Social Ties, Identity and the Delivery of Public Services

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Service delivery with socially connected agents

- Many governments and NGOs rely on local agents to deliver public services to remote areas
  - More willing to stay and need less (no?) compensation
  - Embedded in the community -> social ties
- Social ties can:
  - motivate the agents to exert effort (positive)
  - bias targeting (negative)

This paper

- We design an experiment to identify the effect of social ties on the delivery of a poverty reduction program
  - coverage: how many HHs are treated
  - targeting: which households are treated

- Assess whether targeting bias and coverage can be separated → provide evidence on the underlying social preferences by exploiting differences in group identity

Road Map

1. Context
2. The effect of social ties
3. The structure of social preferences
4. Conclusion

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The context

- West Uganda: many poor, mostly in subsistence agriculture
- Low adoption of modern techniques and improved seeds
- Constraints to adoption:
  1. farmers lack know-how on modern techniques
  2. most seeds are "lemons" [Bold et al. 2017]

The agriculture extension program: techniques & seeds

- The two are complements but also useful individually
- Techniques encouraged by BRAC and rarely used are:
  - zero tillage (11% at baseline)
  - line sowing (32%)
  - no mixed cropping (10%)
- Seeds are high yielding varieties of staples and commercial crops
  - 33% of farmers had tried them at baseline

The agriculture extension program: delivery

- BRAC employs local successful women farmers as DAs to:
  1. Train poor women farmers on modern techniques
  2. Sell high-quality improved seeds produced in-house

- DAs are given free seeds for own usage (valued $1) and are trained regularly (*reported main reason to accept job)*
- DAs buy seeds wholesale from BRAC and resell at a markup (5-10% sale price = 5-10c)

- *DA are not paid to train farmers and get a low commission on seeds → financial incentives do not interfere with social motives*

Program evaluation

- We evaluate the program using an RCT
- 60 treatment villages; 60 control villages
- Random 20% of the farmers (n=4.7K) surveyed at baseline and endline (2 years later)

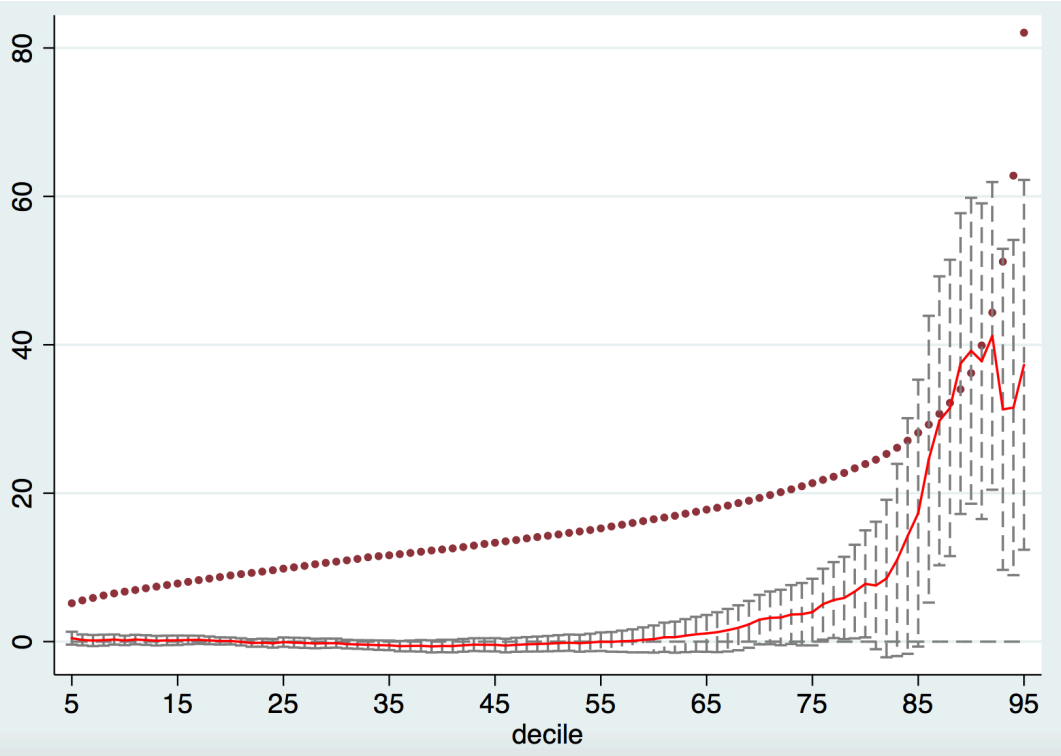
The program "works" for the average beneficiary

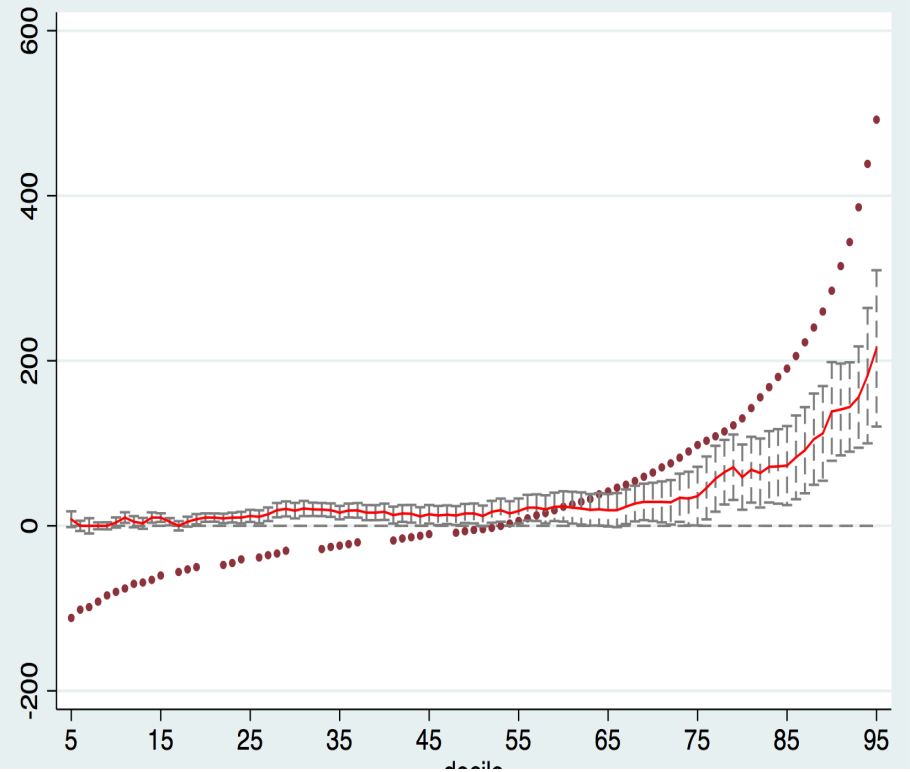
- 20% increase in # marketable crops, 38% increase in profits → 25% increase in consumption
- no evidence of benefits spreading to non-beneficiaries:
  - profit & consumption inequality increase
  - QTEs show gains concentrated in top quantiles

Large gains from being trained/given seeds by DA

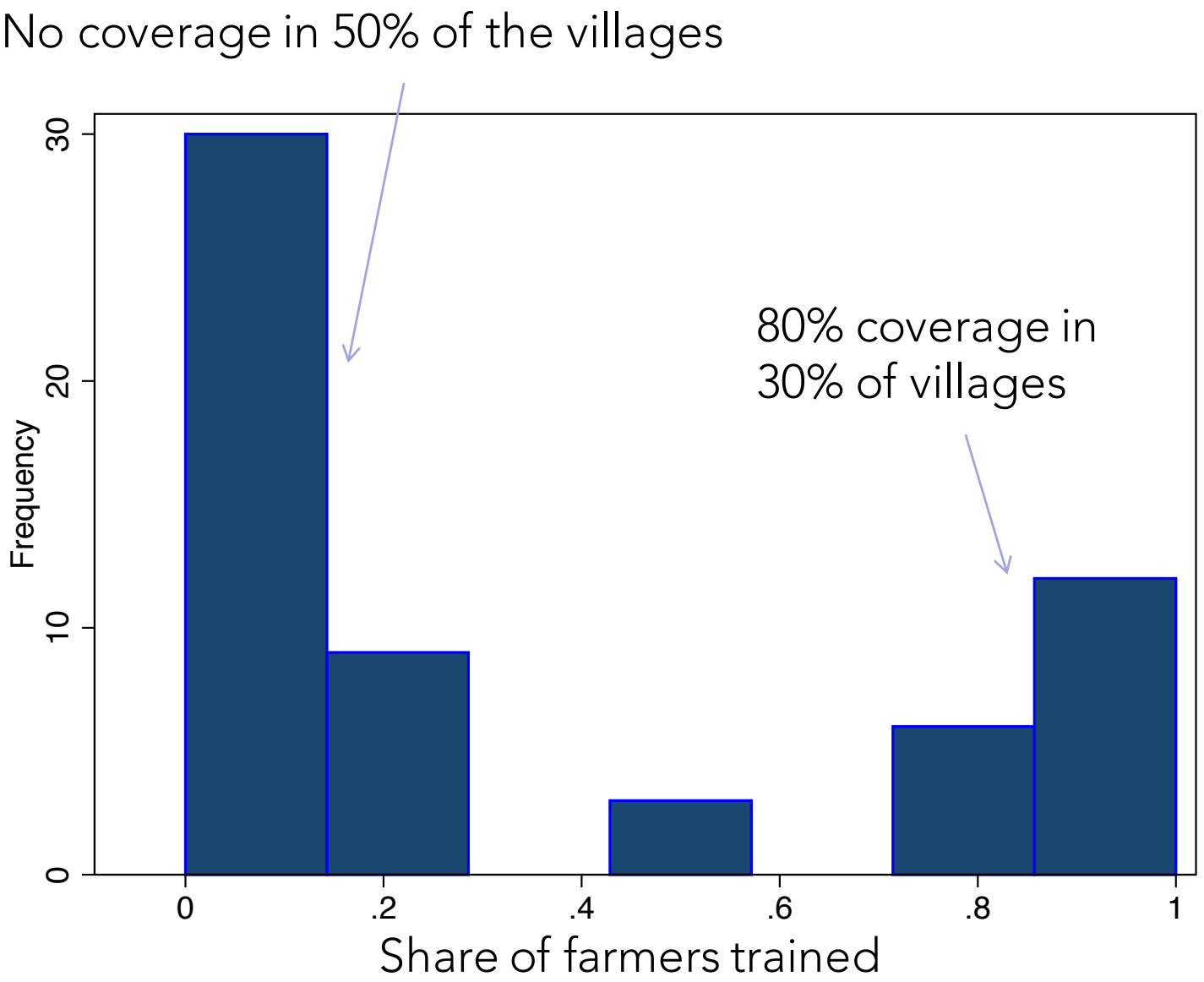
consumption ➡

profits ⬇





Yet, coverage varies substantially across villages



Villages similar on observables:
- levels and variance
- same DA contract

Do social ties explain which and how many farmers DA trains/ sells seeds to?

- BRAC wants DAs to:
  1. Train as many farmers as possible –up to 20
  2. Prioritize the poor

- But DAs' actions are difficult to monitor:
  - Can put low effort
  - Can target connected HHs at expense of most deserving

- Common behaviors in rural development programs:
  (Anderson & Feder 2007, Alatas et al 2013, Baltzer and Hansen 2011, Basurto et al 2017)

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   i. Empirical Design
   ii. Balance Checks
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EMPIRICAL DESIGN

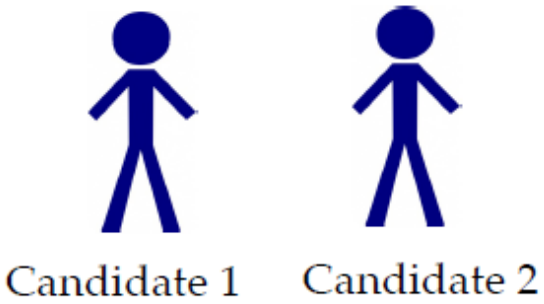
Identification

- Identification requires dealing with unobservables that determine tie status and the outcome of interest

- Standard solution is to use within agent variation
  - FE absorb all unobservables
  - including those we are interested in to measure bias

