The Economic Impact of Depression Treatment in India

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This Study

Motivation

- Depression is correlated with poverty and may contribute to poverty traps.
- Policy challenge: both supply and demand are constrained.
- What is the role for pharmacotherapy?

Impact Evaluation

- Community-based cluster-randomized trial near Bangalore, India.
- Community screening to recruit 1000 adults with mild/moderate symptoms.
- Cross-randomize pharmacotherapy (PC) and livelihoods assistance (LA).
- Assess impacts on depression, socioeconomic outcomes, potential pathways.
- Follow pre-specified analysis plan.

Interventions

Psychiatric Care (PC)

- Collaborate with a local social service organization (GASS).
- Eight months of free psychiatric care through Shridevi Research Hospital.
- Most patients received SSRIs.

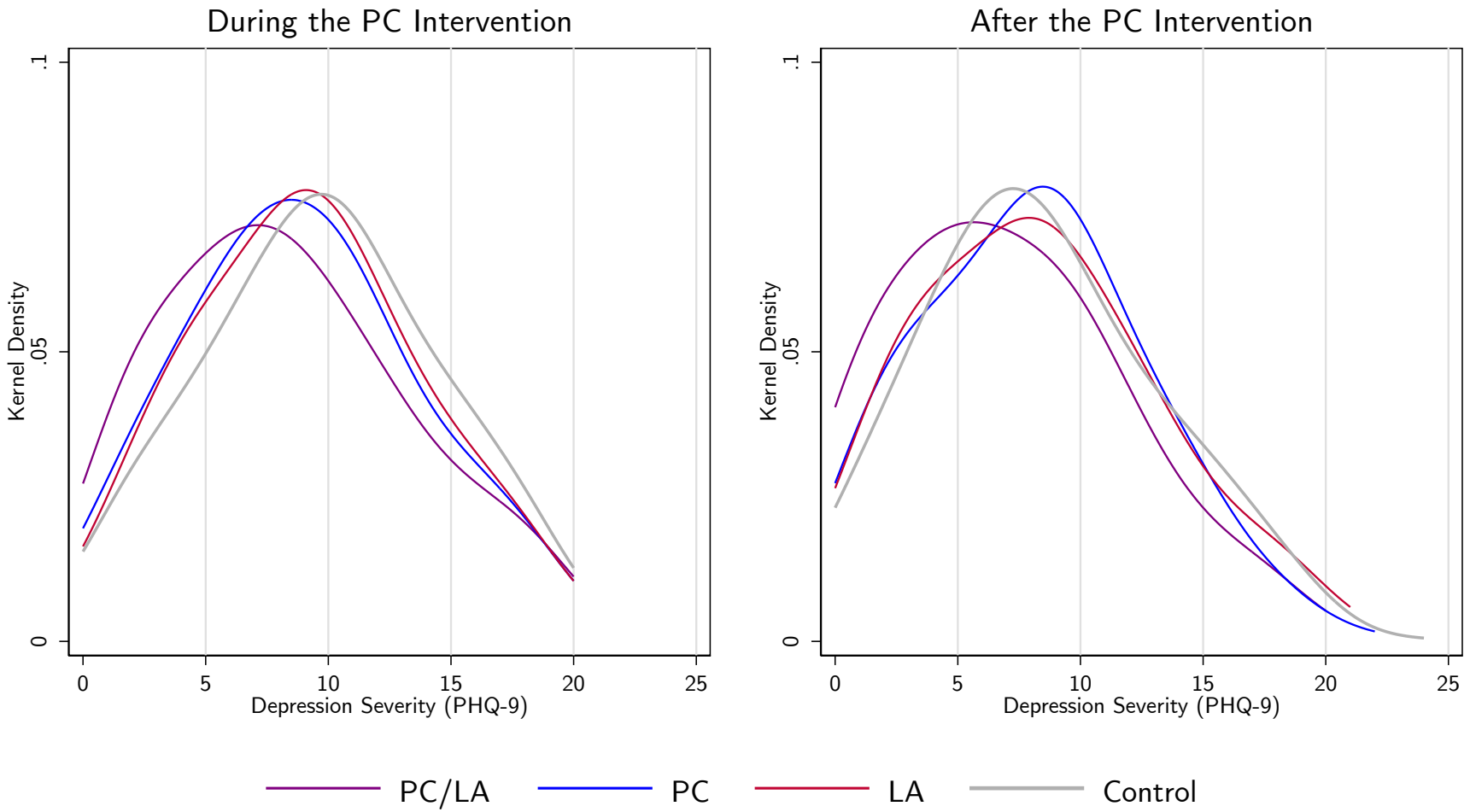
Livelihoods Assistance (LA)

- Two group meetings: how to earn income, deal with on-the-job challenges.
- Personalized assistance to identify and pursue income-generating activities.
- Job placements, small loans, training, according to the participant's needs.

