar well systems. Livestock herding is the main source of income. To express herd size (primary outcome), we use the Cattle Market Value Equivalent (CMVE), which aggregates across species weighted by average market value of each animal type, expressed in terms of the market value of cattle.[6] On average, at baseline, pastoralists herd 25.5 CMVE in Kenya and 17.1

[6]To construct this measure for each country, we use the average market prices from purchases and sales for each

Table 1: Summary statistics of the baseline characteristics

	Kenya				Ethiopia				Pooled			
	Mean/SD	Min	Max	Obs	Mean/SD	Min	Max	Obs	Mean/SD	Min	Max	Obs
Prespecified household characteristics												
Age of the household head	48.08	18.00	98.00	781	50.23	20.00	100.00	398	48.81	18.00	100.00	1179
	[18.35]				[18.30]				[18.35]			
Male headed household (=1)	0.63	0.00	1.00	781	0.79	0.00	1.00	398	0.68	0.00	1.00	1179
	[0.48]				[0.41]				[0.47]			
Education of household head	1.05	0.00	16.00	771	0.54	0.00	13.00	397	0.87	0.00	16.00	1168
	[3.07]				[1.84]				[2.72]			
Adult equivalent	4.68	0.70	12.90	781	4.89	1.40	14.40	398	4.75	0.70	14.40	1179
	[1.95]				[2.00]				[1.97]			
Dependency ratio	0.50	0.00	1.00	781	0.54	0.00	1.00	398	0.51	0.00	1.00	1179
	[0.21]				[0.19]				[0.20]			
Herd size (CMVE)	25.48	0.00	416.95	781	17.01	0.00	277.38	398	22.62	0.00	416.95	1179
	[35.98]				[23.90]				[32.64]			
Annual income per AE (USD)	121.45	0.00	1617.14	781	102.79	0.00	1639.55	398	115.15	0.00	1639.55	1179
	[198.01]				[159.19]				[185.95]			
Own or farm agricultural land	0.18	0.00	1.00	781	0.65	0.00	1.00	398	0.34	0.00	1.00	1179
	[0.38]				[0.48]				[0.47]			
Baseline prespecified primary outcomes												
Share of camels in herd (CMVE)	0.30	0.00	1.00	730	0.12	0.00	0.98	395	0.23	0.00	1.00	1125
	[0.31]				[0.21]				[0.29]			
Share of cattle in herd (CMVE)	0.30	0.00	1.00	730	0.67	0.00	1.00	395	0.43	0.00	1.00	1125
	[0.36]				[0.25]				[0.37]			
Share of goats in herd (CMVE)	0.25	0.00	1.00	730	0.17	0.00	1.00	395	0.22	0.00	1.00	1125
	[0.26]				[0.18]				[0.24]			
Share of sheep in herd (CMVE)	0.14	0.00	1.00	730	0.05	0.00	1.00	395	0.11	0.00	1.00	1125
	[0.17]				[0.08]				[0.15]			
Total household cash earning (USD)	563.19	0.00	5659.99	781	475.61	0.00	4098.87	398	533.63	0.00	5659.99	1179
	[983.85]				[646.07]				[885.05]			
Share of members who completed age-appropriate years of education	0.06	0.00	1.00	641	0.09	0.00	1.00	357	0.07	0.00	1.00	998
	[0.18]				[0.19]				[0.19]			
Baseline prespecified secondary outcomes												
Herd management expenditure (USD)	48.79	0.00	2395.60	781	41.00	0.00	2146.89	398	46.16	0.00	2395.60	1179
	[153.93]				[129.63]				[146.17]			
Milk income	202.86	0.00	8074.98	781	6.96	0.00	214.69	398	136.73	0.00	8074.98	1179
	[717.04]				[29.65]				[591.03]			
Livestock loss (CMVE)	11.05	0.00	116.90	781	9.20	0.16	200.60	343	10.49	0.00	200.60	1124
	[15.22]				[16.96]				[15.79]			
N of lost camel	1.15	0.00	61.00	728	0.28	0.00	6.00	343	0.87	0.00	61.00	1071
	[3.56]				[0.81]				[3.00]			
N of lost cattle	5.13	0.00	96.00	728	7.58	0.00	199.00	343	5.92	0.00	199.00	1071
	[11.40]				[16.04]				[13.11]			
N of lost goats/sheep	32.52	0.00	607.00	728	5.69	0.00	66.00	343	23.93	0.00	607.00	1071
	[55.13]				[8.67]				[47.39]			
Distress sales (CMVE)	0.77	0.00	27.10	781	7.72	0.00	206.75	398	3.12	0.00	206.75	1179
	[2.03]				[19.66]				[11.99]			
Share of children working full-time	0.36	0.00	1.00	644	0.47	0.00	1.00	350	0.40	0.00	1.00	994
	[0.38]				[0.34]				[0.37]			
Share of children working part-time	0.29	0.00	1.00	644	0.26	0.00	1.00	350	0.28	0.00	1.00	994
	[0.39]				[0.32]				[0.37]			
Share of children studying full-time	0.22	0.00	1.00	644	0.12	0.00	1.00	350	0.18	0.00	1.00	994
	[0.36]				[0.23]				[0.32]			
Observations	781				398				1179			

Notes: All columns present mean, standard deviation (in square brackets), and the number of observations for each variable.

CMVE in Ethiopia. The portfolio of animal types in herds is more diversified in Kenya. Ethiopian herds predominantly consist of cattle (67%), while camels make up 12% and goats 17%. In Kenya, 30% of herds consists of camels, 30% of cattle, and 39% of goats and sheep. By our endline, the total average herd size had shrunk by approximately 50%, to 13 CMVE in Kenya, while average herd size remained nearly the same in Ethiopia, at 16.5 CMVE. Herd composition in Ethiopia remained largely unchanged at endline, while goats replaced cattle in Kenya.

At baseline the annual household-level cash income (primary outcome) is 563 USD in Kenya, and 476 USD in Ethiopia.[7] This includes income from sales of livestock, livestock products, or crops, wage employment, casual labor, and business and petty trading. We exclude non-cash income or income from autoconsumed products (e.g., milk, meat, blood) because accurate measurement and valuation of those volumes is notoriously difficult in this context, where each household uses its own, different vessel to collect liquids and slaughtered animals come in a wide variety of sizes. At endline, the annual total cash income is 645 USD in Kenya and 799 USD in Ethiopia.[8] Annual herd management expenditure on fodder, water, and veterinary expenditures (secondary outcome) is 48.79 USD in Kenya and 41 USD in Ethiopia at baseline. This substantially increased to 139 USD in Kenya and 270 USD in Ethiopia at endline. Annual milk income (secondary outcome) is 203 USD in Kenya and 7 USD in Ethiopia at baseline. By endline, this more than doubled in Kenya to 563 USD and increased six-fold, to 43.4 USD in Ethiopia.

The pastoralists in our sample have limited human capital. Only 10%-15% of household heads ever went to any school; the average years of completed education is approximately one year in Kenya and half a year in Ethiopia. The maximum years of education completed by a household head is less than five in both countries.At baseline, the percentage of children aged 5-17 enrolled in school was only 51% in Kenya and 34% in Ethiopia. It is common for children aged 5-17 to engage in herding (34% in Kenya and 54% in Ethiopia). Our primary outcome for education[9] is

animal type reported by pastoral households in all rounds of our panel data between 2010 and 2022. For Kenya, 1 cattle is equivalent to 0.625 camels, 10 goats or 10 sheep. For Ethiopia, 1 cattle is equivalent to 0.4 camels, 10 goats, and 10 sheep. The average market values from our sales and purchases data are presented in Appendix Table E1. CMVE accomplishes the same cross-species aggregation purpose as the more familiar Tropical Livestock Unit (TLU) measure, which weights species according to the physical weight of the average adult animal, which proxies for its nutrient intake needs. Because our interest is in total herd size or herd size composition as a productive asset or as a store of wealth, we favor aggregation based on market value rather than biophysical requirements. The two are necessarily very strongly, positively correlated. We check for robustness to using CMVE or TLU in Appendix Tables D1 and D2.

[7] All variables expressed in USD are converted by the annual average exchange rate, not adjusting for inflation.

[8] Endline/baseline income ratio is 1.14 in Kenya and 1.67 in Ethiopia, while endline/baseline CPI ratio is 2.08 in Kenya and 2.99 in Ethiopia, suggesting the nominal income increase represent a negative change in real income in our sample during this period.

[9] A household member is defined to have completed the age-appropriate years of education by comparing her age, the years of education at endline, and the legal age of education in each country. In Kenya, the legal age to start education is five, six in Ethiopia. Therefore, if a seven-year old completed one year of education then we classify her

the share of household members that have completed the age-appropriate years of education, 6% in Kenya, and 9% in Ethiopia at baseline. These rates are similar 10 years later, where this is 4% in Kenya and 10% in Ethiopia. When children aren't studying full-time, a large share of them work, predominantly herding of goats and sheep. At baseline, 36% and 47% of children work full-time (secondary outcome), while 29% and 26% work part-time (secondary outcome) in Kenya and Ethiopia, respectively. At endline in Ethiopia, the share of full-time working children reduced by almost 40%, while the share of part-time working children remained stable.[10]

In the year before the baseline, pastoralists in Kenya lost 43% of their livestock holding due to deaths and raiding, 17% in Ethiopia (secondary outcome: livestock loss). In Kenya, most of these losses (secondary outcomes: numbers of camels,cattle, goats lost) were of goats, while in Ethiopia these were cattle and goats. In those same years, pastoralists in Kenya sold 3% of their livestock to cope with adverse effects of drought, while this was 45% in Ethiopia (secondary outcome: distress sales).

The left panel of Figure 2 shows that, on average, respondents purchased insurance 0.82 times. 50.5% of respondents purchased insurance at least once.The right panel of Figure 2 shows the distribution of the number of sales seasons in which pastoralists received discount coupons. On average, they received coupons 4.07 times. This is the variation we exploit to identify the causal effects of IBLI on our pre-specified primary and secondary outcomes.

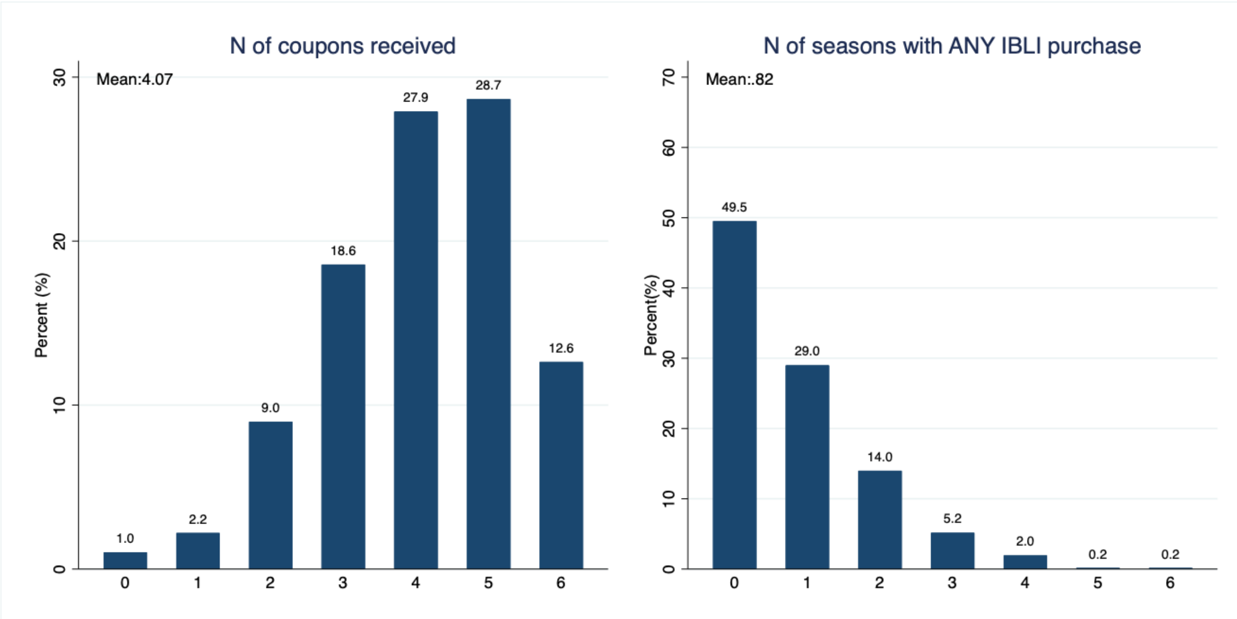
The randomization worked as designed. Table A1 presents balance tests for each of our pre-specified balance variables, by whether or not a household received a discount coupon in each round. Normalized differences are presented in square brackets. We also present the F-statistic for whether or not all variables are jointly significantly different. At the end of each row we present the F-statistic for whether one specific variable across the six rounds of randomization of discount coupons across households jointly generates significant differences. We do not observe any significant differences or significant F-statistics, and normalized differences are below the threshold of 0.25 in 46 out of 48 tests. Therefore we conclude that randomization of discount coupons was successful.

At the 10-year follow-up, we successfully re-interviewed 82% of the baseline households (1,179

to have completed the age-appropriate years of education but if she lived in Kenya we would not classify her similarly. We then compute the share of household members who completed age-appropriate years of education. We restrict the household members who were school-aged (five years old or older in Kenya, and six years old or older in Ethiopia) during the pilot period of 2010 to 2015 in Kenya and 2012 to 2015 in Ethiopia. We had pre-specified maximum years of education in the household as our primary outcome, but given that a substantial share of children are still in school, and their final maximum years of education remains unknown, we instead use the share of members that have completed the age-appropriate years of education as primary outcome.

[10]These data were not collected at endline in Kenya.

Figure 2: Number of coupons received and the seasons with ANY IBLI purchase

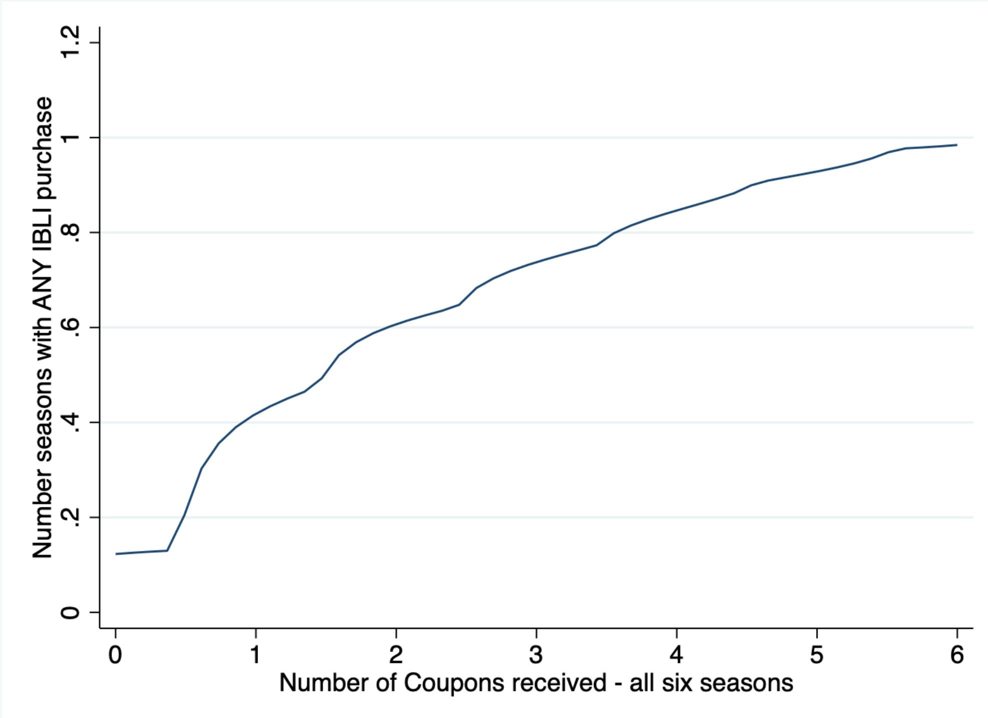


Notes: On the left panel, the x-axis presents the number of seasons that respondents purchased insurance. The y-axis shows the percent of respondents who purchased insurance 0, 1, 2, 3, 4, 5, or 6 six times during these six sales seasons.On the right panel, the x-axis presents the number of coupons that respondents received during the six sales seasons with discount coupons. The y-axis shows the percent of respondents who received 0, 1, 2, 3, 4, 5, or 6 discount coupons during these six sales seasons.

out of 1,439 – Table A2). While this is reasonably good, especially for migratory peoples, attrition is nonetheless a prospective confounding problem. Indeed, households that are not male-headed, that have fewer adults, and that do not own agricultural land were more likely to attrit from the sample (see Appendix Table A3). But crucially, as shown in Appendix Table A4), attrition does not differ by our instrument, the number of coupons received during the initial three seasons. So with good balance between treatment and control and no difference in attrition between treatment and control, non-random attrition should not introduce a selection problem to confound causal identification in these data.[11]

[11]We pre-specified two additional attrition tests. First, a joint test of selective attrition, which shows that only the number of adults in the household significantly predicts attrition (see Table A5). Second, a test for differential attrition per survey round, which shows that respondents that received a discount coupon are 5 percentage points less likely to attrit in sales season 3 (See Table A6).

Figure 3: Correlation - IBLI purchase and coupon receipt



Notes: The x-axis present the number of seasons in which the respondent received discount coupons during the first three sales seasons. The y-axis shows the likelihood that a respondent purchased any insurance during these first three seasons.

5 Estimation Results

Before presenting the estimated long-run effects on our outcome variables, we first examine the effect of randomized discount coupons on insurance purchase, our first stage. Figure 3 presents the correlation between the number of times that a pastoral household received coupons during the six experimental rounds, and IBLI uptake in any of the six sales seasons. As expected, we observe a strong, positive correlation (p<0.001). Table 2 presents the first stage estimation results of Equation (3). Columns 2-7 present the estimated effect of receiving a discount coupon on whether or not the respondent purchased insurance in each round. In the first three rounds, coupon receipt significantly predicts insurance purchase, at the 1% significance level in the first season, and at 5% level in the second and third season. There is no significant effect of the discount coupon on insurance purchase in any of the last three seasons. Hence our choice to use as our instrument the number of coupons that a respondent received during the first three seasons only. Inclusion of the latter three rounds weakens the instrument.

Column 1 of Table 2 presents the results of Equation (3), where we estimate the effect of the

Table 2: First stage regression results

	Any insurance purchased – first three seasons						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
No. of coupons received – first three seasons	0.123***						
	(0.016)						
Received coupon – first season		0.167***					
		(0.029)					
Received coupon – second season			0.069**				
			(0.030)				
Received coupon – third season				0.064**			
				(0.030)			
Received coupon – fourth season					0.004		
					(0.030)		
Received coupon – fifth season						-0.014	
						(0.031)	
Received coupon – sixth season							-0.049
							(0.035)
Controls	✓	✓	✓	✓	✓	✓	✓
Effective F-stat	56.522	32.837	5.294	4.639	0.020	0.213	1.937
10% Critical Value	23.109	23.109	23.109	23.109	23.109	23.109	23.109
N	1179	1166	1154	1165	1154	1151	1151

Notes: All columns present coefficient estimates and robust standard errors (in parentheses). Column (1) shows the result from the following equation: $I_{ij} = \alpha_0 + \alpha_1 D_{ij} + \alpha_3 X_{ij0} + \alpha_4 D^{t=6}_{ij4} + \rho_j + \mu_{ij}$, where $I_{ij} = 1\{\text{there exists } t \in \{1,2,3\} \text{ such that } I_{ijt} > 0\}$. Column (2)-(7) show the results from the following equations: $I_{ij} = \alpha_0 + \alpha_1 D_{ijt} + \alpha_3 X_{ij0} + \rho_j + \mu_{ij}$ for $t = 1,2,3,4,5,6$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. All reported 10% critical values are from Olea and Pflueger (2013), which are the cutoffs that we compare effective F-statistics with to determine whether the instrument is weak.

number of coupons received in the first three seasons on whether or not a respondent purchased any insurance during the first three seasons.[12,13] An increase in one additional coupon received in these first three seasons, significantly increases the likelihood that a respondent purchased insurance by 12.3 percentage points, which is significant at the 1 percent level. The effective F-statistics of Olea and Pflueger (2013) are greater than the critical value at the 10% level, providing support for the strength of our instrument.

