
Affirmative action policies for women: Lessons from the economic laboratory

Loukas Balafoutas

University of Innsbruck

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**Affirmative action policies for women:
Lessons from the **economic laboratory****

Lessons from the economic **WHAT???**

Labor markets and competitive behavior



- Differences between men and women in labor markets in two dimensions: wages and representation in leading positions (EC: 85% of non-executive board members and 91.1% of executive board members are men – 40% objective of Commission)
- Traditional explanations: discrimination, combining family and career, preferences, qualifications...
- Differences in competitive behavior as a further contributing factor?

Labor markets and competitive behavior



- In recent years, gender differences in the willingness to compete have attracted a lot of interest, mainly because they might contribute to a better understanding of gender differences in the labor market.
- If women are less willing to compete – even if they have the same level of qualifications on average – then it could be explained why fewer women are promoted or get a wage increase (holding constant other possible explanations, like discrimination).

Gneezy, Niederle and Rustichini (QJE, 2003).

Men increase their performance in a tournament (solving mazes) more than women.

Gneezy and Rustichini (AER, 2004).

Boys run faster with competition, girls don't.

Niederle and Vesterlund (QJE, 2007).

Women opt into a tournament (adding two-digit numbers) less often than men (35% vs. 73%).

Gneezy, Leonard and List (ECMA, 2009).

Gender differences depend on culture (patriarchal vs. matrilineal society).

Niederle, Segal and Vesterlund (2013).

Affirmative action programs induce women to compete (since they make the competition more gender-specific).

Policy interventions



- Policy interventions – like minimum quotas for women – can affect the willingness of women and men to compete
- But there are very few systematic studies to examine whether this is the case and how such policies really work (e.g., Calsamiglia, Franke and Rey-Biel, 2010, Niederle, Segal and Vesterlund, 2013)
- *“Affirmative action policies promote women and do not harm efficiency in the lab”*, *Science*, 2012, with Matthias Sutter (University of Cologne)
- Our two aims:

Interventions and competitive behavior



1. We evaluate the *effectiveness* of various interventions.
Can they motivate women to increase their participation in tournaments?

2. We evaluate the *efficiency* of various interventions.
 - (i) *Who wins* the competition? Do the interventions lead to the “wrong” winners?
 - (ii) What happens *after the competition*? Are there side effects (with an impact on productivity)? Policies might *backfire* (more on this later).

The task: Adding numbers

- Subjects had to add five two-digit numbers, all drawn randomly from the interval $\{10, \dots, 99\}$. Time: 3 min.

Stufe

1 von 6

Verbleibende Zeit [sec]: 178

Bitte addieren!

78	13	50	51	88
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Ihre Summe:

Diese Summe als Ergebnis.

Bestätigen

- *Stage 1:* Piece-rate **0.5€** per correct solution, no competition
 - *Stage 2:* Competition in **groups of 6** → two winners get **1.5€** each per correct solution
 - *Stage 3:* Choose competition or piece-rate: **Five treatments**
-
- *Stage 4:* Competition, no choice, winners get **1.5€** each per correct solution, plus higher endowment in Stages 5 and 6: **Five treatments**

Design

- *Stage 5:* Team exercise, **0.5€** for entire group per correct solution
- *Stage 6:* Coordination game (minimum effort). Payoff matrix:

Payoffs in €	Minimum of the two numbers in a pair							
	7	6	5	4	3	2	1	
7	€6,50	€5,50	€4,50	€3,50	€2,50	€1,50	€0,50	
6		€6,00	€5,00	€4,00	€3,00	€2,00	€1,00	
5			€5,50	€4,50	€3,50	€2,50	€1,50	
4				€5,00	€4,00	€3,00	€2,00	
3					€4,50	€3,50	€2,50	
2						€4,00	€3,00	
1								€3,50

Treatments (policies)



- Five different ways of determining the two winners in the tournament (Stages 3 and 4):
 1. *Control (CTR)*: The two winners are the two group members with the best performances
 2. *Repetition of the tournament (REP)*: Tournament is repeated once if both winners are men, repeated tournament as in control
 3. *Minimum Quota (QUO)*: At least one woman among the two winners, i.e., best-performing woman always a winner
 4. *Preferential treatment 1 (PT1)*: All three women in a group receive one extra (bonus) point
 5. *Preferential treatment 2 (PT2)*: All three women in a group receive two extra (bonus) points

- Elicit expected ranks for Stages 1, 2 and 4
- Two different orders for stages 5 & 6
- At the end of each session pick randomly one from stages 1-4 and one from stages 5-6 for payment.