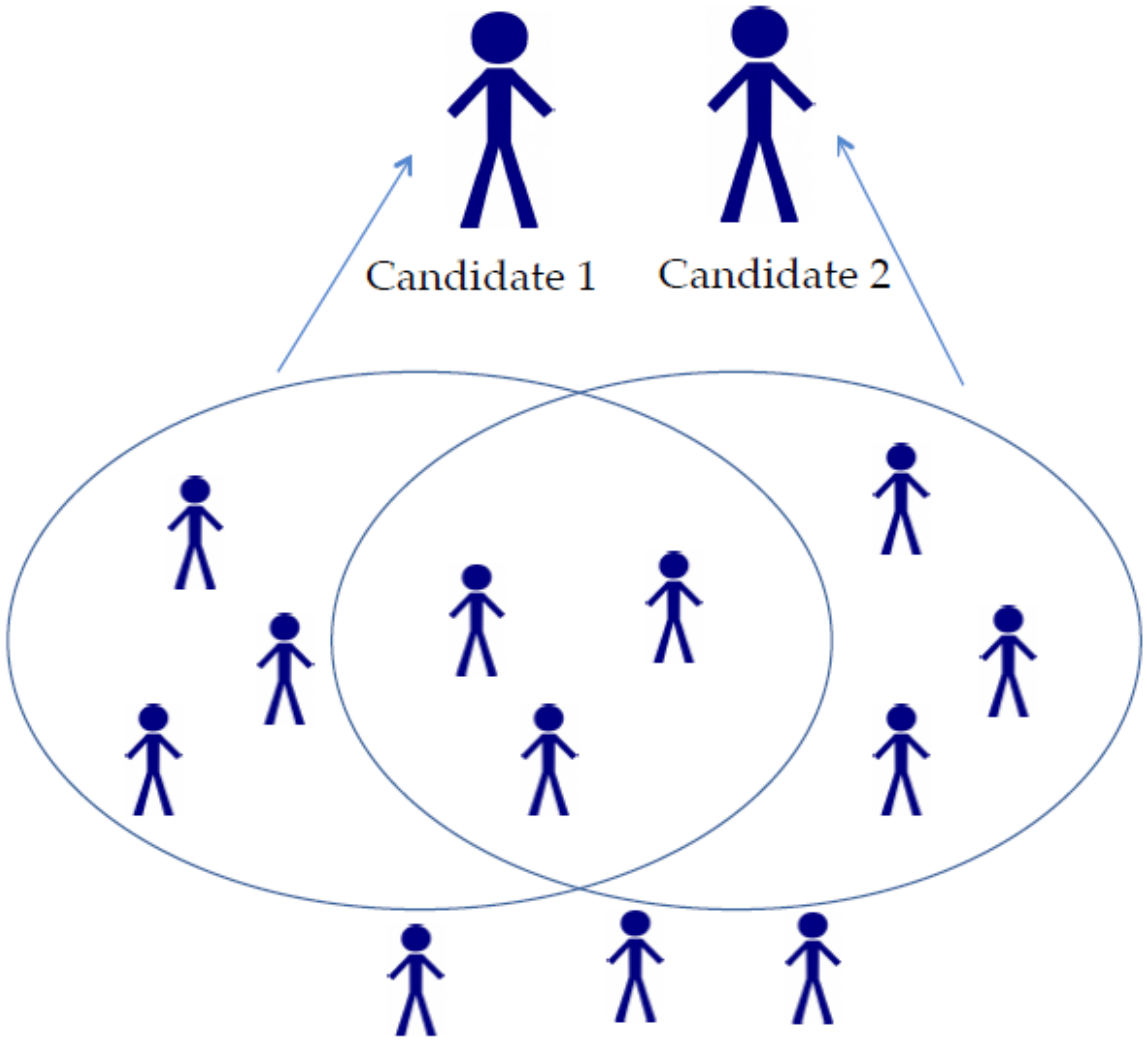
- Our design creates a counterfactual group who are not tied to the agent but are identical to those who are
  - valid counterfactual
  - allows to measure bias

Step 1: BRAC selects two candidates in 60 treatment villages



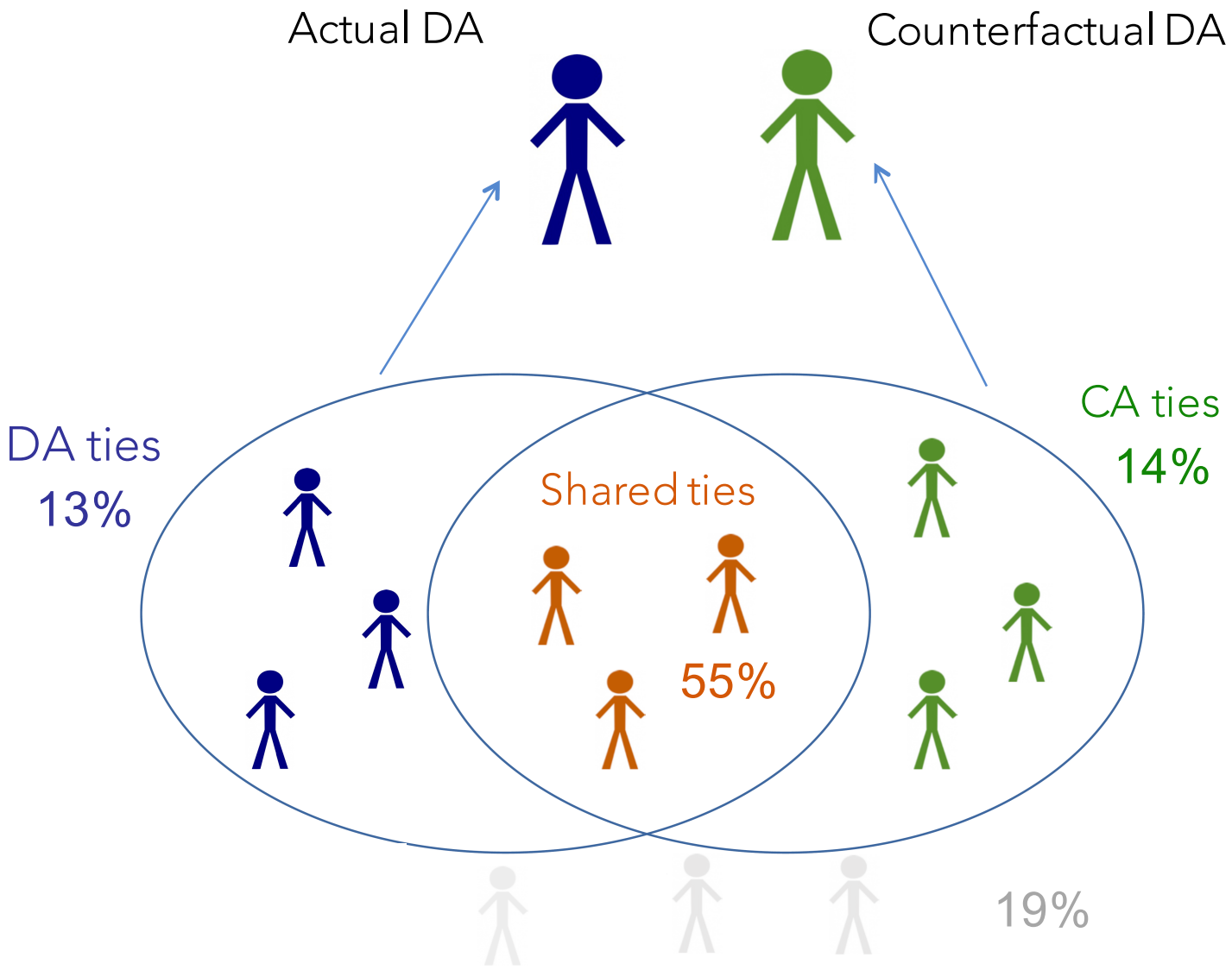
- They are approached individually
- They don't know whether anyone else has been approached
- Farmers cannot apply for the DA post

Step 2: We measure ties btw farmers and the candidates

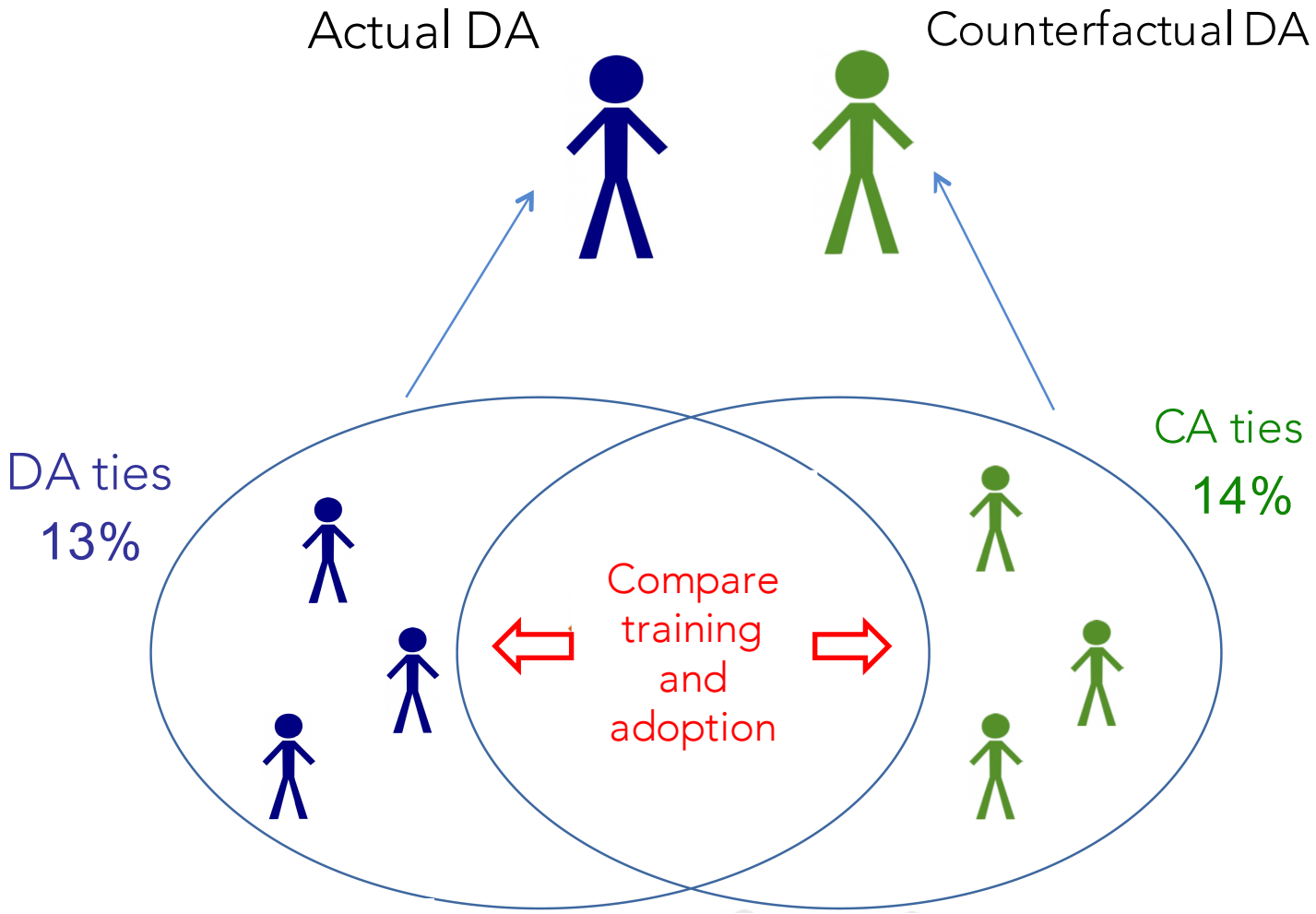


- Sample: random 20% of farmers (n=2.7k)
- Measures of ties: friend & family, acquaintance, discuss agriculture

Step 3: We randomly select one of the two as DA



Step 4: We use farmers tied to the non-chosen candidate as counterfactual



Connection to DA vs CA is exogenous because DA is chosen randomly

BALANCE CHECKS

DAs are similar and positively selected by design

	DA	CA	Average farmer	*p-value* DA = CA	*p-value* DA = Farmer
	(1)	(2)	(3)	(4)	(5)
Age	39.283	38.610	41.677	*0.696*	*0.063*
	(9.36)	(9.40)	(3.14)		
Knows how to read and write (=1 if yes)	1.000	0.967	0.768	*0.156*	*0.000*
	(0.00)	(0.18)	(0.10)		
Completed primary school (=1 if yes)	0.617	0.533	0.467	*0.360*	*0.024*
	(0.49)	(0.50)	(0.13)		
No. of household members	5.783	6.183	5.370	*0.379*	*0.201*
	(2.43)	(2.53)	(0.54)		
Acres of land owned	2.949	2.873	2.041	*0.864*	*0.009*
	(2.51)	(2.31)	(0.74)		
Ever adopted improved seeds (1=yes)	0.843	0.800	0.378	*0.576*	*0.000*
	(0.37)	(0.40)	(0.25)		
No. techniques ever used (out of 3)	0.735	0.809	0.700	*0.499*	*0.690*
	(0.57)	(0.50)	(0.24)		
Acres of land cultivated	1.583	1.763	1.159	*0.430*	*0.004*
	(1.09)	(1.36)	(0.26)		
Engaged in commercial agriculture (1=yes)	0.875	1.000	0.534	*0.334*	*0.006*
	(0.35)	(0.00)	(0.16)		
No. of observations	*60*	*60*	*2,626*		

Farmers connected to either agent are similar

	DA ties	CA ties	p-value
Age	42.11	40.85	0.214
	(14.86)	(16.24)	
Knows how to read and write	0.78	0.79	0.761
	(0.41)	(0.40)	
Completed primary school	0.42	0.47	0.168
	(0.49)	(0.50)	
No. of household members	5.59	5.57	0.923
	(2.27)	(2.22)	
Acres of land owned	2.47	2.55	0.840
	(4.57)	(5.15)	
Ever adopted improved seeds	0.22	0.23	0.908
	(0.42)	(0.42)	
No. techniques ever used (out of 3)	0.71	0.56	0.091
	(0.73)	(0.64)	
Acres of land cultivated	1.22	1.26	0.719
	(0.94)	(1.06)	
Engaged in commercial agriculture	0.52	0.56	0.415
	(0.50)	(0.50)	
Distance to DA (km)	1.43	2.17	0.060
	(3.34)	(6.84)	

