Labor Markets and Poverty in Village Economies

QJE, forthcoming

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Background & Research Questions

- About 1bn people still live in extreme poverty
- Labor is their only endowment $\Rightarrow$ understanding link between labor market choices and poverty is key to poverty reduction

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1. How do the labor market choices of the poor differ from those of wealthier individuals in the same setting?
2. Can a large, one-off transfer reduce the difference and set the poor on a sustainable trajectory out of poverty?

This paper provides answers by combining:

1. a labor survey fielded in 1309 village in rural Bangladesh, covering 21k HHs across the wealth distribution over 7 years
   - Bangladesh: 43% (66m) under GPL -highest rate in SA
2. an exogenous shock to the poors' ability to access same jobs as their wealthier counterparts, generated by the random allocation of a large, one-off transfer of assets and skills (TUP)

Labor survey reveals that:

- poor women mostly engage in casual labor while wealthier women specialize in livestock rearing
  - livestock rearing has higher hourly returns and more regular labor demand
  - poor women work longer hours per day but two months less per year
- *why do the poorest choose casual labor?*

What would they do if given access to livestock?

- answer using the random allocation of a large, one-off transfer of assets (livestock) and skills (TUP)
  - choice to liquidate/rent out or work with the asset tells us whether they faced barriers to choose livestock rearing
  - comparison of effects through time tells us whether the one-off transfer sets them on a sustainable trajectory out of poverty

Key features of research design

Collaborate with implementing NGO (BRAC) to:

- randomise the roll-out of the scaled-up version of the program
- select 6K beneficiaries in treatment and control villages
- survey *all* beneficiaries in 2007, 09, 11, 14 (treated only)

$\Rightarrow$ identify average and quantile treatment effects on the eligibles
$\Rightarrow$ document trajectory out of poverty

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- survey all non-eligible poor + a sample of HH from other wealth classes (15K in total)

$\Rightarrow$ identify indirect effects on non-eligibles and on class gaps

Roadmap

1. Link between poverty and labor market choices at baseline
2. How the program aims to break it
3. The effect of the program on the eligibles
4. *The effect of the program on the non-eligibles*
5. Cost-benefit analysis
6. The ultra-poor after 7 years

Poverty at baseline

- 40 BRAC branches, 1309 villages in the poorest areas of the 13 poorest districts
- PRA yields ranking of all HHs in four or five wealth bins
- BRAC chooses TUP eligibles from bottom bins $\Rightarrow$ "ultra-poor" (eligible) "near poor", "middle class" and "upper class"
- Survey all poor (eligible and not) + 10% of others (21k total)

TUP targets the poorest women (but most are poor)

	(1) Ultra-Poor	(2) Near-Poor	(3) Middle Class	(4) Upper Class
Share of population in this wealth class	.061	.219	.585	.135
Primary female is illiterate	.929	.832	.736	.489
Household is below the $1.25 a day poverty line	.530	.493	.373	.121
Consumption Expenditure (per adult equivalent)	627.8	645.1	759.5	1234.2
Household Assets [USD]	36.5	68.1	279.9	1663.4
Household savings [USD]	7.9	22.1	84.5	481.9
Household receives loans	.191	.393	.498	.433
Household gives loans	.012	.018	.030	.067
Business assets (excl. livestock and land) [USD]	22.9	54.4	286.1	1569.8

