

The Efficiency Gains of Cash Transfers: Experimental Evidence from Kenya

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- Longstanding debate over if and how large capital infusions can contribute to economic development and poverty alleviation, at macro and micro levels
- Consequences of capital infusions might depend on the efficiency of markets & how people use these markets

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- Cash transfers can improve households' economic outcomes through direct wealth effects, as well as by enabling more efficient production decisions

Contribution & Context in Literature

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- In **specific markets**, typically by studying variation in market conditions (e.g. Breza et al. 2022; Cefala et al. 2025a, b; Giné et al. 2012; Jayachandran 2006; Jones et al. 2022; Kaur 2019)
- Using **separation tests**, which examine distortions caused by frictions using weak assumptions but don't identify which specific frictions bind (e.g. Benjamin 1992; Dillon et al. 2019; Kebede 2022; LaFave & Thomas 2016)

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- Common finding of non-negative labour supply effects, with little direct evidence on why (e.g. Baird et al. 2018; Banerjee et al. 2017)
- We highlight the **role of market frictions and their distortionary effects as *an* approach to understanding (heterogeneous) effects of cash / asset transfers on production**

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Experiment

- Village-level randomised **unconditional cash transfers of USD 2,237 PPP** to eligible households
 - Transfers are large \Rightarrow 55% of the mean value of annual household consumption

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 2. Eligibles with no cattle/enterprises (\bar{K}_L^2) vs Eligibles with cattle/enterprises (\bar{K}_H^2)

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 2. Supply *too little* labour overall due to a lower shadow wage
 3. Produce inefficiently with misallocation of household factors of production & consume less

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1. **Production-Side:** *Household labour use in their production is independent of their labour endowments*

- Implemented by Benjamin (1992), and more recently by LaFave & Thomas (2016) \Leftarrow today
- $H_0 : F_L(K^{use}, L^{use}) = w$
- $H_1 : F_L(K^{use}, L^{use}) = w^{shadow}$ where w^{shadow} is a function of household composition

Testing for Efficiency Using Separation Tests

- Two testable implications of separation (H_0), established in the literature:

1. **Production-Side:** *Household labour use in their production is independent of their labour endowments*

- Implemented by Benjamin (1992), and more recently by LaFave & Thomas (2016) \Leftarrow today
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2. **Consumption-Side:** *Production input prices only affect consumer demand through an income effect from changes in profits*

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- Both tests draw on completely different data and independent sources of variation
 - Findings are consistent over both tests
- Failure to reject separation \implies frictions are not distorting decisions & production is efficient
 - It does *not* imply that market frictions do not exist

Cash Transfer Effects on Efficiency: Production-Side Separation Tests

- Regress labour use (L^{use}) in household production on household demographic variables (N)
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	\bar{K}_L^1	\bar{K}_H^1
F -statistic (control)		
F -statistic (cash)		
Observations (control)		
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<i>F</i> -statistic (cash)	1.158 [0.309]	0.743 [0.709]	0.783 [0.668]	1.433 [0.145]
Observations (control)	2,998	1,108	1,270	1,708
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- Identical set of results (all 8) using the consumption-side separation tests

Cash Transfer Effects on Efficiency Using Separation Tests

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2. \bar{K}_L households in control villages have inefficient production (we reject separation) 1 & 2
3. \bar{K}_L households in cash villages have efficient production (we fail to reject separation) 1 & 2
 - Consistent with multiple possible interpretations about what cash transfers do:
 - Cash transfers could alleviate market frictions?
 - More capital allow households to avoid market frictions?
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 - Some other attributes allow households to avoid market frictions and, perhaps because of that, engage in the higher-capital activities?
 - To explore mechanisms \Rightarrow **treatment effects of cash transfers on household decisions** Specification

Cash Transfers and Efficiency: Theory and Empirical Results

- We propose *one* interpretation *consistent* with our set of treatment effects

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 5. Increase consumption
- Household welfare goes up from a direct income effect, but also an indifferent *efficiency* effect

Cash Transfer Effects on Production Activities

At the extensive margin:

- No effects on crop agriculture
- Households expand into livestock, mainly **heavy livestock** rather than light livestock
- Households start new **non-farm enterprises (NFEs)**
- Households are *expanding* their production activities, not switching

[Details 1](#) & [2](#)

	Crops	Livestock			Enterprise	Any
		Light	Heavy	All		
Cash	0.001 (0.005)	0.019* (0.010)	0.110*** (0.016)	0.039*** (0.009)	0.060*** (0.017)	0.001 (0.002)
Control mean	0.981	0.870	0.424	0.887	0.442	0.995
Observations	3,581	3,581	3,581	3,581	3,581	3,581

Cash Transfer Effects on Production

1. Household participation in different economic activities:

Results 1 & 2 & 3

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4. Household revenues from production

Results

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Cash Transfer Effects on Labour Supply and Consumption

Estimate treatment effects of cash transfers on labour supply and consumption **Results 1 & 2 & 3**

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1. Increase in the average product of labour in household production

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- Consistent with \bar{K}_L households becoming more efficient in production

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[Wage Results](#)

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3. Households achieve higher consumption 1.5 years after the cash transfers

Other Non-Competing Explanations

- Gender and Household Bargaining

Household Bargaining Results

- *Unlikely* that our results are driven by treatment effects on intra-household bargaining

- Psychological Factors

Psychological Results

- *Unlikely* that our results are driven by treatment effects on psychological factors

- Demand Effects

- Cash transfers can have general equilibrium effects (Egger et al., 2022; Walker et al., 2024) which would affect investment by raising aggregate demand
- But prior work finds general equilibrium effects only on wealthier, cash-transfer-ineligible households, not the eligible households we use for the main results
- View our findings as illustrating *another* mechanism allowing cash transfers to improve efficiency

Conclusion

- Low-capital households in our setting face market frictions that distort production
- Cash transfers allow households to:
 1. Upgrade their economic activities to high-capital production
 2. Reduce the distortionary effects of market frictions
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- What can we say about specific market frictions?
 - Results are consistent with a model of capital and labour market frictions
- What can we take away from these findings?
 - Value of combining separation tests (using rich panel data) with policy or experimental variation
 - A framework for understanding when and how transfers can improve the *efficiency of production*, beyond a simple wealth effect on consumption