- 4 sessions per treatment, 18 subjects (3 groups) in each session → 360 subjects in total
- Sessions run with students from the University of Innsbruck

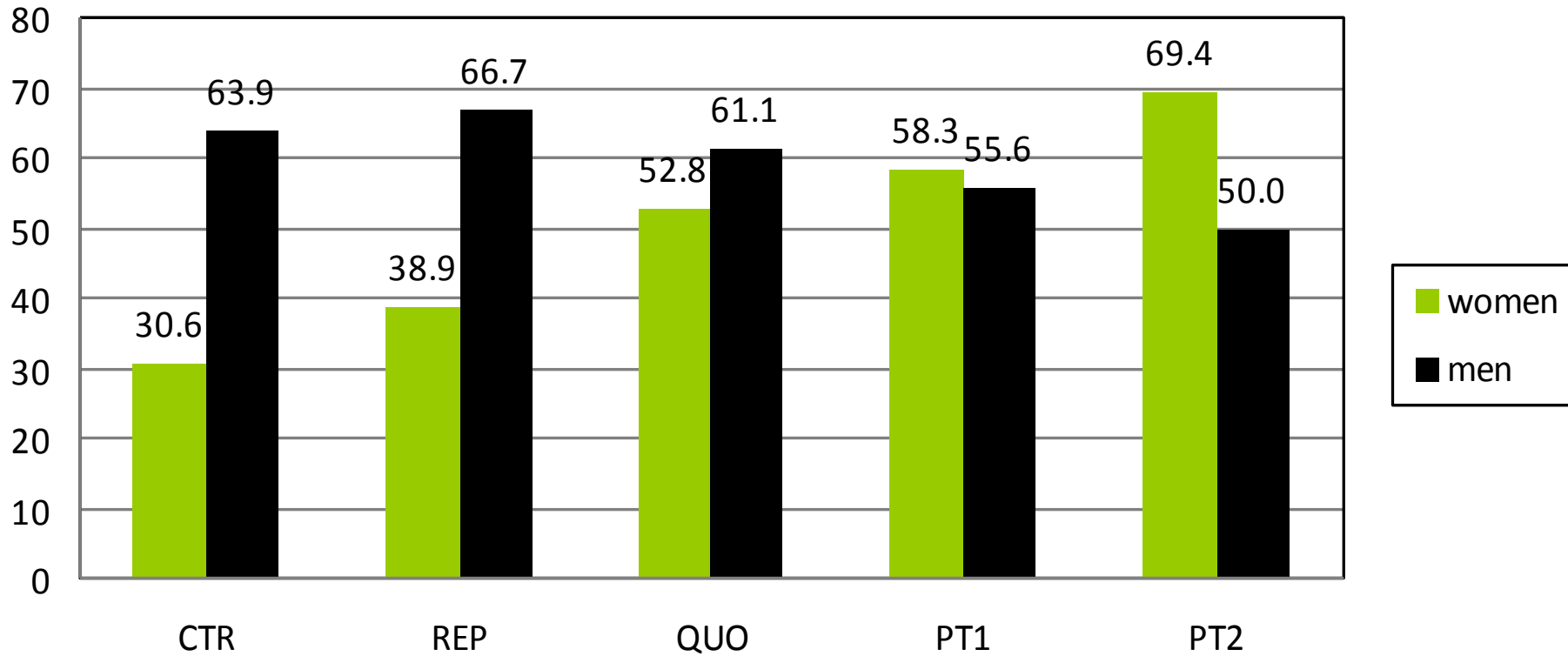
Results - Performance of men and women

mean performances by gender, all treatments

	<i>men</i>	<i>women</i>	<i>p (Mann-Whitney)</i>
<i>Stage 1</i>	6.43	6.02	0.31
<i>Stage 2</i>	7.53	6.82	0.03
<i>Stage 3</i>	7.69	7.36	0.56
<i>Stage 4</i>	7.97	7.56	0.27
<i>Stage 5</i>	8.22	7.64	0.11

Policy effectiveness: Choices in Stage 3

% of subjects choosing competition, by treatment



Who makes better choices?

