

False positives and false negatives in distributive choices

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- Major tensions in the welfare debate concern how to handle situations in which we are unable to distinguish between those who are *deserving* and those who are *undeserving*.
- Two types of mistakes:
 - **false positives**: giving support to those who do not deserve it
 - **false negatives**: not giving support to those who deserve it
- An important question is how people handle the trade-off between these two types of mistakes.

- The trade-off between false positives and false negatives is fundamental in the design of welfare policies, in particular when deciding on eligibility criteria and documentation requirements.
 - Unemployment benefits
 - Social welfare
 - Disability pensions
- Evidence suggests that both false positives (e.g. benefit fraud) and false negatives (e.g. non-take-up) are substantial problems for welfare policy.
- The trade-off is also present in many other policy areas, including the justice system and immigration.

A new dimension of social preferences

- Even if people agree on who is deserving and who is undeserving, people may disagree on how to make the trade-off between false positives and false negatives.
- A dimension of social preferences not yet studied in experimental economics.
 - Some studies on the effect of mistakes when participants punish/reward in public goods games (Magnussen et al 2014).

Main research question

- How do people make trade-offs between false positives and false negatives in distributive choices?

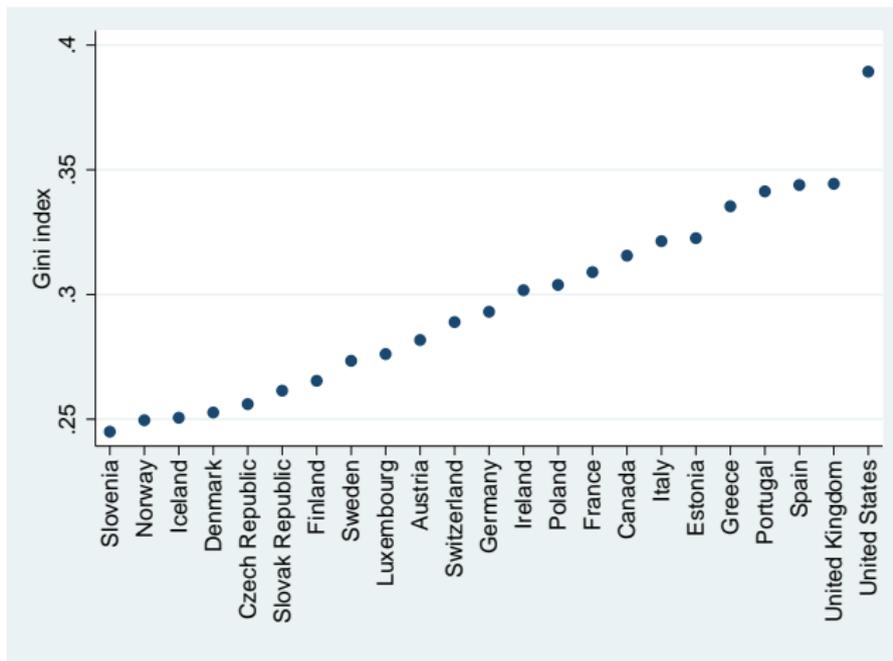
Heterogeneity

- Are right-wing voters more concerned with avoiding false positives than left-wing voters?
- Are Americans more concerned with avoiding false positives than people from a more egalitarian country, Norway?

Democrats versus Republicans



US versus Norway



Plan for the rest of the presentation

- Experimental design
- Main results
- Heterogeneity
- Conclusion

Main features of the design

- **Experimental design: Spectators** decide how to distribute money between two groups of **workers**, where some workers in one of the groups have falsely reported to have worked.
- **Workers** recruited through an international online labor market (mturk).
- **Spectators** recruited through an international data-collection agency (Research Now/Norstat).

Why do we use a spectator design?

- What are the advantages/disadvantages of using a spectator design when studying social preferences?
 - Can be difficult to disentangle self-interest from other concerns when you study stakeholder decisions.
 - Are spectators incentivized? Yes: on the "moral margin".

Why do we recruit participants in this way?

- Very difficult to get a nationally representative sample in the lab.
- We want the spectators in both countries to make decisions for the same stakeholders.