Appendix

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Contribution & Context in Literature

Core goal: bridge literatures on (1) testing for market frictions and (2) cash / asset transfers to offer *an* explanation for when and how transfers can improve efficiency of production

1. Testing for market frictions

- In specific markets (e.g. Breza et al. 2022; Cefala et al. 2025a, b; Giné et al. 2012; Jayachandran 2006; Jones et al. 2022; Kaur 2019)
- Using separation tests (e.g. Benjamin 1992; Dillon et al. 2019; Kebede 2022; LaFave & Thomas 2016)
- We offer *an* approach to combining separation tests with experimental or policy variation

2. Cash / asset transfers

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1. Testing for market frictions

2. Cash / asset transfers

- Ongoing debate: consumption/social protection policy versus a production/investment policy?
- Substantial evidence of heterogeneous effects (e.g. Balboni et al. 2022; Banerjee et al. 2015; Blattman et al 2014; 2020; Bedoya et al. 2019)
- Recent work exploring interactions with market structure (e.g. Baird et al. 2018; Cunha et al. 2019; Egger et al. 2022; Filmer et al. 2023; Walker et al. 2024)
- We highlight the role of market frictions as *an* approach to understanding (heterogeneous) effects of cash / asset transfers on production

Contribution & Context in Literature

- Paper relates to three other literatures
 - Poverty traps: We find that market frictions limit entry into higher-capital production, a common assumption in models of poverty traps (e.g. Ghatak 2025)
 - Occupational upgrading: We find that market frictions limit occupational upgrading, a common assumption in models of occupational stasis (e.g. Banerjee & Newman 1993)
 - Structural transformation: We document *an* example of structural transformation in response to capital infusions

[Back](#)

Sample Description

- Households typically do multiple economic activities:
 - 40% do casual/wage work outside the household, including 9% from migration
 - 95% grow crops, most often maize
 - 87% raise light livestock: mostly chickens and some goats, sheep
 - 42% raise heavy livestock: cattle
 - 44% run a non-farm enterprise, most often retail, light manufacturing, services, or fishing
- Partial hierarchy of economic activities:
 - Cattle & non-farm enterprises involve much more non-land capital
 - Households with cattle & enterprises have higher revenue, consumption
 - Maybe also profits, but they are very hard to measure
- *One* interpretation: market frictions prevent low-capital households from borrowing to fund higher-capital activities that generate more revenue and allow more consumption

[Detailed Comparison](#)

[Back](#)

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 - 42% raise heavy livestock: cattle
 - 44% run a non-farm enterprise, most often retail, light manufacturing, services, or fishing
- Partial [hierarchy of economic activities](#): [Detailed Comparison](#)
 - Cattle & non-farm enterprises involve much more non-land capital
 - Households with cattle & enterprises have higher revenue, consumption
 - Maybe also profits, but they are very hard to measure
- *One* interpretation: market frictions prevent low-capital households from borrowing to fund higher-capital activities that generate more revenue and allow more consumption

Summary Statistics

[Back](#)

	Mean (1)	Std. Dev. (2)	Percentiles					Observations (8)
			10 th (3)	25 th (4)	50 th (5)	75 th (6)	90 th (7)	
<i>Panel A. Demographics</i>								
Household Size	5.6	2.5	2.0	4.0	6.0	7.0	9.0	1,766
Number of Children	2.8	1.9	0.0	1.0	3.0	4.0	5.0	1,766
Number of Adults	2.8	1.5	1.0	2.0	2.0	4.0	5.0	1,766
Household Head Age	40.6	16.5	23.0	28.0	36.0	50.0	65.0	1,764
At Least Primary School Education	0.43	0.49						1,759
<i>Panel B. Household and Outside Economic Activities</i>								
Crop Agriculture	0.98	0.15						1,767
Livestock	0.89	0.32						1,767
Light Livestock	0.87	0.34						1,767
Cattle	0.42	0.49						1,767
Enterprise	0.44	0.50						1,767
Causal and Salaried	0.40	0.49						1,767
<i>Panel C. Economic Outcomes</i>								
Labour Supply	602	416	96	336	528	828	1,116	1,767
Revenue	2,101	3,204	165	451	1,175	2,423	4,708	1,767
Consumption	4,177	2,212	1,730	2,566	3,799	5,418	7,027	1,762
Non-land Assets	1,529	1,506	289	536	1,068	2,019	3,219	1,767
<i>Panel D. Economic Outcomes for Households without Cattle or Enterprises at Baseline</i>								
Labour Supply	524	402	60	276	432	744	1,008	774
Revenue	1,732	2,883	135	345	858	1,900	3,905	774
Consumption	3,797	2,119	1,554	2,323	3,334	4,896	6,586	772
Non-land Assets	1,065	1,080	217	412	727	1,370	2,290	774
<i>Panel E. Economic Outcomes for Households with Cattle or Enterprises at Baseline</i>								
Labour Supply	663	417	156	396	624	876	1,188	993
Revenue	2,388	3,408	229	598	1,467	2,875	5,408	993
Consumption	4,474	2,239	1,973	2,816	4,188	5,724	7,304	990
Non-land Assets	1,890	1,681	388	750	1,439	2,610	3,867	993

Regression Specification of Production-Side Tests

- Regress household labour use on household size/composition (Benjamin, 1992; LaFave & Thomas, 2016)

$$\ln(L_{ivt}^D) = N_{ivt} \beta + \gamma_i + \tau_{vt} + \delta_{t'} + X_{ivt} \mu + \epsilon_{ivt}$$

- N_{ist} measures household size, in total or by age \times sex groups:

$$N_{ist} = \ln(n_{ist})$$

$$N_{ist} = \sum_{k \in K^m} n_{ist}^{mk} + \sum_{k \in K^f} n_{ist}^{fk}$$

- Control for unobserved factors that might affect labour demand & household size/composition: household FEs γ_i , village \times wave FEs τ_{vt} , month-of-survey FEs $\delta_{t'}$, production inputs X_{ivt}
- Households behave as if markets are frictionless if $\beta = 0$