FRAMEWORK

Set up

- T number of farmers differ along three dimensions:
  - their ties to the delivery agent a $\in$ [0,1]
  - their ties to the counterfactual agent c $\in$ [0,1]
  - their wealth w $\in$ [p,r]
- The agent maximizes her utility:
  - a monetary commission $\pi > 0$ for every farmer she treats
  - social benefit σ_{acw}
  - effort cost, increasing and convex in the total number of farmers treated
- The organisation aims to treat the poor

Solution

- The agent chooses how many farmers of class w and connection status t to treat to maximize

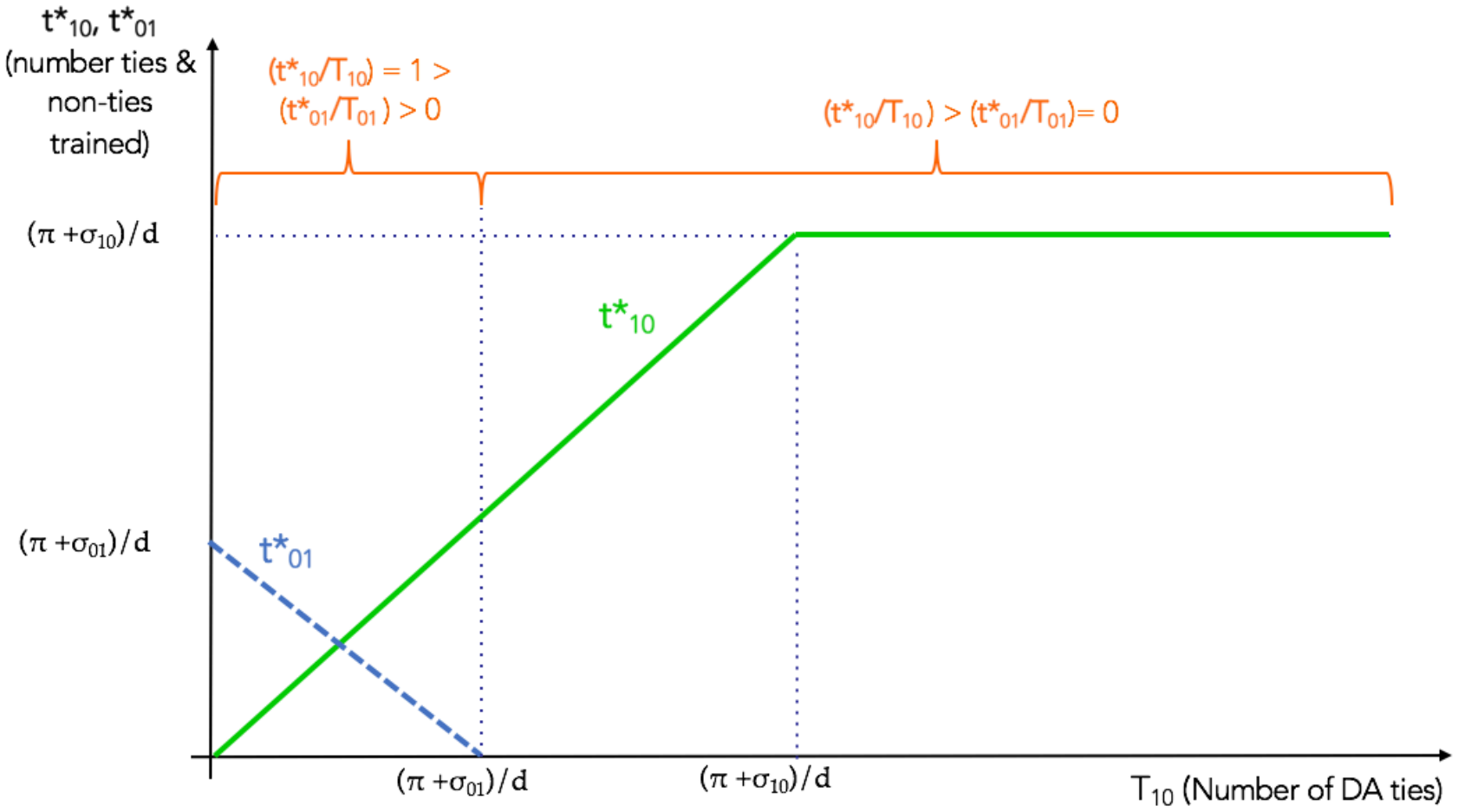
$$\sum_{w}\sum_{\tau}(\pi+\sigma_{\tau}^{w})t_{\tau}^{w}-\frac{d}{2}(\sum_{w}\sum_{\tau}t_{\tau}^{w})^{2}$$

solution is

$$t_{\tau}^{w*}=min[t_{\tau}^{w}(\sigma_{\tau}^{w});wT_{\tau}]$$

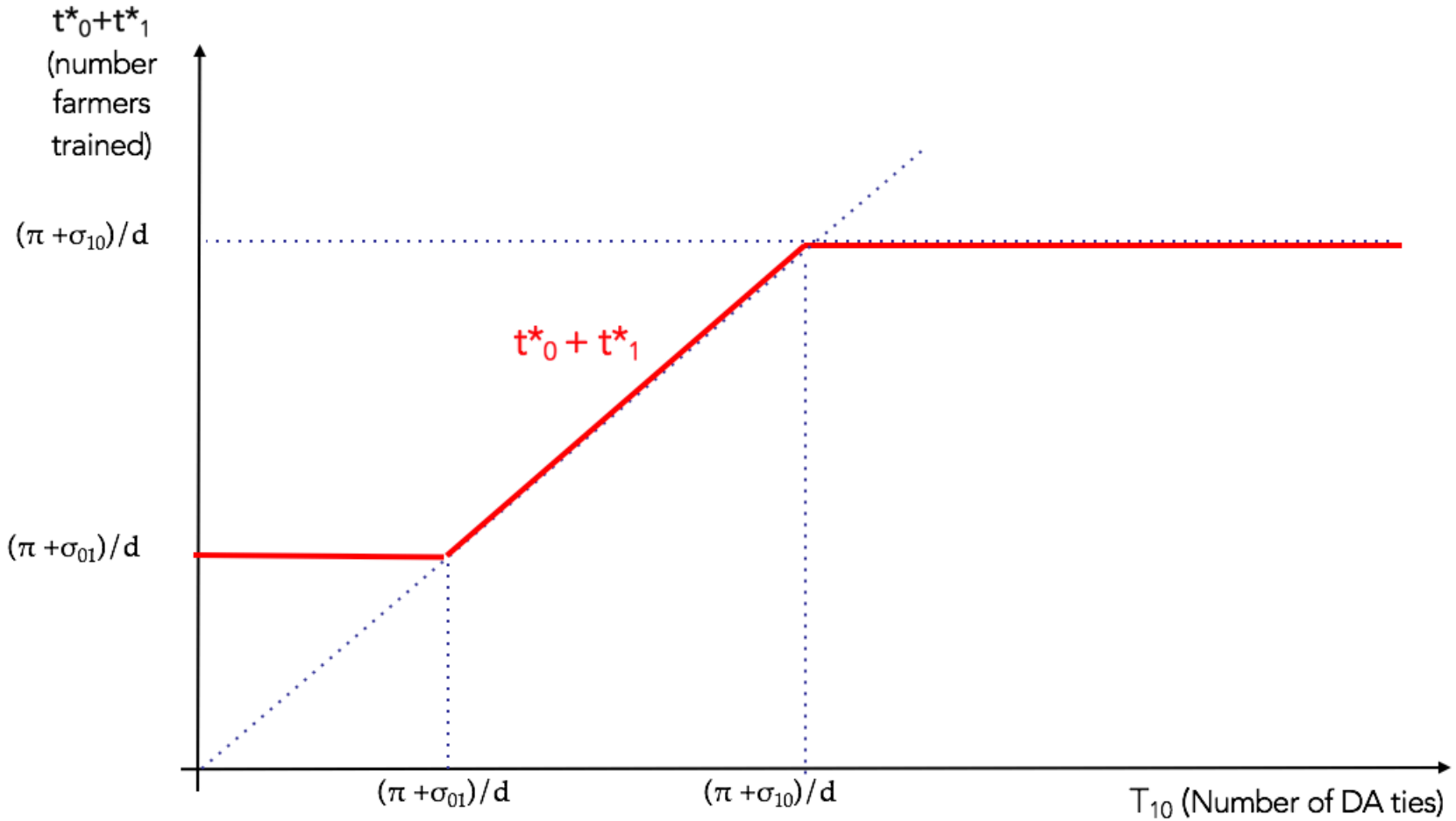
- The interest of the agents and the organization's are misaligned when $\sigma_{10\,r} > \sigma_{01p}$
- agency problem arises because the organisation cannot internalise the agent's preferences when setting the contract regardless of how ties affect utility

Bias: ties are more likely to be treated, other things equal



$T_{11}=T_{00}$ & $\sigma_{10\,r} = \sigma_{10p}$

Coverage: number of farmers treated is increasing in the number of DA ties



RESULTS

The effect of social ties

$$y_{iv} = \alpha + \gamma^{D} \text{DA tie}_i + \gamma^{C} \text{CA tie}_i + \gamma^{S} \text{Shared tie}_i + X_{iv}\delta + u_{iv}$$

- y_{iv}= 1 if farmer i is trained (adopts seeds) 2 years later
- X_{iv} = distance (in km) from respondent to DA, area FE
- Errors are clustered by connection status & village

$\triangle = (\gamma^{D} - \gamma^{C})$ is the causal effect of social ties

DA ties are 7.5pp more likely to be trained than CA ties

	(1)	(2)	(3)	(4)	(5)
		Adopted improved seeds in the last season from…			
	Was trained by the DA in the last year	DA	Other BRAC source	Non BRAC source	Average std effect on adoption of techniques in the last season
DA tie - CA tie	0.0748***	0.0514***	0.0159	-0.0074	0.2100**
	(0.03)	(0.02)	(0.02)	(0.02)	(0.09)
Observations	2,423	2,433	2,433	2,448	1,366
Mean in Omitted Group	0.014	0.012	0.012	0.031	-

no compensation

This is twice as large as the cross-sectional estimate

- experimental: ties vs counterfactual ties
- xsection: ties+ shared ties vs counterfactual ties + no ties

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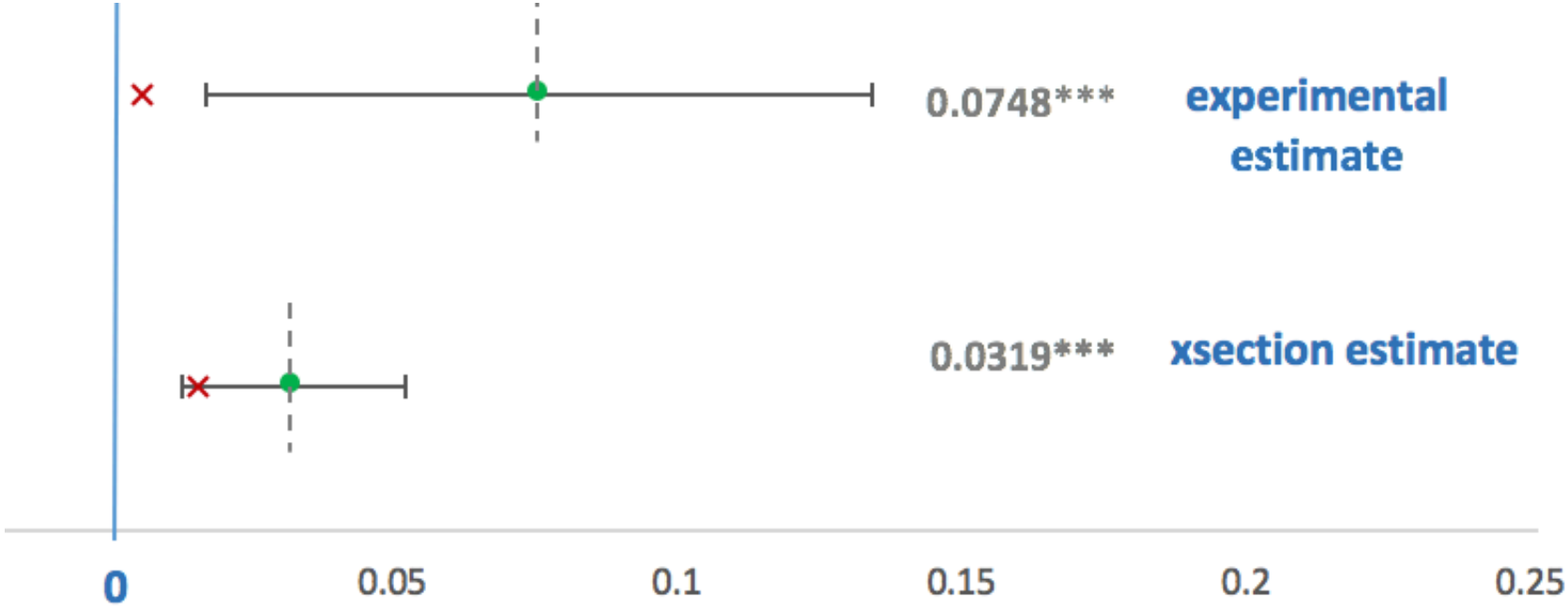