Design: workers

- We recruited 2000 workers from Amazon Mechanical Turk (mTurk) who were promised a participation fee and told that they could earn additional money.
- The workers were given the opportunity to complete an assignment requiring them to work continuously for a certain period of time.
- Alternatively, they could falsely report that they had done the assignment without actually having done so.

Design: workers

We now want you to make a choice between the two following alternatives:

A. *Do a 15 minutes word unscrambling assignment. Your performance will not be measured as there is no right or wrong answer, but we expect you to work continuously on the assignment.*

B. *Report to have done the 15 minutes word unscrambling assignment without doing it. Your fixed participation fee does not depend on whether you choose A or B.*

Your bonus payment may depend on whether you choose A or B. Your bonus payment is determined by a randomly selected third person. This person will have a sum of money to distribute among you and other participants in this study, and will not be able to distinguish between some of those who have done the assignment and those who have only reported to have done the assignment. You may therefore get paid a bonus both if you choose A and if you choose B.

Below we want you to indicate your choice.

Design: spectators

- We recruited 2000 participants who are nationally representative (+ 18 years old, 1000 from USA and 1000 from Norway) on observable characteristics to act as spectators.
- The spectators determined the distribution of 16 USD between two groups of four workers: in the first group all workers had done the assignment, but in the second group a number of workers had falsely reported to have done the assignment.
- Two alternative distributions:
 - To give all the money to the first group, in which case the workers in the first group each received 4 USD and the workers in the other group received nothing.
 - To distribute the money equally between the two groups, in which case all eight workers received 2 USD.

Design: treatments

- Five treatments, between subject design, where we vary the number of cheaters in the second group from zero to four.
 - No uncertainty about the number of cheaters.
 - Identical distributive situations in both countries.
- The design identifies the importance attached to giving to those who are deserving relative to not giving to those who are undeserving.

The zero cheaters treatment

In contrast to traditional survey questions that concern hypothetical situations, we now ask you to make a choice that could have consequences for a real life situation.

A few days ago, we recruited people via an international online market place and gave them the opportunity to complete an assignment. The assignment was a simple task where the participants were required to work continuously for a certain period of time.

Everyone also got the opportunity to falsely report that they had done the assignment without actually having done it. Those who made this choice did not do any other work.

The zero cheaters treatment

We want you to decide how to distribute 16 USD between 8 of the recruited individuals. Your decision may be selected to determine the payments to the 8 individuals; it thus could have real life consequences. All of the 8 individuals did the assignment, and no one falsely reported to have done the assignment. You can choose between two ways of distributing the money. Please mark below which alternative you prefer:

Alternative A: *Give 4 USD to 4 of the individuals and nothing to the other 4 individuals. This means that 4 individuals who did the assignment are not paid.*

Alternative B: *Give 2 USD to each of the 8 individuals.*

The four cheaters treatment

....

We want you to decide how to distribute 16 USD between 8 of the recruited individuals. 4 of the individuals did the assignment, and 4 falsely reported to have done the assignment. You can choose between two ways of distributing the money. Please mark below which alternative you prefer:

Alternative A: *Give 4 USD to 4 of the individuals who did the assignment and nothing to the other 4 individuals who falsely reported to have done the assignment.*

Alternative B: *Give 2 USD to each of the 8 individuals. This means that the 4 individuals who falsely reported to have done the assignment are paid.*

The two cheaters treatment

....

We want you to decide how to distribute 16 USD between 8 of the recruited individuals. 6 of them did the assignment and 2 falsely reported to have done the assignment. You can choose between two ways of distributing the money and your choice may be selected to determine the payments to the 8 individuals. Please mark below which option you prefer:

Alternative A: *Give 4 USD to 4 of the individuals who did the assignment and nothing to the other 4 individuals. This means that 2 individuals who did the assignment are not paid.*