Key Outcomes

- Depression severity: Standardized PHQ-9 score, PHQ-9 < 5 and PHQ-9 < 10 indicators.
- Work time: Time spent on employment, domestic work, and child care in 24-hour time diaries.
- Earnings: Weekly earnings from primary and secondary jobs.
- Child human capital investment: enrollment, attendance days, homework hours, paid work hours. Measured in Rounds 1-4 for children aged 5-18.
- Risk intolerance: DOSPERT Scale (Blais & Weber 2006); generalized risk self-assessment; incentivized lottery game (Eckel & Grossman 2008).

Impact on Depression Symptoms



Impact on Work Time and Earnings

Table 3: Impact on Weekly Work Time and Earnings

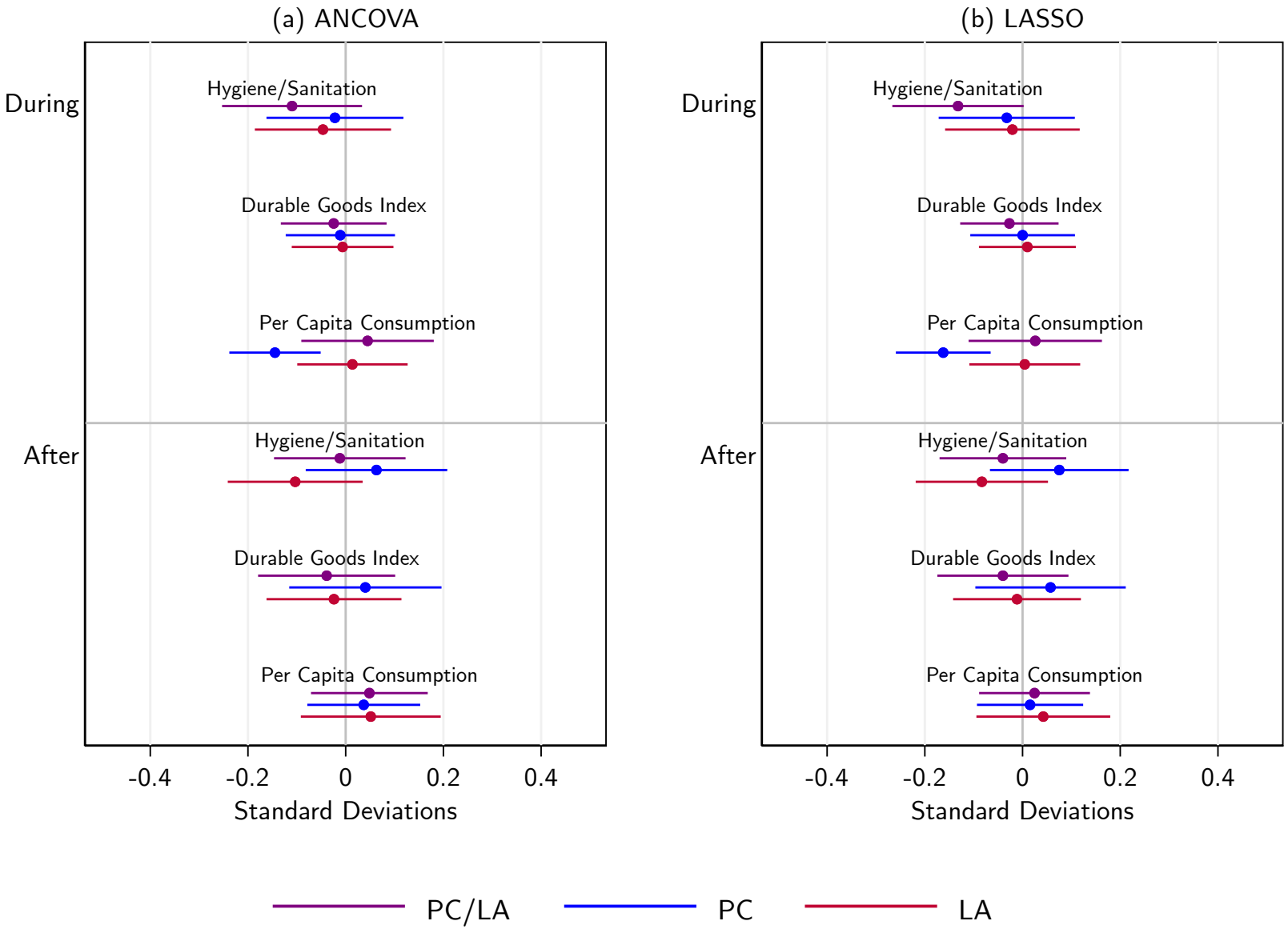
	Hours		Earnings	
	(1)	(2)	(3)	(4)
A: During the PC Intervention				
PC/LA	1.07	1.48	37.9	22.4
	(1.66)	(1.60)	(61.3)	(57.7)
PC	-5.40***	-4.92***	-65.4	-82.9
	(1.70)	(1.64)	(54.2)	(53.1)
LA	-1.02	-0.50	-32.8	-38.0
	(1.68)	(1.61)	(61.8)	(58.1)
Control mean of outcome	58.7	58.7	577.1	577.1
B: After the PC Intervention				
PC/LA	-3.31*	-2.84	38.7	20.8
	(1.77)	(1.74)	(67.3)	(65.9)
PC	-1.18	-0.84	-52.8	-63.6
	(1.98)	(1.89)	(61.0)	(57.5)
LA	-1.52	-1.04	47.9	45.1
	(1.95)	(1.93)	(62.2)	(60.0)
Control mean of outcome	60.4	60.4	639.2	639.2
Specification	ANCOVA	LASSO	ANCOVA	LASSO
Observations	3476	3476	3476	3476