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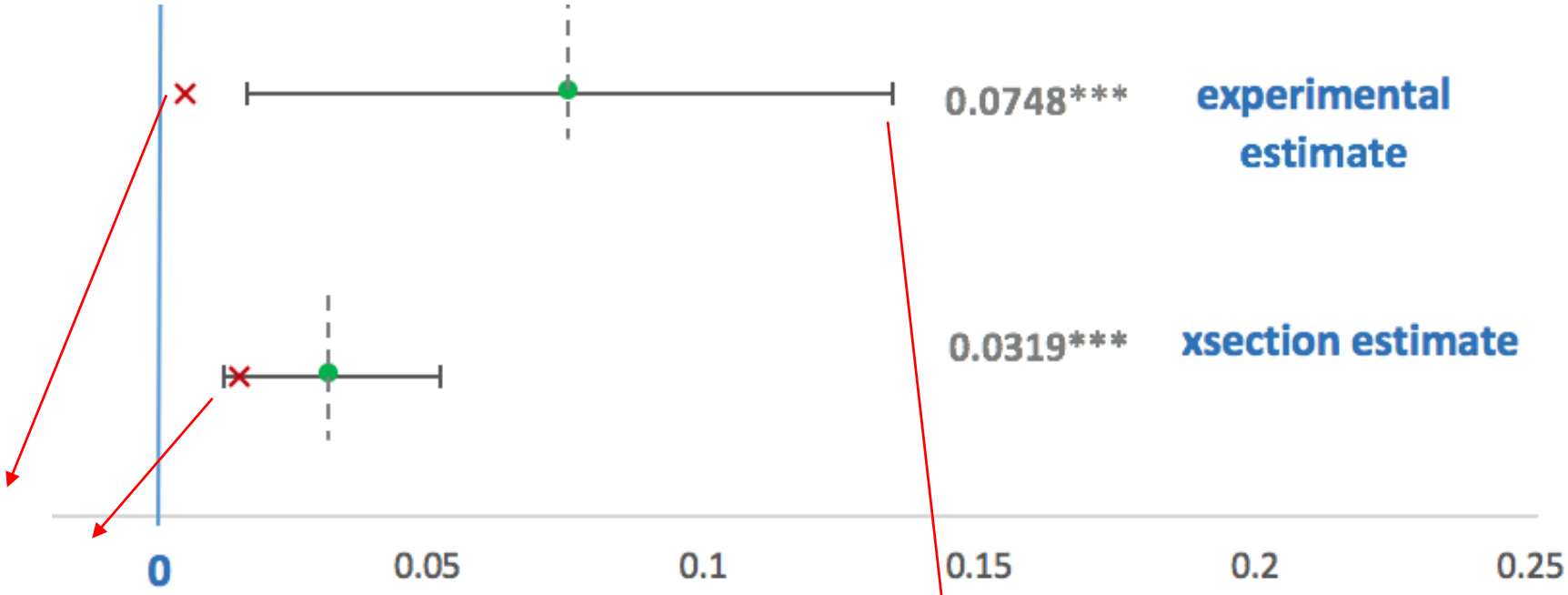
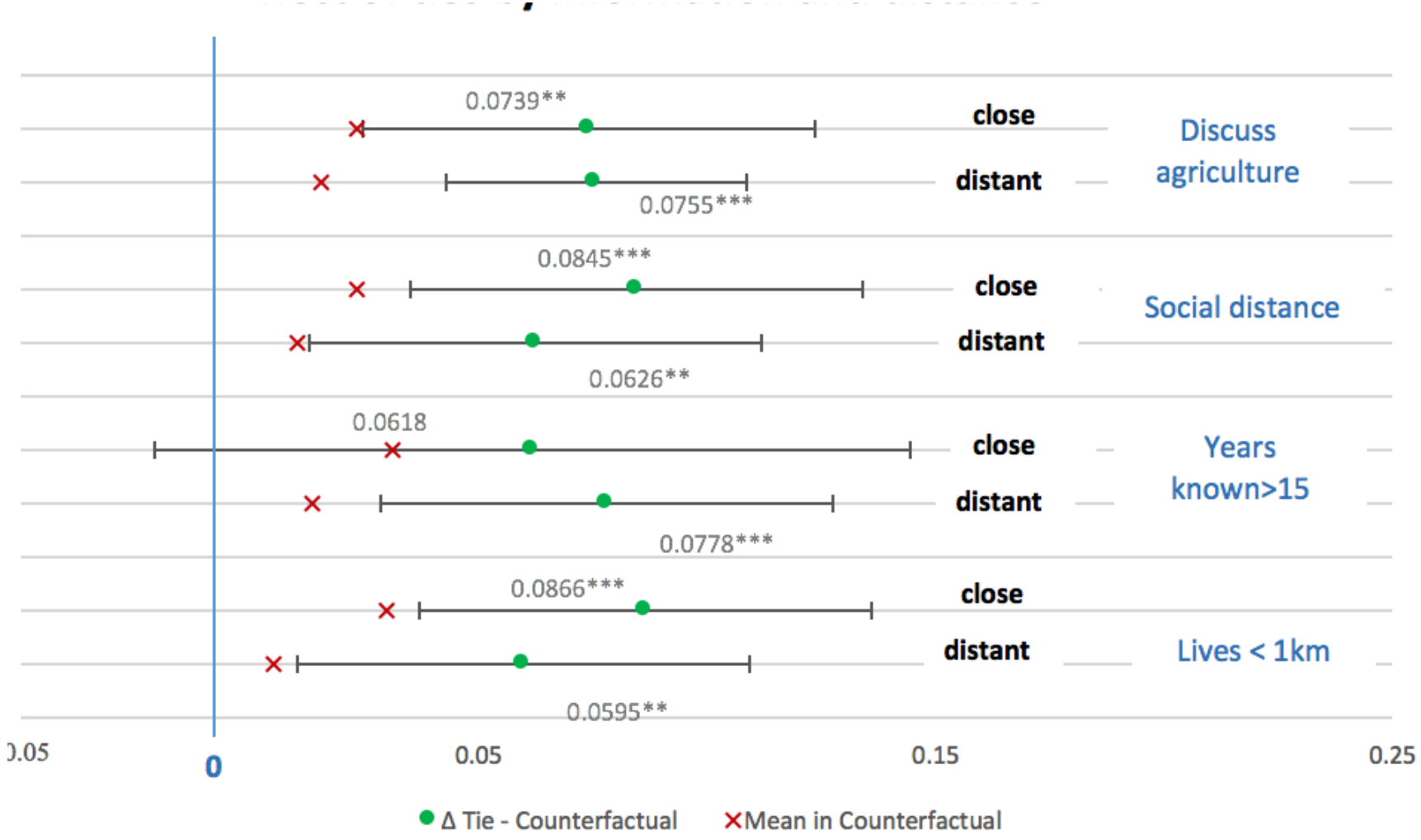
- experimental: ties vs counterfactual ties
- xsection: ties+ shared ties vs counterfactual ties + no ties



counterfactual ties are treated as no ties

shared ties are negatively selected OR the DA puts a negative weight on connections to the CA
H0: ties=shared ties p=.07

The DA favors her ties regardless of social or physical distance

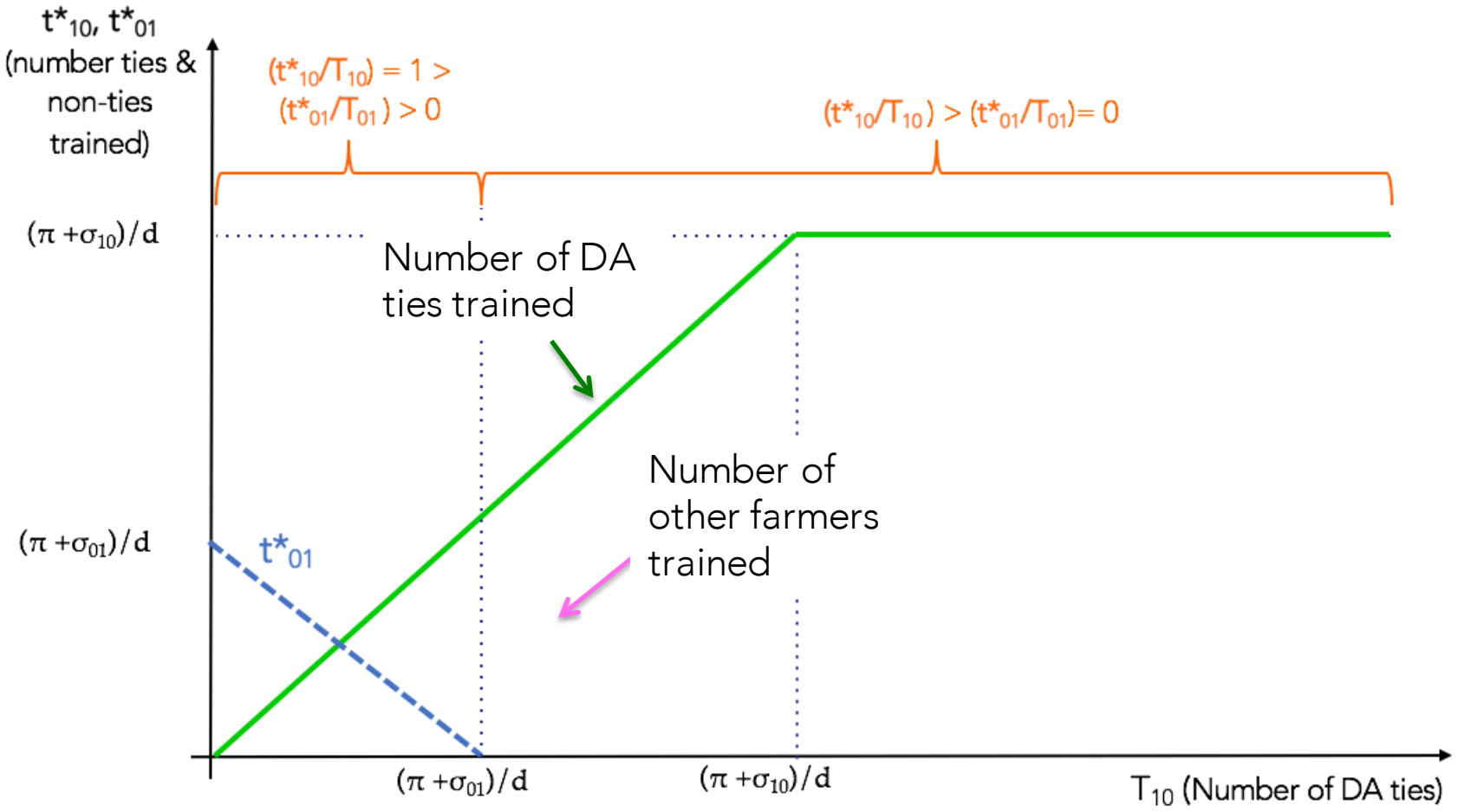


The effect of social ties on coverage and targeting

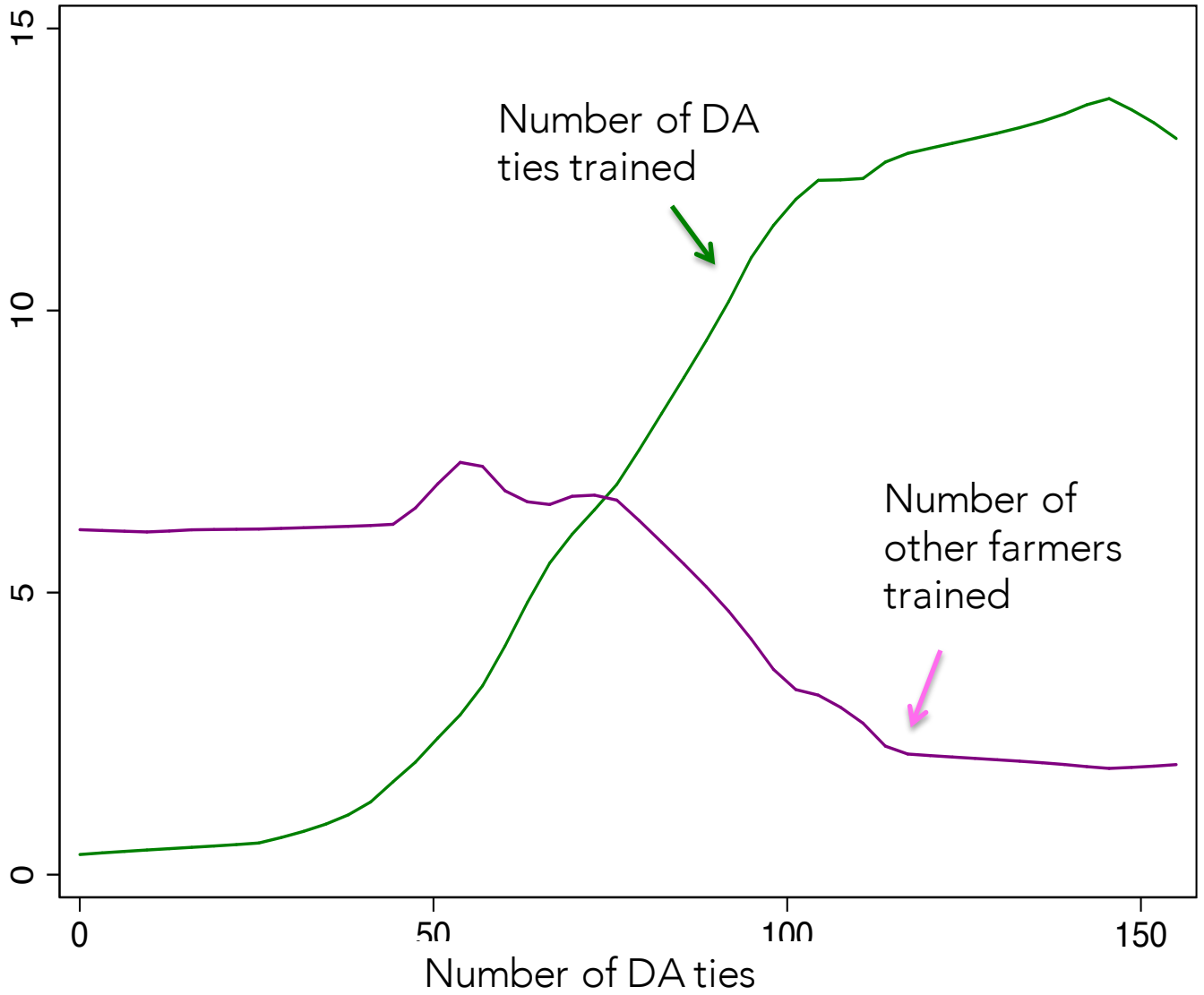
Explore effect of social ties on:

- Number of farmers trained (coverage)
- Pro-poor targeting

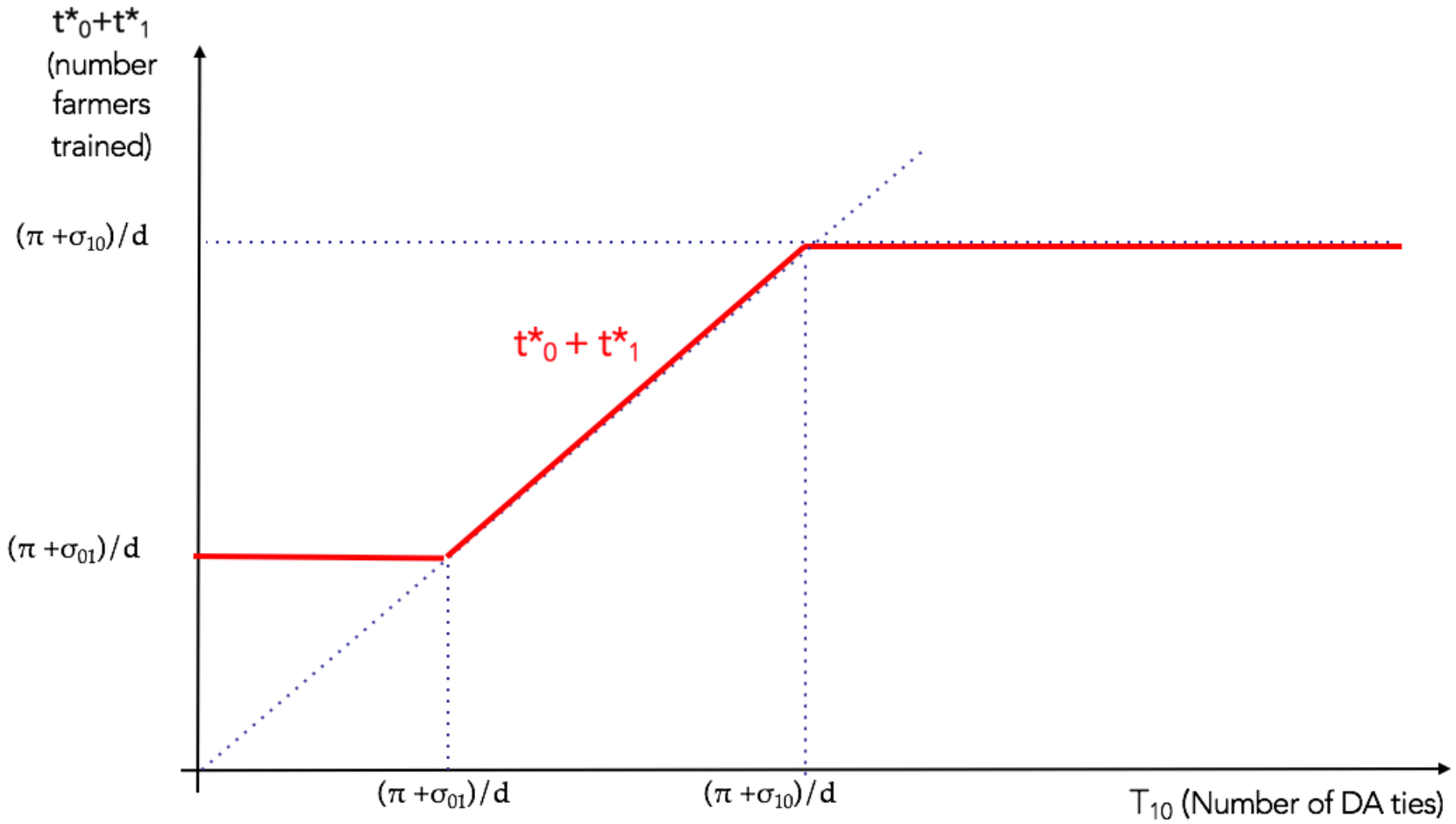
Coverage by tie status, in theory



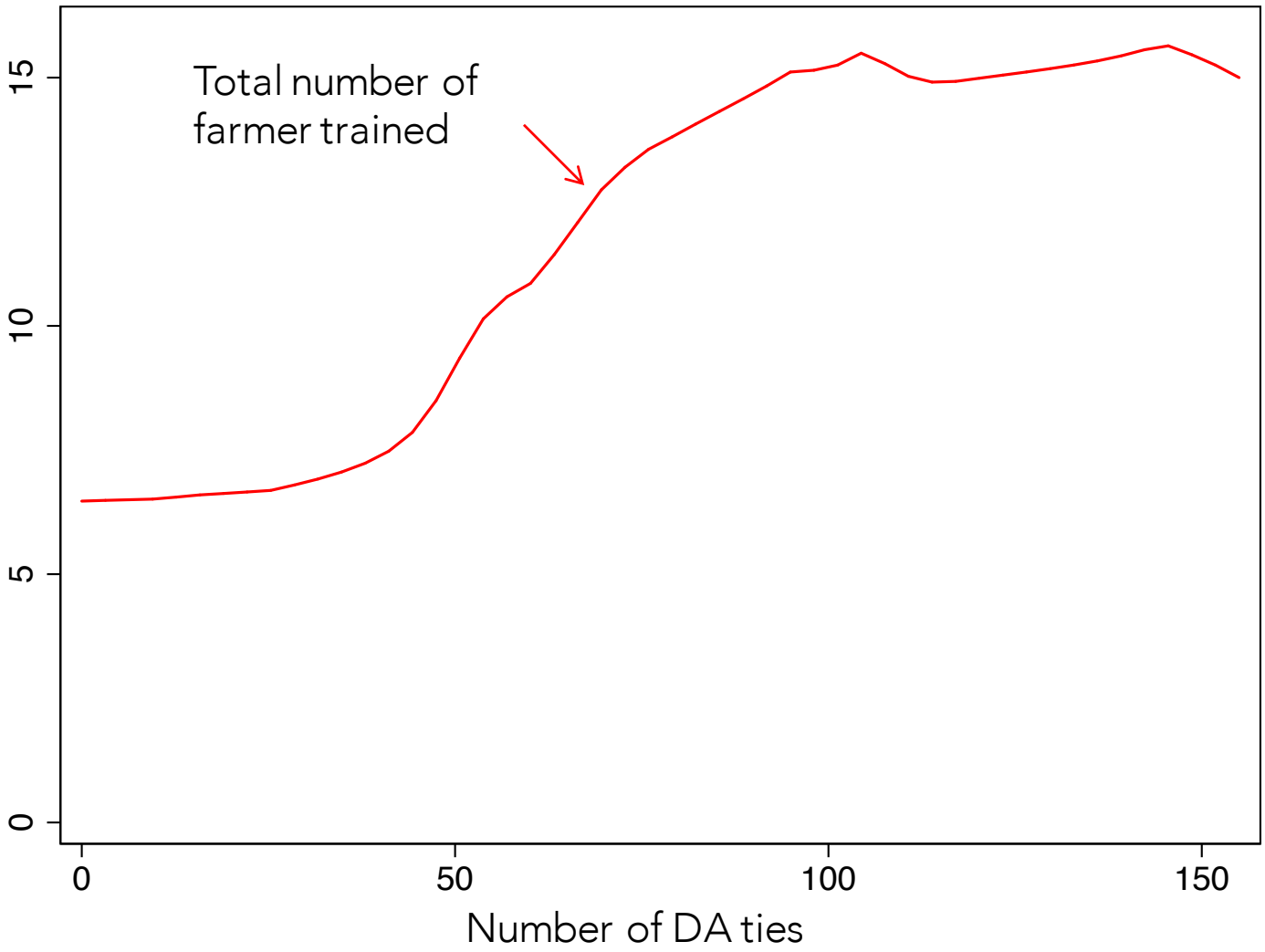
Coverage by tie status, data



Total coverage, theory

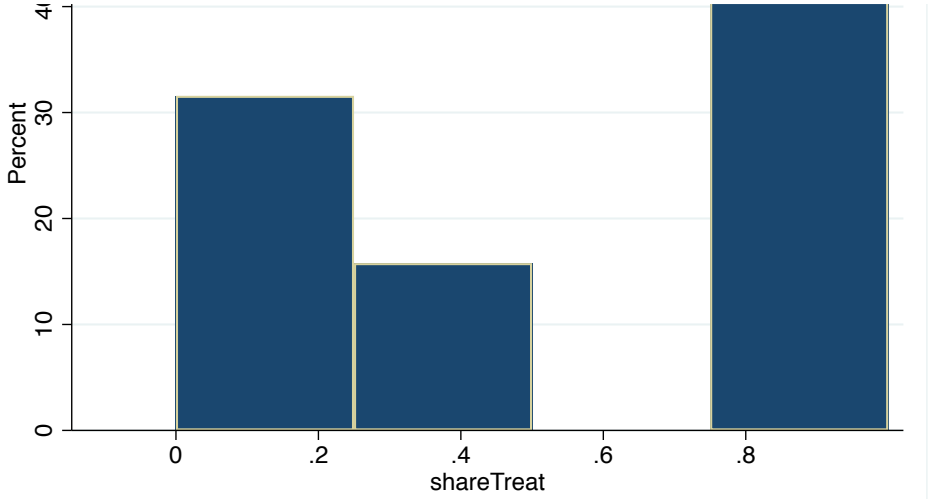


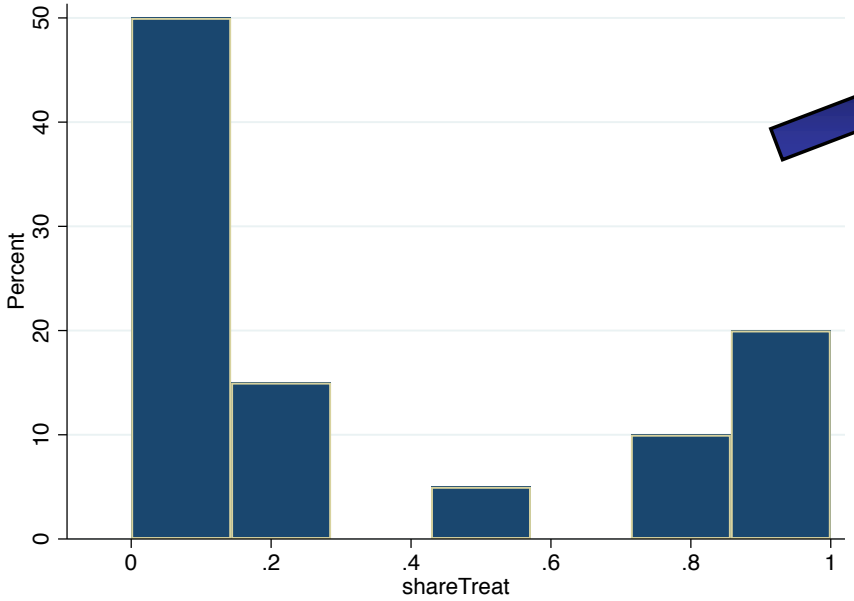
Total coverage, data



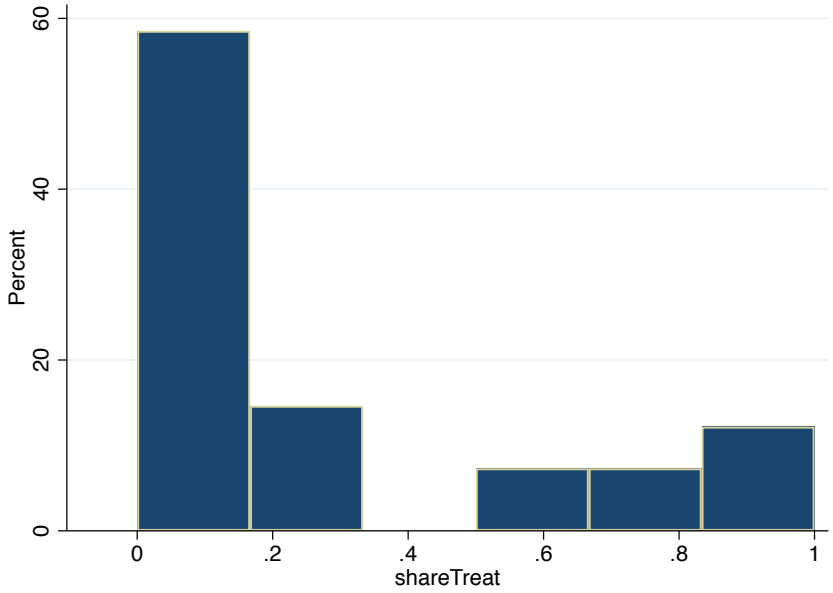
Number of DA ties explains variation in coverage