Results of Production-Side Tests for Control Villages

In control villages, reject separation for full sample

Eligible HHs	
	All (1)
Panel A. Total Household Size	
Log household size	0.382*** (0.128)
<i>p</i> -value	[0.003]
Households	1,499
Observations	2,998

Results of Production-Side Tests for Control Villages

In control villages, reject separation for full sample

Eligible HHs	
All (1)	
Panel A. Total Household Size	
Log household size	0.382*** (0.128)
<i>p</i> -value	[0.003]
Panel B. Household Size by Sex × Age Cells	
<i>F</i> -statistic	2.322***
<i>p</i> -value	[0.006]
Households	1,499
Observations	2,998

Results of Production-Side Tests for Control Villages

In control villages, reject separation for full sample, driven by households without cattle/enterprises.

	Eligible HHs	
	All (1)	No Cattle or Enterprise (2)
Panel A. Total Household Size		
Log household size	0.382*** (0.128)	0.601*** (0.218)
<i>p</i> -value	[0.003]	[0.006]
Panel B. Household Size by Sex × Age Cells		
<i>F</i> -statistic	2.322***	2.278***
<i>p</i> -value	[0.006]	[0.008]
Households	1,499	635
Observations	2,998	1,270

Results of Production-Side Tests for Control Villages

In control villages, reject separation for full sample, driven by households without cattle/enterprises.

Don't reject separation for households with these high-capital, 'upgraded' activities.

	Eligible HHs		
	All (1)	No Cattle or Enterprise (2)	Cattle or Enterprise (3)
Panel A. Total Household Size			
Log household size	0.382*** (0.128)	0.601*** (0.218)	0.157 (0.152)
<i>p</i> -value	[0.003]	[0.006]	[0.301]
Panel B. Household Size by Sex × Age Cells			
<i>F</i> -statistic	2.322***	2.278***	1.365
<i>p</i> -value	[0.006]	[0.008]	[0.177]
Households	1,499	635	854
Observations	2,998	1,270	1,708

Results of Production-Side Tests for Control Villages

In control villages, reject separation for full sample, driven by households without cattle/enterprises.
Don't reject separation for households with these high-capital, 'upgraded' activities.
or for ineligible, wealthier households.

	Eligible HHs			Ineligible HHs
	All (1)	No Cattle or Enterprise (2)	Cattle or Enterprise (3)	(4)
Panel A. Total Household Size				
Log household size	0.382*** (0.128)	0.601*** (0.218)	0.157 (0.152)	0.009 (0.166)
<i>p</i> -value	[0.003]	[0.006]	[0.301]	[0.955]
Panel B. Household Size by Sex × Age Cells				
<i>F</i> -statistic	2.322***	2.278***	1.365	1.091
<i>p</i> -value	[0.006]	[0.008]	[0.177]	[0.365]
Households	1,499	635	854	554
Observations	2,998	1,270	1,708	1,108

Results of Production-Side Tests for Cash Villages

Don't reject separation in cash villages

Eligible HHs	
	All (1)
Panel A. Control Villages	
<i>F</i> -statistic	2.322***
<i>p</i> -value	[0.006]
Households	1,499
Observations	2,998
Panel B. Cash Villages	
<i>F</i> -statistic	1.157
<i>p</i> -value	[0.309]
Households	1,549
Observations	3,098

Results of Production-Side Tests for Cash Villages

Don't reject separation in cash villages, including for non-upgraded households

	Eligible HHs	
	All (1)	No Cattle or Enterprise (2)
Panel A. Control Villages		
<i>F</i> -statistic	2.322***	2.278***
<i>p</i> -value	[0.006]	[0.008]
Households	1,499	635
Observations	2,998	1,270
Panel B. Cash Villages		
<i>F</i> -statistic	1.157	0.707
<i>p</i> -value	[0.309]	[0.745]
Households	1,549	584
Observations	3,098	1,168

Results of Production-Side Tests for Cash Villages

Don't reject separation in cash villages, including for non-upgraded households

Still don't reject separation for upgraded eligibles & ineligibles

	Eligible HHs			Ineligible HHs
	All (1)	No Cattle or Enterprise (2)	Cattle or Enterprise (3)	All (3)
Panel A. Control Villages				
<i>F</i> -statistic	2.322***	2.278***	1.365	1.091
<i>p</i> -value	[0.006]	[0.008]	[0.177]	[0.365]
Households	1,499	635	854	554
Observations	2,998	1,270	1,708	1,108
Panel B. Cash Villages				
<i>F</i> -statistic	1.157	0.707	1.534	0.696
<i>p</i> -value	[0.309]	[0.745]	[0.106]	[0.756]
Households	1,549	584	947	603
Observations	3,098	1,168	1,894	1,206

Results of Production-Side Tests for Cash Villages

Don't reject separation in cash villages, including for non-upgraded households

Still don't reject separation for upgraded eligibles & ineligibles

Not explained by treatment effects on household size or composition

	Eligible HHs			Ineligible HHs
	All (1)	No Cattle or Enterprise (2)	Cattle or Enterprise (3)	All (3)
Panel A. Control Villages				
<i>F</i> -statistic	2.322***	2.278***	1.365	1.091
<i>p</i> -value	[0.006]	[0.008]	[0.177]	[0.365]
Households	1,499	635	854	554
Observations	2,998	1,270	1,708	1,108
Panel B. Cash Villages				
<i>F</i> -statistic	1.157	0.707	1.534	0.696
<i>p</i> -value	[0.309]	[0.745]	[0.106]	[0.756]
Households	1,549	584	947	603
Observations	3,098	1,168	1,894	1,206

Intuition for Consumption-Side Tests

- Consider a pair of consumption goods $\{1, 2\}$ and production inputs $\{a, b\}$
- The price of an input p_a (that does not enter the utility function directly) should only affect consumption c_1 through its effect on profits π^* , and an income effect $\frac{\partial c_1}{\partial \pi^*}$:

$$\frac{\partial c_1}{\partial p_a} = \frac{\partial c_1}{\partial \pi^*} \frac{\partial \pi^*}{\partial p_a}$$