Impact on Child Human Capital Investment

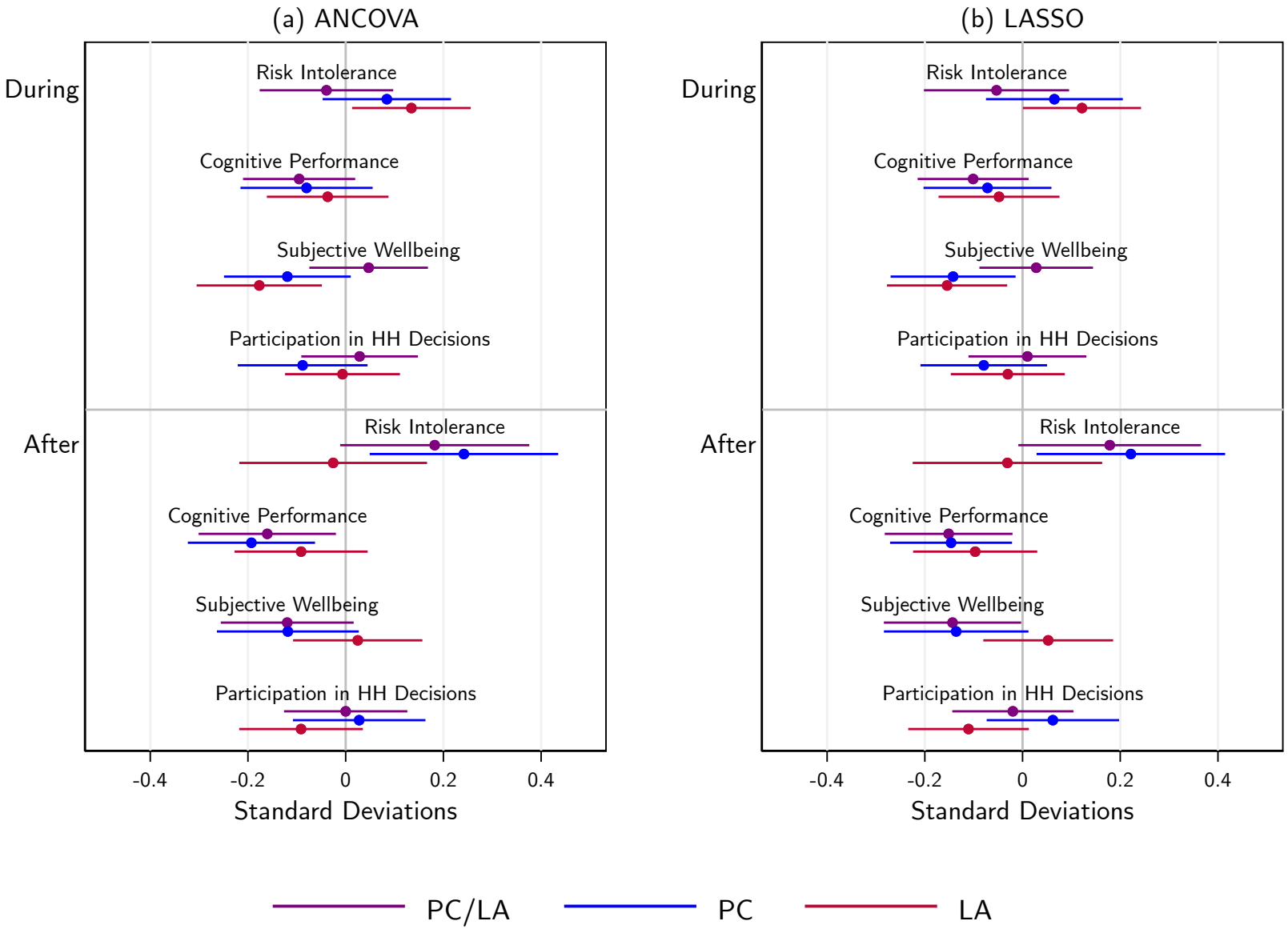
Table 4: Impact on Child Human Capital Investment

	Child Human Capital Investment Index					
	Full Sample		Child Age < 12		Child Age ≥ 12	
	(1)	(2)	(3)	(4)	(5)	(6)
B: After the PC Intervention						
PC/LA	0.12	0.12	-0.087	-0.076	0.42*	0.32
	(0.13)	(0.13)	(0.13)	(0.13)	(0.25)	(0.28)
PC	0.19*	0.22**	-0.013	-0.0018	0.46***	0.46***
	(0.10)	(0.11)	(0.11)	(0.11)	(0.17)	(0.17)
LA	0.11	0.11	-0.026	-0.017	0.34*	0.31
	(0.12)	(0.12)	(0.12)	(0.12)	(0.20)	(0.21)
H_0: $PC/LA = PC$	0.60	0.45	0.97	0.99	0.85	0.68
H_0: $PC/LA = PC = LA$	0.75	0.53	0.94	0.96	0.81	0.56
Control mean of outcome	0.03	0.03	0.25	0.25	-0.25	-0.25
Specification	ANCOVA	LASSO	ANCOVA	LASSO	ANCOVA	LASSO
Observations	2229	2229	1242	1242	987	987

Impacts on Socioeconomic Outcomes



Impacts on Potential Pathways



Discussion

Interpretation of Pathways

- No evidence of a productivity pathway in this sample.
- A preference pathway may explain the joint effects on human capital investment and risk intolerance.