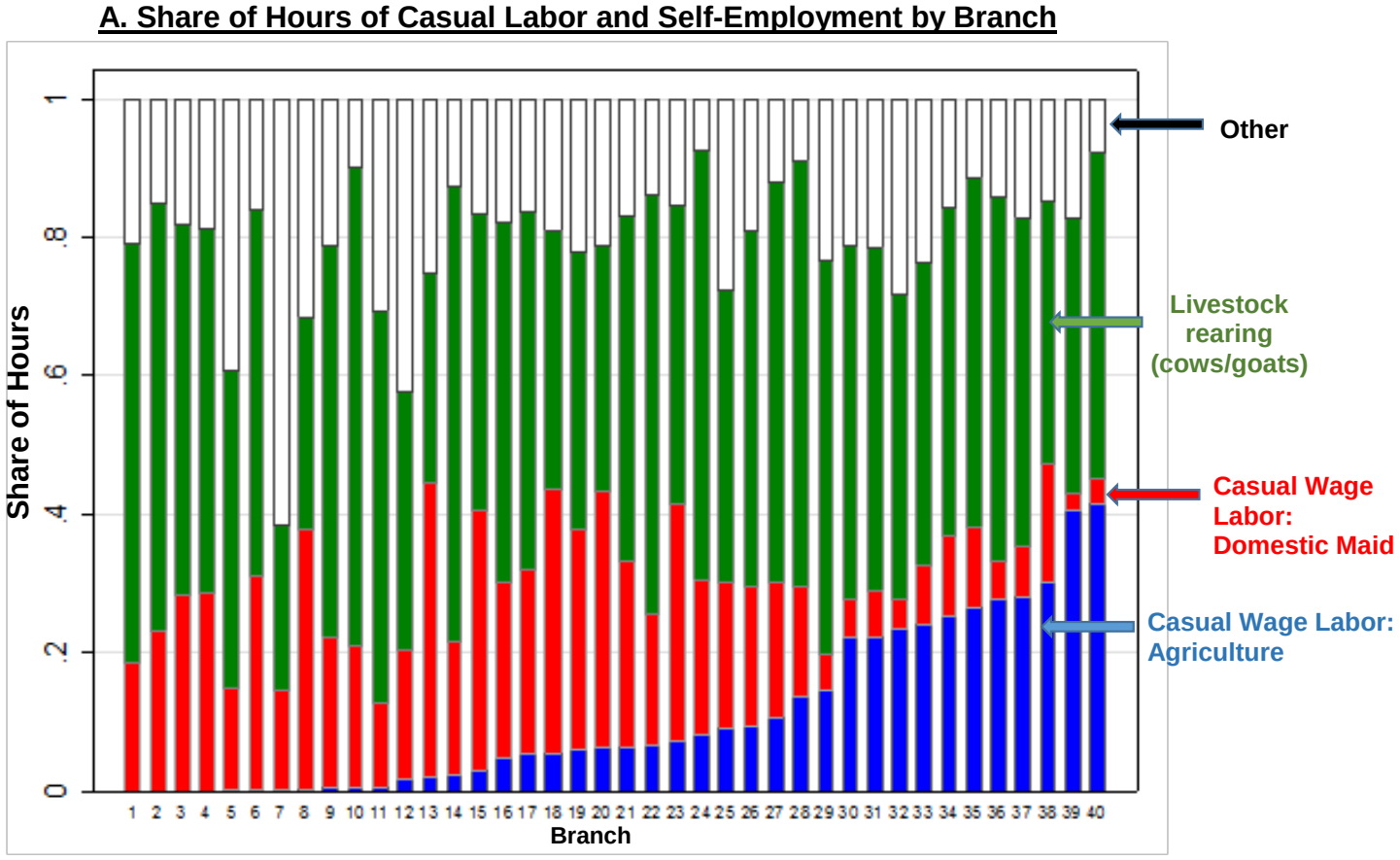
The poorest women have fewer productive assets

	(1) Ultra-Poor	(2) Near-Poor	(3) Middle Class	(4) Upper Class
Value of cows [USD]	33.8	120.2	633.8	1559.1
Value of goats [USD]	7.97	12.8	39.8	71.3
Household rents cows for rearing	.070	.148	.118	.030
Household rents goats for rearing	.111	.157	.102	.021
Household owns land	.066	.107	.487	.911
Value of land owned [USD]	200.0	491.2	6789.6	40125.1
Household rents land for cultivation	.060	.143	.276	.168

Poverty and labor market choices at baseline

- Survey all poor + 10% of others (21k total) to collect information on all income generating activities of each member during the previous year
  - yearly data to fully capture the labor allocated to irregular/seasonal casual jobs
- Focus on primary women as these are targeted by the program
- Four facts

Fact 1: Three activities account for 80% of total work hours



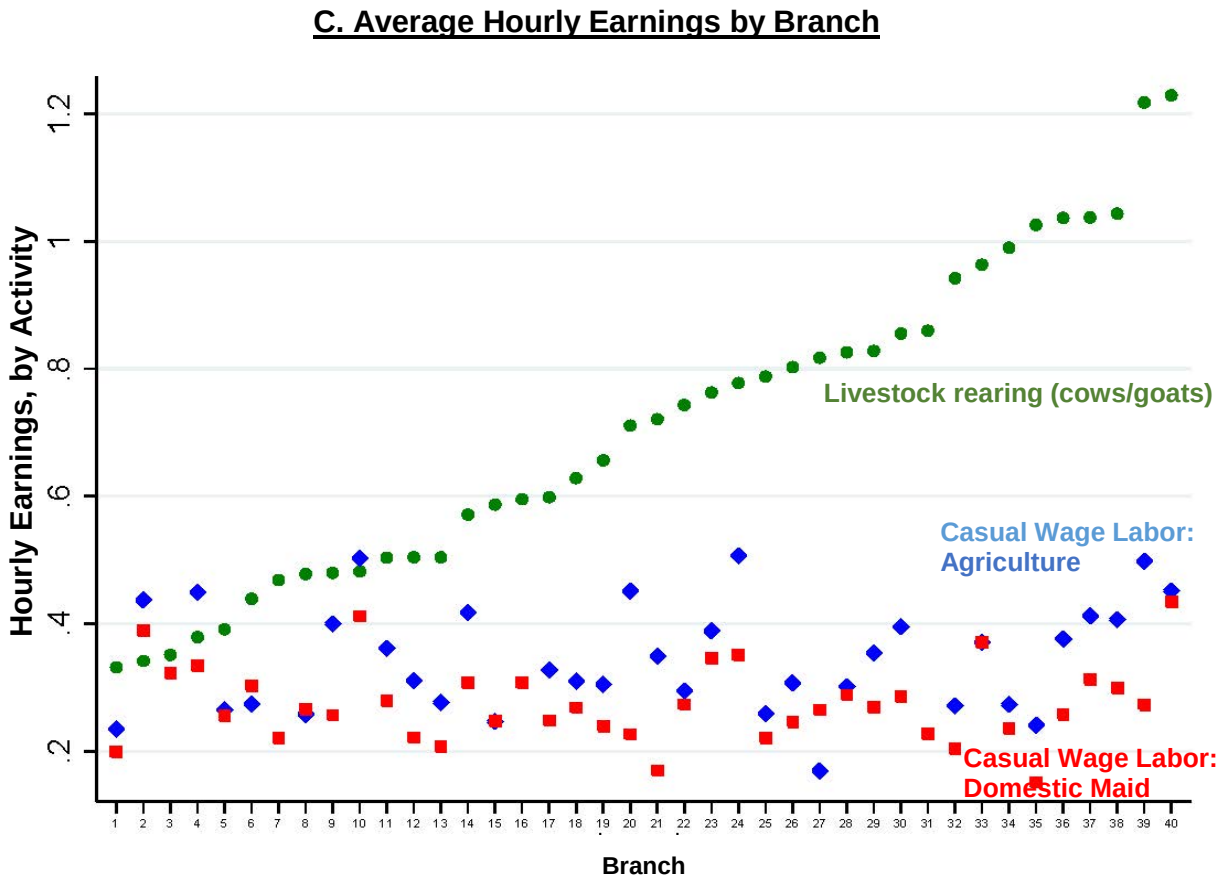
- remaining 20% is spread thinly among many activities (land cultivation, tailor, other wage labor)