5.1 Primary outcomes

Tables 3 and 4 report the coefficient estimates for our pre-specified primary outcomes following Equation (2), with and without controls.[14] we do not observe any effect of insurance purchase on either herd size or household cash earnings.

We see a strong, positive impact on education, however, a 14.6 percentage points increase, significant at the 5% level, in the likelihood that a child in the household has completed the age-appropriate years of education, triple the control group mean of 4.8 percent.[15] To confirm the significant estimated effect on education, we take a more careful look at other indicators. Table C3 presents effects on maximum years of education, total years of education, and average years of education. The effect on maximum years of education is positive but noisy, with a p= 0.156. With respect to total and average years of education we observe statistically significant increases at the 10-year follow-up, a 5.2 years increase in the total household-level years of education relative to 8.5 years in the control group, a 60% increase. In terms of the average years of education, we observe an increase of 2.3 years, from a control mean of 4.9 years, a 46% increase.

We see a substantial decrease of 23.5 percentage points in the share of goats herded, significant at the 5% level, relative to a control mean share of 28.4, a 83% decrease. There are no changes in the share of sheep herded, so by construction we see estimated increases in the share of camels

[12]In the pre-analysis plan we pre-specified the endogenous variable as the cumulative insurance purchase {0,1,2,3} in the first three seasons. However, this specification violates the monotonicity assumption that is required for valid instruments, because the number of times insurance is purchased does not increase monotonically with the number of discount coupons received. When instead, we create a binary variable of whether or not the respondent purchased any insurance in the first three seasons, insurance purchase does monotonically increase with the number of discount coupons received, and we therefore use this endogenous variable.

[13]We do not include any analysis using the intensive margin of IBLI uptake – the CMVE of animals insured because the number of coupons received by respondents is not a significant predictor of this intensive margin uptake.

[14]Missing values in control variables are replaced with the mean value of the variable within each country.

[15]The sample size for the share of children who completed age-appropriate years of education decreases to 770, because the outcome variable is treated as missing when there were no household members who were of school-going age during the pilot period.The results are qualitatively the same when we impute the average share of age-appropriate household members by each country to missing values of the outcome variables.

Table 3: Prespecified primary outcomes: Herd size, earnings, education

	Herd size (CMVE)		Total household cash earning (USD)		Share of members who completed age-appropriate years of education	
	(1)	(2)	(3)	(4)	(5)	(6)
Any insurance purchased	2.078	3.328	-89.409	-98.678	0.142**	0.146**
	(8.731)	(8.792)	(394.301)	(394.083)	(0.061)	(0.061)
Controls		✓		✓		✓
Control mean	14.265	14.265	693.382	693.382	0.048	0.048
Observations	1179	1179	1179	1179	770	770

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table 4: Prespecified primary outcome: Herd composition

	Outcome: N of animal type in CMVE / Total N of animals in CMVE							
	Camel		Cattle		Goats		Sheep	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Any insurance purchased	0.123	0.120	0.108	0.107	-0.225**	-0.235**	-0.007	0.009
	(0.091)	(0.092)	(0.083)	(0.083)	(0.096)	(0.097)	(0.052)	(0.052)
Controls		✓		✓		✓		✓
Control mean	0.263	0.263	0.332	0.332	0.284	0.284	0.121	0.121
Observations	987	987	987	987	987	987	987	987

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

and cattle herded. Point estimates for camel and cattle are positive and marginally insignificant (p=0.190 and 0.198, respectively), suggesting we might be under-powered to detect these effect sizes. To increase statistical power, we also analyze effects at the animal species level. Panel A of Appendix Table D2 reports the results for small animals – goats and sheep, and Panel B for larger animals, camels and cattle. The sign of the coefficients on the share, and the number of animals are similar. The share of larger animals increases significantly for respondents who purchased insurance, while the share of smaller animals decreases.

5.2 Secondary outcomes

Tables 5 and 6 report the results for our pre-specified secondary outcomes, following Equation (2), with and without controls. We observe no statistically significant effects at the five percent level of IBLI purchase on any of our secondary outcomes. The standard errors are large for herd management expenditures, livestock loss, distress sales, whether or not the respondent purchased any insurance in the last 12 months, and the number of CMVE purchased in the last 12 months. The point estimates on annual milk income in the past 12 months are positive and double the mean in the control group, and standard errors suggest that we may be under-powered to detect an effect p=0.102).

With respect to children's activity choices we observe a similar pattern of noisy estimates that are potentially under-powered. With respect to full-time work and part-time work, we observe a negative point estimate of -0.327 and -0.263, relative to a control mean of 0.271 and 0.201, respectively (p=0.251 and 0.304, respectively), suggesting that insurance minimizes the likelihood that children are working either full-time or part-time, although we are underpowered to detect that effect. Consistent with results on education, we also observe a large but noisy point estimate on whether or not children are studying full-time, suggesting an increase of 46 percentage points, double the control mean of 23 percent (p=0.097).

6 Mechanisms

In this section we discuss the potential mechanisms that may explain IBLI's long-term effects. As described above, the initially strong take-up during the pilot experiment with randomized discount coupons dissipated as the pilot moved into its later years. The insurer's sales of IBLI fell precipitously after the research team left the field in 2015. One might reasonably expect not to have found any long-term effects, even on outcomes with clear short-run IBLI impacts. To investigate the

Table 5: Prespecified secondary outcomes

	Herd management expenditure (USD)		Milk Income		Livestock loss (CMVE)		Distress sales (CMVE)		Livestock Sale (CMVE)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Any insurance purchased	-6.359	-1.723	582.158	677.707	1.813	1.943	-0.331	-0.342	-1.144	-0.996
	(95.362)	(95.822)	(452.541)	(471.170)	(2.893)	(2.786)	(0.529)	(0.523)	(1.457)	(1.443)
Controls		✓		✓		✓		✓		✓
Control mean	182.827	182.827	339.362	339.362	5.448	5.448	0.292	0.292	1.872	1.872
Observations	1179	1179	1179	1179	1179	1179	781	781	1179	1179

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I_{ij}} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D^{t=6}_{ij4} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables. In Columns 7 and 8, the number of observations for distress sales decreases to 781 since this information was not collected in Ethiopia.

Table 6: Prespecified secondary outcomes: IBLI purchase and children's activities

	IBLI uptake in the past 12 months (=1 if purchased)		IBLI uptake in the past 12 months (CMVE)		Working full-time		Working part-time		Studying full-time	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Any insurance purchased	0.033	0.035	-0.974	-0.918	-0.296	-0.327	-0.213	-0.263	0.437*	0.462*
	(0.043)	(0.043)	(0.896)	(0.916)	(0.270)	(0.285)	(0.240)	(0.256)	(0.265)	(0.278)
Controls		✓		✓		✓		✓		✓
Control mean	0.042	0.042	0.539	0.539	0.271	0.271	0.201	0.201	0.232	0.232
Observations	1179	1179	1179	1179	376	376	376	376	376	376

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I_{ij}} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D^{t=6}_{ij4} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables. Columns 5 to 10 report the estimated coefficients with 376 observations, which is also due to the absence of this information in Kenyan sample at the endline.

mechanisms that may explain the long-run outcomes, we first analyze the dynamics of long-run effects over time. We do so by running the same regressions on the survey responses provided immediately after the third sales season - i.e., during the initial experimental period, during which our instrument is strong - as well as at the end of the experiment, after the sixth sales season. After this sixth sales season, IBLI delivery into surveyed locations fell precipitously, so IBLI supply-side constraints began to potentially influence ongoing insurance uptake.

Second, we unpack the *ex ante* and *ex post* impacts of IBLI, trying to disentangle the extent to which observed effects result from the mere purchase of insurance - i.e., from the behavioral effects induced by reduced catastrophic risk exposure for a year - or from receipt of an indemnity payment due to a drought - i.e., the buffering effect of payments to compensate for likely loss.

6.1 Dynamics of impacts over time

To investigate the dynamics of effects over time, we estimate Equation (2) on the same outcomes reported in the survey at the end of the third sales season, at the end of the experiment after the sixth sales season, and then in the endline. We report these results in Table C4 to Table C11. Table C4 shows that we do not observe any effects at any time period for herd size and household cash income, and standard errors are large.

For education and child labor, no significant effects emerge by the end of the third season, but we see a positive but noisy point estimate on the educational effect at the end of the sixth season (p= 0.124, p=0.094 without controls), in the direction of the long-term positive effect we observe. These effects are confirmed in the other measures of educational attainment (Table C5). These changes correspond to a 11 percentage point reduction in children's full-time work after the third sales season (p=0.261), compared to a 43 percent control group mean (Table C11). The point estimate on part-time work, however, shows a 15 percentage points increase (p=0.129) after year three, suggesting a transition from full-time to part-time work initially, while the long-run effect is a reduction in both.

In terms of herd composition, there is a negative and significant reduction goats' herd share by the end of the experiment, by 15 percentage points relative to a 23% control mean, significant at the 5% level. The point estimate after the third sales season is also negative, but noisy. The shift is towards camels, for which we observe a marginally insignificant increase after the third sales season (p=0.161). There is no significant change in cattle holdings at any time horizon.

These results suggest that the effect on herd composition – to a smaller share of small ruminants and a larger share of large ruminants – and educational attainment started to materialize around the end of the experiment and then continued afterwards rather than reverting back to the pre-experiment state. But they did not occur right away, as the experiment began (Table C6). One explanation may be that insurance reduced the need for precautionary savings to cover drought-related expenditures on food (to replace lost milk production), fodder, water, and veterinary expenses. In this context, goats are "cash with four legs," a highly liquid, non-lumpy asset (average value roughly USD 10) commonly sold to cover such expenses (McPeak, Little, and Doss, 2011). IBLI indemnity payments provide an alternative to cover such costs. An alternative, complementary explanation is that households invest more in camels (Table C16), a higher-return, more drought-resistant asset than goats, but at USD 120-180 each, much lumpier investments. By reducing households' need for liquidity during or following a drought, IBLI induces households to re-balance their livestock portfolio towards lumpier, more productive but less liquid species. In turn this may have reinforced household investment in children's education, because while children routinely manage goats, camels are large, strong and ornery, managed overwhelmingly by adult men. The observed change in herd composition occurred around the same time as changes in education, suggesting that changes in productive strategies changed the marginal productivity of child labor, thereby boosting investments in education, similar to Shah and Steinberg (2017). Alternatively, perhaps insurance led to changes in educational investments, for example by changing households' future orientation, and that necessitated changes in herd composition. We cannot tease these two complementary hypotheses apart; each is consistent with the data.

6.2 Indemnity payments as lump sum transfers

Another potential mechanism that may explain our long-run effects could be that the indemnity payment from insurance provided a lump sum cash transfer to households, and helped relieve savings or liquidity constraints. This would parallel prior studies of cash transfer interventions (Angelucci, Attanasio, and Di Maro, 2012; Haushofer and Shapiro, 2016; Blattman et al., 2016; Baird, McIntosh, and Özler, 2019). If households were savings constrained, these indemnity payments could have provided cash to purchase lumpy assets such as camels and cattle, explaining changes in herd composition. Alternatively, if households were liquidity constrained and indemnity payments arrived around the same time as education-related expenditures, this could explain the observed changes in educational attainment. To investigate these potential channels we test to what extent the receipt of indemnity payments, which are conditional on insurance and drought, affect outcomes by estimating the following second-stage equation:

$$y_{ijT} = \gamma_0 + \gamma_1 \widehat{I_{ij}} + \gamma_2 \widehat{I_{ij}} \times R_j + \gamma_3 y_{ij0} + \gamma_4 X_{ij0} + \gamma_5 D^T_{ij4} + \rho_j + \varepsilon_{ijT} \qquad (6)$$

where R_j is an exogenous indemnity payment rate specific to the index unit for the three periods of insurance uptake for which we instrument, as determined by the NDVI realization and the pre-specified IBLI contract terms.

The receipt of a indemnity payments is the combined effect of being insured and experiencing a weather shock. The latter is exogenous, and absorbed through the location fixed effect, so the coefficient on $\widehat{I_{ij}} \times R_j$ is the direct effect of the indemnity payment on outcomes (γ_2).

Note that during the initial three sales seasons, payouts were only observed once in Kenya, and not in Ethiopia. The coefficient γ_1 captures the effect of insurance uptake on the outcome in the absence of a payout, which we can think of as the "peace-of-mind" (*ex ante*) effect of insurance. The combined effects of purchasing insurance and receiving the indemnity payment are captured by $\gamma_1 + \gamma_2$, which is the marginal effect of interest in the event an indemnity payout occurs.

Table C12 to C15 show the results of estimating Equation (6) for the primary and secondary outcomes. The marginal effect of receiving insurance and a indemnity payment ($\gamma_1 + \gamma_2$) is provided in the first row of the bottom panel of the tables, and its *p*-value is provided in the second row. Table C12 shows that there are no effects for herd size, and cash earnings. For education, we see that the coefficient on insurance purchase remains strong and positive, irrespective of the indemnity payment. The indemnity payment did not have statistically significant effect on education as well. The combined effect of insurance and indemnity payment, however, is positive at a 15.2 percentage points increase, and statistically insignificant, with a *p*-value of 0.016. Table C13 also shows that none of the direct effect of indemnity payments statistically significant. Statistically significant, combined effects of insurance and indemnity payments, therefore are found in education only.

In terms of our pre-specified secondary outcomes, Tables C14 and C15 show that there are no significant combined effects of insurance and indemnity payments. It should be noted that while the direct effect of insurance on milk income, a notoriously noisy variable, is not statistically significant, implying that insurance does not increase annual milk income substantially. Indemnity payments, however, substantially reduce it by 0.00134 a USD, significant at the 10 percent level, but the combined effect is not significant.

Taken together, these results do not suggest that cash received through indemnity payments drove effects on education and herd composition, ruling out that savings or liquidity constraints are mechanisms driving our results. This is consistent with the broader findings in the literature that cash transfers' short-run effects do not always persist to generate long-term effects.(Araujo, Bosch, and Schady, 2017; Baird, McIntosh, and Özler, 2019; Blattman, Dercon, and Franklin, 2022; Blattman, Fiala, and Martinez, 2020) Rather, the long-term effects we observe come from induced behavioral effects that result from reducing pastoralists' *ex ante* exposure to catastrophic risk.

7 Robustness

In this section we consider the potential effect of spillovers on our estimates. This is important because the original pilot experiment randomized households within communities to either receive discount coupons or not. Particularly because individuals in communities are known to informally share risk with each other, the Stable Unit Treatment Value Assumption (SUTVA) is likely violated.

To study spillovers, we first identify the potential spillover pathways that may exist in both our first- and second stage. These are graphically represented by Figure B1. Let D_{ig} denote discount coupon receipt by herder i residing in community g, I_{ig} represent insurance purchase, and Y_{ig} denote the long-run outcome of this herder. Note that there exists a group of other herders, $-i$, whom we refer to as "peers," that are also from community g. We define D_{-ig} as the peers' discount coupon receipt, I_{-ig} as the peers' decision of whether or not to buy insurance, and Y_{-ig} as the peers' long-run outcome. We assume that there are no inter-community spillovers.

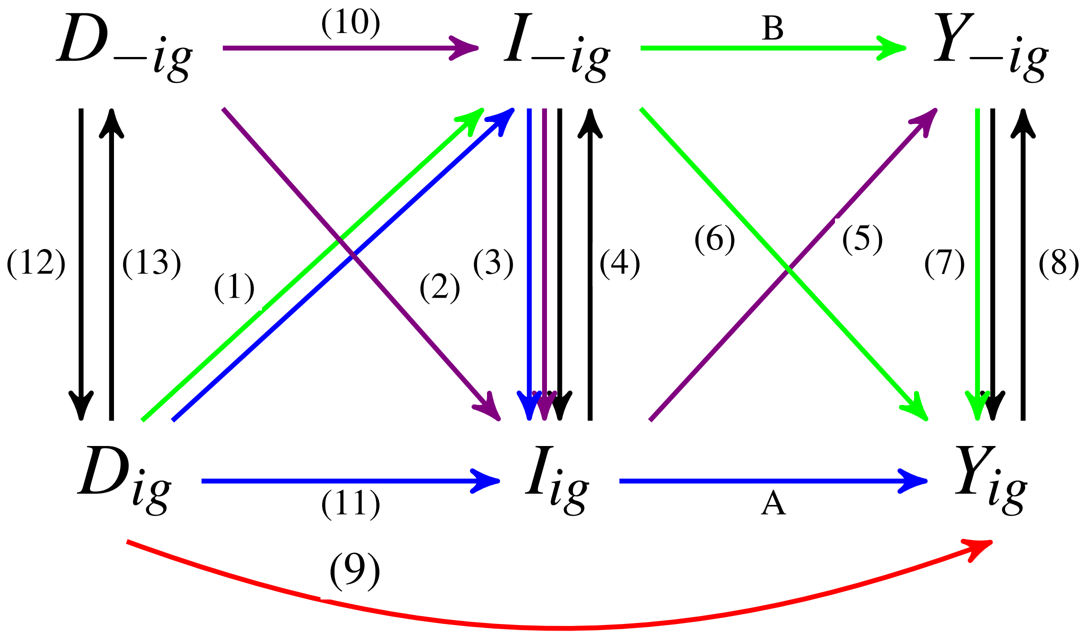
The blue line A represents the main causal effect we are interested in estimating, namely the effect of i's insurance purchase on $i's$ long-run outcomes. Since insurance purchase is endogenous, we use exogenous variation created by the randomized discount coupons D_{ig} as an instrument (pathway (11)) to estimate the LATE. For a detailed description of all the spillover pathways, including examples, please refer to Appendix B.

Given the fact that our research was not designed to measure spillovers, we are limited in our ability to causally identify many of the potential pathways. Furthermore, if we take the measures of D, I and Y for i, these will be mechanically negatively correlated with these measures for $-i$ (see Appendix B for details).

This implies that we can only control for exogenous variation generated by our instruments D_{ig} and D_{-ig}, on both I_{ig} and I_{-ig}, and that any estimated causal effects of D_{ig} on I_{-ig} and D_{-ig} on I_{ig} may consist of both mechanical correlations as well as actual spillovers. In terms of interpretation of our main effect of interest, D_{ig} on I_{ig}, however, this does not matter, as long as the other mechanisms are properly controlled for.