Policy

- It is feasible to provide pharmacotherapy with local resources.
- LA strengthens the impact of PC on depression and protects against some transitory effects of PC.
- Adding LA ($9 per participant) is cost effective.

Depression and the Demand for a Novel Health Product: Evidence from India

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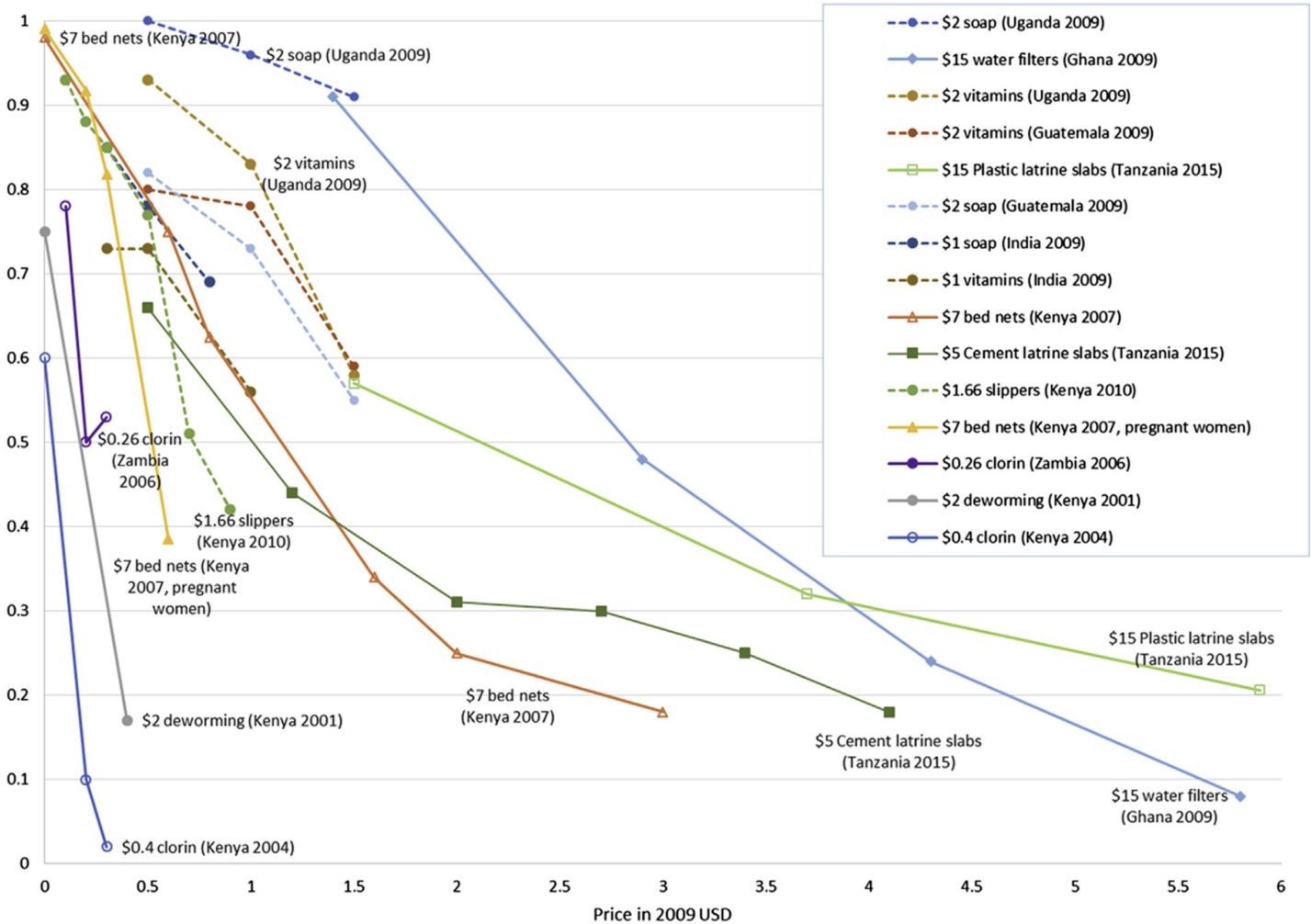
Introduction

Two Puzzles

- Many poor people have low demand and high elasticity of demand for health products (bed nets, water purifiers, clean cook stoves).
- There is a low correlation between product use and willingness to pay.
- Implication: it is difficult for interventions to achieve sustainability.
- Many possible explanations: liquidity constraints, information, behavioral biases.