villages with ties>=20

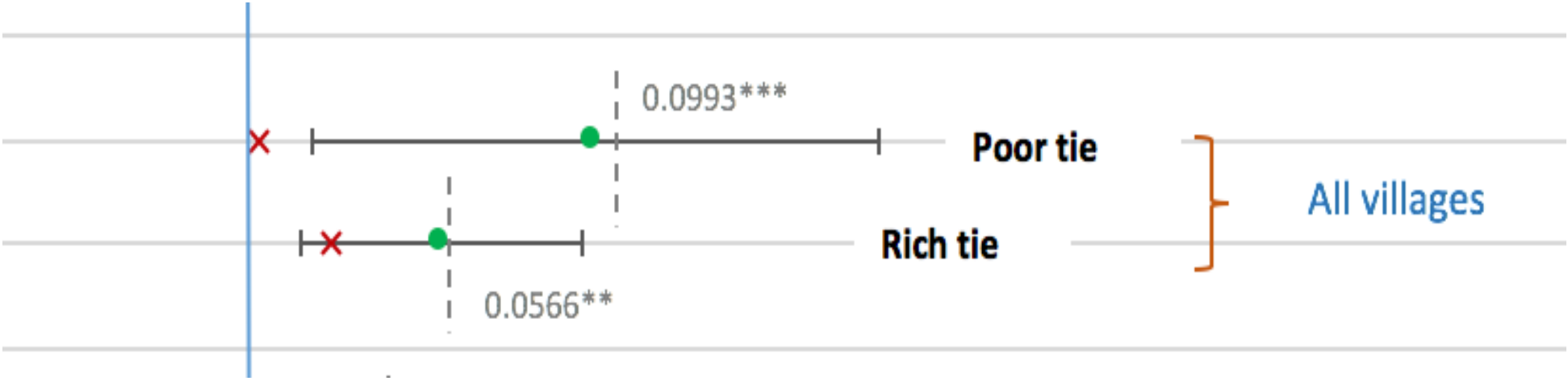




villages with ties<20



Targeting is biased



H0: Rich Tie=Poor Counterfactual p=.03

Treated beneficiaries are 2X richer than ideal beneficiaries

Compare actual allocation chosen by the DA to alternative allocations

Targeting method	Actual	Randomly chosen from the poorest 25%	Poorest	Ratio of actual to random targeting of poorest farmers
Share of trained who are…				
DA ties	0.24	0.13	0.11	1.8
CA ties	0.06	0.11	0.13	0.5
Shared ties	0.62	0.63	0.62	1.0
Baseline food consumption				
median	11.9	7.8	5.6	1.5
mean	17.2	8.3	5.8	2.1

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Uncovering social preferences

Can we reduce the bias while keeping the motivation effect?

Answer depends on whether social preferences are

- Independent: $d\sigma_{10}/d\sigma_{01}=0$ or
- Contagious: $d\sigma_{10}/d\sigma_{01}>0$
- Parochial: $d\sigma_{10}/d\sigma_{01}<0$

Theory: different comparative statistics wrt σ_{01}

Data: use variation in σ_{01} to uncover structure of social preferences

EMPIRICAL DESIGN

Group identity as a variation in σ_0

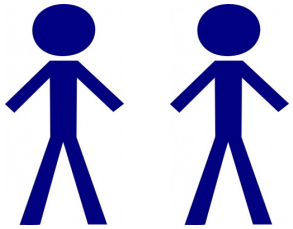
- Group identity is a key determinant of social preferences
  - Social identity theory (Tajfel and Turner 1979)
  - Lab evidence (Chen and Li 2008, Goette et al 2006, Bernhard et al 2006)

- Which group?
  - our identification comes from the comparison of ties to counterfactual ties → group 0
  - common group trait: tied to CA → use variation in CA identity to measure preferences for group 0

Use variation in identity alignment between DA & CA

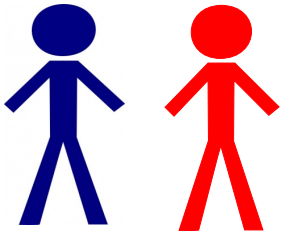
- Compare two types of villages:

Shared identity villages



Villages in which DA and CA have same identity

Different identity villages



Villages in which DA and CA have different identities

- Analysis in 3 steps

Step 1: Identify conflictual identity in our setting

Source of disagreement in the community? (respondent: village leader)	
Politics	61%
Religion	33%
Land	7%
Ethnicity / Tribe	0%
Beside being a citizen of Uganda, which specific group do you feel you belong to first and foremost? (respondent: village leader)	
Politics	95%
Other	5%

Politics is divisive; 2 main parties: NRM (incumbent) and FDC (runner-up)

=> Same identity = same political affiliation

Step 2 : Measure whether DA and CA share same identity

- We ask DA and CA whether they have same political affiliation (self-reported)
- We also ask them to take an Implicit Association Test (IAT) that tells us if they are biased towards NRM or FDC
  - 54% biased towards NRM
  - 46% biased towards FDC
- DA and CA support same party in 49% of the villages (as self-reported) and in 51% (based on IAT)
  - No overlap with religion and tribe

Step 3: Testing for the structure of social preferences

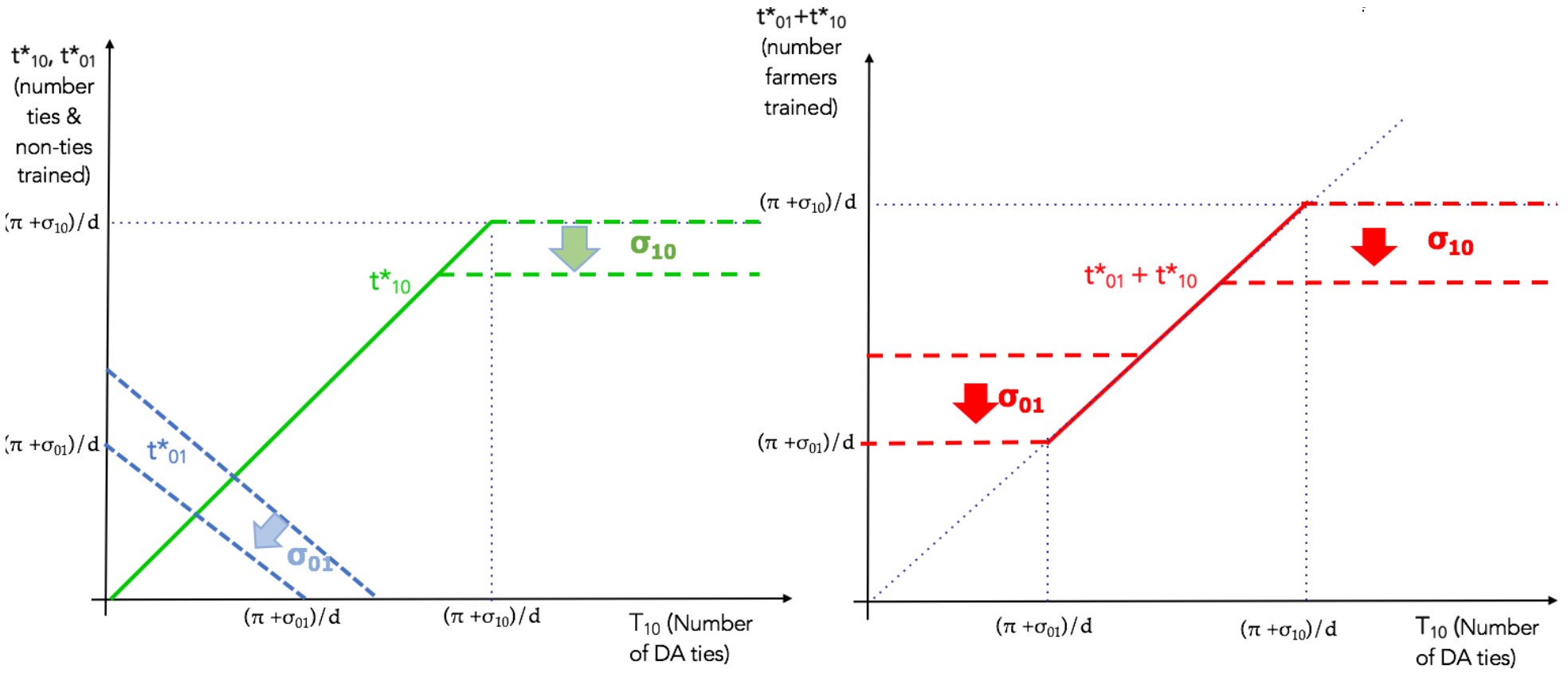
- Define p_1 (p_0) the probability that farmers in group 1 (0) is trained
- Define T_1 (T_0) coverage of group 1(0)

- We now split villages in two
  - those where DA and CA have same political identity
  - those where DA and CA have different political identity

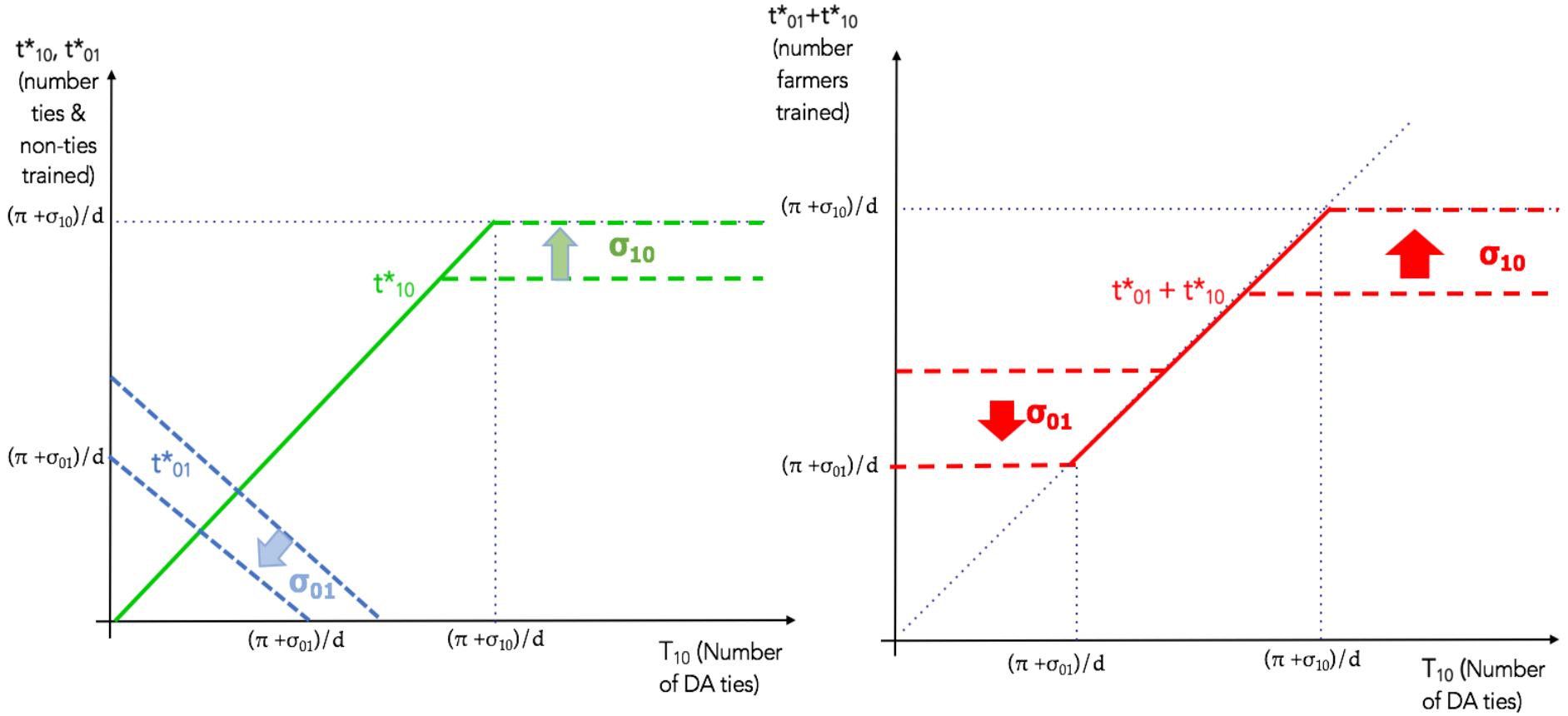
- Compare
  - bias $(p_1 - p_0)_S$ and $(p_1 - p_0)_D$
  - coverage $(T_D - T_S)_1$ vs $(T_D - T_S)_0$

- Different preferences have different implications for bias and coverage

Contagious altruism: divided identity reduces coverage of ties



Parochial altruism: divided identity increases coverage of ties

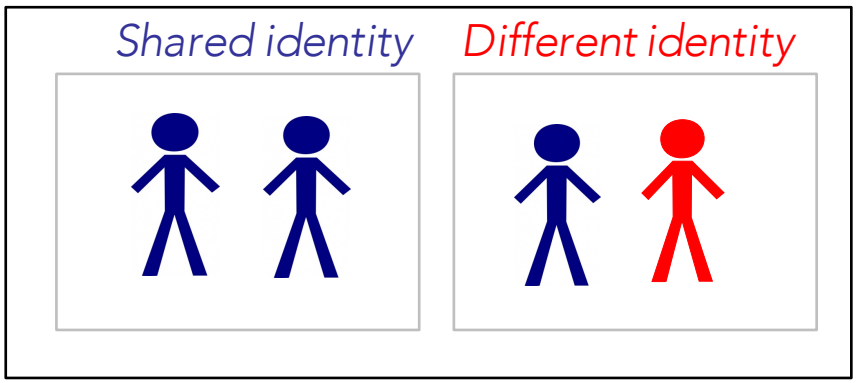


Correlated unobservables

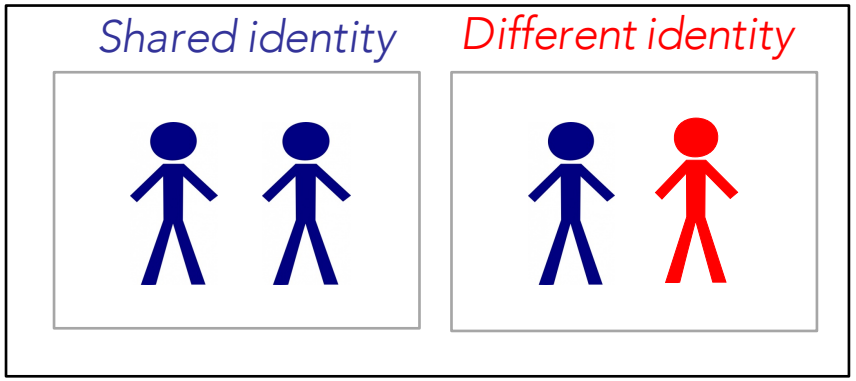
- Divided identity btw DA and CA may be correlated with more political/religious competition which itself affects delivery.