Columns (3)-(8) of Table B3 show the results of the first-stage spillovers. The results are consistent with the existence of the negative mechanical correlations we expect. Columns (3)-(5) show that the coupon receipt of herder i, D_{ig}, and the mean coupon receipt of peers $-i$, henceforth $\overline{D}_{-ig}$,

Figure 4: DAG: potential spillover interaction



Notes: Pathways are indicated by (1)-(13) and A and B. D_{ig} refers to the discount coupons received by herder i in community g, I_{ig} is their insurance purchase, and Y_{ig} their long-run outcome. Other herders from community g, termed "peers," are denoted as $-i$. We refer to their discount coupons received, insurance purchase, and long-run outcomes as D_{-ig}, I_{-ig}, and Y_{-ig}, respectively. Our main causal effect of interest is A, where we estimate the LATE of I_{ig} on Y_{ig}, instrumenting I_{ig} by D_{ig}. The blue arrows present this main specification. The red pathway presents a direct violation of the exclusion restriction. The green pathways present indirect violations of the exclusion restriction and violations of SUTVA, the purple pathways present violations of SUTVA. The black arrows indicate mechanical negative correlations. See Appendix B for more details.

both have a strong and statistically significant effect on the insurance uptake of i, but the effect of the latter is negative. However, when insurance uptake of i is regressed on both D_{ig} and $\overline{D}_{-ig}$ simultaneously, only the former remains significant. Columns (6)-(8) show that similarly, coupon receipt of herder i and the mean coupon receipt of peers $-i$ both have a strong and statistically significant effect on peers' mean insurance uptake, henceforth $\overline{I}_{-ig}$, but the effect of the former is negative. However, when we regress peers' mean uptake on both D_{ig} and $\overline{D}_{-ig}$ simultaneously, neither remains significant. These results suggest that there is no reason to assume that pathways (2), (1), and (10) will bias our LATE estimates.

As a final step, to confirm the conclusions derived after the analysis of the first stage, we do include $\overline{D}_{-ig}$ as additional instrument, and $\overline{I}_{-ig}$ as additional endogenous regressor in our main 2SLS specification . Tables B4 to B7 present the second-stage results of the re-estimation of the main specification (as presented in Tables 3 to 6) with inclusion of these additional variables. The results are qualitatively similar to the main results. We do lose statistical power on the education results, which we attribute to the addition of another instrument and endogenous regressor, as coefficient estimates on $\hat{\bar{I}}_{-ig}$ indicate that there is no effect on $i's$ education outcomes.

8 Conclusion

Conclusion to be added.

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Appendix

A Balance and Attrition

A.1 Balance

We estimate the following equation for our pre-specified set of balance variables that were selected following Jensen, Barrett, and Mude (2017) and Takahashi et al. (2016)[16]:

$$k_{ijt} = \gamma_1 + \gamma_2 \mathrm{D}_{ijt} + \rho_j + \nu_{ijt} \tag{7}$$

where k_{ijt} denotes a characteristic of a household i in area j in sales season t, D is an indicator for whether or not the household received a discount coupon in that sales season, and the other variables are the same as in previous equations.

In addition to the coefficient estimates and standard errors from Equation (7), we use the normalized difference as a scale-invariant measure of the size of the difference, which we calculate by the following equation:

$$\text{Normalized Difference} = \frac{\bar{X}_{treatment} - \bar{X}_{control}}{\sqrt{(s^2_{treatment} + s^2_{control})/2}} \tag{8}$$

where $\bar{X}$ represents the mean and s the standard deviation of a variable.

As stated in the main body of the text, results reported in Table A1 show that randomization was balanced across observables.

A.2 Attrition

At baseline, 1439 households participated in our panel survey. Ten years later we were able to track 1179, or 82% of these households (Table A2). Because our main instrument uses the number of seasons that a household received a coupon during the first three sales seasons, we first test if we have selective attrition by estimating Eq. (9).

[16] Variables include: age of the household head, an indicator for male-headed household, years of education of the household head, adult equivalent, dependency ratio, herd size in TLU, annual income per capita in USD, and whether the household owned or farmed on agricultural land in the last 12 months.

$$\text{Attrition}_{ijT} = \delta_0 + \delta_1 \text{D}_{ij} + \gamma_j + \omega_{ij} \tag{9}$$

where $Attrition_{ijT}$ is an indicator variable that equals 1 if a pastoral household i in community j was interviewed at baseline (2009 in Kenya, 2012 in Ethiopia), but not during the long-run follow-up survey round (2020 in Kenya and 2022 in Ethiopia). D_{ij} is the total number of sales seasons out of the first three where the household received discount coupons. All other variables are defined in the same way as in the previous equations. Table A4 reports the regression results, and we find no significant differential attrition by our instrument. As pre-specified in our pre-analysis plan we also estimate differential attrition based on cumulative coupons receipt in all six sales seasons, and Table A4 shows our results are similar.

We also estimate the following attrition equation to evaluate attrition by discount coupon receipt and discount rate for each sales season separately:

$$\text{Attrition}_{ijT} = \kappa_0 + \kappa_1 \text{D}_{ijt} + \kappa_2 \text{Discount Rate}_{ijt} + \kappa_3 \text{Absent}_{ijt} + \rho_j + \omega_{ijt} \tag{10}$$

where D_{ijt} is an indicator equal to one if a household i in location j in sales season t received a discount coupon. Discount Rate_{ijt} is the coupon discount rate in percentages, defined as zero if the household did not receive any coupon. Since some households drop out from the panel survey in a specific round, to return a round later, we include $Absent_{ijt}$, an indicator denoting that the household was absent from the panel survey in specific sales season t. ρ_j represents location fixed effects. ω_{ijt} is the robust standard error. κ_1, our coefficient estimate of interest, represents the correlation between coupon receipt status in sales season t and attrition in the final round. The estimated results reported in Table A6 show that there is no differential attrition by discount coupon receipt status in any of the estimations, other than the pooled analysis in sales season 3, where those who received a discount coupon are significantly less likely, at the 10 percent level, to attrit than those who did not receive a discount coupon.

Finally, we consider selective attrition by our pre-specified observable household characteristics and estimate the following equation:

$$Attrition_{ijT} = \theta_0 + \theta_1 X_{ij0} + \rho_j + \sigma_{ijt} \tag{11}$$

where X_{ij0} is the vector of characteristics of household i in community j at baseline. Table A3 shows that an additional adult household member makes a household significantly less likely to attrit by 1 percentage point, and this estimate is significant at the 10 percent level. None of the other pre-specified observables significantly predict attrition.[17]

[17] In this table, we replace the missing values with a mean of existing observations and include a dummy variable indicating missing in the regression, to utilize information from all households. We use winsorized value for income per adult equivalent, earnings from livestock sale, and livestock expenditure.

Table A1: Balance of coupon distribution

	Received coupon vs. No coupon						
Sales Season Kenya:	2010 JF	2011 JF	2011 AS	2012 AS	2013 JF	2013 AS	
Sales Season Ethiopia:	2012 AS	2013 JF	2013 AS	2014 JF	2014 AS	2015 JF	F-test
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age of the household head	0.493	1.37	-0.243	0.0224	1.28	0.0177	3.94
	(1.05)	(1.04)	(1.01)	(0.959)	(0.944)	(1.09)	{0.685}
	[0.0515]	[0.0862]	[0.0173]	[0.0309]	[0.101]	[0.00159]	
Male headed household (=1)	-0.0206	-0.0265	-0.0340	-0.0373	0.00494	-0.0253	7.14
	(0.0248)	(0.0244)	(0.0243)	(0.0245)	(0.0251)	(0.0284)	{0.308}
	[0.0345]	[0.0235]	[0.00977]	[-0.00182]	[0.0790]	[-0.0608]	
Education of household head	-0.238	-0.0563	-0.0407	0.0914	-0.224	0.183	5.99
	(0.171)	(0.170)	(0.163)	(0.155)	(0.158)	(0.157)	{0.424}
	[-0.121]	[-0.0606]	[-0.0805]	[-0.0370]	[-0.153]	[0.0777]	
Adult equivalent	-0.00907	0.0569	-0.108	-0.0176	-0.137	-0.142	3.43
	(0.120)	(0.118)	(0.119)	(0.116)	(0.119)	(0.147)	{0.753}
	[0.0308]	[0.0414]	[-0.00252]	[0.0267]	[-0.0253]	[-0.0707]	
Dependency ratio	-0.00238	-0.00368	0.00527	0.0125	0.0148	-0.0123	4.59
	(0.0118)	(0.0114)	(0.0113)	(0.0110)	(0.0109)	(0.0123)	{0.597}
	[0.0446]	[0.0462]	[0.0940]	[0.129]	[0.138]	[-0.0634]	
Herd size (CMVE)	1.14	-0.917	-0.252	-1.36	0.453	-2.06	3.17
	(1.63)	(1.61)	(1.69)	(1.44)	(1.15)	(1.87)	{0.787}
	[-0.0200]	[-0.0637]	[-0.0410]	[-0.0261]	[0.0794]	[-0.0876]	
Annual income per AE (USD)	-4.77	-15.8	-3.28	11.1	-2.64	-20.0	4.03
	(10.2)	(15.5)	(13.7)	(10.6)	(12.8)	(16.4)	{0.673}
	[-0.0438]	[-0.113]	[-0.0875]	[0.0173]	[-0.0829]	[-0.0816]	
Own or farm agricultural land	-0.0293*	-0.00378	0.0151	0.0221	-0.0169	-0.00445	6.95
	(0.0174)	(0.0170)	(0.0157)	(0.0166)	(0.0159)	(0.0190)	{0.326}
	[0.152]	[0.204]	[0.290]	[0.259]	[0.180]	[-0.00469]	
F statistics of Joint F-test:	5.988	4.702	4.279	8.845	8.241	8.770	
P-value of Joint F-test:	0.649	0.789	0.831	0.356	0.410	0.362	

Notes: Each cell reports the results from individual regression estimating Equation (7):$y_{ijt} = \alpha + \beta_1 \text{Received Coupon}_{ijt} + \gamma_j + \varepsilon_{ijt}$, where y_{ijt} denotes a characteristic of a household i in area j in sales season t. Columns (1) to (6) report mean differences, robust standard errors (in parentheses), and and normalized difference (in square brackets) between the coupon recipients and non-recipients. All estimations include country and community fixed effects. Column (7) reports joint significance test for each variable across seasons where the first row presents the Chi-statistics and the second row presents the p-value of the test statistic in brackets. Dependency ratio is the ratio of dependents – people younger than 15 or older than 64 – to the working-age population, those ages 15-64.See Table 1 notes for definitions of variables. * denotes significance at 0.10; ** at 0.05; and *** at 0.01.

Table A2: N of households present in each round

	Kenya			Ethiopia		
	Total	Original sample	*Net* replacement	Total	Original sample	*Net* replacement
	(1)	(2)	(3)	(4)	(5)	(6)
R1	924	924	.	515	515	.
R2	924	887	37	506	474	32
R3	924	857	30	514	479	3
R4	924	838	19	513	470	8
R5	923	829	8	438	398	
R6	919	785				
R7	868	781				
Balanced sample		712 (77 %)			387 (75 %)	
Initial & Last		781 (85 %)			398 (77 %)	

Notes: This table shows the number of households interviewed in each round. Column (1) and (4) show the number of households surveyed for each round. Column (2) and (5) are defined on the balanced sample in *and*. Column (3) and (6) show the number of households for the replacement. *Balanced sample* and *Initial* & *Last* show the number of households surveyed in all periods, and $R1$ and $R7$, respectively. Balanced sample gives balanced panel across all the rounds. *Net* replacement at round t is calculated by replacement_t = total_t − original_$t - \sum_k = 1^{t-1}$replace_k for $t = 2, \cdots, T-1$ and mechanically empty for $t = 1, T$.

Table A3: Attrition across baseline characteristics

	Outcome: Interviewed at baseline but not in latest round (=1)
	(1)
Age of the household head	-2.04
	(1.33)
Male headed household (=1)	-.0555*
	(.0335)
Education of household head	.355
	(.229)
Adult equivalent	-.383***
	(.143)
Dependency ratio	-.00781
	(.0151)
Herd size (CMVE)	1.3
	(1.95)
Annual income per AE (USD)	20.8
	(15.9)
Own or farm agricultural land	-.0478*
	(.0254)
P-value of joint F-test	0.016
N	1439

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $x_{ijt=0} = \alpha + \beta Attrition_{ijt=T} + \gamma_j + \varepsilon_{ijt}$ where $Attrition_{ijt=T}$ is an indicator variable equals to 1 if an individual household i in community j was interviewed at baseline (2009 in Kenya, 2012 in Ethiopia), but not at the latest round (2020 in Kenya and 2022 in Ethiopia). $X_{ijt=0}$ is the vector of characteristics of household i in community j at baseline. γ_j is the community fixed effects to control for the strata-level commonalities. ε_{ijt} is the robust standard error. See Table 1 notes for definitions of variables. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include country and community fixed effects. P-value of joint F-test reports p-value from the joint signifiance test for all variables across attrition.

Table A4: Differential attrition across cumulative coupon receipt status

	Outcome: Interviewed at baseline but not in latest round (=1)	
	(1)	(2)
N of coupons received – the initial three seasons	-.00764	
	(.00998)	
N of coupons received – all six seasons		-.00285
		(.00734)
N	1439	1439

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the Equation (9): $\text{Attrition}_{ijt=T} = \alpha + \beta_1 \text{Cumulative N of Coupon Receipt}_{ij} + \beta_2 \text{Cumulative Discount Rates}_{ij} + \gamma_j + \varepsilon_{ij}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include country and community fixed effects.

Table A5: Attrition across baseline characteristics

	Outcome: Interviewed at baseline but not in latest round (=1)
	(1)
Age of the household head	-.000372
	(.000596)
Male headed household (=1)	-.0357
	(.0255)
Education of household head	.00429
	(.00441)
Adult equivalent	-.0122**
	(.00526)
Dependency ratio	-.0196
	(.0512)
Herd size (CMVE)	.000421
	(.000354)
Annual income per AE (USD)	.0000429
	(.0000718)
Own or farm agricultural land	-.0482
	(.0343)
P-value of joint F-test	0.024
N	1439

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from Equation (11): $Attrition_{ijt=T} = \alpha + \beta X_{ijt=0} + \gamma_j + \varepsilon_{ijt}$ where $Attrition_{ijt=T}$ is an indicator variable equals to 1 if an individual household i in community j was interviewed at baseline (2009 in Kenya, 2012 in Ethiopia), but not at the latest round (2020 in Kenya and 2022 in Ethiopia). $X_{ijt=0}$ is the vector of characteristics of household i in community j at baseline. γ_j is the community fixed effects to control for the strata-level commonalities. ε_{ijt} is the robust standard error. See Table 1 notes for definitions of variables. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include country and community fixed effects. P-value of joint F-test reports joint signifiance test for all variables (except for fixed effects) across attrition.

Table A6: Differential attrition across coupon receipt status

	(1) Outcome: Interviewed at baseline but not in latest round (=1)
***Sale season 1*: 2010 JF (Kenya), 2012 AS (Ethiopia)**	
Received coupon	.0214
	(.026)
Discount Rate	-.000136
	(.000498)
***Sale season 2*: 2011 JF (Kenya), 2013 JF (Ethiopia)**	
Received coupon	-.0362
	(.0242)
Discount Rate	.000616
	(.000467)
***Sale season 3*: 2011 AS (Kenya), 2013 AS (Ethiopia)**	
Received coupon	-.0525**
	(.0249)
Discount Rate	.000704
	(.000478)
***Sale season 4*: 2012 AS (Kenya), 2014 JF (Ethiopia)**	
Received coupon	.00744
	(.0252)
Discount Rate	-.000327
	(.000474)
***Sale season 5*: 2013 JF (Kenya), 2014 AS (Ethiopia)**	
Received coupon	.00978
	(.0248)
Discount Rate	-.000154
	(.000464)
***Sale season 6*: 2013 AS (Kenya), 2015 JF (Ethiopia)**	
Received coupon	.0394
	(.0265)
Discount Rate	-.000524
	(.000372)
N	1439

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from Equation (10):$\text{Attrition}_{ijt=T} = \alpha + \Sigma_{t=1}^{6}(\beta_1^t \text{Received Coupon}_{ijt} + \beta_2^t \text{Discount Rate}_{ijt} + Absent_{ijt}) + \gamma_j + \varepsilon_{ijt}$, where $\text{Received Coupon}_{ijt}$ is an indicator equals to one if a household i in admin unit j in sales season t received a discount coupon, $\text{Discount Rate}_{ijt}$ is the discount rate from the coupon in percentage term, defined as zero if the household did not receive any coupon.* denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include country and community fixed effects.

B Spillover

Our estimate of the Local Average Treatment Effect (LATE) is a valid estimator of the causal effect of IBLI if our design satisfies the following assumptions: (i) Stable Unit Treatment Value Assumption (SUTVA); (ii) the exclusion restriction; (iii) monotonicity (iv) exogeneity of the instrument.

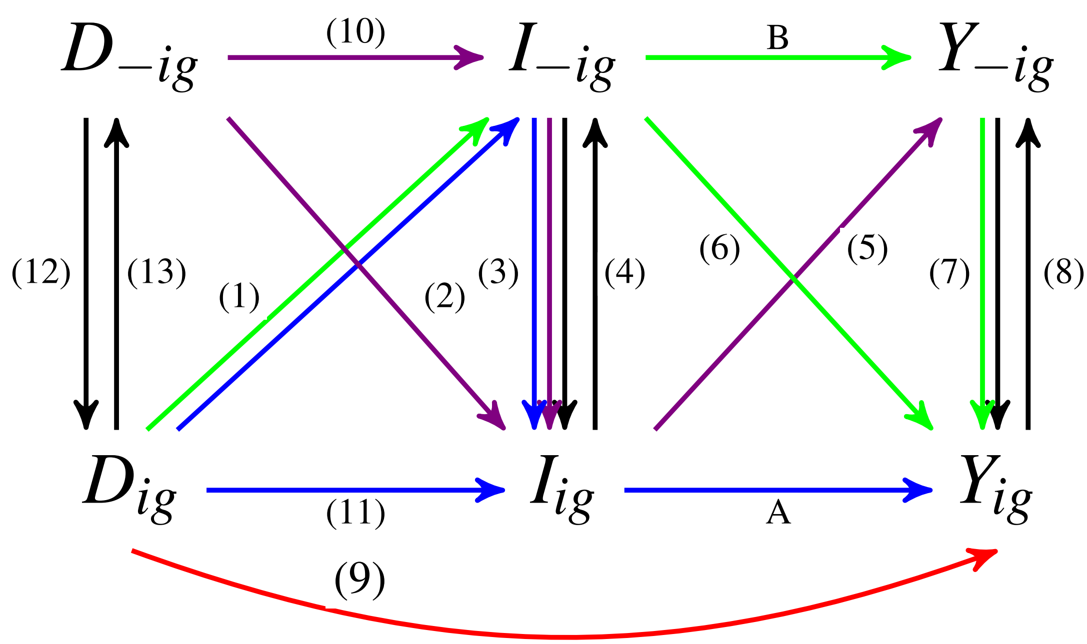
To estimate the causal effect of IBLI on long-run outcomes, we use the number of randomized discount coupons received during the first three seasons of IBLI sales as an instrument for whether or not a respondent took up any IBLI during the first three seasons. This is a context where we should anticipate two-sided non-compliance, so we check that we satisfy the monotonicity assumption in Table B1 in the main paper. Our results demonstrate that the likelihood of IBLI take-up in the first three seasons monotonically increases with the number of coupons received during the first three seasons.