Number of subjects entering competition, /36	CTR	REP	QUO	PT1	PT2
Payoff maximizing (men)	13	15	17	10	13
Actual (men)	23	24	22	20	18
Payoff maximizing (women)	12	15	13	23	19
Actual (women)	11	14	19	21	25

Tournament efficiency



- To measure tournament efficiency, we look at the performances of the two winners
- In theory, two opposite effects:
 - (i) Policy interventions may exclude some high-performing men to the benefit of less qualified women
 - (ii) But they induce more high-performing women to enter the tournament

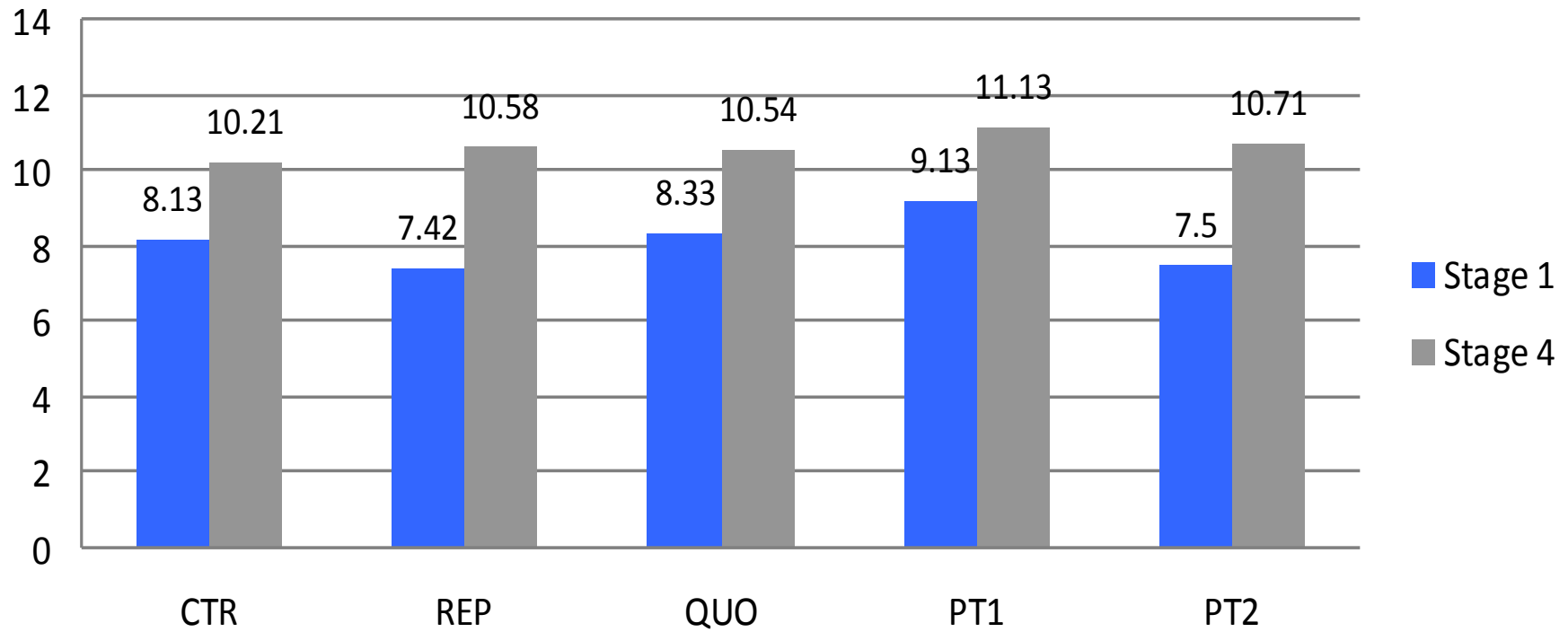
Tournament efficiency



- We find that tournament efficiency does not suffer: Comparison of Stage 1 performances of the two winners across treatments: $p=0.30$ (Kruskal-Wallis test)
- If we use Stage 4 performances as our measure of skills, we find that tournament efficiency is higher with any policy intervention compared to the control- although differences not significant