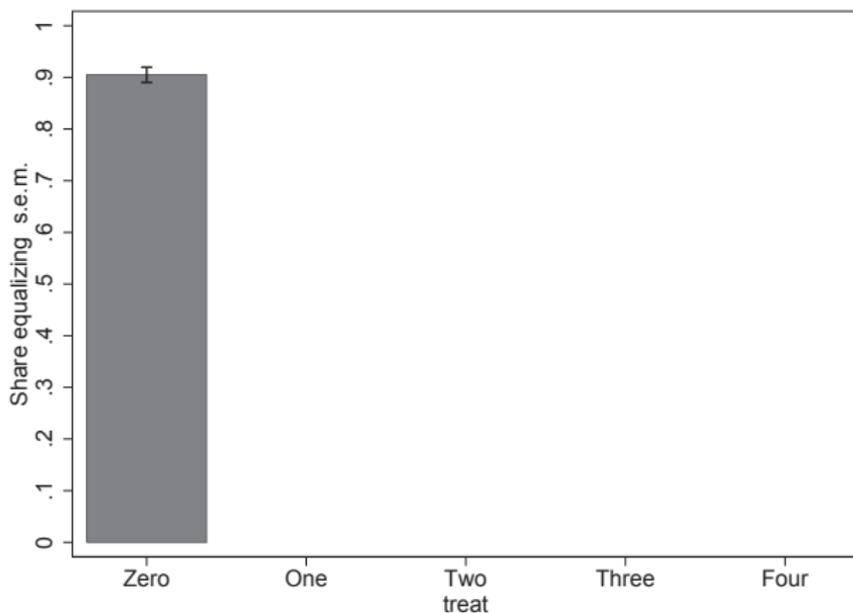
Alternative B: *Give 2 USD to each of the 8 individuals. This means that the 2 individual who falsely reported to have done the assignment are paid.*

Design: summary

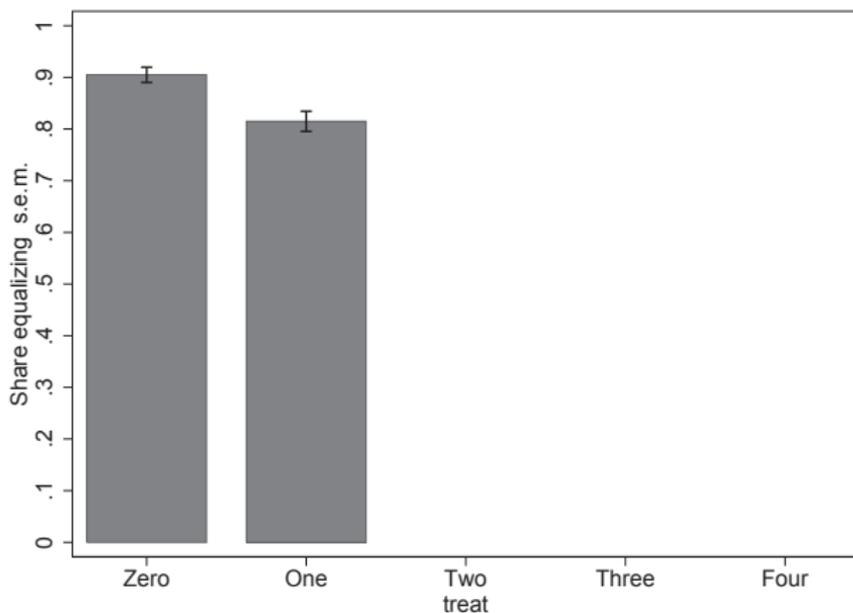
- Spectators had to choose between an alternative that involved not giving to some who was deserving (false negatives) and an alternative that involved giving to someone who was undeserving (false positives).
- The only treatment variation is with respect to the number of cheaters, C , which determines the number of false negatives and false positives.
 - The number of false negatives if alternative A is chosen is four minus the number of cheaters, $4 - C$.
 - The number of false positives if alternative B is chosen is the number of cheaters, C .

- The majority of workers, 52.7 percent, chose to complete the assignment.
- A large minority, 47.3 percent, reported to have completed the assignment without having done so.