If we assume that the receipt of discount coupons and the take-up of insurance do not generate spillovers – and thus SUTVA is not violated – it is unlikely that the exclusion restriction is violated through spillovers. This is because discount coupons were randomly assigned across households in communities. However, if we relax SUTVA, this can lead to spillovers in the second stage, from a herder's insurance purchase decision onto her peers' insurance purchase decision; from a herder's purchase decision onto her peers' outcomes; or from a herder's outcomes onto her peers' outcomes. Furthermore, spillovers may also arise in the first stage, where a herder's receipt of a discount coupon affects her peers' insurance purchase. Because the effect of a herder's discount coupons on their long-run outcomes still runs solely through the herder's insurance purchase, these spillovers would not violate the exclusion restriction. However, the effect of our instrument on insurance purchase now consists of a direct and an indirect effect.

The potential spillovers in the first- and second-stage can be graphically represented by Figure B1. Let D_{ig} denote discount coupon receipt by herder i residing in community g, I_{ig} represent insurance purchase, and Y_{ig} denote the long-run outcome of this herder. Note that there exists a group of other herders, $-i$, whom we refer to as "peers," that are also from community g. We can then define D_{-ig} as the peers' discount coupon receipt, I_{-ig} as the peers' decision of whether or not to buy insurance, and Y_{-ig} as the peers' long-run outcome. We assume that there are no inter-community spillovers.

The blue line (A) represents the main causal effect we are interested in estimating, namely the effect of i's insurance purchase on long-run outcomes. Since insurance purchase is endogenous, we use exogenous variation created by the randomized discount coupons D_{ig} as an instrument (pathway (11)) to estimate the LATE.

Figure B1: DAG: potential spillover interaction



Notes: Pathways are indicated by (1)-(13) and A and B. D_{ig} refers to the discount coupons received by herder i in community g, I_{ig} is their insurance purchase, and Y_{ig} their long-run outcome. Other herders from community g, termed "peers," are denoted as $-i$. We refer to their discount coupons received, insurance purchase, and long-run outcomes as D_{-ig}, I_{-ig}, and Y_{-ig}, respectively. Our main causal effect of interest is A, where we estimate the LATE of I_{ig} on Y_{ig}, instrumenting I_{ig} by D_{ig}. The blue arrows present this main specification. The red pathway presents a direct violation of the exclusion restriction. The green pathways present indirect violations of the exclusion restriction and violations of SUTVA, the purple pathways present violations of SUTVA. The black arrows indicate mechanical negative correlations. See Appendix B for more details.

Figure B1 summarizes all potential spillovers, of which not all are a concern from the perspective of estimating a valid LATE. For completeness, we start by providing examples of each potential spillover in our context in the list below before we discuss which of those create a concern from the perspective of generating a valid LATE.

- Pathway (1) and (2): The receipt of a discount coupon by a herder affects the likelihood that their peers take-up insurance, and vice versa. In our context, examples of this might be that herder i, upon receiving the discount coupon, also receives *information* about insurance that they communicate to $-i$, which makes $-i$, irrespective of their own coupon receipt, more likely to purchase insurance. Alternatively, receiving a discount coupon by i could lead to *status concerns* that (dis)incentivize $-i$ to purchase insurance, irrespective of their own coupon receipt.

- Pathway (3) and (4): The insurance purchase by a herder has an effect on the likelihood that their peer purchases insurance and vice versa. Examples of this in our context are *social learning*, where $-i$ learns about insurance from i, or *copying*, where $-i$ wants to exhibit the same behaviour as i. Another example is *free-riding*, which refers to the fact that i's insurance purchase decreases the incentive for $-i$ to purchase insurance. This may occur because i and $-i$ informally share risk through transfers, and $-i$ anticipates transfers following claim payments by i, or in case $-i$ views i's insurance purchase as an opportunity to learn about the insurance product.

- Pathway (5) and (6): The insurance purchase by herder i changes the outcomes of a peer (Y_{-ig}) directly, not through the outcomes of i (see pathway (7) and (8) below). An example would be a case where the willingness to share risk through informal transfers by either i or $-i$ is changed as a result of their insurance status. For example, Takahashi, Barrett, and Ikegami (2019) shows that a herder's insurance uptake has no effect on her willingness to transfer to peers, but insurance purchase by peers does increase herder i's willingness to transfer. Alternatively, if formal insurance is available, and i purchases insurance but $-i$ does not, i may become less willing to transfer to $-i$ because $-i$ refrained from protecting themselves by purchasing insurance and instead decided to free-ride on i's insurance purchase (Berg, Blake, and Morsink, 2022).

- Pathway (7) and (8): The outcomes of herder i affect the outcomes of their peers, or vice versa. This is empirically difficult to distinguish from the mechanisms discussed in pathways (5) and (6). Examples would be where claim payments received by i increase i's income, and as a result, i increases transfer to $-i$.

Based on Figure B1 we can categorize threats to a valid LATE as arising from a combination of violations of the exclusion restriction, SUTVA, and violations of SUTVA only.

From the perspective of the *exclusion restriction*, the only pathways of spillovers that are a concern are pathways from D_{ig} to Y_{ig} that do not run through I_{ig}. These are:

- pathway (1) $\rightarrow$ (6)

- pathway (1) $\rightarrow$ B $\rightarrow$ (7)

The following pathways are not a concern from the perspective of the exclusion restriction, because they all run from D_{ig} to I_{ig} to Y_{ig}:

- pathway (1) $\rightarrow$ (3) $\rightarrow$ A;

- pathway (1) $\rightarrow$ (3) $\rightarrow$ (5) $\rightarrow$ (7);
- pathway (11) $\rightarrow$ (4) $\rightarrow$ (6);
- pathway (11) $\rightarrow$ (4) $\rightarrow$ B $\rightarrow$ (7).

Any pathways that run from D_{-ig} to Y_{ig}, either through I_{ig} or I_{-ig} do not pose a violation of the exclusion restriction because they do not affect the causal effect of the instrument D_{ig} on I_{ig}. They do, however, change the overall population of compliers to treatment, and – if spillovers exist in the second stage – would thus affect the estimate of the $\hat{I}_{ig}$ on Y_{ig}. This can happen through:

- (2) $\rightarrow$ A;
- (2) $\rightarrow$ (4) $\rightarrow$ (6);
- (2) $\rightarrow$ (4) $\rightarrow$ B $\rightarrow$ (7);
- (10) $\rightarrow$ (3) $\rightarrow$ A;
- (10) $\rightarrow$ (3) $\rightarrow$ (5) $\rightarrow$ (7);
- (10) $\rightarrow$ (6)
- (10) $\rightarrow$ (B) $\rightarrow$ (7).

As we only have random variation in D_{ig} and D_{-ig}, we can only estimate the causal pathways (1), (2), (10), and (11). Any effects beyond this coming from D_{ig} – such as pathway (1) $\rightarrow$ (3) – cannot be causally interpreted. It is the result of the fact that instrumenting I_{-ig} with D_{ig} is required for a causal interpretation, but the existence of (11) implies that the exclusion restriction would be violated if we do so.

Therefore, we first focus on estimating the direct effects on the first stage only, which would include:

- pathway (1): D_{ig} on I_{-ig}
- pathway (2): D_{-ig} on I_{ig}
- pathway (10): D_{-ig} on I_{-ig}
- pathway (11): D_{ig} on I_{ig}

and the combinations of the two direct effects:

- pathways (1) and (10): D_{ig} & D_{-ig} on $\bar{I}_{-ig}$
- pathways (2) and (11): D_{ig} & D_{-ig} on I_{ig}

B.1 Estimation Strategies

To investigate spillovers empirically, we construct the following variables for $-i$:

- $-i's$ coupon receipt (D_{-ig}): This is constructed by creating a variable for each herder i that is the mean of the number of coupons received in the first three seasons by all other herders ($-i$) in their community g:

$$\overline{D}_{-ig} := \frac{1}{N_g} \sum_{-i_g=1}^{n_g} [\text{No. of coupons received - first three seasons}]_{-ig}$$

  where [No. of coupons received - first three seasons]$_{-ig}$ is the total number of coupons distributed in the community to all herders except for i in the initial three seasons.

- $-$i's insurance uptake (I_{-ig}): This is constructed by creating a variable for each herder i that is the share of herders $-i$ out of all herders in the community except for i that purchased any insurance during the first three seasons:

$$\bar{I}_{-ig} := \frac{1}{N_g} \sum_{-i_g=1}^{n_g} [\text{Any insurance purchased - first three seasons}]_{-ig}$$

  where [Any insurance purchased - first three seasons]$_{-ig}$ is a binary variable that is one if the households bought insurance at least once in the first three sales seasons.

We also create a vector of control covariates for all herders $-i$ in community g in the same way that we create the above-mentioned variables, which we define as $\overline{X}_{-ig0}$.

We show the summary statistics of these variables in Table B1. By construction – because all herders are included as i in D_{ig} and Y_{ig}, and they are also included as $-i$ in $\overline{D}_{-ig}$ and $\overline{Y}_{-ig}$ – the means of these $-i$ variables across the entire sample are always the same as the mean for the i variables, but the standard deviation is reduced. As a result, if one were to estimate correlations between these two variables, mechanically, we would expect a negative correlation.

Table B1: Summary statistics of the spillover variables

	Kenya				Ethiopia				Pooled			
	Mean/SD	Min	Max	Obs	Mean/SD	Min	Max	Obs	Mean/SD	Min	Max	Obs
D_{ig}: No. of coupons received – first three seasons	1.78	0.00	3.00	781	1.57	0.00	2.00	398	1.71	0.00	3.00	1179
	[0.87]				[0.60]				[0.79]			
I_{ig}: Any insurance purchase - first three seasons	0.41	0.00	1.00	781	0.45	0.00	1.00	398	0.42	0.00	1.00	1179
	[0.49]				[0.50]				[0.49]			
$\overline{D}_{-ig}$: Peers' mean no. of coupons received – first three season	1.78	1.65	1.88	781	1.57	1.35	2.00	398	1.71	1.35	2.00	1179
	[0.04]				[0.09]				[0.12]			
$\overline{I}_{-ig}$: Peers' any insurance purchase – first three seasons	0.41	0.13	0.79	781	0.45	0.00	1.00	398	0.42	0.00	1.00	1179
	[0.16]				[0.17]				[0.17]			
Peers' average: Male headed household (=1)	0.63	0.00	0.88	781	0.79	0.50	1.00	398	0.68	0.00	1.00	1179
	[0.25]				[0.09]				[0.22]			
Peers' average: Age of the household head	48.08	27.19	59.14	781	50.23	37.11	57.03	398	48.81	27.19	59.14	1179
	[6.14]				[4.55]				[5.74]			
Peers' average: Share of male children	0.52	0.38	0.64	781	0.49	0.21	0.65	398	0.51	0.21	0.65	1179
	[0.06]				[0.07]				[0.07]			
Peers' average: Head ever went to school (=1)	0.13	0.00	0.31	781	0.11	0.00	0.30	398	0.13	0.00	0.31	1179
	[0.09]				[0.09]				[0.09]			
Peers' average: Fully settled (=1)	0.23	0.00	0.92	781	0.76	0.00	0.95	398	0.41	0.00	0.95	1179
	[0.23]				[0.13]				[0.32]			
Observations	781				398				1179			

Notes: All columns present mean, standard deviation (in square brackets), and the number of observations for each variable.

Furthermore, the nature of our randomization was such that 33 communities (16 sublocations in Kenya and 17 kebeles in Ethiopia) were selected, and a list of households in the community was used to draw a random sample of households for inclusion in the study. In the second stage, per community, households were randomized to either receive discount coupons or not. In each round, 60% of these sampled households (80% in Ethiopia) were assigned to receive a coupon and 40% (20% in Ethiopia) were assigned not to receive a coupon. It implies that conditional on being selected for the study sample in a location, $-i$'s likelihood of being randomly assigned to receive a coupon is conditional on i's treatment assignment. As a result, treatment assignment of i is mechanically negatively correlated to treatment assignment of $-i$. This is demonstrated in Table B3.

Columns (1) and (2) of Table B3 show that an increase of 1 in the mean number of coupons received during the first three seasons by $-i$ decreases the number of coupons received by i during the first three seasons by -31, relative to a control mean of 1.7 coupons. The inverse relationship demonstrates that one additional coupon received by i reduces the mean number of coupons received by peers by -0.025.

B.2 Results

If we want to understand the causal effect of the instrument D_{ig} on I_{ig}, we need to control for any potential mechanical and/or spillover effects of D_{-ig} on I_{ig}, either direct or indirect, via I_{-ig}. Therefore we estimate five equations for each outcome I_{ig} and $\overline{I}_{-ig}$ as below. First, for herder i's purchase:

$$\text{pathway (11): } I_{ig} = \alpha + \beta_1 D_{ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig} \tag{12}$$

$$\text{pathway (2): } I_{ig} = \alpha + \beta_2 \overline{D}_{-ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig} \tag{13}$$

$$\text{pathway (2); (11): } I_{ig} = \alpha + \beta_1 D_{ig} + \beta_2 \overline{D}_{-ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig} \tag{14}$$

$$\tag{15}$$

where X_{ig} refers to a vector of recipient's baseline controls and $\overline{X}_{-ig0}$ to a vector of the means of peers' baseline controls. We include D_{ig}, $\overline{D}_{-ig}$, and $\overline{I}_{-ig}$, seperately and jointly. In equation (5) we can then interpret β_1 as the direct effect of D_{ig} on I_{ig} (pathway (11)), β_2 as the direct effect of $\overline{D}_{-ig}$ on I_{ig} (pathway (2)), and β_3 as capturing the indirect effect of $\overline{D}_{-ig}$ on I_{ig}, that runs through $\overline{I}_{-ig}$.

For the mean purchase of peers, $\overline{I}_{-ig}$,

$$\text{pathway (1): } \overline{I}_{-ig} = \alpha + \beta_4 D_{ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig} \tag{16}$$

$$\text{pathway (10): } \overline{I}_{-ig} = \alpha + \beta_5 \overline{D}_{-ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig} \tag{17}$$

$$\text{pathway (1); (10): } \overline{I}_{-ig} = \alpha + \beta_4 D_{ig} + \beta_5 \overline{D}_{-ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig} \tag{18}$$

$$\tag{19}$$

where we include D_{ig}, $\overline{D}_{-ig}$, and I_{ig}, separately and jointly. In equation (10) we can then interpret β_4 as the direct effect of D_{ig} on $\overline{I}_{-ig}$ (pathway (1)), β_5 as the direct effect of $\overline{D}_{-ig}$ on $\overline{I}_{-ig}$ (pathway (10)), and β_6 as capturing the indirect effect of D_{ig} on $\overline{I}_{-ig}$, that runs through I_{ig}.

Columns (3)-(8) of Table B3 show the results of the first-stage spillovers. Column (3) repeats the first-stage results presented so far in the paper, which show that an increase of 1 in the number of coupons received by the recipient in the first three seasons increases their likelihood of purchasing any insurance during the first three seasons by 12.3 percentage points. Column (4) shows that an increase of 1 standard deviation in the peers' mean number of coupons received reduces the likelihood of purchase of any insurance in the first three seasons by the recipient by 44.1 percentage points (SD of $\overline{D}_{-ig} = 0.12$; $0.12 * (-3.672) = 44.06$). Column (5) shows that if we use the two variables of coupon receipts – D_{ig}, $\overline{D}_{-ig}$, then the effects from the recipient's coupons is the only effect that is significant.

Columns (6)-(8) present the results for the mean insurance purchase by peers, $\overline{I}_{-ig}$. Column (6) shows that an increase of 1 in the number of coupons received by the recipient decreases the mean likelihood that peers purchase insurance by 0.3 percentage points. Column (7) shows, however, that a 1 standard deviation increase in the peers' mean number of coupons received increases the mean likelihood that peers purchase insurance by 1.3 percentage points (SD of $\overline{D}_{-ig} = 0.12$; $0.12 * 0.111 = 0.0133$). This is consistent with the effect we expect of our exogenous instrument on insurance purchase. When both the coupon receipt of the recipient and mean coupon receipt of peers are included, neither is statistically significant (Column (8)).

Table B2: Spillover effects: First stage and mechanical correlation

	Outcome: Number of coupons received - first three seasons		Outcome: Any insurance purchase - first three seasons					
	D_{ig}: Recipient's	$\overline{D}_{-ig}$: Peers'	I_{ig}: Recipient's			$\overline{I}_{-ig}$: Peers'		
No. of coupons received – first three seasons	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D_{ig}: Recipient's		-0.025***	0.123***		0.142***	-0.003***		-0.002
		(0.001)	(0.016)		(0.034)	(0.001)		(0.001)
$\overline{D}_{-ig}$: Peers'	-31.145***			-3.672***	0.747		0.111***	0.060
	(0.753)			(0.594)	(1.239)		(0.026)	(0.063)
Pathway (DAG)			(11)	(2)	(2);(11)	(1)	(10)	(1);(10)
Recipient controls (i)	✓	✓	✓	✓	✓	✓	✓	✓
Peers' controls (-i)	✓	✓	✓	✓	✓	✓	✓	✓
Control mean	1.707	1.707	0.200	.	0.200	0.426	.	0.426
Observations	1179	1179	1179	1179	1179	1179	1179	1179

Notes: All columns present coefficient estimates and robust standard errors (in parentheses).

Column (1) to (3) presents the results on outcome I_{ig}. Column (1): $I_{ig} = \alpha + \beta_1 D_{ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig}$, Column (2): $I_{ig} = \alpha + \beta_2 \overline{D}_{-ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig}$, Column (3): $I_{ig} = \alpha + \beta_1 D_{ig} + \beta_2 \overline{D}_{-ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig}$,

Column (4) to (6) presents the results on outcome $\overline{I}_{-ig}$. Column (4): $\overline{I}_{-ig} = \alpha + \beta_4 D_{ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig}$, Column (5): $\overline{I}_{-ig} = \alpha + \beta_5 \overline{D}_{-ig} + \beta_6 I_{ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig}$, Column (6): $\overline{I}_{-ig} = \alpha + \beta_4 D_{ig} + \beta_5 \overline{D}_{-ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig}$,

Column (7) and (8) presents the results on outcome D_{ig} and $\overline{D}_{-ig}$, respectively. Column (7): $D_{ig} = \theta_0 + \theta_1 \overline{D}_{-ig} + \theta_2 X_{ig0} + \theta_3 \overline{X}_{-ig0} + \nu_{1g} + \eta_{1ig}$, Column (8): $\overline{D}_{-ig} = \theta_4 + \theta_5 D_{ig} + \theta_6 X_{ig0} + \theta_7 \overline{X}_{-ig0} + \nu_{2g} + \eta_{2ig}$,

* denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons.

In Tables B4-B7, we re-estimate the second-stage estimations presented in Tables 3 to 6, but including $\overline{D}_{-ig}$ as an additional instrument and $\overline{I}_{-ig}$ as an additional endogenous variable. Coefficient estimates are mostly not significant, but the results are qualitatively similar to the main results. Even if they are statistically not significant, the signs and the magnitude of the coefficients are the same, although they lack in statistical significance due to the loss of statistical power by introducing another instruments into estimations where the statistical power was already quite low.