These activities differ along many dimensions

livestock rearing	maid and ag jobs
self-employed	work for others
capital & some skills	unskilled labor only
open-ended	spot contracts
earnings uncertain	earnings uncertain

- stable wage jobs with guaranteed pay do not exist in these villages

Fact 2: Casual jobs pay less per hour



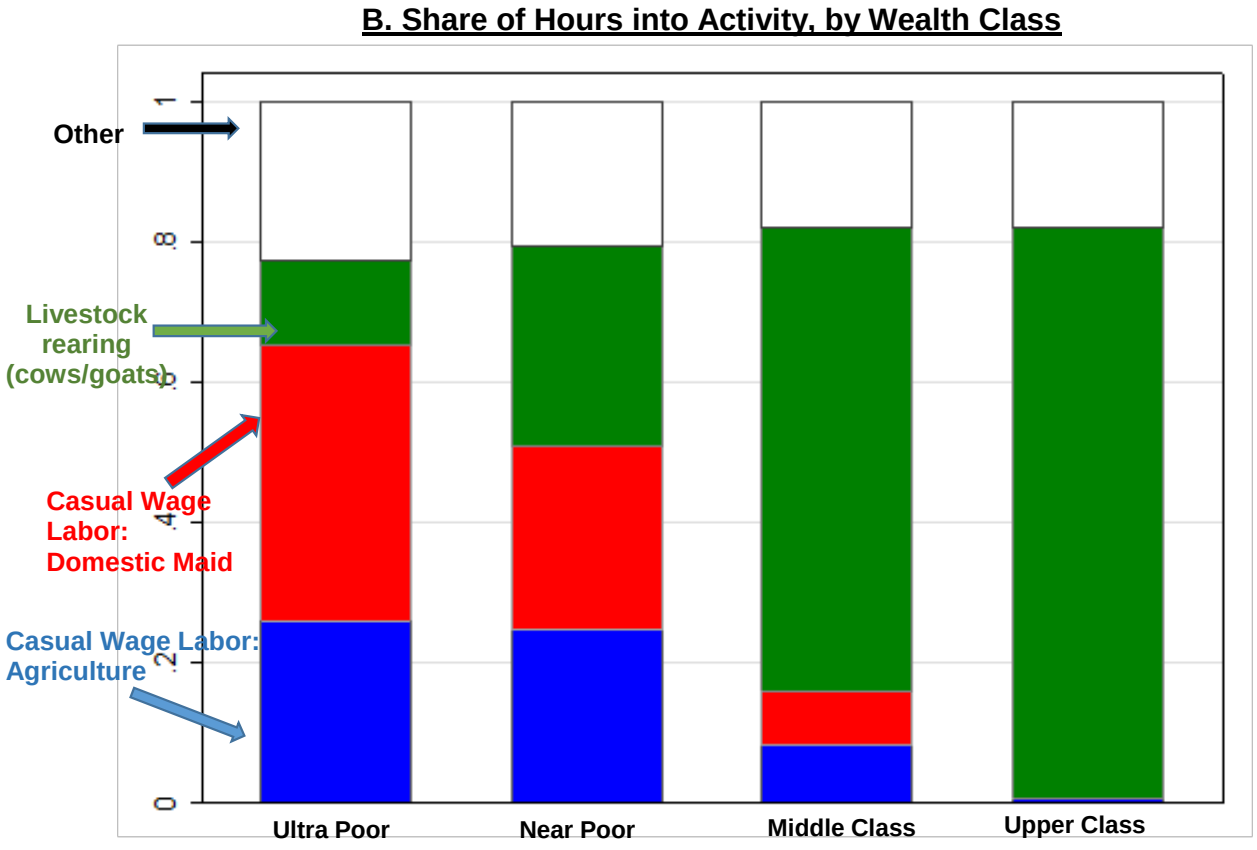
Marginal vs average returns

- for casual jobs $w \cong MPL$
- for livestock rearing we need to parse out contribution of K
- if PF is CD $MPL = s \times APL$ where s=labor share of income
- thus MPL is higher in livestock rearing than ag labor if s>.48 (than maid if s>.37)