The Demand for Health Products



Dupas and Miguel (2017): *Handbook of the Economics of Field Experiments*

The Role of Depression?

Depression May Limit the Demand for Novel Health Products

- Depression may shift in the budget constraint by reducing productivity.
- Depression may interfere with learning about a novel product.
- Depression may create barriers to action.
  - Anhedonia may reduce the utility from adopting a new technology.
  - Pessimism may reduce the *perceived* utility of adoption.
  - Indecisiveness may make it more difficult to decide whether to adopt.

Research Questions

1. Does depression affect the demand for a novel health product?
2. If so, which pathways may be important?

The Product

- Hand sanitizer is a novel health health product.
- Particularly useful for people with limited access to soap and running water.
- Available in local pharmacies but not commonly used.
- 80 rupees ($1.17), $<$1% of monthly household budget

Trial Design

Step 1: Community-based Depression Treatment (DT)

Step 2: Free Provision of Hand Sanitizer (FP) (six months after Step 1)

- 80% of participants received 600ml of sanitizer for free.
- Cross-randomized individually with DT.

Step 3: Measure Sanitizer Use (six months after Step 2)

Step 4: Elicit Willingness to Pay for Sanitizer (six months after Step 3)

Measurement

Willingness to Pay

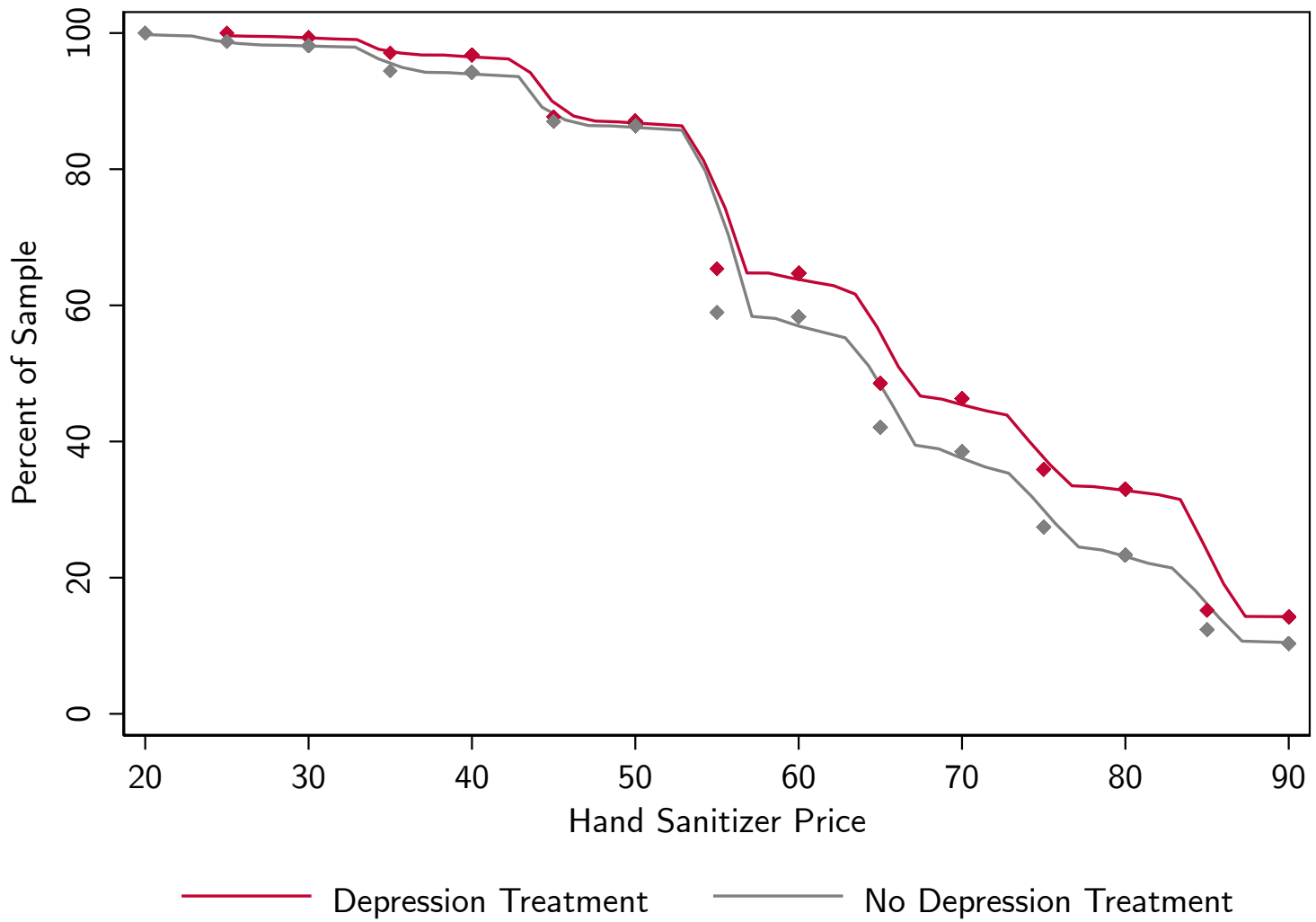
- BDM incentive-compatible WTP elicitation: the participant states and "offer price" and the surveyor randomly selects a "draw price". If the offer price exceeds the draw price, the participant buys the good for the draw price.
- BDM occurs after most FP participants have depleted the free sanitizer.