Table B4 reports the effects on primary outcomes – herd size, cash earnings, and education. Similar to Table 3, the effects of recipients' own insurance purchase on herd size and cash earnings are not significant. For education we find that – in the specification without controls – both the recipients' insurance purchase as well as the peers' mean insurance purchase have a positive and significant effect on education. For the effect of the recipients' insurance purchase we observe a 15.7 percentage points increase in the share of members who completed age-appropriate years of education (p-value: 0.580). If we include recepeints' control only, we observe a 12.5 percentage points increase (p-value: 0.516). If we include all controls, we observe a 24.7 percentage points increase with a p-value of 0.349. We do not observe a statistically significant effect of peers' mean insurance purchase in all specifications, although due to potential reverse causality between I_{ig} and $\overline{I}_{-ig}$ this should not be interpreted as casual effect.

Table B5 reports that the effects on the herd composition, which also shows that results are qualitatively similar to the main results. In the specification without controls, the predicted insurance purchase by the recipient, $\hat{I}_{ig}$, now suggests a 22 percentage points increase, significant at the 10% significance level. Furthermore, in the specification with controls, the predicted insurance purchase increases the share of cattle by 36.0 percentage points, but this effect is also not robust to the exclusion of controls. Columns (7) to (9) show negative effects of the recipients' insurance purchase on the share of goats, albeit it being statistically insignificant in Column (9) (p-value 0.746), and the point estimates varying between 24.0 percentage points without controls to 11.1 percentage points with both recipients' and peers' controls. These results are consistent with Table 4, where a decline of 23.5 percentage points was noted. It's also important to highlight that the coefficient on $\overline{I}_{-ig}$ is negative and not statistically significant.

Table B6 presents the effects on the prespecified secondary outcomes: herd management expenditure (USD), milk income, livestock loss evaluated by CMVE, distress sales (CMVE), and livestock sale. These findings are qualitatively consistent with Tables 5, where no significant effect is observed. The signs and the effects of $\hat{I}_{ig}$ are also similar except when we include peers' control for livestock loss and distress sales. Additionally, we don't observe any significant effects stemming from the peers' mean likelihood of purchasing insurance.

Table B7 presents the effects on other prespecified secondary outcomes, including recent IBLI uptake both at intensive and extensive margins, as well as children's activities. None of the effects of $\hat{I}_{ig}$ are significant, mirroring our findings in Table 6 qualitatively. However, we do not observe the previously noted positive significant effect on studying full time. Although imprecisely estimated, the effect size is notable: an increase of 65 percentage points without controls (p-value 0.191) and 25.3 percentage points with full controls (p-value 0.805). We do not observe any significant effects from peers' mean likelihood of purchasing insurance.

Table B3: Spillover effects: First stage and mechanical correlation

	Outcome: Number of coupons received - first three seasons		Outcome: Any insurance purchase - first three seasons					
	D_{ig}: Recipient's	$\overline{D}_{-ig}$: Peers'	I_{ig}: Recipient's			$\overline{I}_{-ig}$: Peers'		
No. of coupons received – first three seasons	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D_{ig}: Recipient's		-0.025***	0.123***		0.142***	-0.003***		-0.002
		(0.001)	(0.016)		(0.034)	(0.001)		(0.001)
$\overline{D}_{-ig}$: Peers'	-31.145***			-3.672***	0.747		0.111***	0.060
	(0.753)			(0.594)	(1.239)		(0.026)	(0.063)
Pathway (DAG)			(11)	(2)	(2);(11)	(1)	(10)	(1);(10)
Recipient controls (i)	✓	✓	✓	✓	✓	✓	✓	✓
Peers' controls (-i)	✓	✓	✓	✓	✓	✓	✓	✓
Control mean	1.707	1.707	0.200	.	0.200	0.426	.	0.426
Observations	1179	1179	1179	1179	1179	1179	1179	1179

Notes: All columns present coefficient estimates and robust standard errors (in parentheses).
Column (1) to (3) presents the results on outcome I_{ig}. Column (1): $I_{ig} = \alpha + \beta_1 D_{ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig}$, Column (2): $I_{ig} = \alpha + \beta_2 \overline{D}_{-ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig}$, Column (3): $I_{ig} = \alpha + \beta_1 D_{ig} + \beta_2 \overline{D}_{-ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig}$,
Column (4) to (6) presents the results on outcome $\overline{I}_{-ig}$. Column (4): $\overline{I}_{-ig} = \alpha + \beta_4 D_{ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig}$, Column (5): $\overline{I}_{-ig} = \alpha + \beta_5 \overline{D}_{-ig} + \beta_6 I_{ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig}$, Column (6): $\overline{I}_{-ig} = \alpha + \beta_4 D_{ig} + \beta_5 \overline{D}_{-ig} + \rho X_{ig0} + \gamma \overline{X}_{-ig0} + \delta_g + \varepsilon_{ig}$,
Column (7) and (8) presents the results on outcome D_{ig} and $\overline{D}_{-ig}$, respectively. Column (7): $D_{ig} = \theta_0 + \theta_1 \overline{D}_{-ig} + \theta_2 X_{ig0} + \theta_3 \overline{X}_{-ig0} + \nu_{1g} + \eta_{1ig}$, Column (8): $\overline{D}_{-ig} = \theta_4 + \theta_5 D_{ig} + \theta_6 X_{ig0} + \theta_7 \overline{X}_{-ig0} + \nu_{2g} + \eta_{2ig}$,
* denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons.

Table B4: Spillover effects on prespecified primary outcomes: Herd size, earnings, education with two endogenous variables

	Herd size (CMVE)			Total household cash earning (USD)			Share of members who completed age-appropriate years of education		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\widehat{I_{ig}}$: Any insurance purchase - first three seasons	2.485	3.878	0.208	-125.555	-135.190	-430.321	0.105	0.125	0.157
	(11.228)	(11.276)	(20.490)	(430.674)	(429.388)	(1130.550)	(0.190)	(0.193)	(0.168)
$\hat{\bar{I}}_{-ig}$: Peers' any insurance purchase – first three season	17.482	23.198	-119.587	-1544.928	-1530.794	-13502.212	-1.438	-0.812	0.435
	(168.443)	(167.174)	(873.663)	(6743.689)	(6755.025)	(40697.165)	(7.249)	(7.303)	(6.388)
Recipient controls (i)		✓	✓		✓	✓		✓	✓
Peers' controls (-i)			✓			✓			✓
Control mean	14.265	14.265	14.265	693.382	693.382	693.382	0.048	0.048	0.048
Observations	1179	1179	1179	1179	1179	1179	770	770	770

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \gamma_3\widehat{\bar{I}}_{-ig} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \gamma_2 X_{-ij0} + \beta_3 D^{t=6}_{ij4} + \rho_j + \varepsilon_{ijT}$ where we instrument $\widehat{I}_{ij}$ and $\widehat{\bar{I}}_{-ig}$ by both D_{ig} and D_{-ig}. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep.

Table B5: Spillover effects on Prespecified primary outcome: Herd composition with two endogenous variables

	Outcome: N of animal type in CMVE / Total N of animals in CMVE											
	Camel			Cattle			Goats			Sheep		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\widehat{I_{ig}}$: Any insurance purchase - first three seasons	0.220*	0.216*	-0.613	0.019	0.008	0.472	-0.240**	-0.244**	-0.111	-0.007	0.016	0.279
	(0.125)	(0.123)	(0.567)	(0.131)	(0.138)	(0.310)	(0.101)	(0.104)	(0.344)	(0.051)	(0.051)	(0.245)
$\hat{\bar{I}}_{-ig}$: Peers' any insurance purchase – first three season	4.044	3.870	-26.989	-3.674	-4.002	13.384	-0.643	-0.392	4.522	0.009	0.298	10.033
	(3.602)	(3.437)	(21.439)	(3.591)	(3.913)	(11.324)	(1.173)	(1.230)	(12.453)	(0.620)	(0.667)	(8.780)
Recipient controls (i)		✓	✓		✓	✓		✓	✓		✓	✓
Peers' controls (-i)			✓			✓			✓			✓
Control mean	0.263	0.263	0.263	0.332	0.332	0.332	0.284	0.284	0.284	0.121	0.121	0.121
Observations	987	987	987	987	987	987	987	987	987	987	987	987

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \gamma_3 \hat{\bar{I}}_{-ig} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \gamma_2 X_{-ij0} + \beta_3 D^{t=6}_{ij4} + \rho_j + \varepsilon_{ijT}$ where we instrument $\widehat{I}_{ij}$ and $\widehat{\bar{I}}_{-ig}$ by both D_{ig} and D_{-ig}. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep.

Table B6: Spillover effects on prespecified secondary outcomes with two endogenous variables

	Herd management expenditure (USD)			Milk Income			Livestock loss (CMVE)			Distress sales (CMVE)			Livestock Sale (CMVE)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
$\widehat{I}_{ig}$: Any insurance purchase - first three seasons	-65.605	-62.834	477.054	714.312	844.286	-26.448	5.119	5.156	-2.744	-0.495	-0.565	-0.546	-0.823	-0.581	-5.780
	(148.886)	(148.687)	(424.064)	(516.903)	(549.032)	(788.260)	(6.787)	(6.508)	(10.524)	(0.678)	(0.697)	(0.693)	(1.886)	(1.903)	(3.843)
$\widehat{\bar{I}}_{-ig}$: Peers' any insurance purchase – first three season	-2530.910	-2560.477	18649.720	5660.998	6995.305	-27398.439	140.758	134.314	-169.486	-7.195	-9.772	-10.480	13.647	17.309	-185.911
	(3834.294)	(3805.441)	(16999.063)	(6642.075)	(7649.229)	(31791.967)	(204.793)	(195.178)	(441.015)	(42.322)	(42.312)	(41.652)	(38.681)	(40.774)	(148.740)
Recipient controls (i)		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Peers' controls (-i)			✓			✓			✓			✓			✓
Control mean	182.827	182.827	182.827	339.362	339.362	339.362	5.448	5.448	5.448	0.292	0.292	0.292	1.872	1.872	1.872
Observations	1179	1179	1179	1179	1179	1179	1179	1179	1179	781	781	781	1179	1179	1179

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \gamma_3\widehat{\bar{I}}_{-ig} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \gamma_2 X_{-ij0} + \beta_3 D^{t=6}_{ij4} + \rho_j + \varepsilon_{ijT}$ where we instrument $\widehat{I}_{ij}$ and $\widehat{\bar{I}}_{-ig}$ by both D_{ig} and D_{-ig}. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep.

Table B7: Spillover effects on prespecified secondary outcomes: IBLI purchase and children's activities

	IBLI uptake in the past 12 months (=1 if purchased)			IBLI uptake in the past 12 months (CMVE)			Working full-time			Working part-time			Studying full-time		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
$\widehat{I}_{ig}$: Any insurance purchase - first three seasons	0.030	0.037	-0.063	-1.985	-1.997	7.742	0.074	0.257	-0.138	-0.145	-0.006	0.257	-0.654	-0.585	-0.353
	(0.070)	(0.070)	(0.180)	(1.902)	(2.015)	(6.663)	(0.797)	(1.008)	(0.942)	(0.620)	(0.778)	(1.029)	(1.684)	(1.588)	(1.427)
$\widehat{\bar{I}}_{-ig}$: Peers' any insurance purchase – first three season	-0.147	0.066	-3.831	-43.215	-45.213	337.409	10.420	16.304	4.912	1.911	7.228	13.639	-30.763	-29.293	-21.110
	(1.285)	(1.268)	(8.122)	(55.114)	(58.114)	(291.627)	(26.915)	(33.017)	(29.167)	(19.695)	(24.651)	(31.329)	(53.801)	(50.585)	(42.576)
Recipient controls (i)		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Peers' controls (-i)			✓			✓			✓			✓			✓
Control mean	0.042	0.042	0.042	0.539	0.539	0.539	0.271	0.271	0.271	0.201	0.201	0.201	0.232	0.232	0.232
Observations	1179	1179	1179	1179	1179	1179	376	376	376	376	376	376	376	376	376

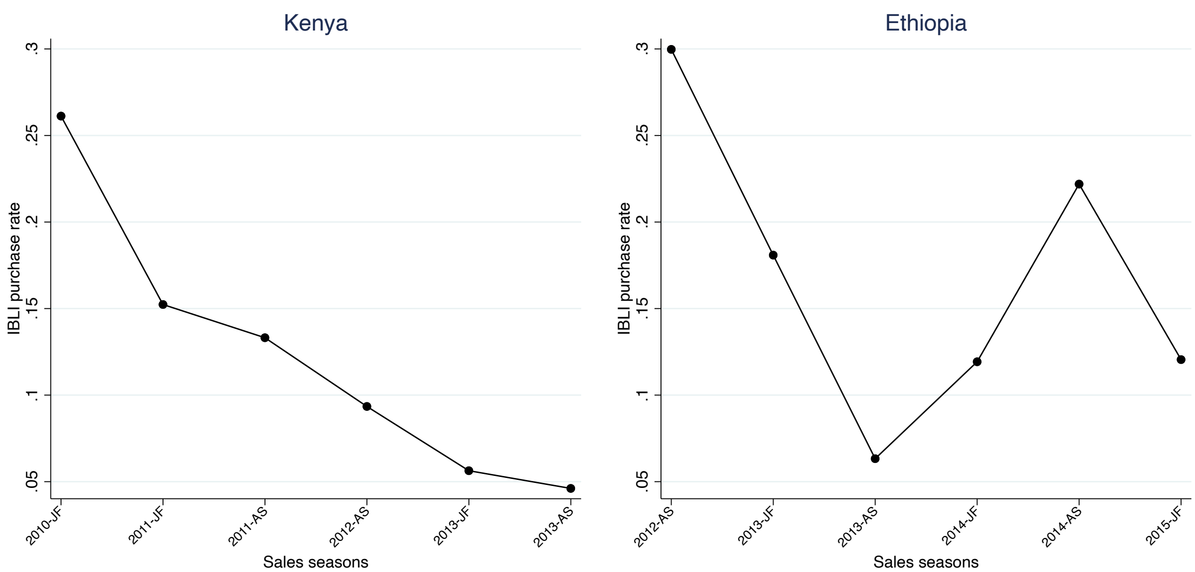
Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \gamma_3\widehat{\bar{I}}_{-ig} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \gamma_2 X_{-ij0} + \beta_3 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT}$ where we instrument $\widehat{I}_{ij}$ and $\widehat{\bar{I}}_{-ig}$ by both D_{ig} and D_{-ig}. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep.

For robustness, we repeat the analyses presented in Table B4 to B7 with cluster standard errors at the village level. The results reported in Table E6 to E9 show that our results using robust standard error is robust to the clustering of the standard errors at the village level.

We also repeat the same analyses without community FE. The results in Table E10 to E13 show that the community fixed effect was decreasing the precision of the estimate. Considering the fact that the our spillover is measured at the community level, so the community fixed effects will take away variations at the community level, which leaves very little variations for peers' insurance uptake or coupon receipts.

C Tables and Figures Referenced in Text

Figure C1: IBLI Purchase Overtime



Notes: IBLI purchase rate is calculated as the ratio of the number of households who bought an insurance over the number of households in the sample.

Table C1: Checking monotonicity assumption

	Number of seasons purchase IBLI (%)			
Number of coupons recipient's received	0	1	2	3
0	80.000	16.250	3.750	0.000
1	67.797	27.119	4.802	0.282
2	51.646	38.821	9.185	0.347
3	48.214	34.524	17.262	0.000

	Number of seasons purchase IBLI (%)	
Number of coupons recipient's received	0	1
0	80.000	20.000
1	67.797	32.203
2	51.646	48.354
3	48.214	51.786

Table C2: Summary statistics of outcome variables

	Kenya				Ethiopia				Pooled			
	Mean/SD	Min	Max	Obs	Mean/SD	Min	Max	Obs	Mean/SD	Min	Max	Obs
Herd size in CMVE	12.96	0.00	349.80	781	16.51	0.00	498.78	398	14.16	0.00	498.78	1179
	[24.46]				[38.72]				[30.07]			
Share of camels in herd (CMVE)	0.31	0.00	1.00	619	0.10	0.00	1.00	395	0.23	0.00	1.00	1014
	[0.38]				[0.22]				[0.34]			
Share of cattle in herd (CMVE)	0.21	0.00	1.00	619	0.65	0.00	1.00	395	0.38	0.00	1.00	1014
	[0.35]				[0.23]				[0.38]			
Share of goats in herd (CMVE)	0.34	0.00	1.00	619	0.18	0.00	1.00	395	0.28	0.00	1.00	1014
	[0.35]				[0.17]				[0.30]			
Share of sheep in herd (CMVE)	0.14	0.00	1.00	619	0.06	0.00	0.83	395	0.11	0.00	1.00	1014
	[0.20]				[0.08]				[0.17]			
Annual total household cash earning (USD)	645.09	0.00	7891.03	781	798.94	0.00	10724.90	398	697.03	0.00	10724.90	1179
	[1181.81]				[1227.28]				[1199.04]			
Share of members who completed age-appropriate years of education	0.04	0.00	1.00	654	0.10	0.00	1.00	219	0.06	0.00	1.00	873
	[0.15]				[0.28]				[0.19]			
Herd management expenditure (USD)	139.34	0.00	3648.66	666	269.68	0.00	5722.84	398	188.10	0.00	5722.84	1064
	[290.75]				[505.02]				[390.02]			
Annual milk income (USD)	562.75	0.00	29929.54	781	43.39	0.00	14132.17	398	387.43	0.00	29929.54	1179
	[1940.55]				[710.37]				[1650.42]			
Livestock lost in the past 12 months (CMVE)	3.00	0.00	56.80	781	9.95	0.00	352.32	398	5.35	0.00	352.32	1179
	[6.38]				[24.68]				[15.59]			
N of lost camel	1.08	0.00	28.00	578	0.57	0.00	25.00	398	0.87	0.00	28.00	976
	[3.25]				[2.29]				[2.91]			
N of lost cattle	0.53	0.00	40.00	578	8.36	0.00	300.00	398	3.73	0.00	300.00	976
	[2.46]				[22.47]				[14.97]			
N of lost shoat	17.95	0.00	270.00	578	1.02	0.00	52.32	398	11.05	0.00	270.00	976
	[32.47]				[3.09]				[26.40]			
Distress sale in the past 12 months (CMVE)	0.49	0.00	25.60	781	.	.	.	0	0.49	0.00	25.60	781
	[2.01]				[.]				[2.01]			
Share of children working full-time	.	.	.	0	0.28	0.00	1.00	376	0.28	0.00	1.00	376
	[.]				[0.31]				[0.31]			
Share of children working part-time	.	.	.	0	0.18	0.00	1.00	376	0.18	0.00	1.00	376
	[.]				[0.30]				[0.30]			
Share of children studying full-time	.	.	.	0	0.23	0.00	1.00	376	0.23	0.00	1.00	376
	[.]				[0.29]				[0.29]			
IBLI uptake in the past 12 months (=1 if purchased)	0.00	0.00	1.00	781	0.15	0.00	1.00	398	0.05	0.00	1.00	1179
	[0.04]				[0.36]				[0.22]			
IBLI uptake in the past 12 months (CMVE)	0.02	0.00	13.80	781	1.80	0.00	100.00	398	0.62	0.00	100.00	1179
	[0.49]				[7.22]				[4.30]			
Observations	781				398				1179			

Notes: All columns present mean, standard deviation (in square brackets), and the number of observations for each variable. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Herd size in CMVE is the sum of the animals herded by the household, aggregated using cattle market-value equivalent. Annual total household cash earning is the sum of income from the following categories: sale of livestock, sale of livestock products, crop cultivation, salaried employment, casual labor, business and petty trading, and other major sources of income excluding gifts and remittances during the recent 4 pastoral seasons. Herd management expenditure includes expenditure on water, fodder, supplementary feeding, and veterinary expenses.