Fact 3: Demand for casual jobs is irregular

	Casual Wage Labor		Self Employment		
	(1) Agriculture	(2) Domestic Maid	(3) Livestock Rearing [Cows, Goats]	(4) t-test [Col 1 = Col 3]	(5) t-test [Col 2 = Col 3]
Days per year	127	167	334	[.000]	[.000]
	(65.9)	(89.5)	(41.2)		
Hours per day	7.62	7.04	1.83	[.000]	[.000]
	(1.15)	(1.74)	(.771)		
Hourly earnings [US	.344	.268	.719	[.000]	[.000]
	(.102)	(.109)	(.779)		

Fact 4: Choice of activity is strongly correlated with poverty



- poor women work longer hours but 60 fewer days p.a.
- poor engage in casual labor across SA and SSA [Fink et al. 14, Kaur 15]

Open questions

Why don't poor women engage in (higher returns, more regular) livestock rearing?

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1. returns depend on individual invariant traits so that observed returns $\neq$ what the poor would earn
2. returns larger for all but poor women face binding constraints

Response to program allows us to tell

1. if returns depend on individual invariant traits so that observed returns $\neq$what the poor would earn $\Rightarrow$ one-off asset&skill transfer will mechanically increase wealth but it will not affect labor allocation
2. if returns larger for all but poor women face constraints $\Rightarrow$ transfer will relax the constraints and allow them to engage in livestock rearing
    - note: the program relaxes several constraints at the same time

Program description

Aim: to reach poorest women who are by-passed by other programs

- Eligibles are selected by BRAC based on community PRA [Alatas et al 12]
  - On average, 6 women per village (6% of HHs) are eligible

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1. Asset transfer (choose btw livestock, crafts, retail..)
   - Commit to retain it for two years but free to sell after that
   - $560 PPP :1X yearly PCE; 2X yearly earnings; 9X savings
2. Asset specific training + support- intensive over first year
   - Cost of training and support also $560 PPP

Evaluation strategy

- Randomise the program roll-out across 40 BRAC branch offices (1309 communities) in the poorest areas of the country
  - randomly choose 2 sub-districts (about 97sq mi) and 2 branches within each
    - one treatment, one control (until 2011)
- Randomise at the branch level to minimise contamination:
  - BRAC branches serve all villages in a radius of 8km
  - each program officer only deals with treatment or control
  - beneficiaries informed of their status only when treated
- Scaled up version: all villages within one branch are treated
  –> estimates capture GE effects within branch

Attrition, Balance and Compliance

- Attrition over the four years is 13%, both in treatment and control villages
  - balanced sample: 6732 eligible beneficiaries & 15,107 HHs from other classes
- Eligibles in treatment and control communities look similar on all outcomes at baseline
  - p-values mostly $>.05$ & normalised differences always $< .25$ [Imbens and Wooldridge 09]
- Compliance is 86%
  - 14% due to ex-post ineligibility or refusal
  - on average much richer than the compliers

Methodology: ITT

To evaluate the average impact we estimate:

- $y_{it} = \alpha + \sum_{j=1}^{2} \beta^j W_t^j T_i + \gamma T_i + \sum_{j=1}^{2} \delta^j W_t^j + \eta_d + \epsilon_{id}$
- Where $T_i = 1$ if i lives in a treated community, W_t are survey waves and η_d are subdistrict fixed effects
- Estimator accounts for baseline differences
- SE are clustered at the BRAC office level [robust to dof correction, wild bootstrap]
- Randomisation ensures that T_i is orthogonal to ϵ_{id}
- β^j indentifies the causal impact of the program on the average outcome in year j under the assumptions of common trend within subdistrict and no contamination

The program changes labor allocation..

Labor Supply (hours)	Livestock	Agriculture	Maid
Program impact after 2 years	488***	-42.3	-57.4
	(30.7)	(53.0)	(42.9)
Program impact after 4 years	415***	-46.2	-117**
	(38.9)	(42.7)	(45.0)
Baseline mean	115	269	325
Four year impact: % change	361%	-17.1%	-36.1%
Two year impact = Four year impact	.111	.930	.125
Adjusted R-squared	.335	.184	.067
Number of ultra-poor women	6732	6732	6732
Number of observations (clusters)	20196 (40)	20196 (40)	20196 (40)

..leading to a 22% increase in labor supply..