- The ratio of any pair of input price effects on a consumption good is independent of the consumption good itself, since the income effects cancel out:

$$\frac{\frac{\partial c_1}{\partial p_a}}{\frac{\partial c_a}{\partial p_b}} = \frac{\frac{\partial c_1}{\partial \pi^*} \frac{\partial \pi^*}{\partial p_a}}{\frac{\partial c_1}{\partial \pi^*} \frac{\partial \pi^*}{\partial p_b}} = \frac{\frac{\partial \pi^*}{\partial p_a}}{\frac{\partial \pi^*}{\partial p_b}}$$

- **Testable Implication:** The ratio of any pair of input price effects is the same for all goods:

$$\frac{\frac{\partial c_1}{\partial p_a}}{\frac{\partial c_1}{\partial p_b}} = \frac{\frac{\partial \pi^*}{\partial p_a}}{\frac{\partial \pi^*}{\partial p_b}} = \frac{\frac{\partial c_2}{\partial p_a}}{\frac{\partial c_2}{\partial p_b}}$$

Regression Specification of Consumption-Side Tests

- Regress consumption shares for each consumption good g on input prices using an extension of the Almost Ideal Demand System (LaFave et al., 2025)

$$c_{ivt}^g = \sum_x \ln(p_{vt}^x) \beta_x^g + \dots + \gamma_i + \gamma_t + \epsilon_{ivt}$$

- Control for household FEs γ_i , time FEs γ_t , wages, prices of consumption goods, an aggregate price index, linear splines of per-capita household expenditure, and other household characteristics
- Use a parsimonious 4×2 system:
 - 4 consumption subaggregates: cereals, meat/dairy, other food and non-food
 - 2 production inputs: chicken feed and fertiliser
- Implement non-linear Wald tests for each pair of consumption goods (g, g') and inputs (x, x') :

$$\beta_x^g \times \beta_{x'}^{g'} = \beta_x^{g'} \times \beta_{x'}^g$$

Results of Consumption-Side Tests for Control Villages

[Back](#)

H_0 : The Ratios of Input Price Effects Should be Equal Across Consumption Goods for Any Pairs (**Separation**)

		Eligible Households			Ineligibles
		All (1)	No Cattle or Enterprise (2)	Cattle or Enterprise (3)	All (4)
<i>Panel A. Parsimonious Specification Pairwise Ratio Tests for Control Villages</i>					
Good g	Good g'	p -value: $\beta_{\text{fertiliser}}^g \times \beta_{\text{feed}}^{g'} = \beta_{\text{fertiliser}}^{g'} \times \beta_{\text{feed}}^g$			
Cereals	Meat/Dairy	[0.021]	[0.007]	[0.350]	[0.522]
Cereals	Other Food	[0.023]	[0.069]	[0.247]	[0.586]
Cereals	Non-food	[0.212]	[0.507]	[0.489]	[0.781]
Meat/Dairy	Other Food	[0.111]	[0.045]	[0.305]	[0.838]
Meat/Dairy	Non-food	[0.988]	[0.683]	[0.395]	[0.842]
Other Food	Non-food	[0.346]	[0.845]	[0.864]	[0.883]
Households		1,739	764	975	671
Observations		3,478	1,528	1,950	1,342

Panel B. Parsimonious Specification Pairwise Ratio Tests for Cash Villages

Good g	Good g'	p -value: $\beta_{\text{fertiliser}}^g \times \beta_{\text{feed}}^{g'} = \beta_{\text{fertiliser}}^{g'} \times \beta_{\text{feed}}^g$			
Cereals	Meat/Dairy	[0.130]	[0.338]	[0.420]	[0.642]
Cereals	Other Food	[0.345]	[0.184]	[0.999]	[0.400]
Cereals	Non-food	[0.573]	[0.396]	[0.537]	[0.463]
Meat/Dairy	Other Food	[0.290]	[0.270]	[0.247]	[0.398]
Meat/Dairy	Non-food	[0.960]	[0.757]	[0.390]	[0.353]
Other Food	Non-food	[0.678]	[0.624]	[0.240]	[0.254]

Results of Consumption-Side Tests for Cash Villages

[Back](#)

H_0 : The Ratios of Input Price Effects Should be Equal Across Consumption Goods for Any Pairs (**Separation**)

	Eligible Households			Ineligibles
	All (1)	No Cattle or Enterprise (2)	Cattle or Enterprise (3)	All (4)
<i>Panel A. Parsimonious Specification</i>				
	<i>Summary of Pairwise Ratio Tests in Control Villages</i>			
p -value: joint test for all pairs	[0.104]	[0.053]	[0.686]	[0.938]
Rejections at 5%	2	2	0	0
Rejections at 10%	2	3	0	0
	<i>Summary of Pairwise Ratio Tests in Cash Villages</i>			
p -value: joint test for all pairs	[0.504]	[0.611]	[0.673]	[0.727]
Rejections at 5%	0	0	0	0
Rejections at 10%	0	0	0	0
Pairwise ratios	6	6	6	6
<i>Panel B. Saturated Specification</i>				
	<i>Summary of Pairwise Ratio Tests in Control Villages</i>			
p -value: joint test for all pairs	[0.041]	[0.391]	[0.549]	[0.988]
Rejections at 5%	14	2	1	0
Rejections at 10%	23	17	6	0
	<i>Summary of Pairwise Ratio Tests in Cash Villages</i>			
p -value: joint test for all pairs	[0.875]	[0.945]	[0.998]	[0.507]
Rejections at 5%	0	0	0	1
Rejections at 10%	3	1	0	4

Empirical Framework for Experimental Results

- Standard **intention-to-treat (ITT)** estimates on household economic outcomes

$$Y_{ivs} = \beta \text{Cash}_{vs} + Y_{ivs}^{\text{base}} \gamma + X_{ivs} \delta + \tau_s + \epsilon_{ivs} \quad (1)$$