Table C3: Education - School-aged during experiment

	Maximum years of education	Total years of education	Average years of education
	(1)	(2)	(3)
Any insurance purchased	1.930	5.163*	2.268**
	(1.361)	(3.003)	(1.134)
Controls	✓	✓	✓
Control mean	6.715	8.488	4.860
Observations	770	1179	770

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table C4: Herd size, earnings, and education —short-run and long-run

	Herd size (CMVE)			Total household cash earning (USD)			Share of members who completed age-appropriate years of education		
	3rd sales season	End of experiment	10-year long-run	3rd sales season	End of experiment	10-year long-run	3rd sales season	End of experiment	10-year long-run
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Any insurance purchased	-4.286	-0.562	3.328	-234.657	329.315	-98.678	-0.032	0.054	0.146**
	(6.111)	(5.584)	(8.792)	(252.644)	(306.211)	(394.083)	(0.031)	(0.034)	(0.061)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Control mean	20.648	17.931	14.265	575.291	772.971	693.382	0.031	0.030	0.048
Observations	1165	1118	1179	1165	1118	1179	982	948	770

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I_{ij}} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table C5: Education - short-run and long-run

	Maximum years of education			Total years of education			Average years of education		
	3rd sales season	End of experiment	10-year long-run	3rd sales season	End of experiment	10-year long-run	3rd sales season	End of experiment	10-year long-run
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Any insurance purchased	-0.037	0.818	1.930	-0.404	0.278	5.163*	-0.048	0.188	2.268**
	(0.603)	(0.895)	(1.361)	(0.895)	(1.941)	(3.003)	(0.254)	(0.564)	(1.134)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Control mean	1.212	4.712	6.715	1.617	8.023	8.488	0.487	2.119	4.860
Observations	982	948	770	1165	1118	1179	982	948	770

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y\_ijT = \beta\_0 + \beta\_LATE\widehat{I}\_ij + \beta\_1y\_ij0 + \beta\_2X\_ij0 + \beta\_3D\_ij4^{t=6} + \rho\_j + \varepsilon\_ijT$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table C6: Herd composition large versus small ruminants - short-run and long-run

	N of animals (CMVE) / Total herd size (CMVE)					
	Camels and cattle			Goats and sheep		
	3rd sales season	End of experiment	10-year long-run	3rd sales season	End of experiment	10-year long-run
	(1)	(2)	(3)	(4)	(5)	(6)
Any insurance purchased	0.076	0.133	0.230^{**}	-0.076	-0.133	-0.230^{**}
	(0.070)	(0.089)	(0.115)	(0.070)	(0.089)	(0.115)
Controls	✓	✓	✓	✓	✓	✓
Control mean	0.669	0.643	0.596	0.331	0.357	0.404
Observations	1085	1009	987	1085	1009	987

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D^{t=6}_{ij4} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table C7: Herd composition — short-run and long-run

	Outcome: N of animal type in CMVE / Total N of animals in CMVE											
	Camel			Cattle			Goat			Sheep		
	3rd sales season	End of experiment	10-year long-run	3rd sales season	End of experiment	10-year long-run	3rd sales season	End of experiment	10-year long-run	3rd sales season	End of experiment	10-year long-run
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Any insurance purchased	0.083	0.078	0.120	-0.006	0.057	0.107	-0.049	-0.180^{**}	-0.235^{**}	-0.028	0.055	0.009
	(0.059)	(0.074)	(0.092)	(0.058)	(0.069)	(0.083)	(0.065)	(0.072)	(0.097)	(0.031)	(0.050)	(0.052)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Control mean	0.301	0.258	0.263	0.369	0.385	0.332	0.221	0.228	0.284	0.109	0.128	0.121
Observations	1085	1009	987	1085	1009	987	1085	1009	987	1085	1009	987

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D^{t=6}_{ij4} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table C8: Herd management expenditure and milk income — short-run and long-run

	Herd management expenditure (USD)			Annual milk income (USD)		
	3rd sales season	End of experiment	10-year long-run	3rd sales season	End of experiment	10-year long-run
	(1)	(2)	(3)	(4)	(5)	(6)
Any insurance purchased	556.612	447.220	-1.723	419.689	132.892	677.707
	(3445.516)	(1729.392)	(95.822)	(419.429)	(103.842)	(471.170)
Controls	✓	✓	✓	✓	✓	✓
Control mean	3489.562	2370.027	182.827	291.025	106.449	339.362
Observations	1156	1118	1179	1165	1118	1179

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table C9: Distress sale and livestock sale — short-run and long-run

	Distress sales (CMVE)			Livestock sale (CMVE)		
	3rd sales season	End of experiment	10-year long-run	3rd sales season	End of experiment	10-year long-run
	(1)	(2)	(3)	(4)	(5)	(6)
Any insurance purchased	-0.587	0.610	-0.342	-1.277	1.089	-0.996
	(0.830)	(0.411)	(0.523)	(2.614)	(4.181)	(1.443)
Controls	✓	✓	✓	✓	✓	✓
Control mean	0.787	0.460	0.292	6.605	8.775	1.872
Observations	767	720	781	1096	1089	1179

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table C10: Livestock loss by animal type — short-run and long-run

	N of lost animals								
	Camel			Cattle			Goats/Sheep		
	3rd sales season	End of experiment	10-year long-run	3rd sales season	End of experiment	10-year long-run	3rd sales season	End of experiment	10-year long-run
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Any insurance purchased	-0.519	0.226	0.231	0.281	-0.794	1.144	15.743	0.786	-7.176
	(1.241)	(0.381)	(1.135)	(2.049)	(0.810)	(2.023)	(12.163)	(5.502)	(9.483)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Control mean	1.832	0.585	0.982	2.058	1.110	3.539	19.940	9.337	11.788
Observations	943	823	896	943	823	896	943	823	896

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I_{ij}} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table C11: Time use of children -— short-run and long-run

	Working full-time			Working part-time			Studying full-time		
	3rd sales season	End of experiment	10-year long-run	3rd sales season	End of experiment	10-year long-run	3rd sales season	End of experiment	10-year long-run
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Any insurance purchased	-0.069	-0.002	-0.327	0.158	0.106	-0.263	-0.138	-0.113	0.462*
	(0.099)	(0.088)	(0.285)	(0.103)	(0.098)	(0.256)	(0.098)	(0.089)	(0.278)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Control mean	0.427	0.409	0.271	0.289	0.291	0.201	0.177	0.167	0.232
Observations	1040	1030	376	1040	1030	376	1040	1030	376

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I_{ij}} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table C12: Payout effect on herd size, earnings, education

	Herd size (CMVE)		Total household cash earning (USD)		Share of members who completed age-appropriate years of education	
	(1)	(2)	(3)	(4)	(5)	(6)
Any insurance purchased (γ_1)	2.010	3.444	-115.0	-122.9	0.148**	0.152**
	(9.019)	(9.097)	(405.5)	(404.0)	(0.0640)	(0.0632)
Any insurance purchased × Indemnity rate (γ_2)	0.000472	-0.000794	0.177	0.166	-0.0000415	-0.0000412
	(0.00279)	(0.00264)	(0.366)	(0.322)	(0.0000382)	(0.0000351)
Coef: γ_1 + γ_2	2.011	3.443	-114.831	-122.687	0.148	0.152
p-val.: γ_1 + γ_2	0.824	0.705	0.776	0.761	0.021	0.016
Controls		✓		✓		✓
Control mean	14.265	14.265	693.382	693.382	0.048	0.048
Observations	1179	1179	1179	1179	770	770

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \gamma_0 + \gamma_1 \widehat{I_{ij}} + \gamma_2 \widehat{\text{Payout}}_{ij} + \gamma_3 y_{ij0} + \gamma_4 X_{ij0} + \gamma_5 D^T_{ij4} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but not more than three times, within the initial three seasons. Any payout receipt similarly refers to whether a household received any payout during the same period. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table C13: Payout effect on herd composition

	Outcome: N of animal type in CMVE / Total N of animals in CMVE							
	Camel		Cattle		Goats		Sheep	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Any insurance purchased (γ_1)	0.121	0.117	0.116	0.116	-0.231**	-0.242**	-0.00900	0.00791
	(0.0930)	(0.0936)	(0.0832)	(0.0834)	(0.0974)	(0.0988)	(0.0537)	(0.0532)
Any insurance purchased × Indemnity rate (γ_2)	0.0000136	0.0000177	-0.0000544	-0.0000630	0.0000447	0.0000519	0.0000112	0.00000498
	(0.0000544)	(0.0000543)	(0.0000997)	(0.000103)	(0.0000808)	(0.0000825)	(0.0000196)	(0.0000168)
Coef: γ_1 + γ_2	0.121	0.117	0.116	0.116	-0.231	-0.242	-0.009	0.008
p-val.: γ_1 + γ_2	0.194	0.209	0.164	0.164	0.018	0.014	0.867	0.882
Controls		✓		✓		✓		✓
Control mean	0.263	0.263	0.332	0.332	0.284	0.284	0.121	0.121
Observations	987	987	987	987	987	987	987	987

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \gamma_0 + \gamma_1 \widehat{I_{ij}} + \gamma_2 \widehat{\text{Payout}}_{ij} + \gamma_3 y_{ij0} + \gamma_4 X_{ij0} + \gamma_5 D^T_{ij4} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but not more than three times, within the initial three seasons. Any payout receipt similarly refers to whether a household received any payout during the same period. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table C14: Payout effects on secondary outcomes: Herd management expenditure and milk income

	Herd management expenditure (USD)		Milk Income		Livestock loss (CMVE)		Distress sales (CMVE)		Livestock Sale (CMVE)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Any insurance purchased (γ_1)	-8.055	-0.416	655.2	754.9	1.597	1.745	-0.345	-0.359	-1.330	-1.146
	(100.6)	(101.0)	(475.3)	(494.8)	(2.977)	(2.854)	(0.552)	(0.547)	(1.501)	(1.487)
Any insurance purchased × Indemnity rate (γ_2)	0.0117	-0.00896	-0.505*	-0.528*	0.00150	0.00136	0.0000814	0.000100	0.00128	0.00102
	(0.0877)	(0.0828)	(0.289)	(0.293)	(0.00183)	(0.00157)	(0.000133)	(0.000153)	(0.00102)	(0.000883)
Coef: γ_1 + γ_2	-8.044	-0.425	654.738	754.333	1.598	1.746	-0.345	-0.359	-1.328	-1.145
p-val.: γ_1 + γ_2	0.936	0.997	0.168	0.127	0.592	0.540	0.531	0.511	0.375	0.441
Controls		✓		✓		✓		✓		✓
Control mean	182.827	182.827	339.362	339.362	5.448	5.448	0.292	0.292	1.872	1.872
Observations	1179	1179	1179	1179	1179	1179	781	781	1179	1179

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \gamma_0 + \gamma_1 \widehat{I_{ij}} + \gamma_2 \widehat{\text{Payout}}_{ij} + \gamma_3 y_{ij0} + \gamma_4 X_{ij0} + \gamma_5 D^T_{ij4} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but not more than three times, within the initial three seasons. Any payout receipt similarly refers to whether a household received any payout during the same period. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table C15: Payout effects on secondary outcomes: IBLI purchase

	IBLI uptake in the past 12 months (=1 if purchased)		IBLI uptake in the past 12 months (CMVE)	
	(1)	(2)	(3)	(4)
Any insurance purchased (γ_1)	0.0346	0.0366	-1.005	-0.966
	(0.0446)	(0.0445)	(0.926)	(0.959)
Any insurance purchased × Indemnity rate (γ_2)	-0.00000820	-0.0000113	0.000218	0.000323
	(0.0000103)	(0.0000113)	(0.000212)	(0.000324)
Coef: γ_1 + γ_2	0.035	0.037	-1.005	-0.965
p-val.: γ_1 + γ_2	0.439	0.411	0.278	0.314
Controls		✓		✓
Control mean	0.042	0.042	0.539	0.539
Observations	1179	1179	1179	1179

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \gamma_0 + \gamma_1 \widehat{I_{ij}} + \gamma_2 \widehat{\text{Payout}}_{ij} + \gamma_3 y_{ij0} + \gamma_4 X_{ij0} + \gamma_5 D^T_{ij4} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but not more than three times, within the initial three seasons. Any payout receipt similarly refers to whether a household received any payout during the same period. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table C16: Number of animals by animal type

	N of animals (CMVE)				Raw N of animals			
	Camel	Cattle	Goat	Sheep	Camel	Cattle	Goat	Sheep
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Any insurance purchased	1.894	-1.379	-0.601	-0.387	1.056	-1.379	-7.895	-4.892
	(5.291)	(5.773)	(1.128)	(0.656)	(3.242)	(5.773)	(9.465)	(5.829)
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Control mean	7.842	5.017	2.308	1.487	4.680	5.017	20.222	13.617
Observations	1017	1017	1017	1017	1017	1017	1017	1017

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I_{ij}} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table C17: Education – missing values imputed with avaerage

	Share of members who completed age-appropriate years of education			
	Without missing values imputed		missing values imputed	
	(1)	(2)	(3)	(4)
Any insurance purchased	0.142**	0.146**	0.077*	0.080*
	(0.061)	(0.061)	(0.043)	(0.043)
Controls		✓		✓
Control mean	0.048	0.048	0.055	0.055
Observations	770	770	1179	1179

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table C18: Effects on the number of young adults (18-25 years old, Kenya only)

	N of young adults		Share of young adults	
	(1)	(2)	(3)	(4)
Any insurance purchased	0.144	0.133		
	(0.312)	(0.304)		
Baseline N of young adults	0.039	0.026		
	(0.039)	(0.039)		
Baseline average education of young adults			0.011***	0.009***
			(0.002)	(0.002)
Baseline share of young adults			-0.255***	-0.237***
			(0.040)	(0.040)
Controls		✓		✓
Control mean	0.778	0.778		
Observations	781	781	479	479

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \beta_3 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT}$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Online Appendix

D Robustness Check

D.1 Herd size, livestock loss, animals insured in TLU (in contrast to CMVE)

In the analysis above, we used cattle market-value equivalent (CMVE) to aggregate the number of animals across animal species, instead of tropical livestock unit (TLU) that are typically used as a measure of the value of livestock assets. Since CMVE is a new aggregation unit to be used, we also construct variables in TLU i) to confirm that the values in CMVE is reasonable, and ii) to run the same estimations again with variables in TLU to check if the results are robust to changes in aggregation units.

Table D5 (rows 3 to 11) reports the summary statistics of the variables in TLU. The main difference between CMVE and TLU conversions is that the CMVE puts a larger weight on camels and shoats than does the TLU conversion.

Table D1 shows that our findings in the previous section regarding the herd sizes are robust to the changes in the unit of aggregation. The results are consistent with the results using CMVE measure in terms of sign, magnitude, and statistical significance, as expected. Note that the pattern for the composition for each country is also consistent. We confirm all the null results on TLU lost, TLU distress sales, TLU sold, and recent purchase of IBLI in the last 12 months window.

The extreme values mentioned above may have been driven by a few individuals who work as traders and own/manage a large herd. Since it is not possible with our data to separate the traders out, we include the sub-sample analysis using baseline heard quantiles and winsorized herd size value at 99th percentile. The results reported in Table D3 suggest that by winsorizing the value at 99th percentile we have an estimate with higher precision, especially from Ethiopia. Also the sign of the coefficient in Ethiopia has been changed to positive (Compare to Column (1)-(2) of Table 3) and the sub-sample analysis seem to suggest that the magnitude of the positive coefficients on herd size is driven by the herders from the lower baseline herd size quantile. Combining all these results indicates that the extreme values do not seem to be driving the results presented in the main analysis.

We also present the results from quantile regression, looking at the effects at 15th, 25th, 50th, 75th, and 85th percentile values. Table D4 shows that the estimated coefficients are positive at all quantiles, and was statistically significant at 25th and 50th percentile, suggesting that even mechanically IBLI increases the herd size at a low-middle quantile. Note that only 37% of the sample households maintains the original herd size quartile until the endline.

D.2 Adding round 2 outcomes as control

In our main specification, we only control for baseline (round 1) outcome variable. Since we use IBLI purchase experiences and coupon receipt status of the initial three sales seasons as an endogenous variables and instruments, the information collected in round 2 could serve as a baseline for the information from the sales season 2 and 3 in Kenya and sales season 3 in Ethiopia. Therefore, we check if our results are robust to the inclusion of the outcome variables from round 2 of the panel, in addition to the current specification.

Overall, we find consistent results with the main regression in terms of signs and statistical significance. For most outcome variables, we have the information from the round 2.

Table D6 reports that on the primary outcomes. The magnitude and signs are similar to the main results in general. One change to note is that the children's education variable, in the current version, suffers from a large decrease in sample size – which results in a change in statistical significance of the coefficient estimates in column (8).

Table D7 reports that on the livestock compositions. The signs and statistical significance are similar. The magnitude of the coefficient estimates becomes larger for camel, cattle, and goat (in absolute value), which is in line with the hypothesis of shifting to the larger asset.

Table D8 shows that on the secondary outcomes. Note that we exclude the variable "IBLI uptake in the past 12 months (CMVE)" because we do not control for the round 2 as well as baseline. Again, we find similar results that all the coefficient of variables of interests are null. Herd management expenditure becomes positive once we control for the one at round 2, but it is still very close to zero.

Table D9 shows that on livestock losses. Signs are similar. Magnitude of coefficients are larger for camel and smaller for cattle as compared to the original estimates. Note that sample size is smaller.

Table D1: Effects on herd size in Tropical Livestock Units

		Share of aniamls							
	Herd size	Camel	Cattle	Goat	Sheep	Livestock loss	Distress sales	Sold	IBLI purchase (in the last 12 months)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Any insurance purchased	3.101	0.107	0.124	-0.237**	0.005	0.759	-0.288	-1.146	-0.430
	(7.993)	(0.089)	(0.083)	(0.096)	(0.052)	(2.242)	(0.488)	(1.387)	(0.524)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Control mean	12.922	0.249	0.363	0.270	0.117	5.109	0.287	1.689	0.319
Observations	1179	987	987	987	987	1124	781	1131	1179

Notes: Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation:$y\_i,u,j,t=T=\beta^0+\beta^1 y\_i,u,j,t=0+\beta^2 x\_i,u,j,t=0+\beta^3 C\_i,u,j+\beta^{LATE}\widehat{IBLI}\_i,u,j+\gamma\_j+\varepsilon\_i,u,j,t=T$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects.

Table D2: Herd size — Cattle Market Value Equivalent versus Tropical Livestock Units

	N of animals / Total herd size		N of animals		
	CMVE	TLU	CMVE	TLU	RAW
	(1)	(2)	(3)	(4)	(5)
Panel A: Goats and sheep					
Any insurance purchased	-0.121**	-0.121**	-0.510	-0.656	-6.563
	(0.058)	(0.058)	(0.660)	(0.564)	(5.639)
Controls	✓	✓	✓	✓	✓
Control mean	0.202	0.194	1.898	1.692	16.920
Observations	1974	1974	2034	2034	2034
Panel B: Camel and cattle					
Any insurance purchased	0.133*	0.134*	0.039	-0.186	-0.393
	(0.070)	(0.069)	(4.103)	(3.876)	(3.441)
Controls	✓	✓	✓	✓	✓
Control mean	0.298	0.306	6.430	5.852	4.849
Observations	1974	1974	2034	2034	2034

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y\_ijT = \beta\_0 + \beta\_LAT\widehat{EI}\_ij + \beta\_1y\_ij0 + \beta\_2X\_ij0 + \beta\_3D\_ij4^{t=6} + \rho\_j + \varepsilon\_ijT$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables.