Product Use

- Participants self-report whether they use sanitizer at least daily.
- Validation: observe the quantity remaining for FP participants.
- We observe use while most FP participants still have some sanitizer left.

DT Increases Sanitizer Demand

Impact of Free Provision on Demand



DT has different effects on WTP and use

Table 3: Empirical Tests of Potential Pathways

$$Y_{ij}^p = \eta^p + \delta^p DT_j + \theta^p FP_{ij} + \lambda^p (DT_j \times FP_{ij}) + X_j' \psi^p + \varepsilon_{ij}^p$$

	Individual Earnings	Daily Use	Familiar with Product	WTP
	(1)	(2)	(3)	(4)
δ^p	-41.7	0.092	0.021	5.07*
	(92.5)	(0.091)	(0.061)	(2.65)
θ^p	54.3	0.40***	0.81***	1.74
	(68.4)	(0.069)	(0.041)	(2.04)
λ^p	-24.0	-0.16	-0.013	-2.50
	(104.9)	(0.10)	(0.066)	(3.00)
$\delta^p + \lambda^p$	-65.7	-0.07	0.008	2.57*
P-Value:	[0.18]	[0.14]	[0.75]	[0.07]
Months since free provision	12	6	12	12
Control mean	316	0.15	0.09	60.6
Observations	794	794	794	794

Pathways

Summary

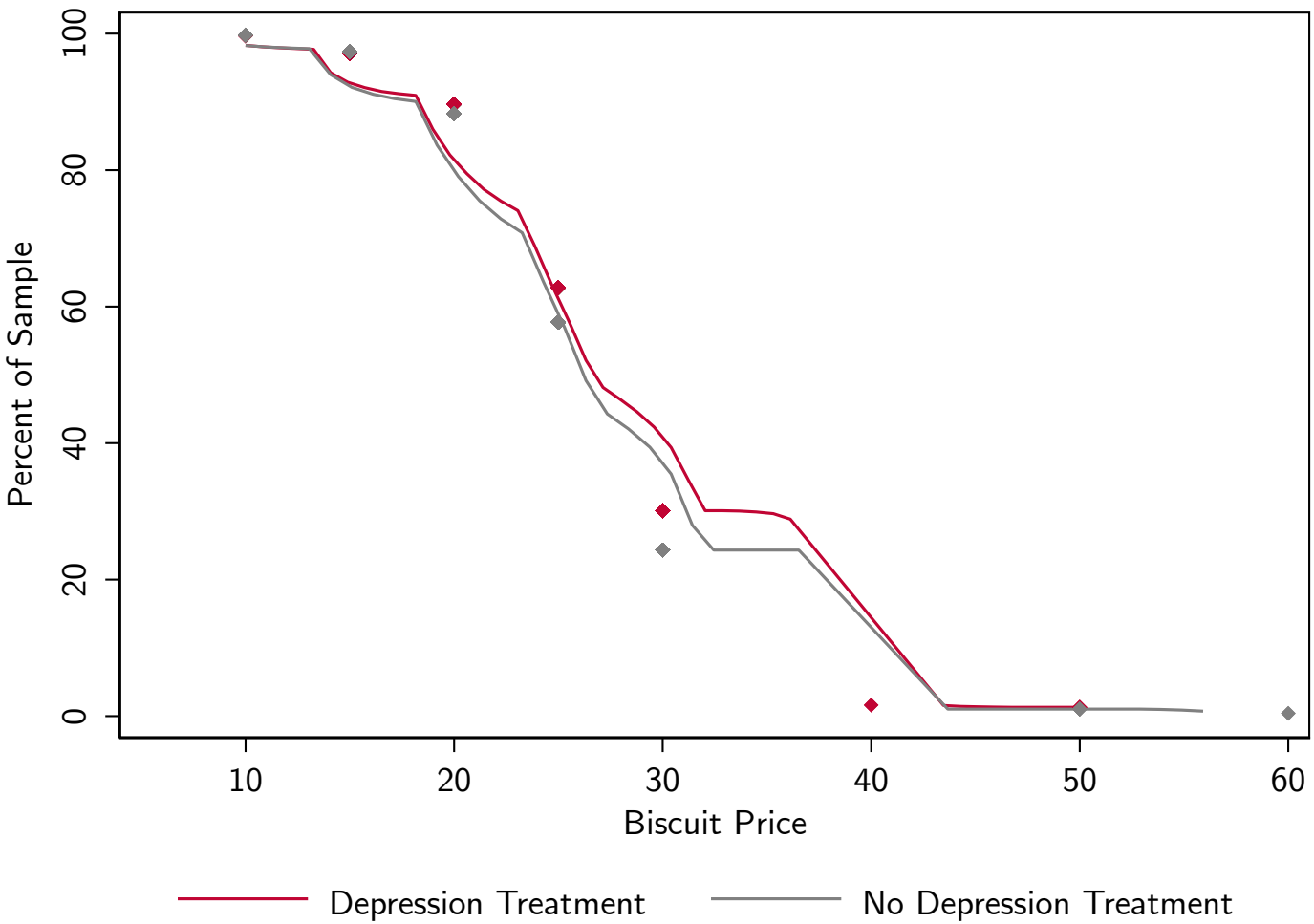
- X **income** (no effects of DT on earnings/income/consumption)
- X **experiential learning** (free provision does not moderate the effect of DT)
- ? **preferences** (Cannot reject that demand and use have the same sign)
- ✓ **cost of action** (DT increases demand but not use; no impact on WTP for a non-novel product.)