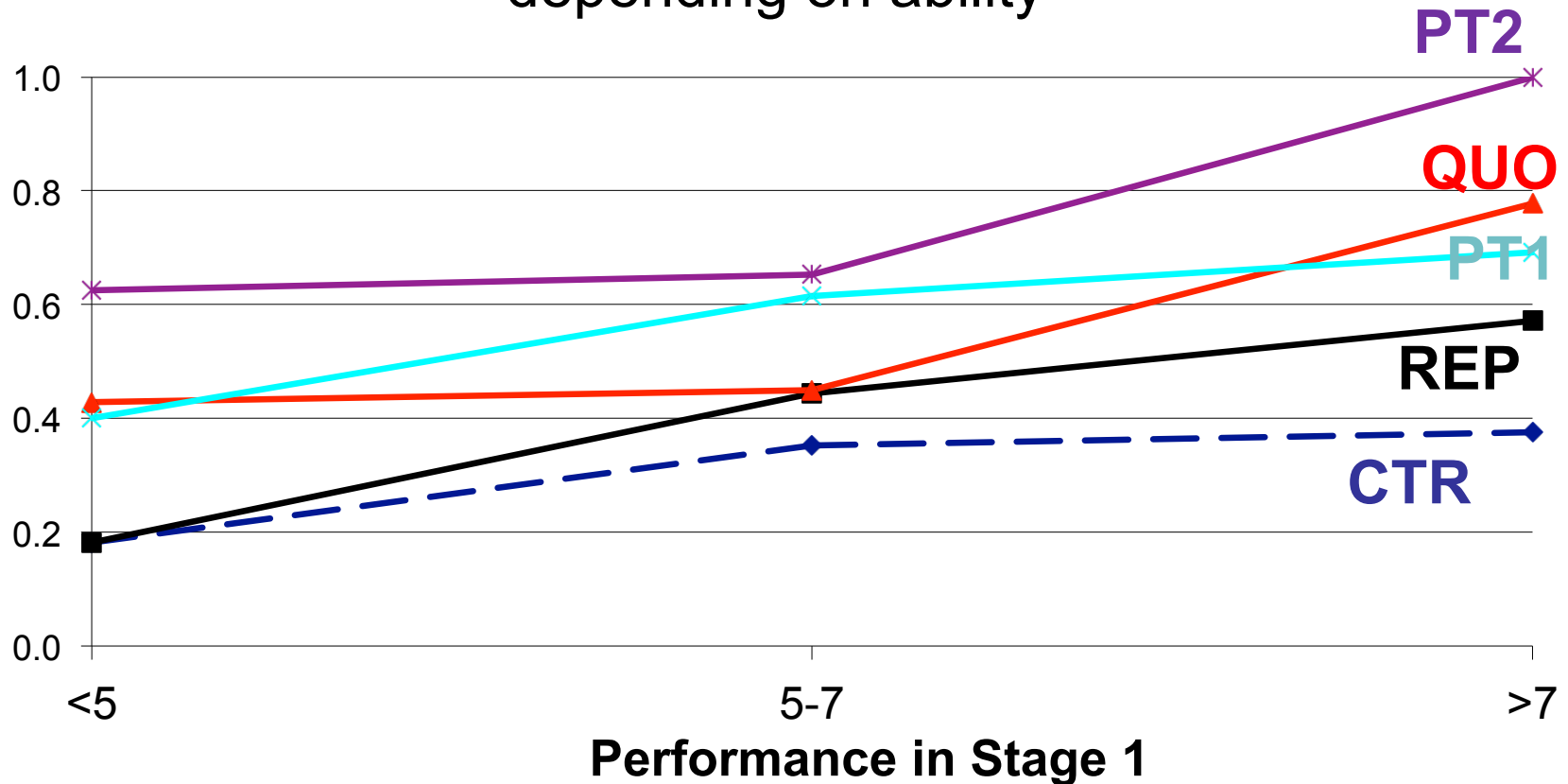
Tournament efficiency

Mean performance of the two winners, by treatment



Why does efficiency not suffer?