- Condition on strata FEs τ_s and covariates prespecified in Orkin et al. (2025) X_{ivs}
- Standard errors clustered by village (unit of treatment assignment)

Empirical Framework for Experimental Results

- Standard **intention-to-treat (ITT)** estimates on household economic outcomes

$$Y_{ivs} = \beta \text{Cash}_{vs} + Y_{ivs}^{\text{base}} \gamma + X_{ivs} \delta + \tau_s + \epsilon_{ivs} \quad (1)$$

- Condition on strata FEs τ_s and covariates prespecified in Orkin et al. (2025) X_{ivs}
- Standard errors clustered by village (unit of treatment assignment)
- Production outcomes
 - Choice of economic activities at the extensive margin
 - Activity-specific inputs: capital assets, labour, intermediate inputs, technology use
 - Activity-specific revenue

Empirical Framework for Experimental Results

- Standard **intention-to-treat (ITT)** estimates on household economic outcomes

$$Y_{ivs} = \beta \text{Cash}_{vs} + Y_{ivs}^{\text{base}} \gamma + X_{ivs} \delta + \tau_s + \epsilon_{ivs} \quad (1)$$

- Condition on strata FEs τ_s and covariates prespecified in Orkin et al. (2025) X_{ivs}
- Standard errors clustered by village (unit of treatment assignment)
- Production outcomes
 - Choice of economic activities at the extensive margin
 - Activity-specific inputs: capital assets, labour, intermediate inputs, technology use
 - Activity-specific revenue
- Consumption outcomes

Empirical Framework for Experimental Results

- Standard **intention-to-treat (ITT)** estimates on household economic outcomes

$$Y_{ivs} = \beta \text{Cash}_{vs} + Y_{ivs}^{\text{base}} \gamma + X_{ivs} \delta + \tau_s + \epsilon_{ivs} \quad (1)$$

- Condition on strata FEs τ_s and covariates prespecified in Orkin et al. (2025) X_{ivs}
- Standard errors clustered by village (unit of treatment assignment)
- Production outcomes
 - Choice of economic activities at the extensive margin
 - Activity-specific inputs: capital assets, labour, intermediate inputs, technology use
 - Activity-specific revenue
- Consumption outcomes
- Labour supply outcomes
 - In a frictionless setting, this is a *consumption* decision: labour supply \equiv inverse of leisure
 - With frictional markets and a failure of separation, labour supply is a *mix* of both production and consumption decisions

Impacts on Household Participation in Different Economic Activities

At the extensive margin:

- No effects on crop agriculture

	Crops	Livestock			Enterprise	Any
		Light	Heavy	All		
Cash	0.001 (0.005)					
Control mean	0.981					
Observations	3,581					

Impacts on Household Participation in Different Economic Activities

At the extensive margin:

- No effects on crop agriculture
- Households expand into livestock, mainly **heavy livestock** rather than light livestock

	Crops	Livestock			Enterprise	Any
		Light	Heavy	All		
Cash	0.001 (0.005)	0.019* (0.010)	0.110*** (0.016)	0.039*** (0.009)		
Control mean	0.981	0.870	0.424	0.887		
Observations	3,581	3,581	3,581	3,581		

Impacts on Household Participation in Different Economic Activities

At the extensive margin:

- No effects on crop agriculture
- Households expand into livestock, mainly **heavy livestock** rather than light livestock
- Households start new **non-farm enterprises (NFEs)**

	Crops	Livestock			Enterprise	Any
		Light	Heavy	All		
Cash	0.001 (0.005)	0.019* (0.010)	0.110*** (0.016)	0.039*** (0.009)	0.060*** (0.017)	0.001 (0.002)
Control mean	0.981	0.870	0.424	0.887	0.442	0.995
Observations	3,581	3,581	3,581	3,581	3,581	3,581

Impacts on Household Participation in Different Economic Activities

At the extensive margin:

- No effects on crop agriculture
- Households expand into livestock, mainly **heavy livestock** rather than light livestock
- Households start new **non-farm enterprises (NFEs)**
- Households are *diversifying* their production activities, not switching

Diversification 1 & 2

	Crops	Livestock			Enterprise	Any
		Light	Heavy	All		
Cash	0.001 (0.005)	0.019* (0.010)	0.110*** (0.016)	0.039*** (0.009)	0.060*** (0.017)	0.001 (0.002)
Control mean	0.981	0.870	0.424	0.887	0.442	0.995
Observations	3,581	3,581	3,581	3,581	3,581	3,581

[Back](#)

Impacts on Capital and Labour Use

- In crop agriculture, households accumulate no productive capital nor use more labour

	Crops	Livestock			Enterprise	Aggregate
		Light	Heavy	All		
<i>Value of Capital Assets (USD PPP)</i>						
Cash	11.3 (9.5)					
Control mean	106.3					
Observations	3,581					
<i>Days of Labour Use</i>						
Cash	1.4 (4.7)					
Control mean	116.2					
Observations	3,581					

Impacts on Capital and Labour Use

- In crop agriculture, households accumulate no productive capital nor use more labour
- In **livestock**, households increase their capital assets and labour use
 - Livestock capital assets are mostly accumulated for **heavy livestock**

	Crops	Livestock			Enterprise	Aggregate
		Light	Heavy	All		
<i>Value of Capital Assets (USD PPP)</i>						
Cash	11.3 (9.5)	28.7*** (6.3)	125.0*** (26.1)	153.8*** (29.5)		
Control mean	106.3	143.5	432.6	576.1		
Observations	3,581	3,581	3,581	3,581		
<i>Days of Labour Use</i>						
Cash	1.4 (4.7)			29.4*** (10.3)		
Control mean	116.2			319.7		
Observations	3,581			3,581		

Impacts on Capital and Labour Use

- In crop agriculture, households accumulate no productive capital nor use more labour
- In **livestock**, households increase their capital assets and labour use
 - Livestock capital assets are mostly accumulated for **heavy livestock**
- In **NFEs**, households increase their capital assets and labour use