  1. Control for % votes for main party (using 2016 election data) or population share of main religion (using our census data)
  2. Estimate for polarised and non polarised villages separately (with endogenous polarisation threshold) – akin to "close elections id strategy)

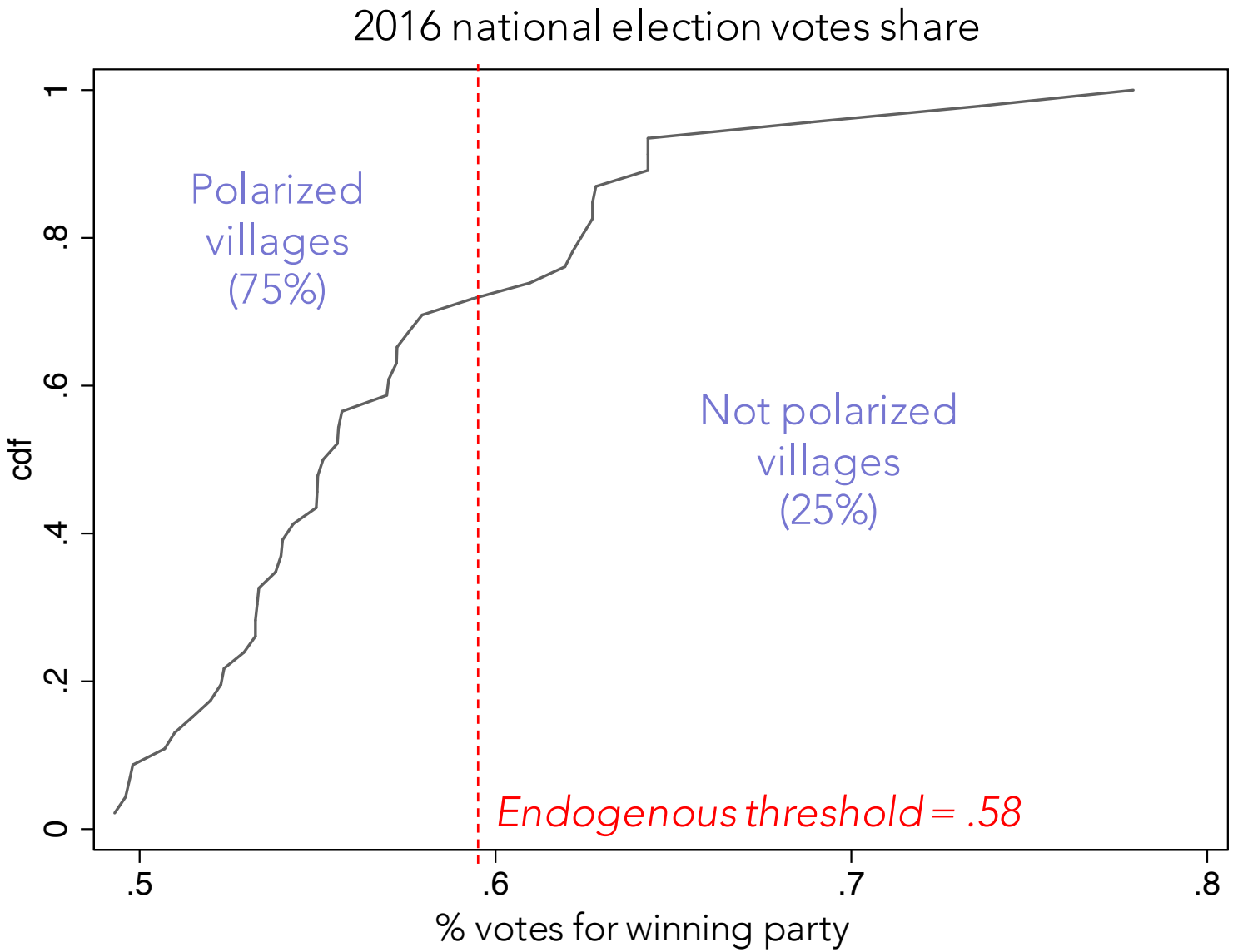
<u>Non-polarized villages</u>



<u>Polarized villages</u>



Politics is polarised in most villages



In line with this, DA-CA identity alignment is not correlated with village traits

	Politics		
	DA and CA have different identity	DA and CA have shared identity	*p-value*
Minutes to the BRAC branch (walking)	107.098	95.447	*0.472*
	(60.14)	(56.83)	
Minutes to closest market (walking)	69.381	77.761	*0.540*
	(50.09)	(48.82)	
Minutes to main road (walking)	1.844	2.479	*0.636*
	(3.36)	(6.02)	
Road usable during rainy season (1=yes)	0.584	0.487	*0.375*
	(0.39)	(0.41)	
Microfinance (=1 if available)	0.054	0.054	*0.993*
	(0.20)	(0.21)	
Farmer cooperative (=1 if available)	0.215	0.362	*0.134*
	(0.31)	(0.39)	
SACCOs (=1 if available)	0.466	0.366	*0.382*
	(0.44)	(0.39)	
Electricity (=1 if available)	0.460	0.409	*0.667*
	(0.43)	(0.43)	
Television broadcast (=1 if available)	0.665	0.687	*0.863*
	(0.46)	(0.46)	
Newspapers (=1 if available)	0.147	0.091	*0.479*
	(0.33)	(0.23)	
Mobile coverage (=1 if available)	0.789	0.658	*0.276*
	(0.39)	(0.48)	
No. of villages	26	27	

and neither are the traits of the DA

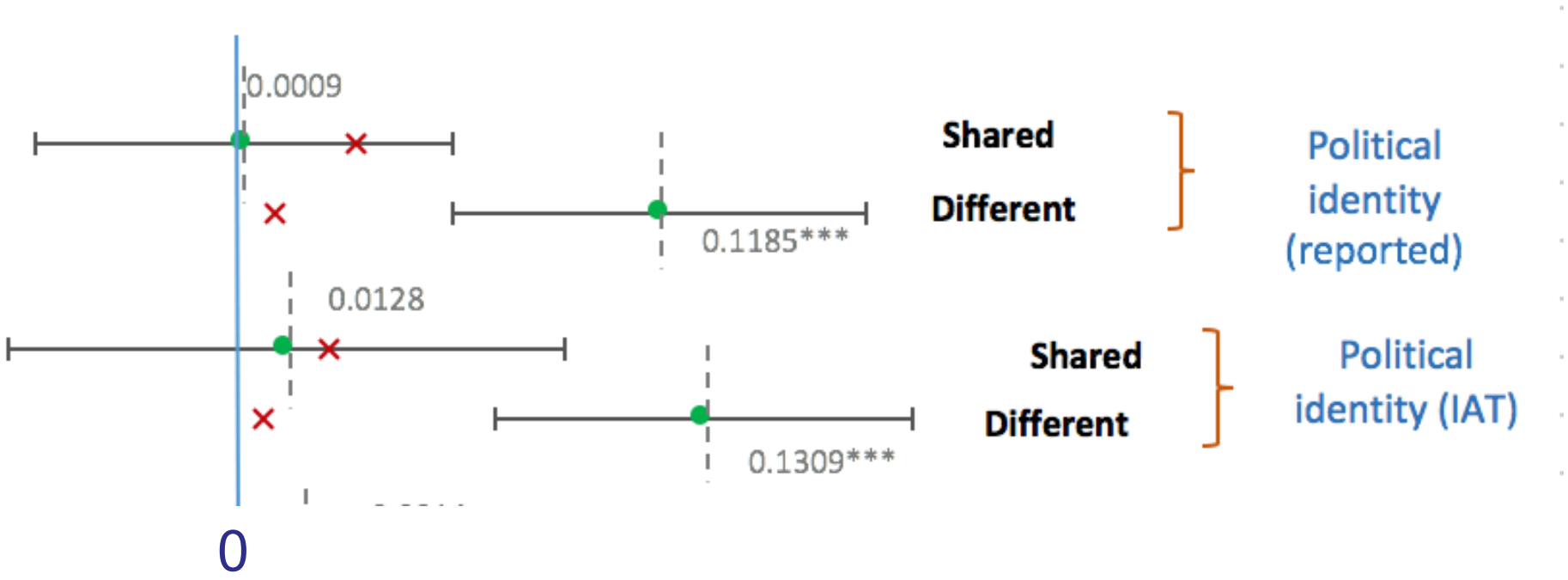
	Politics		
	DA and CA have different identity	DA and CA have shared identity	*p-value*
No. of villages	26	27	
DA traits			
Age	38.731	39.519	*0.752*
	(9.81)	(8.10)	
Completed primary school	0.577	0.667	*0.510*
	(0.50)	(0.48)	
No. of household members	5.500	6.481	*0.138*
	(1.73)	(2.89)	
Acres of land owned	2.760	3.389	*0.377*
	(2.13)	(2.92)	
Ever adopted improved seeds (1=yes)	(0.86)	(0.79)	*0.573*
	(0.36)	(0.41)	
No. techniques ever used (out of 3)	(0.61)	(0.80)	*0.259*
	(0.50)	(0.58)	
Acres of land cultivated	1.481	1.833	*0.241*
	(0.93)	(1.22)	
Engaged in commercial agriculture (1=yes)	0.923	0.667	*0.020*
	(0.27)	(0.48)	

There is variation in ties in both sets of villages

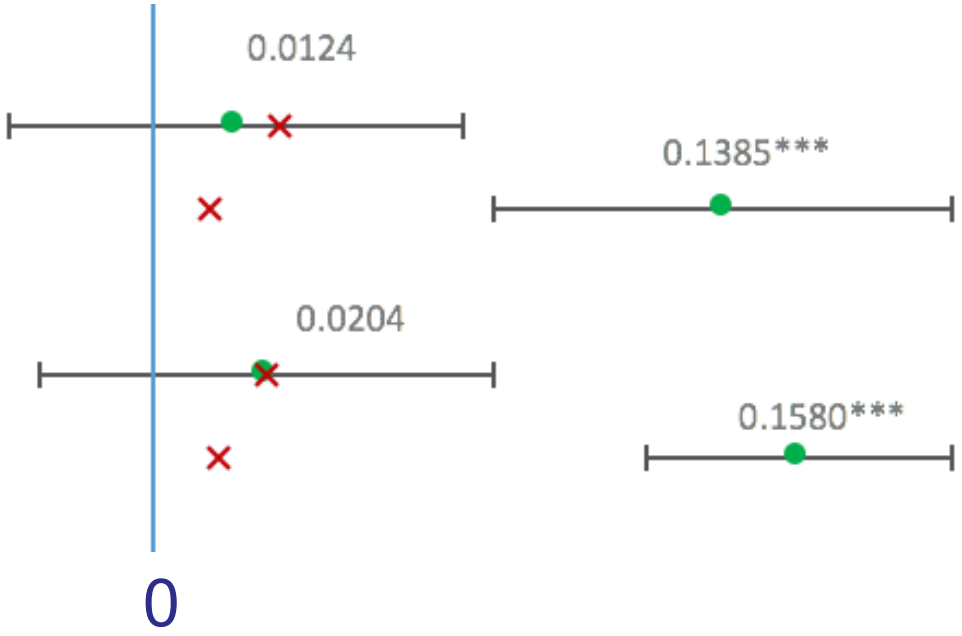
	Political identity		*p-value*
	Different	Same	
# DA Ties	5.577	3.667	*0.350*
	(8.60)	(5.81)	
# Counterfactual Ties	8.769	5.185	*0.200*
	(10.35)	(9.72)	
# Shared ties	21.462	25.519	*0.408*
	(15.04)	(20.11)	