Labor Supply	**All three activities**	
	(1) Hours	**(2) Days**
Program impact after 2 years	341***	72.4***
	(67.9)	(10.0)
Program impact after 4 years	206***	61.1***
	(73.0)	(12.5)
Baseline mean	916	247
Four year impact: % change	22.4%	25.0%
Two year impact = Four year impact [p-value]	.080	.179
Adjusted R-squared	.072	.069
Number of ultra-poor women	6732	6732
Number of observations (clusters)	20196 (40)	20196 (40)

..and a 37% increase in total earnings

Earnings	**All three activities**
	(1) Earnings
Program impact after 2 years	62.286**
	(30.17)
Program impact after 4 years	87.761***
	(28.58)
Baseline mean	242
Four year impact: % change	37%
Two year impact = Four year impact [p-value]	.455
Adjusted R-squared	0.088
Number of observations (clusters)	20135 (40)

A trajectory out of poverty?

- the program creates employment opportunities –> the average beneficiary works 22% more hours and earns 37% more
- key question is what these earnings are used for:
  - entirely consumed vs.
  - partly saved and invested in productive assets to grow their business

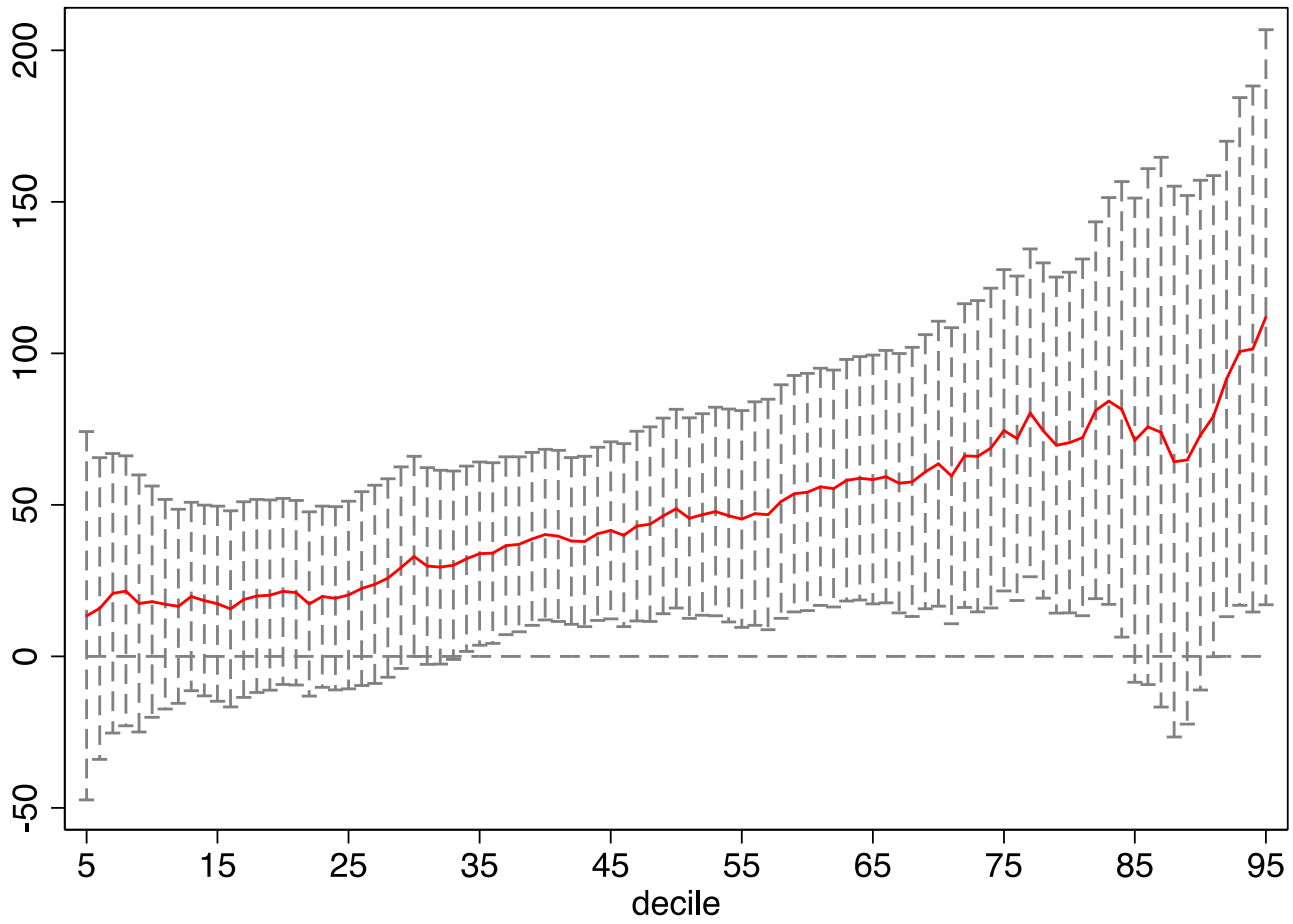
Consumption expenditures ⇑

	Poverty and Consumption		
	(1) Below Poverty Line	(2) Consumption Expenditure (per adult equivalent)	(3) Value of Household Assets
Program impact after 2 years	-.051	30.19	6.86
	(.046)	(25.34)	(7.26)
Program impact after 4 years	-.084**	62.62***	39.65***
	(.038)	(20.82)	(9.08)
Baseline mean	.556	628.67	36.14
Four year impact: % change	-15%	10%	110%
Two year impact = Four year impact [p-value]	.379	.111	.000
Adjusted R-squared	.032	.044	.082
Number of ultra-poor women	6732	6732	6732
Observations (clusters)	18882 (40)	18838 (40)	20196 (40)