	Crops	Livestock			Enterprise	Aggregate
		Light	Heavy	All		
<i>Value of Capital Assets (USD PPP)</i>						
Cash	11.3 (9.5)	28.7*** (6.3)	125.0*** (26.1)	153.8*** (29.5)	80.5*** (26.2)	243.7*** (42.2)
Control mean	106.3	143.5	432.6	576.1	165.0	840.9
Observations	3,581	3,581	3,581	3,581	3,461	3,581
<i>Days of Labour Use</i>						
Cash	1.4 (4.7)			29.4*** (10.3)	21.0*** (7.1)	52.0*** (13.8)
Control mean	116.2			319.7	115.6	551.4
Observations	3,581			3,581	3,581	3,581

Impacts on Other Inputs

- Intermediate Input Expenditures

Input Expenditures Results

- Same pattern as before: no effect for crops, increases in livestock and NFEs

- Technology and Modernisation Efforts

Technology Results

- Same pattern as before: no effect for crops, increases in livestock and NFEs

Impacts on Other Inputs

- Intermediate Input Expenditures

Input Expenditures Results

- Same pattern as before: no effect for crops, increases in livestock and NFEs

- Technology and Modernisation Efforts

Technology Results

- Same pattern as before: no effect for crops, increases in livestock and NFEs

- Land

Land Results

- Modest positive effect on land ownership, mostly not cultivated

- Transfers and Finances

Transfers and Finances Results

- Marginally higher savings, no effects on lending or borrowing
- No effects on inter-household transfers made or received

Back

Impacts on Revenues

- Crop revenues are unchanged

	Crops		Livestock		Enterprise	Aggregate
	Home	Market	Home	Market	Market	
Cash	26.9 (17.7)	3.1 (4.5)				
Control mean	226.6	40.1				
Observations	3,581	3,581				

Impacts on Revenues

- Crop revenues are unchanged
- Households earn higher **livestock** revenues from market sales; no effect on home consumption

	Crops		Livestock		Enterprise	Aggregate
	Home	Market	Home	Market	Market	
Cash	26.9 (17.7)	3.1 (4.5)	-1.4 (39.4)	40.2*** (13.0)		
Control mean	226.6	40.1	343.5	114.5		
Observations	3,581	3,581	3,581	3,581		

Impacts on Revenues

- Crop revenues are unchanged
- Households earn higher **livestock** revenues from market sales; no effect on home consumption
- Households earn higher **NFE** revenues, which are market-oriented

	Crops		Livestock		Enterprise	Aggregate
	Home	Market	Home	Market	Market	
Cash	26.9 (17.7)	3.1 (4.5)	-1.4 (39.4)	40.2*** (13.0)	413.5*** (128.6)	502.1*** (138.2)
Control mean	226.6	40.1	343.5	114.5	829.9	1,531.7
Observations	3,581	3,581	3,581	3,581	3,505	3,581

Impacts on Revenues

- Crop revenues are unchanged
- Households earn higher **livestock** revenues from market sales; no effect on home consumption
- Households earn higher **NFE** revenues, which are market-oriented

	Crops		Livestock		Enterprise	Aggregate
	Home	Market	Home	Market	Market	
Cash	26.9 (17.7)	3.1 (4.5)	-1.4 (39.4)	40.2*** (13.0)	413.5*** (128.6)	502.1*** (138.2)
Control mean	226.6	40.1	343.5	114.5	829.9	1,531.7
Observations	3,581	3,581	3,581	3,581	3,505	3,581

- Households move towards market-oriented production from subsistence farming
- Evidence of increased market linkages and potentially **structural transformation**

Impacts on Labour Supply

Impacts on Labour Supply

- Higher labour supply to **livestock** and **NFE** household activities, but no change in crops

[Back](#)

	Household Activities				Outside	Aggregate
	Crops	Livestock	Enterprise	All Household		
Cash	0.3 (4.6)	24.2** (10.5)	18.3*** (6.4)	43.1*** (13.9)		
Control mean	110.8	302.0	109.1	522.0		
Observations	3,581	3,581	3,581	3,581		

Impacts on Labour Supply

- Higher labour supply to **livestock** and **NFE** household activities, but no change in crops [Back](#)
- Reduction in labour supply to **outside activities**, including migration, as labour is redirected to household activities
- Increase in **total labour supply**: households are *not* buying leisure with the cash transfer
 - Inconsistent with frictionless markets

	Household Activities				Outside	Aggregate
	Crops	Livestock	Enterprise	All Household		
Cash	0.3 (4.6)	24.2** (10.5)	18.3*** (6.4)	43.1*** (13.9)	-13.5*** (4.7)	29.6** (14.6)
Control mean	110.8	302.0	109.1	522.0	80.2	602.2
Observations	3,581	3,581	3,581	3,581	3,581	3,581

Heterogenous Impacts on Labour Supply

- Higher aggregate labour supply is driven:
 - mainly by baseline non-upgraded households
 - less by baseline upgraded households

	Household Activities					
	Crops	Livestock	Enterprise	All Household	Outside	Aggregate
Cash	1.0 (5.1)	33.9** (14.2)	21.3** (8.4)	56.7*** (17.0)	-12.9 (8.1)	43.9** (19.2)
Cash + Cash \times Upgraded	-0.2 (5.7)	16.0 (13.1)	15.2* (8.0)	31.0* (17.7)	-13.7** (6.0)	17.2 (18.8)
<i>p</i> -value: Cash \times Upgraded = 0	[0.835]	[0.310]	[0.557]	[0.234]	[0.941]	[0.281]
Control mean	110.8	302.0	109.1	522.0	80.2	602.2
Observations	3,581	3,581	3,581	3,581	3,581	3,581

Heterogenous Impacts on Labour Supply

- Higher aggregate labour supply is driven:
 - mainly by baseline non-upgraded households
 - less by baseline upgraded households
- Consistent with the tests for market frictions
 - Reject separation for low-capital households, but not for high-capital households