Most alternative pathways lead to parallel effects on product demand and use.

Placebo Test for a Non-Novel Product

- Biscuits (cookies) are common and familiar.
- 30 rupees ($0.46) for a package.

A Small and Insignificant Impact of DT on Demand for Biscuits ($p = 0.12$)



Policy

Policy Implications for Settings with Endemic Depression

- Free distribution may dominate cost sharing.
- By affecting demand but not use, depression undermines the effect of "screening" benefit of charging positive prices.
- Minimize psychic costs by bringing the product to users (avoid "ordeal mechanisms").
- Point-of-use distribution may achieve greater adoption than cost-sharing for a given budget.

Free Provision Does Not Increase Demand

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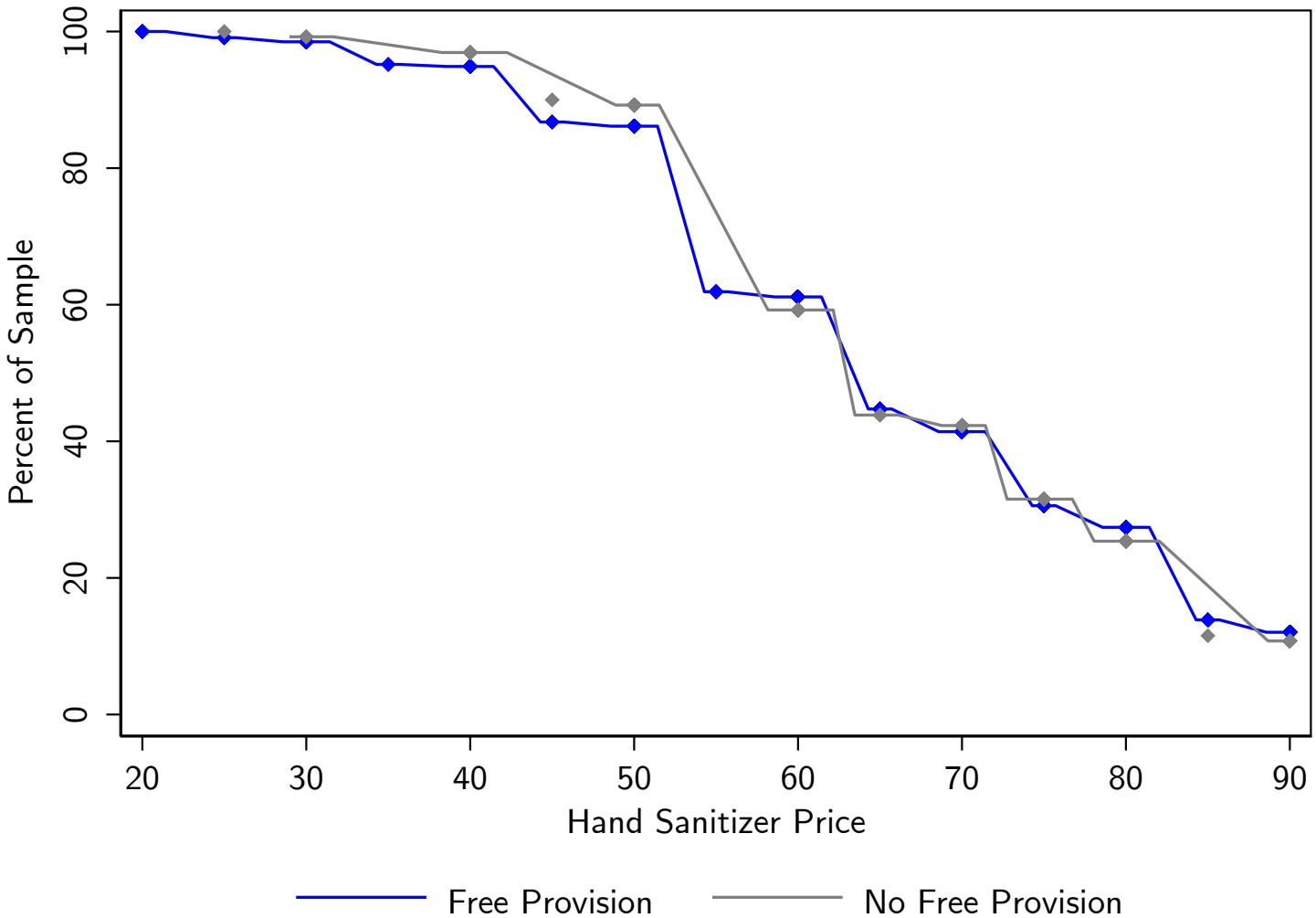