RESULTS

Bias larger when the outgroup has different **political** identity



also restricting to polarised villages



Shared

Different

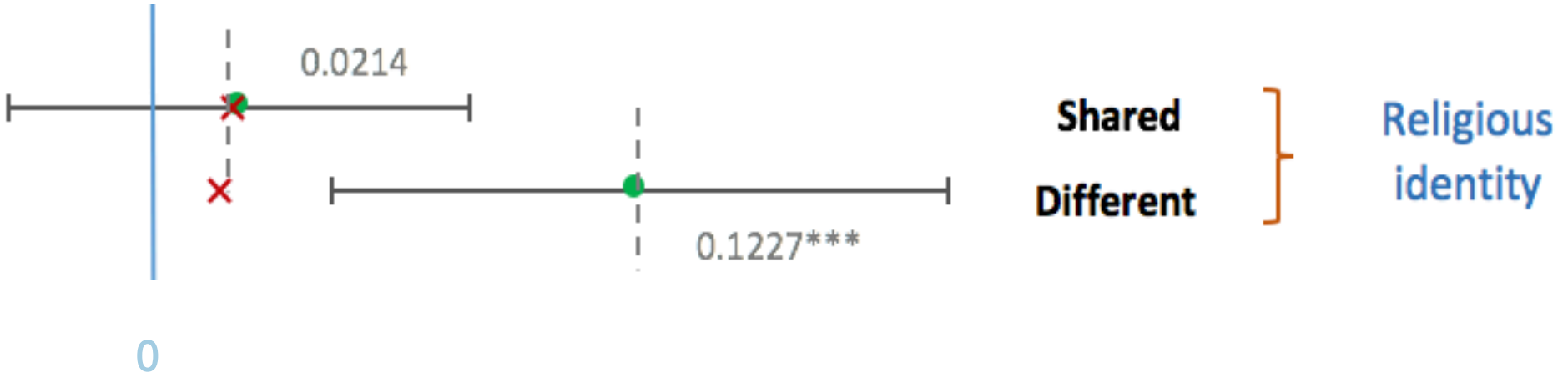
Political identity (SF) and competition

Shared

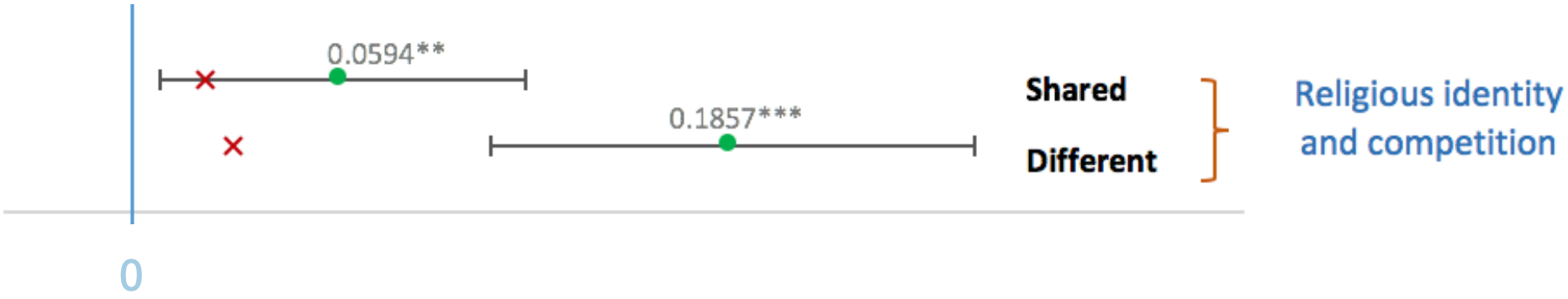
Different

Political identity (IAT) and competition

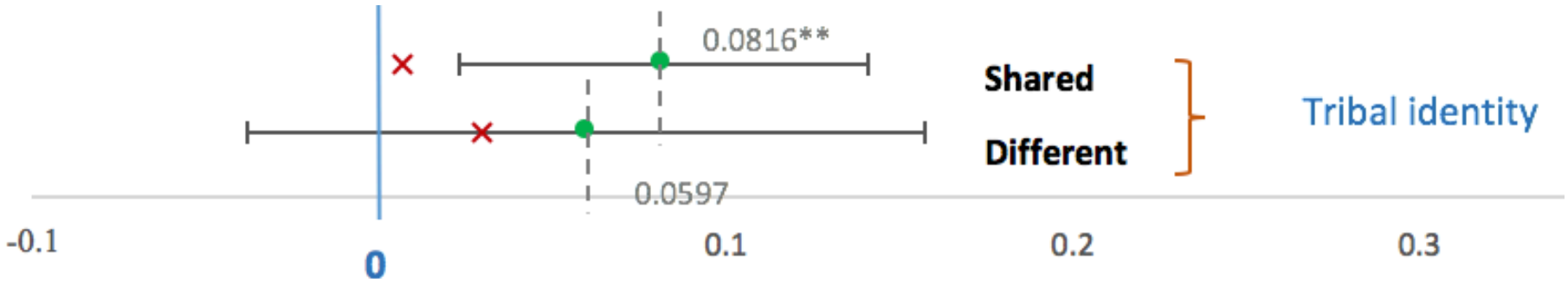
Bias larger when the outgroup has the same **religious** identity



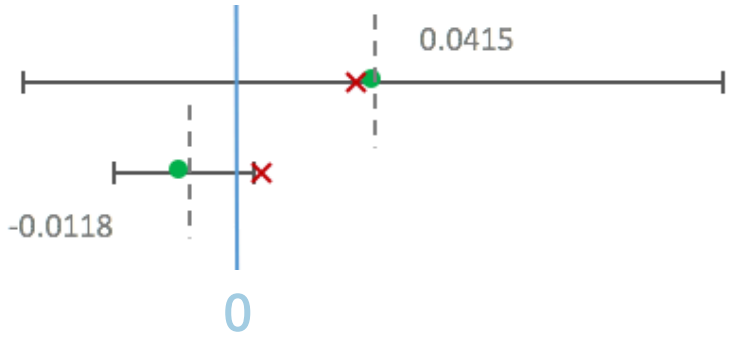
also restricting to polarised villages



Whilst non-conflictual identity makes no difference



With shared identity, DAs target the poor regardless of ties

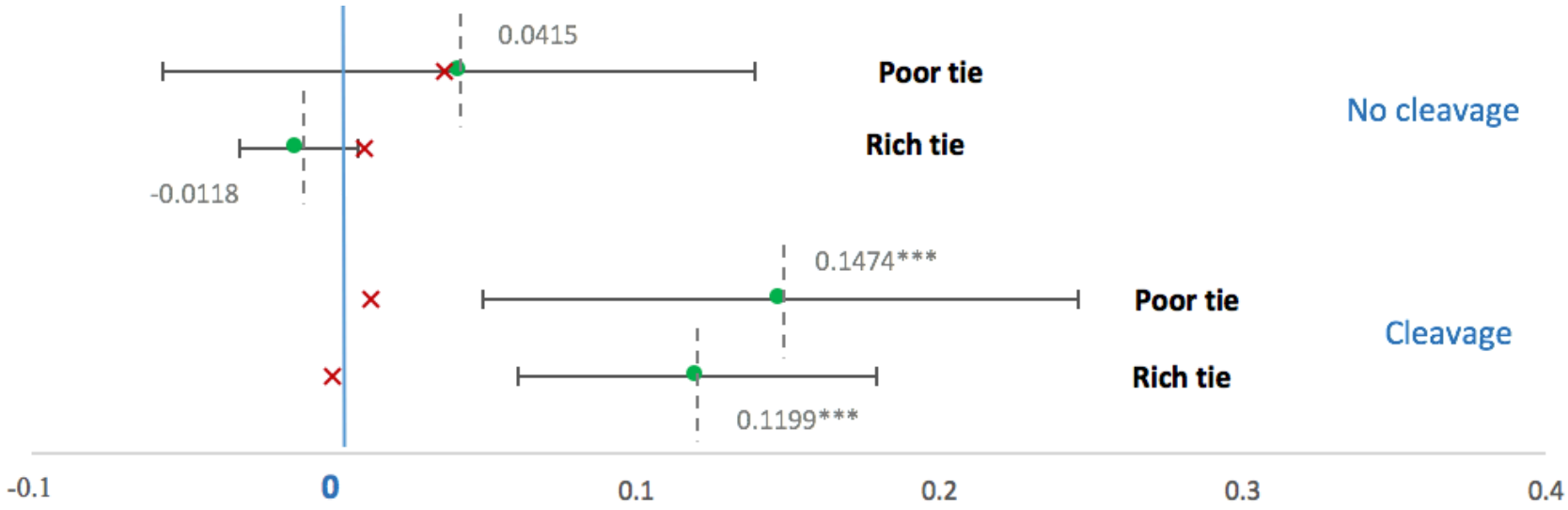


Poor tie

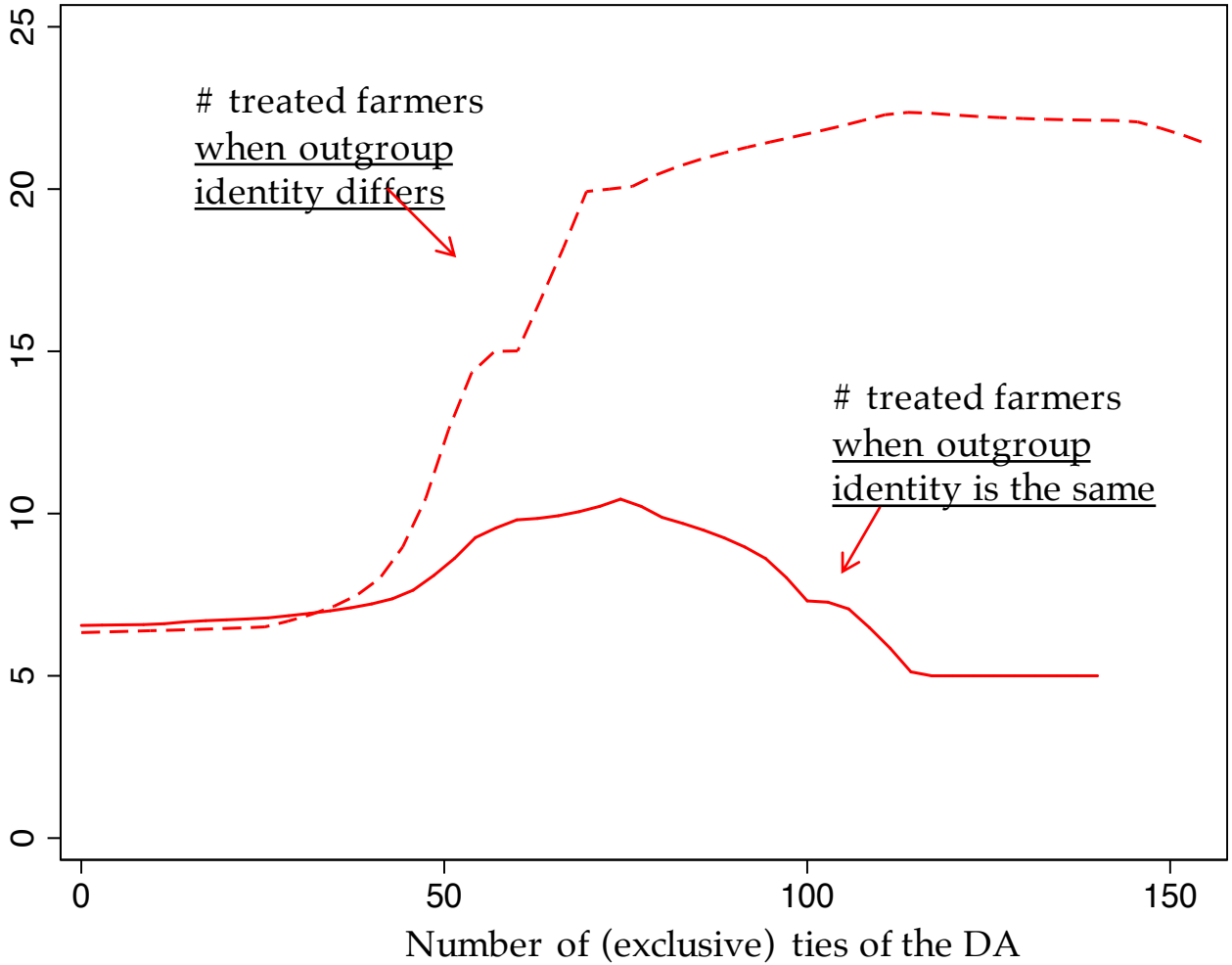
Rich tie

No cleavage

With different identity, DAs target their ties regardless of wealth



Total coverage and bias go hand in hand



Conclusions

- The effect of social ties depends on whether outgroup has a distinct identity over a conflictual dimension (here politics and religion)
- If yes, social ties increase coverage but worsen targeting
- If not, there is no bias but no coverage effect either

→ social preferences are interdependent: motivation to help one's friends comes from the existence of "enemies"

Implications for future research

1. Diversity
   - Established channel: diversity lowers cooperation
   - New channel: diversity reduces cooperation across groups but increases cooperation within group

2. Network structure
   - Current focus: number of links of potential DA
   - New focus: "negative" links can matter as much
   - I.e. it's not just whether you are connected to the delivery agent, but also who else you are and are *not* connected to

Policy implications

- Appointing agents with a large network is only effective if they have a motive to help – in this case the desire to exclude the outgroup
- Appointing one delivery agent per group might backfire if agents are solely motivated to help the in-group to spite the out-group

Do we have to rely on negative preferences?

- Evidence from other settings indicates that higher powered incentives can mute the effect of ties (beneficial crowding out)