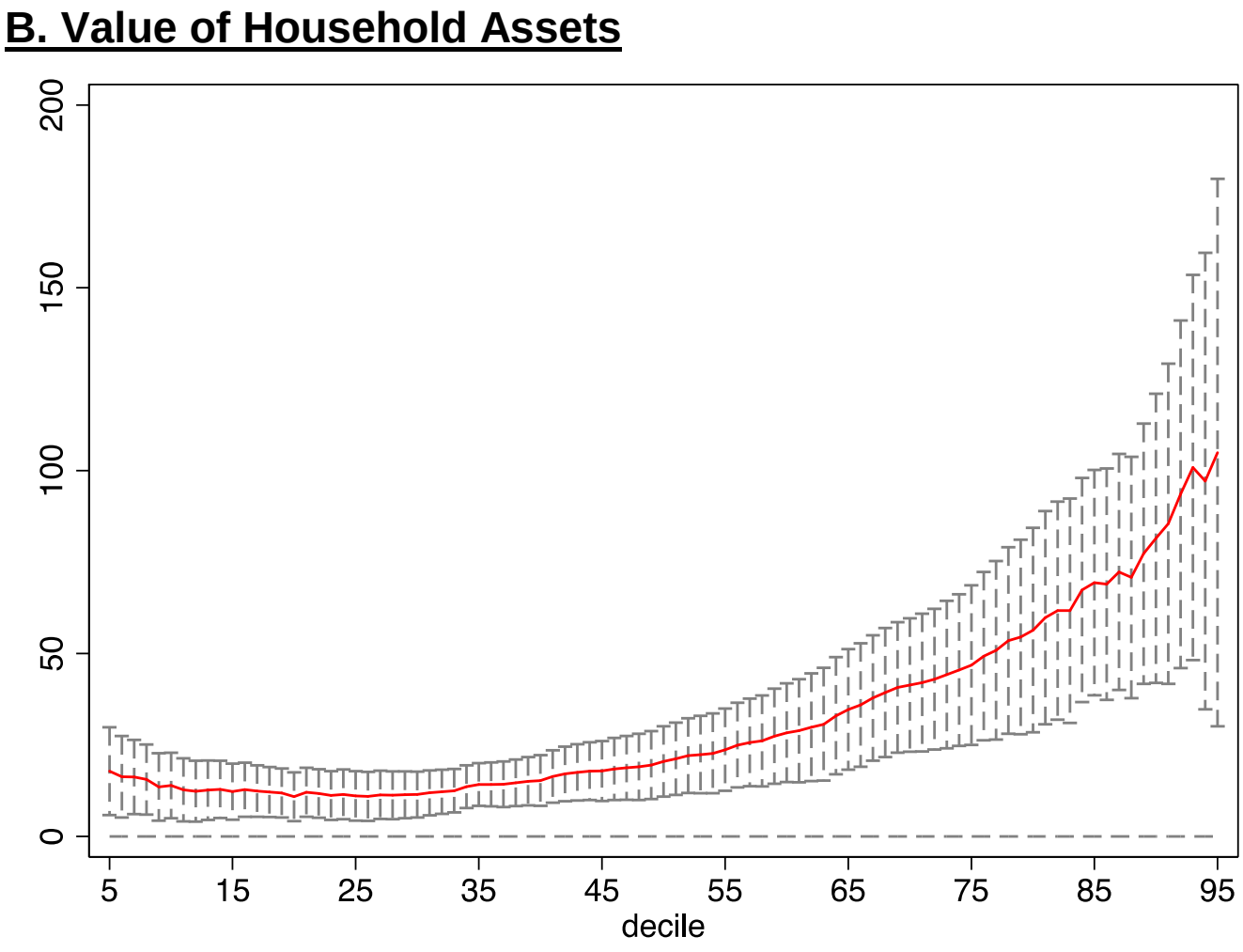
- gains larger after 4Y

but effects on PCE are heterogeneous

A. Consumption Expenditure (per adult equivalent)



..and so are changes in HH durables



Savings increase ninefold

	Financial Assets		
	(1) Household Cash Savings	(2) Household Receives Loans	(3) Household Gives Loans
Program impact after 2 years	54.54***	.123***	.042***
	(4.60)	(0.03)	(0.01)
Program impact after 4 years	53.22***	.110***	.051***
	(4.01)	(0.03)	(0.01)
Baseline mean	6.17	.180	.011
Four year impact: % change	863%	61%	464%
Two year impact = Four year impact [p-value]	.781	.714	.527
Adjusted R-squared	.204	.086	.026
Number of ultra-poor women	6732	6732	6732
Observations (clusters)	20179 (40)	20196 (40)	20196 (40)

- treated women start lending –> potential of positive spillovers on other HHs [Angelucci and De Giorgi 09; Dupas et al. 15]

Cows stocks & business assets increase..