Heterogeneity in the Impact of DT

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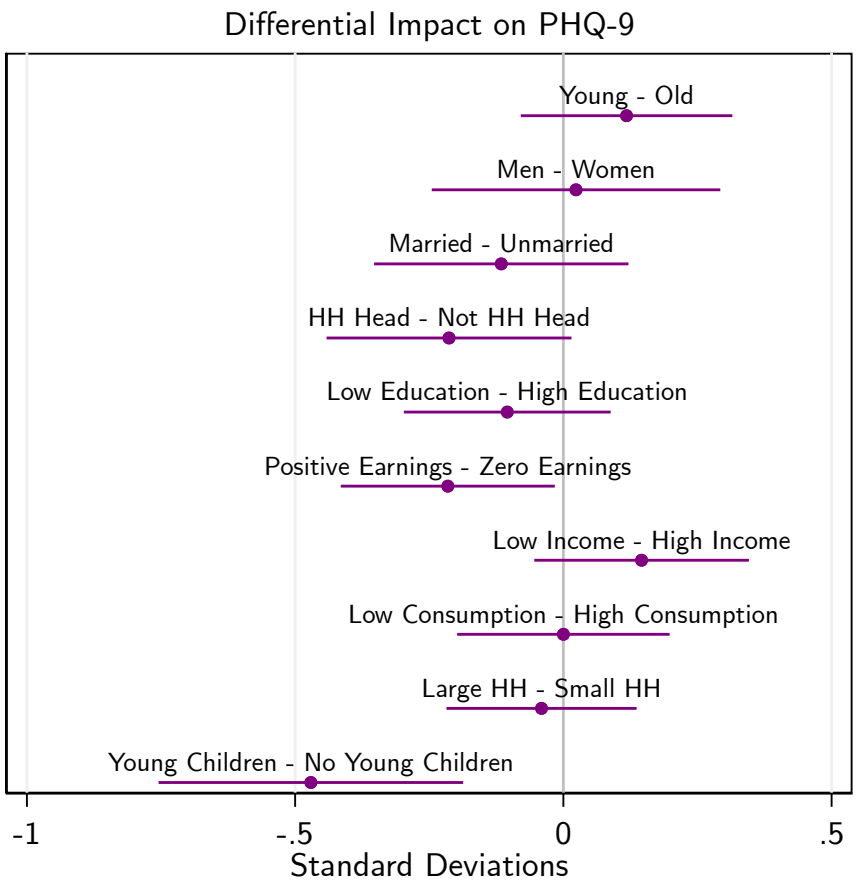

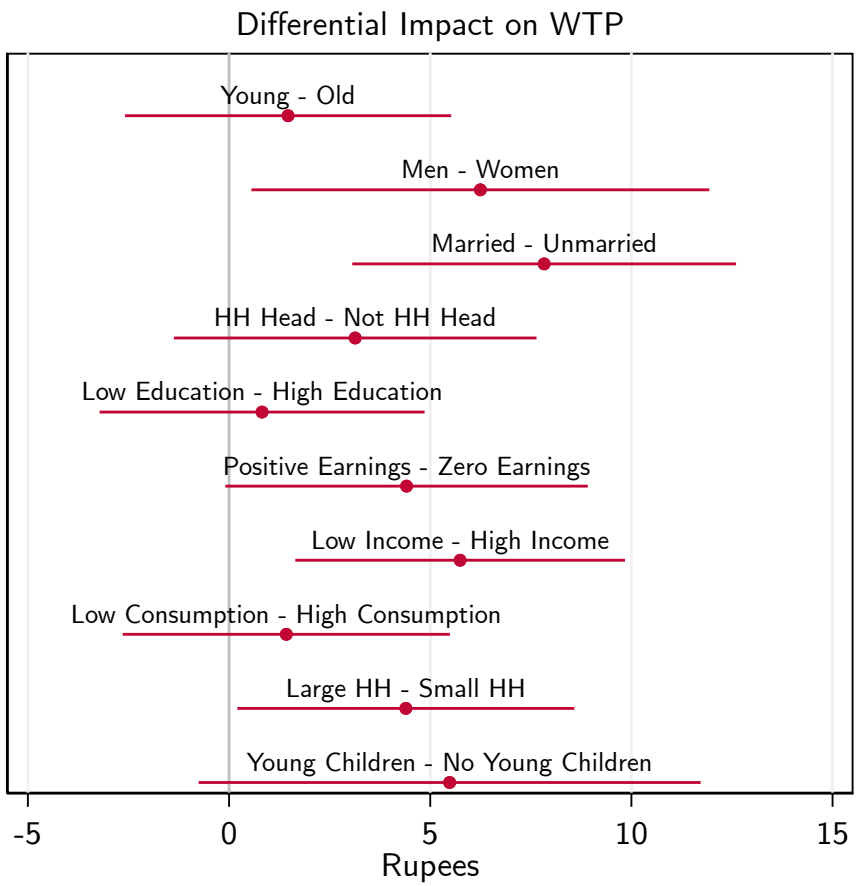

Heterogeneity in the Impact of FP

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