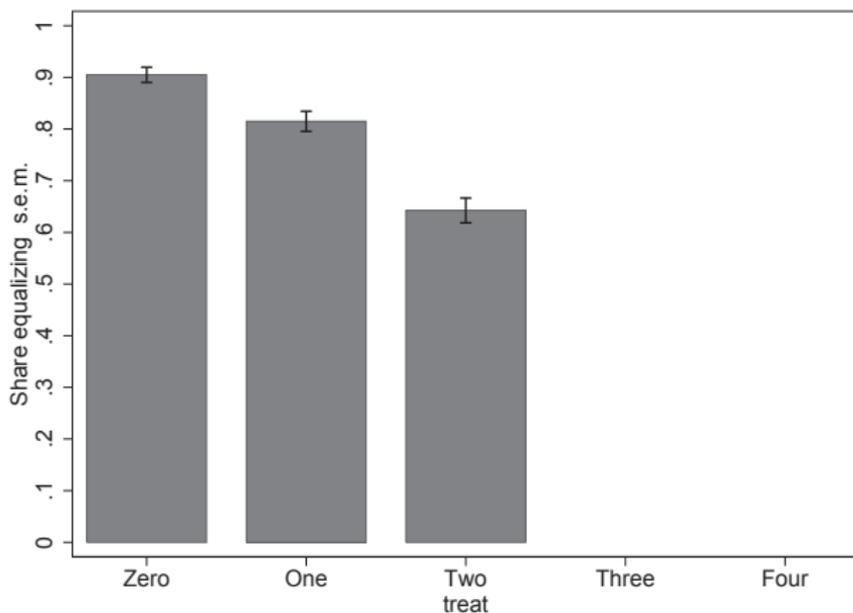
Share of spectators who equalize by treatment



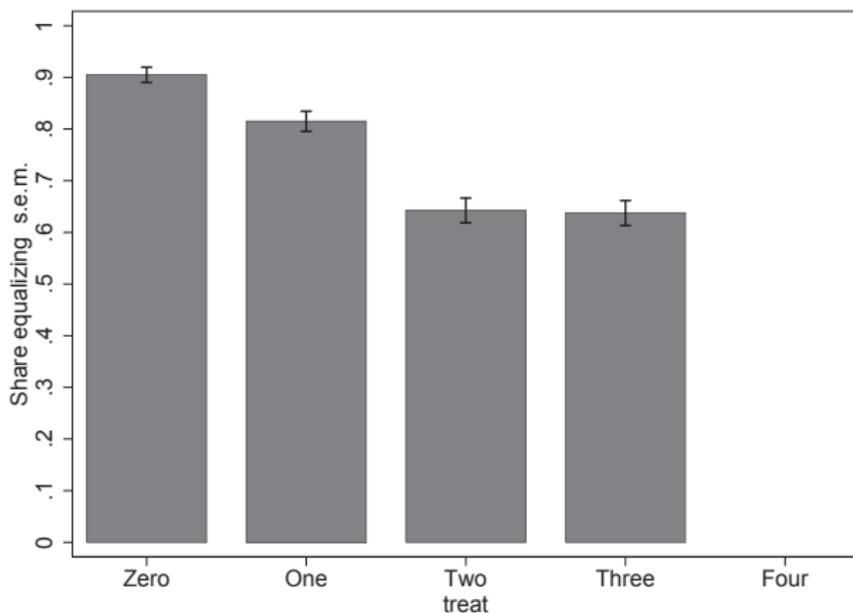
Share of spectators who equalize by treatment