	(1) Value of Cows	(2) Value of Goats	(3) Value of Other Business Assets
Program impact after 2 years	484.65***	28.11***	23.84***
	(19.46)	(3.77)	(6.85)
Program impact after 4 years	539.66***	20.57***	64.76***
	(45.16)	(4.12)	(11.91)
Baseline mean	36.07	6.50	22.92
Mean value of assets transfer from program	464.03	39.9	-
Four year impact: % change (net of transfer if positive)	208%	-298%	283%
Two year impact = Four year impact [p-value]	.148	.004	.000
Adjusted R-squared	0.390	0.109	0.066
Number of ultra-poor women	6732	6732	6732
Observations (clusters)	20182 (40)	20072 (40)	20195 (40)

- accumulation of business assets accelerates over time

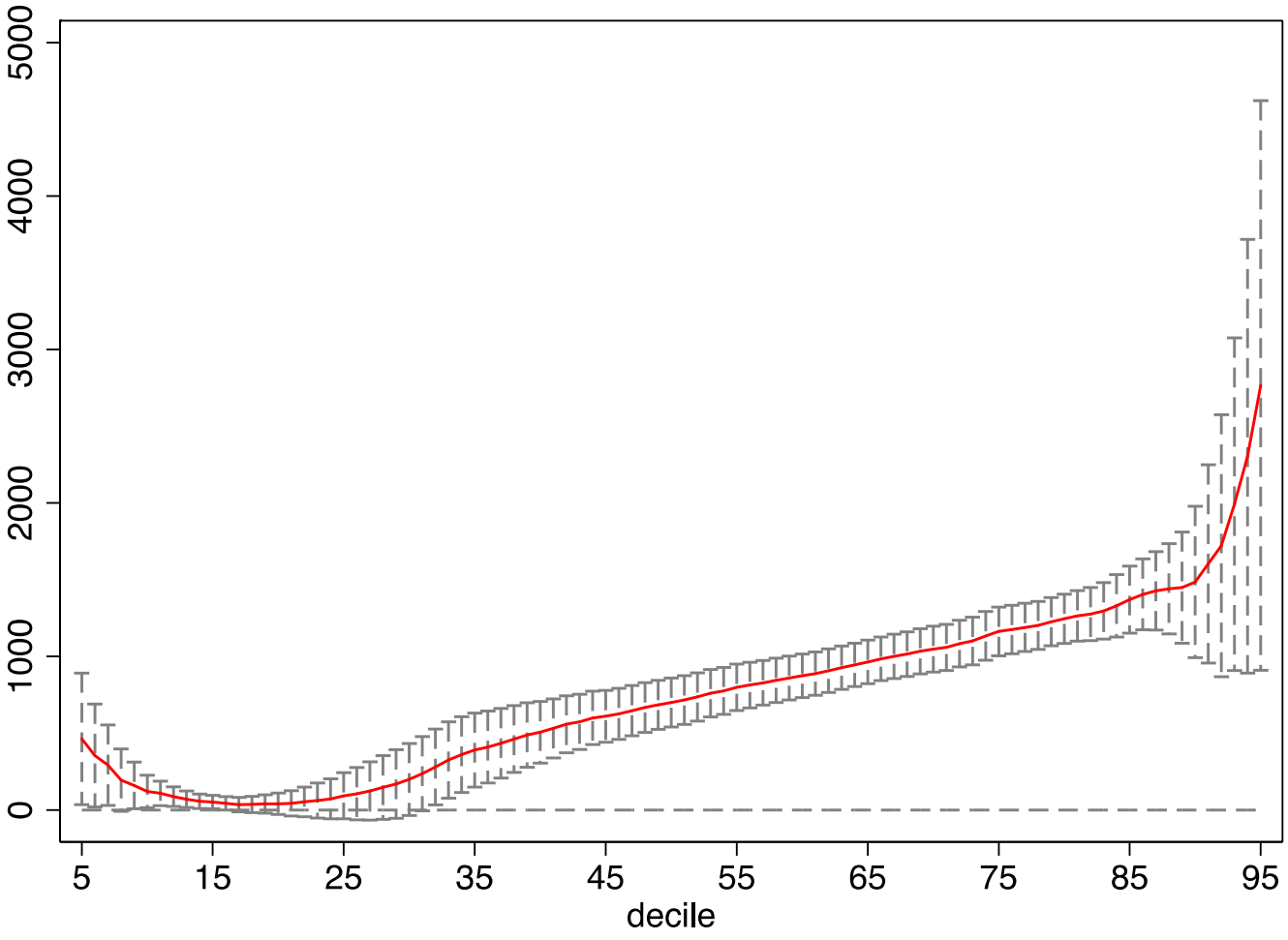
..and so does access to land

	(1) Rents Land	(2) Owns Land	(3) Value of Land owned
Program impact after 2 years	.069***	.005	39.80
	(.020)	(.011)	(75.23)
Program impact after 4 years	.110***	.026*	326.98**
	(.022)	(.012)	(131.27)
Baseline mean	.058	.068	174.50
Mean value of assets transfer from program	-	-	-
Four year impact: % change (net of transfer if positive)	190%	38.2%	187%
Two year impact = Four year impact [p-value]	.054	.005	.002
Adjusted R-squared	.077	.034	0.019
Number of ultra-poor women	6732	6732	6732
Observations (clusters)	20196 (40)	20196 (40)	20195 (40)