	Household Activities					
	Crops	Livestock	Enterprise	All Household	Outside	Aggregate
Cash	1.0 (5.1)	33.9** (14.2)	21.3** (8.4)	56.7*** (17.0)	-12.9 (8.1)	43.9** (19.2)
Cash + Cash × Upgraded	-0.2 (5.7)	16.0 (13.1)	15.2* (8.0)	31.0* (17.7)	-13.7** (6.0)	17.2 (18.8)
p -value: Cash × Upgraded = 0	[0.835]	[0.310]	[0.557]	[0.234]	[0.941]	[0.281]
Control mean	110.8	302.0	109.1	522.0	80.2	602.2
Observations	3,581	3,581	3,581	3,581	3,581	3,581

Impacts on Dual Household Economic Activities

	Crops			Light-Livestock		Heavy-Livestock
	Light Livestock	Heavy Livestock	Enterprise	Heavy Livestock	Enterprise	Enterprise
<i>Panel A. Household Involved in Both Activities</i>						
Cash	0.023** (0.011)	0.112*** (0.017)	0.053*** (0.017)	0.089*** (0.016)	0.053*** (0.017)	0.086*** (0.014)
Control mean	0.854	0.419	0.439	0.406	0.403	0.195
Observations	3,581	3,581	3,581	3,581	3,581	3,581
<i>Panel B. Household Involved in At Least One of the Two Activities</i>						
Cash	-0.002 (0.003)	0.003 (0.004)	0.008* (0.004)	0.039*** (0.009)	0.027*** (0.009)	0.085*** (0.016)
Control mean	0.994	0.984	0.982	0.887	0.909	0.671
Observations	3,581	3,581	3,581	3,581	3,581	3,581

Impacts on Multiple Household Economic Activities

	Crops Light Livestock Heavy Livestock -	Crops Light Livestock - Enterprise	Crops - Heavy Livestock Enterprise	- Light Livestock Heavy Livestock Enterprise	Crops Light Livestock Heavy Livestock Enterprise
<i>Panel A. Household Involved in All Activities</i>					
Cash	0.094*** (0.017)	0.047*** (0.017)	0.083*** (0.014)	0.077*** (0.014)	0.075*** (0.014)
Control mean	0.401	0.400	0.195	0.189	0.188
Observations	3,581	3,581	3,581	3,581	3,581
<i>Panel B. Household Involved in At Least One of the Activities</i>					
Cash	0.001 (0.002)	0.000 (0.002)	0.007* (0.003)	0.036*** (0.008)	0.001 (0.002)
Control mean	0.994	0.995	0.986	0.920	0.995
Observations	3,581	3,581	3,581	3,581	3,581

Impacts on Transfers and Finances

- Small positive effects on savings
- No effects on inter-household transfers
- No effects on lending or borrowing

		Transfers		Loans	
	Savings (1)	Received (2)	Given (3)	Received (4)	Given (5)
Cash	25.3*** (9.7)	-20.1 (17.7)	-4.1 (8.7)	-5.9 (12.8)	5.1 (4.2)
Control mean	122.3	232.8	120.1	133.3	28.9
Observations	3,580	3,539	3,553	3,581	3,581

Impacts on Land

- Positive effects on both compound and other land ownership and acreage

	Land Ownership			Acreage Owned			Cultivated Land	
	All (1)	Compound (2)	Other (3)	All (4)	Compound (5)	Other (6)	Any (7)	Acres (8)
Cash	0.036*** (0.010)	0.049*** (0.014)	0.035** (0.016)	0.279*** (0.064)	0.134*** (0.049)	0.143*** (0.039)	-0.001 (0.010)	0.110** (0.055)
Control mean	0.876	0.800	0.297	1.459	1.055	0.402	0.942	1.285
Observations	3,581	3,581	3,581	3,547	3,549	3,577	3,576	3,576

- Small increase in **cultivated land** relative to land purchased
 - Only *some* new land is being purchased for agriculture
- Livestock generally doesn't have dedicated land
 - They overnight in the compound (even cows) and graze in communal land
- NFEs generally don't have separate premises
 - Retail NFEs are run in a rented space near the village centre
 - Other types of NFEs (e.g. welding, producing baskets) are run out of the compound

Impacts on Technology and Input Expenditures

- Households do not adopt any new technologies in agriculture, but do for **livestock** rearing
- Households expand their **NFEs** into new products and markets
- Households increase their input expenditures for **livestock** and **NFEs**

	Crops	Livestock	Enterprise	Aggregate
<i>Technology Adoption</i>				
Cash	0.10 (0.07)	0.17*** (0.04)	0.11*** (0.04)	0.40*** (0.12)
Control mean	2.11	0.79	0.35	3.57
Observations	3,580	3,580	3,581	3,581
<i>Intermediate Input Expenditures</i>				
Cash	10.5*** (3.7)	9.4*** (2.4)	294.2*** (81.8)	302.8*** (79.9)
Control mean	63.0	25.9	478.4	554.4
Observations	3,581	3,555	3,499	3,581

Technology Adoption and Modernisation Definitions

- **Technology adoption in crop agriculture:** (a) saved water for irrigation or used a pump; (b) improved soil e.g. using compost, fertiliser, lime, or ash; (c) used insecticide, fungicide, herbicide, or pesticide; (d) used improved or high yield seeds or seedlings; (e) terraced land or install a fence; (f) tried out a new crop; (g) used lime or ash for the soil, or had the soil tested; (h) engaged in intercropping, row planting, or crop rotation; (i) used a new crop storage solution or greenhouse; (j) used new machine or new farming tool.
- **Technology adoption in livestock related activities:** (a) vaccinated livestock, used a vet, purchased livestock medicine, or inseminated livestock; (b) sprayed or dipped livestock; (c) built or used a livestock enclosure; (d) tried out any new animal not previously tended to.
- **Enterprise expansion activities:** (a) introduced new or significantly improved products or services; (b) went into a new market or accessed new customers. Note this value may be more than two if there are multiple enterprises in a household.