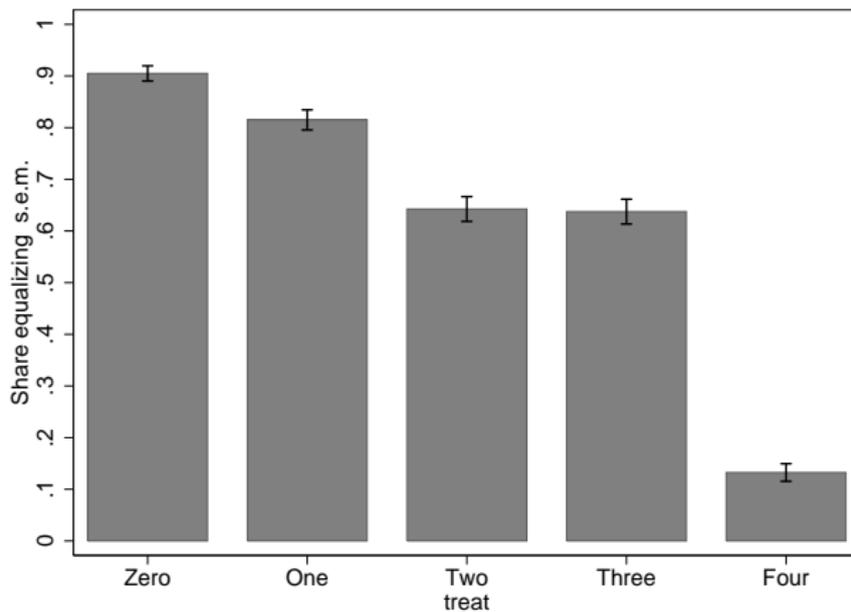
Share of spectators who equalize by treatment



Share of spectators who equalize by treatment



Share of spectators who equalize by treatment



- We can classify people based on whether they strictly place more weight on false positives than on false negatives. In doing so we only rely on treatment 2 and treatment 4.
 - We define someone as a *false positive averse* if he or she is willing to accept three false negatives in order to avoid one false positive. These are people who choose not to equalize in treatment 2.
 - We define someone as a *false negative averse* if he or she is willing to accept three false positives in order to avoid one false negative. These are people who choose to equalize in treatment 4.
 - We define the remaining individuals as *Intermediate*.

Table: Share of types

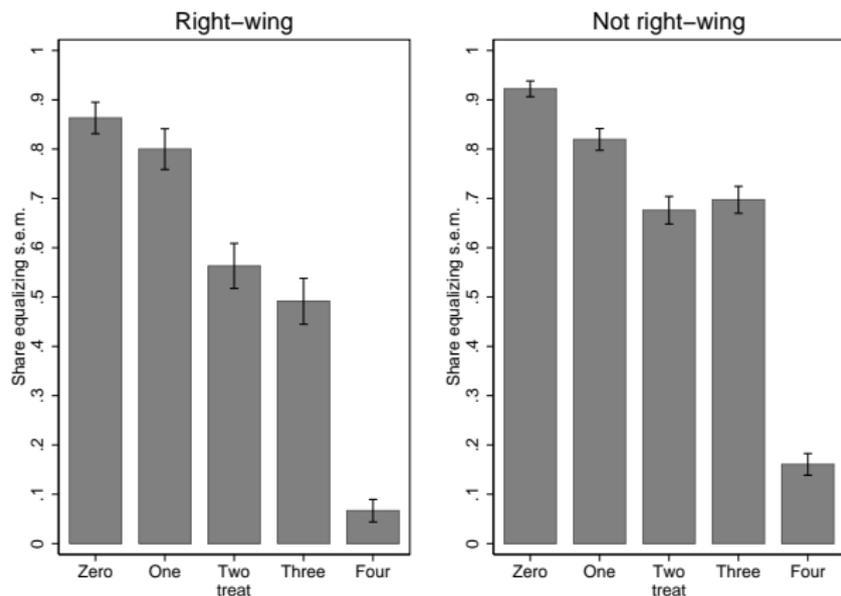
False positive averse	0.185
Intermediate	0.177
False negative adverse	0.683

The effect of cheaters on equalization

	Equalize	Equalize	Equalize	Equalize
cheaters	-0.172*** (0.006)	-0.173*** (0.006)	-0.089*** (0.015)	-0.089*** (0.015)
male		-0.064*** (0.019)		-0.091*** (0.026)
agelow		0.027 (0.019)		0.057** (0.026)
educationlow		-0.011 (0.026)		0.010 (0.036)
incomelow		0.033 (0.024)		0.000 (0.034)
Constant	0.971*** (0.013)	0.985*** (0.019)	0.876*** (0.032)	0.891*** (0.037)
Observations	2000	2000	1200	1200
R^2	0.254	0.260	0.025	0.040

Standard errors in parentheses

Share who equalize by political affiliation and treatment



Classification by political affiliation

Table: Share of types

	Right-wing	Not right-wing
False positive averse	0.20	0.18
Intermediate	0.31	0.12
False negative adverse	0.49	0.70