- access to land increases over time

Asset accumulation is very heterogeneous

D. Productive assets



Summing up

- program allows poor women to work in livestock rearing
  - by revealed preferences the poor were willing but unable to rear livestock $\Rightarrow$program removes barriers that stopped them
- this sets the poor on a trajectory out of poverty where they accumulate more assets over time, leading to larger gains $\Rightarrow$ consistent with poverty traps
- effects are very heterogeneous $\Rightarrow$ small livestock businesses do not fit all

Open questions

- scalability: does it "work" elsewhere?
- effects are big: do they impact others?
- program is expensive: is it worth it?

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- effects are big: do they impact others? mostly no
- program is expensive: is it worth it?

Cost benefit analysis

- Program costed $1120 per HH in 2007
- Compare this to the estimated consumption benefits
- We assess whether benefits>costs, not whether:
  - this is better than a counterfactual cash transfer
  - this is the most effective program or most efficient labor allocation

Average benefit/cost ratio = 3.2, IRR=22%

Table 9: Cost-Benefit Analysis

Panel A. External parameters	
Cost per household at year 0	1121.34
Cost per household discounted at year 4	1363.00
Social discount rate = 5%	
Panel B. Estimated Consumption Benefits	
1 Change in household consumption expenditure year 1	61
2 Change in household consumption expenditure year 2	106
3 Change in household consumption expenditure year 3	237
4 Change in household consumption expenditure year 4	345
5 NPV Change in household consumption expenditure from year 5 for 20	3581
6 Change in household assets year 4	40
7 Total benefits (1+2+3+4+5+6)	7360
8 **Benefits/cost ratio (assuming benefits last 20 years from transfer**	**3.21**
Sensitivity to different discount rates/time horizons	
Social discount rate = 10%	*2.50*
Benefits last 10 years from transfer date	*1.86*
Benefits last 5 years from transfer date	*0.82*
9 IRR (assuming benefits last 20 years from transfer date)	**0.22**
Sensitivity to different outside options/time horizons	
Wage jobs available all year at $.34 per hour	0.16
Benefits last 10 years from transfer date	0.17
Benefits last 5 years from transfer date	-0.01

Are gains stable after Y4?

- Increasing asset accumulation indicates gains might increase
- New "year 7" survey sheds light on this
- Challenge: in 2011 BRAC treated 49% of control villages and 20% of control ultrapoor, choosing the poorest
- Estimate 7y effects using different counterfactuals for these "late treated"

Gains are sustained after 7 years

	(1) Household Consumption Expenditure	(2) Value of Household Assets	(3) Household Cash Savings	(4) Value of Productive Assets
Program impact after 4 years	358.2***	39.65***	53.22***	972.6***
	(63.54)	(9.075)	(4.007)	(158.3)
Program impact after 7 years				
adjustment for program effect on the late treated:				
none	281.0**	27.09*	21.43***	662.0***
	(119.6)	(13.93)	(3.935)	(214.4)
=median 3Y treatment effect on the early treated	327.2***	30.36**	31.84***	782.8***
	(119.5)	(13.94)	(4.054)	(214.6)
=75th ptile 3Y treatment effect on the early treated	338.9***	33.52**	36.34***	830.9***
	(119.6)	(13.96)	(4.222)	(215.0)
=25th ptile 3Y treatment effect on the early treated	315.5**	28.36**	27.90***	751.1***
	(119.5)	(13.93)	(3.962)	(214.5)
Four year impact = Seven year impact (row 1)	.563	.354	.000	.052
Four year impact = Seven year impact (row 2)	.816	.496	.000	.233
Four year impact = Seven year impact (row 3)	.749	.409	.000	.374
Four year impact = Seven year impact (row 4)	.885	.652	.001	.164
Observations (clusters)	25176 (40)	26437 (40)	26437 (40)	26435 (40)

Lessons and implications

- Large baseline differences in labor allocation shrink when extremely poor women are given the opportunity to engage in the same activities as their wealthier counterparts
  - suggests ultrapoor women face constraints to access these activities
- The program leverages idle capacity –> the average beneficiary works 22% more hours and earns 37% more relative to baseline
  - in line with evidence from the evaluation of cash grants programs that also result in large increases in hours worked [Blattman et al 2014].

Open questions

- Defining trait of TUP is the focus on starting small businesses via large transfers of productive assets & skills – is it the *size* or the *kind* of transfer that make it work?
  - if access to capital is the binding constraint, an equivalent transfer of cash should do at least as well
  - when given the choice, Pakistani ultrapoor HHs seem to think so: 99% choose cash over assets+skills (Attanasio et al 20??) –do HHs underestimate their skills deficiencies?
- Livestock rearing dominates casual jobs but heterogeneity of returns is huge
  - what are the determinants of success?
  - which jobs could be better?