Table D3: Heterogeneous effects on herd size (CMVE) by baseline herdsize

	(1)	(2)	(3)	(4)	(5)
Any insurance purchased	11.301	7.072	10.305	11.255	5.651
	(7.097)	(10.543)	(13.540)	(7.094)	(6.077)
Any insurance purchased × 25 to 50%-quantile	-1.184				
	(25.544)				
Any insurance purchased × 50 to 75%-quantile	-10.912				
	(16.525)				
Any insurance purchased × more than 75%-quantile	-15.740	-11.896			
	(22.397)	(24.270)			
Any insurance purchased × more than 50%-quantile			-12.250		
			(18.812)		
Any insurance purchased × more than 25%-quantile				-9.367	
				(13.930)	
Controls	✓	✓	✓	✓	✓
Control mean	14.265	14.265	14.265	14.265	13.145
Observations	1179	1179	1179	1179	1179

Notes: Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation:XXX. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Please refer to Table C2 for the definition of outcome variables. Column (5) shows the results of main regression with wisonrize herd size at 99%.

Table D4: Effects on herd size at different quantile in endline

	15th percentile	25th percentile	50th percentile	75th percentile	85th percentile
	(1)	(2)	(3)	(4)	(5)
Any insurance purchased	1.293	2.342	4.955**	10.377*	7.320
	(1.228)	(1.442)	(2.152)	(5.421)	(14.736)
Controls					
Control mean	14.265	14.265	14.265	14.265	14.265
Observations	1179	1179	1179	1179	1179

Notes:

Table D5: Summary statistics of additional outcome variables

	Kenya				Ethiopia				Pooled			
	Mean/SD	Min	Max	Obs	Mean/SD	Min	Max	Obs	Mean/SD	Min	Max	Obs
Camel+Cattle/Herd size (CMVE)	0.52	0.00	1.00	619	0.75	0.00	1.00	395	0.61	0.00	1.00	1014
	[0.41]				[0.19]				[0.36]			
Goat+Sheep/Herd size (CMVE)	0.48	0.00	1.00	619	0.25	0.00	1.00	395	0.39	0.00	1.00	1014
	[0.41]				[0.19]				[0.36]			
Herd size in TLU	12.17	0.00	336.09	781	14.00	0.00	440.23	398	12.79	0.00	440.23	1179
	[22.88]				[33.46]				[26.92]			
Camel/Herd size (TLU)	0.30	0.00	1.00	619	0.08	0.00	1.00	395	0.22	0.00	1.00	1014
	[0.37]				[0.18]				[0.33]			
Cattle/Herd size (TLU)	0.21	0.00	1.00	619	0.73	0.00	1.00	395	0.41	0.00	1.00	1014
	[0.35]				[0.22]				[0.40]			
Goat/Herd size (TLU)	0.35	0.00	1.00	619	0.14	0.00	1.00	395	0.27	0.00	1.00	1014
	[0.34]				[0.15]				[0.30]			
Sheep/Herd size (TLU)	0.14	0.00	1.00	619	0.05	0.00	0.83	395	0.11	0.00	1.00	1014
	[0.20]				[0.07]				[0.17]			
Livestock loss (TLU)	2.87	0.00	52.69	781	9.32	0.00	332.70	398	5.05	0.00	332.70	1179
	[5.99]				[23.79]				[14.96]			
Distress sales (TLU)	0.48	0.00	22.86	781	.	.	.	0	0.48	0.00	22.86	781
	[1.90]				[.]				[1.90]			
Livestock sale (TLU)	1.49	0.00	53.66	781	2.38	0.00	40.71	398	1.79	0.00	53.66	1179
	[3.98]				[3.91]				[3.98]			
TLU insured in the past 12 months	0.02	0.00	12.43	781	1.05	0.00	57.14	398	0.36	0.00	57.14	1179
	[0.44]				[4.16]				[2.49]			
Total years of eduction in a HH (among children 5-17 yo)	9.80	0.00	49.00	729	6.13	0.00	38.00	398	8.50	0.00	49.00	1127
	[9.38]				[6.21]				[8.58]			
Average years of eduction in a HH (among children 5-17 yo)	3.20	0.00	12.50	729	1.42	0.00	7.60	398	2.57	0.00	12.50	1127
	[2.63]				[1.45]				[2.44]			
N of camel (CMVE)	9.37	0.00	128.00	619	3.09	0.00	107.50	398	6.91	0.00	128.00	1017
	[18.08]				[9.37]				[15.57]			
N of cattle (CMVE)	3.19	0.00	200.00	619	10.28	0.00	358.00	398	5.96	0.00	358.00	1017
	[11.69]				[26.30]				[19.11]			
N of goat (CMVE)	2.25	0.00	20.00	619	2.24	0.00	96.00	398	2.25	0.00	96.00	1017
	[2.71]				[5.67]				[4.12]			
N of sheep (CMVE)	1.55	0.00	15.00	619	0.90	0.00	48.00	398	1.30	0.00	48.00	1017
	[2.29]				[2.83]				[2.53]			
Observations	781				398				1179			

Notes: Notes: All columns present mean, standard deviation (in square brackets), and the number of observations for each variable. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep. Herd size in CMVE is the sum of the animals herded by the household, aggregated using cattle market-value equivalent. The variables are constructed by the sum of ratio of cattle market-value equivalent ratio.

Table D6: Effects on primary outcomes (Adding outcomes at R2 as controls)

	Herd size (CMVE)		Total household cash earning (USD)		Max. years of education		Max. years of education (Children)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Any insurance purchased	2.418	3.765	-71.105	-97.836	1.663	1.517	2.653*	2.944**
	(9.818)	(9.866)	(442.200)	(439.077)	(1.173)	(1.163)	(1.404)	(1.419)
Controls		✓		✓		✓		✓
Control mean	14.265	14.265	719.999	719.999	7.127	7.127	4.776	4.776
Observations	1166	1166	1166	1166	781	781	924	924

Table D7: Effects on livestock composition (Adding outcomes at R2 as controls)

	N of animals in CMVE / Total herd size in CMVE							
	Camel		Cattle		Goat		Sheep	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Any insurance purchased	0.153	0.148	0.137	0.135	-0.265**	-0.272**	-0.018	0.001
	(0.104)	(0.105)	(0.094)	(0.094)	(0.111)	(0.112)	(0.060)	(0.059)
Controls		✓		✓		✓		✓
Control mean	0.263	0.263	0.332	0.332	0.284	0.284	0.121	0.121
Observations	973	973	973	973	973	973	973	973

Table D8: Effects on secondary outcomes (Adding outcomes at R2 as controls)

	Herd management expenditure (USD)		Milk Income		Livestock loss (CMVE)		Distress sales (CMVE)		Livestock Sale (CMVE)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Any insurance purchased	19.055	23.328	794.293	923.976*	1.139	1.262	-0.383	-0.400	-1.135	-0.992
	(107.323)	(107.216)	(529.371)	(558.833)	(2.667)	(2.562)	(0.514)	(0.512)	(1.445)	(1.432)
Controls		✓		✓		✓		✓		✓
Control mean	193.424	193.424	366.105	366.105	5.448	5.448	0.292	0.292	1.872	1.872
Observations	1166	1166	1166	1166	1179	1179	779	779	1179	1179

Table D9: Effects on livestock loss by animal type (adding outcomes at R2 as controls)

	N of lost animals					
	Camel		Cattle		Goat/Sheep	
	(1)	(2)	(3)	(4)	(5)	(6)
Any insurance purchased	1.038	1.125	0.202	-0.051	-8.366	-8.178
	(1.169)	(1.154)	(2.664)	(2.453)	(9.793)	(9.606)
Controls		✓		✓		✓
Control mean	0.982	0.982	3.539	3.539	11.788	11.788
Observations	691	691	691	691	691	691

E Additional Tables and Figures Referenced in Text

Table E1: The Average Market Values of Animals

	(1)	(2)	(3)	(4)	(5)	(6)
		Marsabit, Kenya			**Borana, Ethiopia**	
	KES	Cattle Equivalent	Data Rounds	Birr	Cattle Equivalent	Data Rounds
Camel	25,132	1.6	1-7	7,447	2.5	1-4
Cattle	15,617	1.0	1-7	3,023	1.0	1-4
Sheep	1,515	0.1	7			
Goats	1,561	0.1	7			
Sheep or Goat	2,308	0.15	1-6	484	0.16	1-4

Table E2: Balance of coupon distribution in Kenya

	Received coupon vs. No coupon						
Sales Season:	2010 JF	2011 JF	2011 AS	2012 AS	2013 JF	2013 AS	F-test
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age of the household head	1.45	1.12	0.0112	-0.276	1.24	-2.39*	7.25
	(1.19)	(1.20)	(1.21)	(1.07)	(1.05)	(1.31)	{0.298}
	[0.0801]	[0.0553]	[0.00141]	[-0.0144]	[0.0754]	[-0.144]	
Male headed household (=1)	-0.0167	-0.0141	-0.0286	-0.0309	0.0148	-0.0293	3.52
	(0.0296)	(0.0291)	(0.0291)	(0.0298)	(0.0304)	(0.0369)	{0.741}
	[-0.0349]	[-0.0343]	[-0.0556]	[-0.0585]	[0.0270]	[-0.0594]	
Education of household head	-0.281	-0.0645	-0.0430	0.122	-0.261	0.290	5.42
	(0.216)	(0.213)	(0.214)	(0.204)	(0.206)	(0.235)	{0.492}
	[-0.0884]	[-0.0156]	[-0.00885]	[0.0441]	[-0.0852]	[0.0942]	
Adult equivalent	0.114	0.119	-0.0305	-0.0232	-0.177	-0.120	3.88
	(0.130)	(0.136)	(0.136)	(0.137)	(0.134)	(0.180)	{0.693}
	[0.0564]	[0.0635]	[-0.0147]	[-0.00878]	[-0.0829]	[-0.0592]	
Dependency ratio	0.00525	-0.00582	0.00206	0.0223	0.00104	-0.00847	3.38
	(0.0143)	(0.0135)	(0.0137)	(0.0136)	(0.0129)	(0.0158)	{0.760}
	[0.0253]	[-0.0282]	[0.0130]	[0.113]	[0.00562]	[-0.0373]	
Herd size (CMVE)	1.37	-0.743	1.21	-0.688	1.09	-1.02	2.69
	(2.02)	(2.00)	(1.83)	(1.38)	(1.11)	(1.64)	{0.847}
	[0.0316]	[-0.0178]	[0.0151]	[-0.0378]	[0.0605]	[-0.0514]	
Annual income per AE (USD)	-17.0	-19.6	-1.73	13.9	3.46	-19.3	4.40
	(13.1)	(19.5)	(18.2)	(14.1)	(17.1)	(24.5)	{0.623}
	[-0.0845]	[-0.0671]	[-0.00778]	[0.0632]	[0.0128]	[-0.0678]	
Own or farm agricultural land	-0.0215	-0.0206	0.0428**	0.0206	-0.0227	-0.00401	13.0
	(0.0168)	(0.0160)	(0.0168)	(0.0179)	(0.0181)	(0.0234)	{0.0440}
	[-0.0394]	[-0.0566]	[0.131]	[0.0395]	[-0.0537]	[0.00644]	
F statistics of Joint F-test:	6.785	5.215	9.014	7.057	7.741	7.754	
P-value of Joint F-test:	0.560	0.734	0.341	0.530	0.459	0.458	

Notes: Each cell reports the results from individual regression estimaing Equation (7):$y_{ijt} = \alpha + \beta_1 \text{Received Coupon}_{ijt} + \gamma_j + \varepsilon_{ijt}$, where y_{ijt} denotes a characteristic of a household i in area j in sales season t. Columns (1) to (6) report mean differences, robust standard errors (in parentheses), and and normalized difference (in square brackets) between the coupon recipients and non-recipients. All estimations include country and community fixed effects. Columns (1) to (6) report mean differences, robust standard errors (in parentheses), and and normalized difference (in square brackets) between the coupon recipients and non-recipients.Column (7) reports joint signifiance test for each variable across seasons where the first row presents the Chi-statistics and the second row presents the p-value of the test statistic in bracketsDependency ratio is the ratio of dependents – people younger than 15 or older than 64 – to the working-age population, those ages 15-64.See Table 1 notes for definitions of variables. * denotes significance at 0.10; ** at 0.05; and *** at 0.01.

Table E3: Balance of coupon distribution in Ethiopia

	Received coupon vs. No coupon						
Sales Season:	2012 AS	2013 JF	2013 AS	2014 JF	2014 AS	2015 JF	F-test
	(1)	(2)	(3)	(4)	(5)	(6)	
Age of the household head	-2.23	2.11	-0.939	0.825	1.39	4.27**	8.37
	(2.22)	(2.10)	(1.84)	(2.07)	(2.03)	(1.88)	{0.212}
	[-0.125]	[0.120]	[-0.0449]	[0.0426]	[0.0885]	[0.239]	
Male headed household (=1)	-0.0316	-0.0631	-0.0486	-0.0546	-0.0216	-0.0182	6.21
	(0.0450)	(0.0435)	(0.0433)	(0.0418)	(0.0437)	(0.0439)	{0.400}
	[-0.0810]	[-0.168]	[-0.126]	[-0.143]	[-0.0616]	[-0.0556]	
Education of household head	-0.115	-0.0322	-0.0341	0.00161	-0.112	-0.0191	1.75
	(0.238)	(0.230)	(0.115)	(0.0886)	(0.0996)	(0.0727)	{0.941}
	[-0.0672]	[-0.0196]	[-0.0283]	[0.00246]	[-0.128]	[-0.0389]	
Adult equivalent	-0.359	-0.127	-0.319	-0.00255	-0.0307	-0.181	4.43
	(0.277)	(0.242)	(0.239)	(0.221)	(0.250)	(0.254)	{0.618}
	[-0.167]	[-0.0695]	[-0.160]	[0.00102]	[-0.0175]	[-0.0861]	
Dependency ratio	-0.0241	0.00260	0.0141	-0.0139	0.0517***	-0.0191	10.9
	(0.0195)	(0.0207)	(0.0192)	(0.0173)	(0.0199)	(0.0196)	{0.0920}
	[-0.127]	[0.00747]	[0.0876]	[-0.0773]	[0.281]	[-0.108]	
Herd size (CMVE)	0.473	-1.43	-4.26	-3.17	-1.26	-3.89	3.47
	(2.47)	(2.34)	(3.82)	(3.81)	(3.01)	(4.30)	{0.748}
	[0.00220]	[-0.0605]	[-0.156]	[-0.118]	[-0.0491]	[-0.127]	
Annual income per AE (USD)	30.0***	-4.73	-7.54	3.58	-19.0*	-21.2	13.4
	(11.5)	(20.3)	(11.5)	(9.81)	(11.0)	(13.4)	{0.0370}
	[0.233]	[-0.0218]	[-0.0876]	[0.0223]	[-0.190]	[-0.193]	
Own or farm agricultural land	-0.0514	0.0457	-0.0613*	0.0260	-0.00126	-0.00522	5.81
	(0.0468)	(0.0477)	(0.0356)	(0.0377)	(0.0327)	(0.0324)	{0.444}
	[-0.120]	[0.106]	[-0.112]	[0.0914]	[0.0277]	[0.00581]	
F statistics of Joint F-test:	12.397	5.190	6.158	5.790	12.697	11.247	
P-value of Joint F-test:	0.134	0.737	0.629	0.671	0.123	0.188	

Notes: Each cell reports the results from individual regression estimaing Equation (7):$y_{ijt} = \alpha + \beta_1 \text{Received Coupon}_{ijt} + \gamma_j + \varepsilon_{ijt}$, where y_{ijt} denotes a characteristic of a household i in area j in sales season t. Columns (1) to (6) report mean differences, robust standard errors (in parentheses), and and normalized difference (in square brackets) between the coupon recipients and non-recipients. All estimations include country and community fixed effects. Columns (1) to (6) report mean differences, robust standard errors (in parentheses), and and normalized difference (in square brackets) between the coupon recipients and non-recipients.Column (7) reports joint signifiance test for each variable across seasons where the first row presents the Chi-statistics and the second row presents the p-value of the test statistic in bracketsDependency ratio is the ratio of dependents – people younger than 15 or older than 64 – to the working-age population, those ages 15-64.See Table 1 notes for definitions of variables. * denotes significance at 0.10; ** at 0.05; and *** at 0.01.

Table E4: First stage regression results

	Number of seasons respondent purchased ANY IBLI – all six seasons											
	Pooled				Kenya				Ethiopia			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Cum. coupon receipt (N)	0.127***				0.160***				0.045			
	(0.021)				(0.024)				(0.042)			
Coupon Receipt (Season 1)		0.256***		0.156*		0.266***		0.193*		0.188		0.188
		(0.059)		(0.087)		(0.067)		(0.114)		(0.117)		(0.149)
Coupon Receipt (Season 2)		0.169***		0.075		0.219***		0.104		0.004		-0.078
		(0.061)		(0.084)		(0.068)		(0.109)		(0.130)		(0.161)
Coupon Receipt (Season 3)		0.120**		0.054		0.245***		0.191*		-0.267**		-0.372**
		(0.059)		(0.090)		(0.067)		(0.115)		(0.120)		(0.163)
Coupon Receipt (Season 4)		0.058		-0.067		0.072		0.025		-0.012		-0.223
		(0.059)		(0.088)		(0.068)		(0.113)		(0.115)		(0.153)
Coupon Receipt (Season 5)		0.056		-0.107		0.015		-0.090		0.145		-0.064
		(0.061)		(0.085)		(0.070)		(0.107)		(0.127)		(0.156)
Coupon Receipt (Season 6)		0.073		-0.037		0.156**		0.119		-0.086		-0.301*
		(0.066)		(0.090)		(0.074)		(0.108)		(0.129)		(0.161)
Discount rate (Season 1)			0.005***	0.003			0.006***	0.002			0.004**	0.002
			(0.001)	(0.002)			(0.002)	(0.003)			(0.002)	(0.003)
Discount rate (Season 2)			0.003***	0.003			0.005***	0.003			0.002	0.002
			(0.001)	(0.002)			(0.002)	(0.003)			(0.002)	(0.002)
Discount rate (Season 3)			0.003**	0.002			0.005***	0.002			0.000	0.003
			(0.001)	(0.002)			(0.002)	(0.003)			(0.002)	(0.003)
Discount rate (Season 4)			0.002*	0.003*			0.002	0.001			0.003	0.005**
			(0.001)	(0.002)			(0.002)	(0.003)			(0.002)	(0.002)
Discount rate (Season 5)			0.003**	0.004**			0.001	0.003			0.004**	0.005**
			(0.001)	(0.002)			(0.002)	(0.003)			(0.002)	(0.002)
Discount rate (Season 6)			0.002**	0.003*			0.002*	0.001			0.003	0.005**
			(0.001)	(0.001)			(0.001)	(0.002)			(0.002)	(0.002)
Effective F-stat	35.965	5.809	7.930	4.664	43.297	8.033	6.768	4.220	1.129	1.514	2.527	2.550
10% Critical Value	16.380	12.680	12.843	13.479	16.380	12.684	12.965	13.627	16.380	13.411	14.164	14.260
N	1179	1168	1168	1168	781	781	781	781	398	387	387	387

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equations: $IBLI_{i,u,j} = \alpha^0 + \alpha^1 y_{i,u,j,t=0} + \alpha^2 x_{i,u,j,t=0} + \alpha^3 Discount_{i,u,j} + \gamma + \mu_{i,u,j}$, where $IBLI_{i,u,j} = \sum_{t\in[C]} I^{IBLI}_{i,u,j,t}$ where $I^{IBLI}_{i,u,j,t} = 1$ if $IBLI_{i,u,j,t} > 0$, $Discount_{i,u,j} = \sum_{t\in[C]} I^{Discount}_{i,u,j,t}$ where $I^{Discount}_{i,u,j,t} = 1$ if $Discount_{i,u,j,t} > 0$ and C=[2010JF, 2011JF, 2011AS, 2012AS, 2013JF, 2013AS in Kenya, and 2012AS, 2013JF, 2013AS, 2014JF, 2014AS, 2015JF in Ethiopia. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include country and community fixed effects. In columns (1), (5) and (9), the reported 10% critical values are from Stock and Yogo (2005) and in other columns they are from Olea and Pflueger (2013), which are the cutoffs that we compare effective F-statistics with to determine whether the instrument is weak.