Impacts on Consumption

	Consumption Subcomponents					
	Aggregate	Food	Non-Food Non-Durable	Durable	Social	Education
Cash	305.1*** (88.7)	101.2* (54.8)	80.2*** (10.6)	58.2** (27.4)	28.1*** (9.3)	25.5 (19.9)
Control mean	4,177.0	2,727.3	140.8	823.6	109.9	383.8
Observations	3,573	3,566	3,568	3,573	3,573	3,573

[Back](#)

Impacts on Mixed Income from Household Economic Activities

	Crops (1)	Livestock (2)	Enterprise (3)	Aggregate (4)
Cash	8.0 (19.1)	19.9 (43.8)	168.5** (69.1)	197.5** (80.5)
Control mean	172.4	363.7	319.9	841.9
Control std. dev.	590.7	1,263.2	1,468.1	2,072.6
Observations	3,573	3,555	3,474	3,581

[Back](#)

Impacts on Wages

	Wages							
	Non-farm Components							
	Crops (1)	Livestock (2)	Non-farm (3)	Forestry (4)	Fishing (5)	Mining (6)	Construction (7)	Casual (8)
Cash	0.44* (0.24)	-0.17 (0.38)	0.32 (0.32)	0.91* (0.46)	-0.37 (0.41)	1.17 (1.18)	0.12 (0.23)	-0.03 (0.33)
Control mean	6.14	3.59	10.42	6.25	11.28	19.85	9.64	5.08
Observations	3,581	3,581	3,581	3,581	3,581	3,581	3,581	3,581

[Back](#)

Impacts on Labour Demand and Supply for Ineligible Households

	Household Activities					
	Crops	Livestock	Enterprise	All Household	Outside	Aggregate
<i>Panel A. Labour Demand</i>						
Cash	0.7 (6.8)	-13.9 (22.9)	8.1 (9.0)	-8.3 (31.0)	-1.3 (5.5)	
Control mean	103.0	345.9	122.1	606.1	50.3	
Observations	1,394	1,394	1,394	1,394	1,394	
<i>Panel B. Labour Supply</i>						
Cash	2.0 (6.4)	-13.9 (22.9)	4.6 (8.2)	-7.6 (29.7)	-1.6 (7.6)	-8.9 (32.2)
Control mean	94.2	345.9	115.8	555.8	73.9	629.7
Observations	1,394	1,394	1,394	1,394	1,394	1,394

[Back](#)

Cash Transfers and Intrahousehold Bargaining

- Transfers are labelled as “for the household” but 80% of HHs receive their payments via women, which might shift intrahousehold bargaining.
- Mahmud, Orkin and Riley (2025) find no effects of cash on typical survey measures of bargaining power (same sample and intervention):
 - Who owns assets
 - Consumption shares for women’s clothes, items typically seen as women’s goods
 - “Soft” measures of bargaining power: women’s say in a range of decisions affecting the household

Cash Transfers and Psychological Factors

- Literature shows cash can affect psychology: ↓ financial stress, ↑ motivation (Banerjee et al. 2020, Kaur et al. 2025)
- We find evidence consistent with this: Improvements in mental health and aspirations for income/wealth.
- We find no change in preferences, self-efficacy, or locus of control
- Mental health and aspirations can't *explain activity shifts*
 - Little heterogeneity in psychological effects. So psych channels can't explain why only some households upgrade
 - Studies which vary these channels don't find strong evidence of activity shifts
 - Studies of **mental health treatments** don't find effects on investment or activity shifts (Lund et al. 2024)
 - Another arm **varying aspirations** via role model videos finds activity shifts, but not as large as for cash. Suggests psych alone is insufficient – households receiving this treatment still face constraints
 - Psych households don't purchase much livestock or increase investments
 - Psych households increase inputs, revenue, labor supply in NFEs – but effects are ~50% of cash. They also don't form new enterprises, vs 4.8 pp increase in new enterprises for cash

Additional Results on Capital Assets

- Capital distributions are **bimodal** at baseline for control and treated households
 - Baseline non-upgraded households are at the low mode
 - Baseline already-upgraded households are at the high mode
 - Gap between low and high mode is approximately 1,000 USD PPP (45% of cash transfer)
- Treatment induces a **shift** from the low mode to the high mode at endline
- Treated households have similar endline distributions to ineligible households

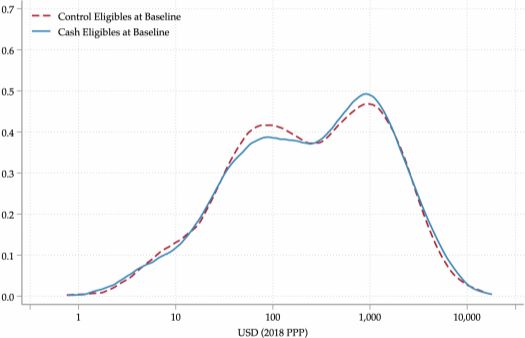
[Capital Distributions of Eligible Households](#)

[Capital Distributions of Ineligible Households](#)

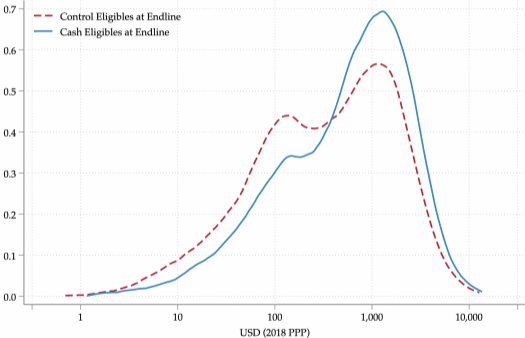
[Back](#)

Capital Distributions of Eligible Households

A. Baseline

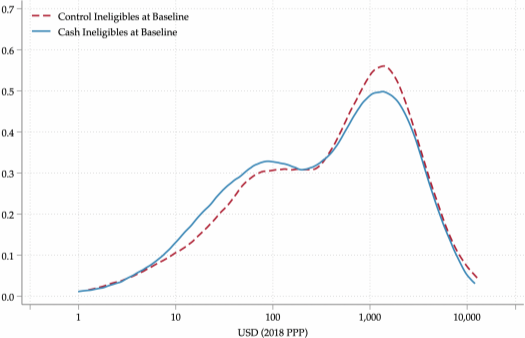


B. Endline



Capital Distributions of Ineligible Households

A. Baseline



B. Endline