Political preferences and cheaters

	Equalize	Equalize	Equalize	Equalize	Equalize	Equalize
right-wing	-0.102*** (0.021)	-0.050 (0.031)	-0.041 (0.031)	-0.120*** (0.030)	0.062 (0.075)	0.082 (0.074)
cheaters	-0.172*** (0.006)	-0.164*** (0.007)	-0.164*** (0.007)	-0.086*** (0.015)	-0.062*** (0.018)	-0.062*** (0.017)
right-wing*ch		-0.026** (0.012)	-0.026** (0.012)		-0.089** (0.036)	-0.093*** (0.035)
Constant	0.999*** (0.014)	0.984*** (0.015)	0.996*** (0.020)	0.902*** (0.032)	0.856*** (0.036)	0.869*** (0.040)
Controls	No	No	Yes	No	No	Yes
Observations	2000	2000	2000	1200	1200	1200
R^2	0.263	0.264	0.269	0.038	0.043	0.056

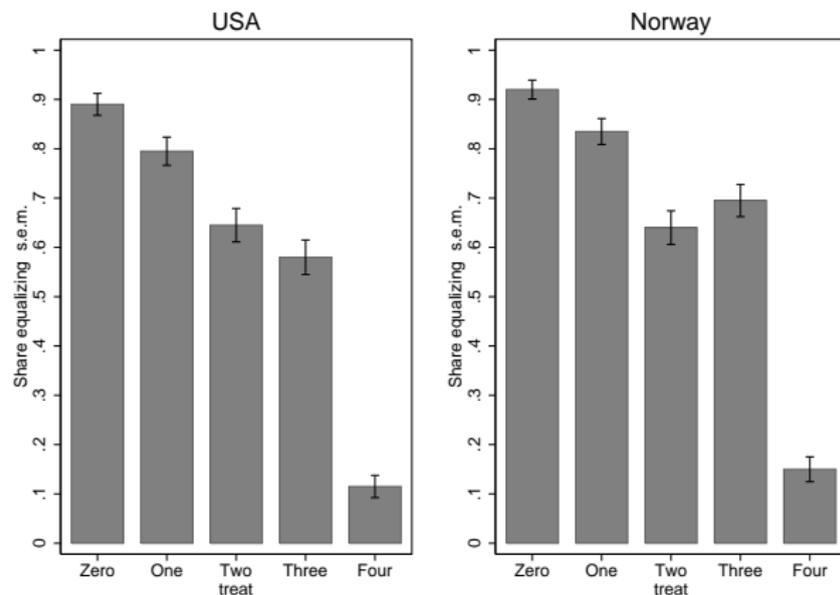
Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

US versus Norway

- The Norwegian spectators were presented with exactly the same treatments and matched with the same group of workers.
- USA and Norway represent two extremes with respect to income inequality and the extent of social security.
- Are there cross-national differences in how the trade-off between false positives and false negatives are made?

Share who equalize by treatment and country



Note: The figure shows the share of spectators who choose to equalize in each of the five treatments and country.

Are the US and Norway different?

	Equalize	Equalize	Equalize	Equalize
US	-0.050*	-0.076***	0.025	-0.001
	(0.026)	(0.029)	(0.063)	(0.064)
cheaters		-0.089***	-0.070***	-0.070***
		(0.015)	(0.021)	(0.021)
cheaters*US			-0.038	-0.038
			(0.031)	(0.030)
Constant	0.723***	0.919***	0.863***	0.881***
	(0.018)	(0.038)	(0.043)	(0.047)
Controls	No	Yes	No	Yes
Observations	1200	1200	1200	1200
R^2	0.003	0.045	0.029	0.047

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Conclusion

- A large majority are more concerned with avoiding not giving to those who are deserving, than with avoiding giving to those who are undeserving.
 - Substantial heterogeneity in how the trade-off between the two mistakes are made.
- Right-wing voters are more concerned with false positives than left-wing voters (in particular in the US).
 - Suggest that political disagreements is not only about what should be viewed as fair, but also about how to handle the trade-off between false positives and false negatives.