Table E5: First stage – using coupon receipt status of individual sales season

	Outcome: Respondent purchased ANY IBLI in each season					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Pooled sample						
Coupon Receipt (Season 1)	0.236***					
	(0.023)					
Coupon Receipt (Season 2)		0.078***				
		(0.022)				
Coupon Receipt (Season 3)			0.128***			
			(0.017)			
Coupon Receipt (Season 4)				0.067***		
				(0.017)		
Coupon Receipt (Season 5)					0.070***	
					(0.016)	
Coupon Receipt (Season 6)						0.058***
						(0.013)
Effective F-stat	105.823	12.690	55.896	15.817	19.533	19.782
10% Critical Value	16.380	16.380	16.380	16.380	16.380	16.380
N	1168	1168	1176	1175	1173	1171
Panel B: Kenya						
Coupon Receipt (Season 1)	0.236***					
	(0.027)					
Coupon Receipt (Season 2)		0.095***				
		(0.025)				
Coupon Receipt (Season 3)			0.148***			
			(0.021)			
Coupon Receipt (Season 4)				0.050**		
				(0.020)		
Coupon Receipt (Season 5)					-0.001	
					(0.016)	
Coupon Receipt (Season 6)						0.043***
						(0.012)
Effective F-stat	77.545	14.627	49.695	6.225	0.008	13.244
10% Critical Value	16.380	16.380	16.380	16.380	16.380	16.380
N	781	781	781	781	781	781
Panel C: Ethiopia						
Coupon Receipt (Season 1)	0.233***					
	(0.043)					
Coupon Receipt (Season 2)		0.022				
		(0.045)				
Coupon Receipt (Season 3)			0.068***			
			(0.026)			
Coupon Receipt (Season 4)				0.115***		
				(0.030)		
Coupon Receipt (Season 5)					0.284***	
					(0.034)	
Coupon Receipt (Season 6)						0.091***
						(0.033)
Effective F-stat	29.017	0.238	7.062	14.461	68.124	7.661
10% Critical Value	16.380	16.380	16.380	16.380	16.380	16.380
N	387	387	395	394	392	390

Notes: Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equations: $IBLI_{i,u,j} = \alpha^0 + \alpha^1 y_{i,u,j,t=0} + \alpha^2 x_{i,u,j,t=0} + \alpha^3 Discount_{i,u,j} + \gamma + \mu_{i,u,j}$, where $IBLI_{i,u,j} = 1$ if $IBLI_{i,u,j,t} > 0$, $Discount_{i,u,j} = 1$ if $Discount_{i,u,j,t} > 0$. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include country and community fixed effects. In all columns, the reported 10% critical values are from Stock and Yogo (2005), which are the cutoffs that we compare effective F-statistics with to determine whether the instrument is weak.

Table E6: Spillover effects on prespecified primary outcomes: Herd size, earnings, education with two endogenous variables

	Herd size (CMVE)			Total household cash earning (USD)			Share of members who completed age-appropriate years of education		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\widehat{I_{ig}}$: Any insurance purchase - first three seasons	2.485	3.878	0.208	-125.555	-135.190	-430.321	0.105	0.125	0.157
	(11.228)	(11.276)	(20.490)	(430.674)	(429.388)	(1130.550)	(0.190)	(0.193)	(0.168)
$\hat{\bar{I}}_{-ig}$: Peers' any insurance purchase – first three season	17.482	23.198	-119.587	-1544.928	-1530.794	-13502.212	-1.438	-0.812	0.435
	(168.443)	(167.174)	(873.663)	(6743.689)	(6755.025)	(40697.165)	(7.249)	(7.303)	(6.388)
Recipient controls (i)		✓	✓		✓	✓		✓	✓
Peers' controls (-i)			✓			✓			✓
Control mean	14.265	14.265	14.265	693.382	693.382	693.382	0.048	0.048	0.048
Clustered standard errors	village	village	village	village	village	village	village	village	village
Observations	1179	1179	1179	1179	1179	1179	770	770	770

Notes: All columns present coefficient estimates and cluster standard errors at the village level (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \gamma_3\hat{\bar{I}}_{-ig} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \gamma_2 X_{-ij0} + \beta_3 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT}$ where we instrument $\widehat{I}_{ij}$ and $\hat{\bar{I}}_{-ig}$ by both D_{ig} and D_{-ig}. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep.

Table E7: Spillover effects on Prespecified primary outcome: Herd composition with two endogenous variables

	Outcome: N of animal type in CMVE / Total N of animals in CMVE											
	Camel			Cattle			Goats			Sheep		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\widehat{I_{ig}}$: Any insurance purchase - first three seasons	0.220*	0.216*	-0.613	0.019	0.008	0.472	-0.240**	-0.244**	-0.111	-0.007	0.016	0.279
	(0.125)	(0.123)	(0.567)	(0.131)	(0.138)	(0.310)	(0.101)	(0.104)	(0.344)	(0.051)	(0.051)	(0.245)
$\hat{\bar{I}}_{-ig}$: Peers' any insurance purchase – first three season	4.044	3.870	-26.989	-3.674	-4.002	13.384	-0.643	-0.392	4.522	0.009	0.298	10.033
	(3.602)	(3.437)	(21.439)	(3.591)	(3.913)	(11.324)	(1.173)	(1.230)	(12.453)	(0.620)	(0.667)	(8.780)
Recipient controls (i)		✓	✓		✓	✓		✓	✓		✓	✓
Peers' controls (-i)			✓			✓			✓			✓
Control mean	0.263	0.263	0.263	0.332	0.332	0.332	0.284	0.284	0.284	0.121	0.121	0.121
Clustered standard errors	village	village	village	village	village	village	village	village	village	village	village	village
Observations	987	987	987	987	987	987	987	987	987	987	987	987

Notes: All columns present coefficient estimates and cluster standard errors at the village level (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \gamma_3\hat{\bar{I}}_{-ig} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \gamma_2 X_{-ij0} + \beta_3 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT}$ where we instrument $\widehat{I}_{ij}$ and $\hat{\bar{I}}_{-ig}$ by both D_{ig} and D_{-ig}. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep.

Table E8: Spillover effects on prespecified secondary outcomes with two endogenous variables

	Herd management expenditure (USD)			Milk Income			Livestock loss (CMVE)			Distress sales (CMVE)			Livestock Sale (CMVE)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
$\widehat{I}_{ig}$: Any insurance purchase - first three seasons	-65.605	-62.834	477.054	714.312	844.286	-26.448	5.119	5.156	-2.744	-0.495	-0.565	-0.546	-0.823	-0.581	-5.780
	(148.886)	(148.687)	(424.064)	(516.903)	(549.032)	(788.260)	(6.787)	(6.508)	(10.524)	(0.678)	(0.697)	(0.693)	(1.886)	(1.903)	(3.843)
$\hat{\bar{I}}_{-ig}$: Peers' any insurance purchase – first three season	-2530.910	-2560.477	18649.720	5660.998	6995.305	-27398.439	140.758	134.314	-169.486	-7.195	-9.772	-10.480	13.647	17.309	-185.911
	(3834.294)	(3805.441)	(16999.063)	(6642.075)	(7649.229)	(31791.967)	(204.793)	(195.178)	(441.015)	(42.322)	(42.312)	(41.652)	(38.681)	(40.774)	(148.740)
Recipient controls (i)		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Peers' controls (-i)			✓			✓			✓			✓			✓
Control mean	0.426	0.426	0.426	0.426	0.426	0.426	0.426	0.426	0.426	0.426	0.426	0.426	0.426	0.426	0.426
Clustered standard errors	village	village	village	village	village	village	village	village	village	village	village	village	village	village	village
Observations	1179	1179	1179	1179	1179	1179	1179	1179	1179	781	781	781	1179	1179	1179

Notes: All columns present coefficient estimates and cluster standard errors at the village level (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \gamma_3\hat{\bar{I}}_{-ig} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \gamma_2 X_{-ij0} + \beta_3 D_{ij4}^{t=6} + \rho_j + \varepsilon_{ijT}$ where we instrument $\widehat{I}_{ij}$ and $\hat{\bar{I}}_{-ig}$ by both D_{ig} and D_{-ig}. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep.

Table E9: Spillover effects on prespecified secondary outcomes: IBLI purchase and children's activities

	IBLI uptake in the past 12 months (=1 if purchased)			IBLI uptake in the past 12 months (CMVE)			Working full-time			Working part-time			Studying full-time		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
$\widehat{I}_{ig}$: Any insurance purchase - first three seasons	0.030	0.037	-0.063	-1.985	-1.997	7.742	0.074	0.257	-0.138	-0.145	-0.006	0.257	-0.654	-0.585	-0.353
	(0.070)	(0.070)	(0.180)	(1.902)	(2.015)	(6.663)	(0.797)	(1.008)	(0.942)	(0.620)	(0.778)	(1.029)	(1.684)	(1.588)	(1.427)
$\widehat{\bar{I}}_{-ig}$: Peers' any insurance purchase – first three season	-0.147	0.066	-3.831	-43.215	-45.213	337.409	10.420	16.304	4.912	1.911	7.228	13.639	-30.763	-29.293	-21.110
	(1.285)	(1.268)	(8.122)	(55.114)	(58.114)	(291.627)	(26.915)	(33.017)	(29.167)	(19.695)	(24.651)	(31.329)	(53.801)	(50.585)	(42.576)
Recipient controls (i)		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Peers' controls (-i)			✓			✓			✓			✓			✓
Control mean	0.042	0.042	0.042	0.539	0.539	0.539	0.271	0.271	0.271	0.201	0.201	0.201	0.232	0.232	0.232
Clustered standard errors	village	village	village	village	village	village	village	village	village	village	village	village	village	village	village
Observations	1179	1179	1179	1179	1179	1179	376	376	376	376	376	376	376	376	376

Notes: All columns present coefficient estimates and robust cluster standard errors at the village level (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \gamma_3\widehat{\bar{I}}_{-ig} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \gamma_2 X_{-ij0} + \beta_3 D^{t=6}_{ij4} + \rho_j + \varepsilon_{ijT}$ where we instrument $\widehat{I}_{ij}$ and $\widehat{\bar{I}}_{-ig}$ by both D_{ig} and D_{-ig}. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep.

Table E10: Spillover effects on prespecified primary outcomes: Herd size, earnings, education with two endogenous variables

	Herd size (CMVE)			Total household cash earning (USD)			Share of members who completed age-appropriate years of education		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\widehat{I_{ig}}$: Any insurance purchase - first three seasons	4.246	5.837	3.246	-34.125	-49.175	-76.016	0.135	0.135	0.134**
	(11.012)	(10.497)	(8.995)	(425.361)	(410.447)	(395.531)	(0.092)	(0.089)	(0.063)
$\hat{\bar{I}}_{-ig}$: Peers' any insurance purchase – first three season	131.264**	109.288***	16.337	2904.802	1143.433	1176.920	1.130*	1.054*	0.234
	(54.730)	(40.753)	(14.690)	(2025.919)	(2090.670)	(877.264)	(0.629)	(0.592)	(0.168)
Recipient controls (i)		✓	✓		✓	✓		✓	✓
Peers' controls (-i)			✓			✓			✓
Control mean	14.265	14.265	14.265	693.382	693.382	693.382	0.048	0.048	0.048
Village FE									
Observations	1179	1179	1179	1179	1179	1179	770	770	770

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \gamma_3\widehat{\bar{I}}_{-ig} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \gamma_2 X_{-ij0} + \beta_3 D_{ij4}^{t=6} + \varepsilon_{ijT}$ where we instrument $\widehat{I}_{ij}$ and $\widehat{\bar{I}}_{-ig}$ by both D_{ig} and D_{-ig}. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep.

Table E11: Spillover effects on Prespecified primary outcome: Herd composition with two endogenous variables

	Outcome: N of animal type in CMVE / Total N of animals in CMVE											
	Camel			Cattle			Goats			Sheep		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\widehat{I_{ig}}$: Any insurance purchase - first three seasons	0.098	0.090	0.123	0.175	0.187	0.127	-0.261	-0.261	-0.253**	-0.030	-0.008	0.003
	(0.152)	(0.098)	(0.096)	(1.747)	(0.499)	(0.089)	(0.193)	(0.201)	(0.107)	(0.135)	(0.094)	(0.053)
$\hat{\bar{I}}_{-ig}$: Peers' any insurance purchase – first three season	-2.474**	-0.636	-0.129	32.427	9.033	0.599**	-2.534***	-2.671***	-0.304	-2.356	-1.505	-0.258*
	(1.232)	(0.539)	(0.223)	(69.077)	(6.982)	(0.264)	(0.886)	(0.943)	(0.258)	(2.079)	(0.976)	(0.143)
Recipient controls (i)		✓	✓		✓	✓		✓	✓		✓	✓
Peers' controls (-i)			✓			✓			✓			✓
Control mean	0.263	0.263	0.263	0.332	0.332	0.332	0.284	0.284	0.284	0.121	0.121	0.121
Village FE												
Observations	987	987	987	987	987	987	987	987	987	987	987	987

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \gamma_3\hat{\bar{I}}_{-ig} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \gamma_2 X_{-ij0} + \beta_3 D_{ij4}^{t=6} + \varepsilon_{ijT}$ where we instrument $\widehat{I}_{ij}$ and $\widehat{\bar{I}}_{-ig}$ by both D_{ig} and D_{-ig}. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep.

Table E12: Spillover effects on prespecified secondary outcomes with two endogenous variables

	Herd management expenditure (USD)			Milk Income			Livestock loss (CMVE)			Distress sales (CMVE)			Livestock Sale (CMVE)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
$\widehat{I_{ig}}$: Any insurance purchase - first three seasons	47.855	46.751	4.484	428.243	539.787	684.536	5.267	5.393	2.098	0.393	0.033	-0.150	-0.793	-0.644	-0.846
	(149.948)	(129.044)	(98.308)	(580.105)	(528.242)	(489.003)	(7.473)	(7.331)	(2.646)	(1.559)	(1.106)	(0.561)	(1.677)	(1.694)	(1.466)
$\hat{\bar{I}}_{-ig}$: Peers' any insurance purchase – first three season	2406.204***	1778.021**	374.711	-7207.097***	-4253.614**	658.532	136.511***	131.975***	11.430	29.887**	21.041***	7.547***	17.302***	18.953***	9.060**
	(864.750)	(787.955)	(266.159)	(2611.759)	(2104.267)	(812.105)	(35.796)	(37.817)	(19.721)	(12.457)	(7.645)	(2.508)	(6.239)	(6.506)	(3.921)
Recipient controls (i)		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Peers' controls (-i)			✓			✓			✓			✓			✓
Control mean	182.827	182.827	182.827	339.362	339.362	339.362	5.448	5.448	5.448	0.292	0.292	0.292	1.872	1.872	1.872
Village FE															
Observations	1179	1179	1179	1179	1179	1179	1179	1179	1179	781	781	781	1179	1179	1179

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I_{ij}} + \gamma_3\widehat{\bar{I}}_{-ig} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \gamma_2 X_{-ij0} + \beta_3 D_{ij4}^{t=6} + \varepsilon_{ijT}$ where we instrument $\widehat{I_{ij}}$ and $\widehat{\bar{I}}_{-ig}$ by both D_{ig} and D_{-ig}. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep.

Table E13: Spillover effects on prespecified secondary outcomes: IBLI purchase and children's activities

	IBLI uptake in the past 12 months (=1 if purchased)			IBLI uptake in the past 12 months (CMVE)			Working full-time			Working part-time			Studying full-time		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
$\widehat{I_{ig}}$: Any insurance purchase - first three seasons	0.102	0.097	0.047	-0.164	-0.130	-0.711	-0.206	-0.039	0.248	-0.894	-1.192	14.928	6.858	5.380	4.731
	(0.158)	(0.145)	(0.056)	(1.926)	(1.955)	(0.980)	(0.731)	(1.537)	(7.350)	(2.249)	(2.821)	(1301.756)	(527.741)	(205.961)	(864.250)
$\widehat{\bar{I}}_{-ig}$: Peers' any insurance purchase – first three season	2.978***	2.667***	0.582***	35.806***	36.191***	10.361**	2.629	5.581	38.544	-11.805	-12.276	554.404	204.618	107.197	429.108
	(0.808)	(0.781)	(0.190)	(11.250)	(13.958)	(5.268)	(14.857)	(21.042)	(303.449)	(21.258)	(22.912)	(48508.704)	(16604.938)	(4383.620)	(84789.053)
Recipient controls (i)		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Peers' controls (-i)			✓			✓			✓			✓			✓
Control mean	0.042	0.042	0.042	0.539	0.539	0.539	0.271	0.271	0.271	0.201	0.201	0.201	0.232	0.232	0.232
village FE															
Observations	1179	1179	1179	1179	1179	1179	376	376	376	376	376	376	376	376	376

Notes: All columns present coefficient estimates and robust standard errors (in parentheses) from the following equation: $y_{ijT} = \beta_0 + \beta_{LATE}\widehat{I}_{ij} + \gamma_3\widehat{\bar{I}}_{-ig} + \beta_1 y_{ij0} + \beta_2 X_{ij0} + \gamma_2 X_{-ij0} + \beta_3 D^{t=6}_{ij4} + \varepsilon_{ijT}$ where we instrument $\widehat{I}_{ij}$ and $\widehat{\bar{I}}_{-ig}$ by both D_{ig} and D_{-ig}. * denotes significance at 0.10; ** at 0.05; and *** at 0.01. All columns include community fixed effects. Any insurance purchased refers to the act of purchasing insurance at least once, but up to three times, within the initial three seasons. Cattle market-value equivalent (CMVE) is a unit to aggregate the animals across different animal types based on their market values using panel survey data. In Kenya, 1 CMVE= 0.625 camel=1 cattle=10 goats/sheep, and in Ethiopia, 1 CMVE=4 camel=1 cattle=6.25 goats/sheep.