Share of women who choose the competition,
depending on ability



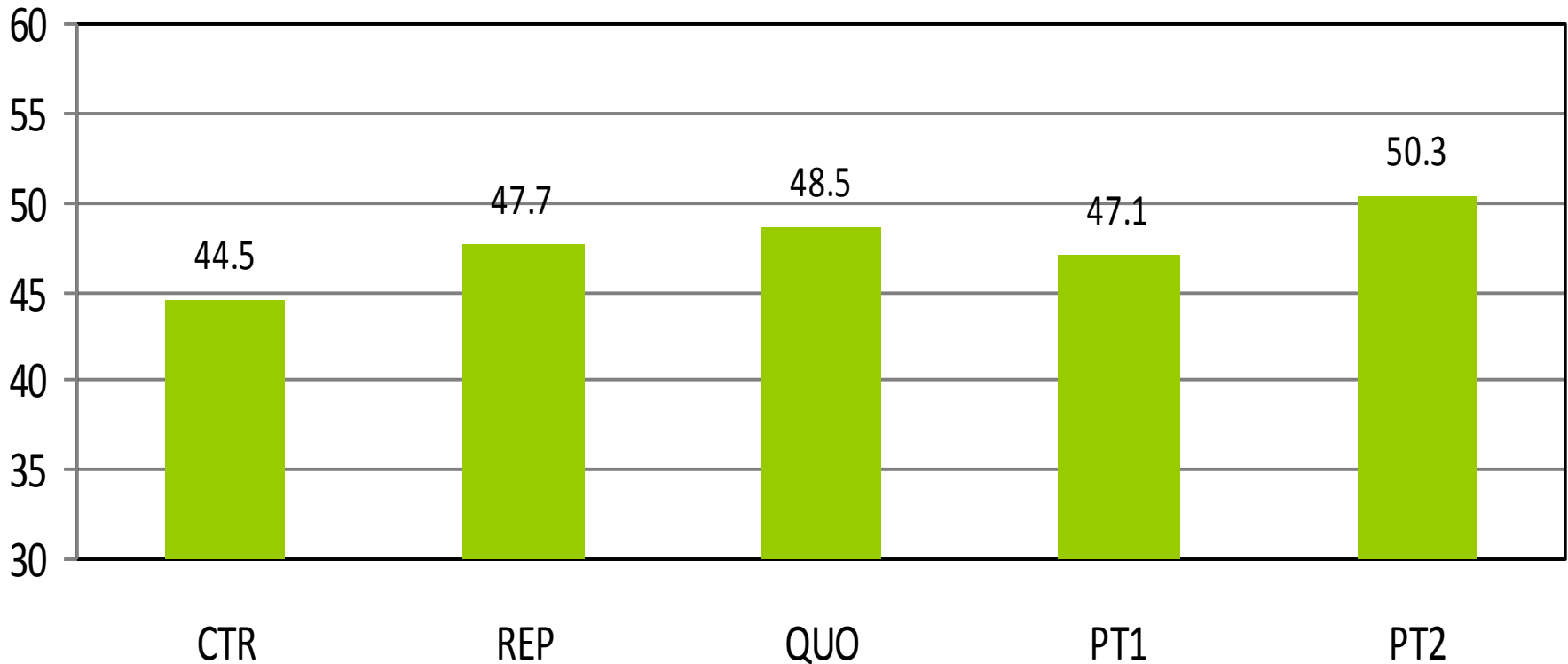
Post-tournament efficiency



- 1st measure of post-tournament efficiency: *Total group performance* in Stage 5
- Group members who have lost the tournament in Stage 4 may produce relatively less in the team task
- Especially men who think they “should” have won (measured based on reported beliefs)
- On the other hand, Stage 4 winners may produce relatively more for the team in Stage 5
- Compare with Stage 5 performances in the control

Post-tournament efficiency

Average group performance in Stage 5, by treatment



Post-tournament efficiency



- Evidence of small efficiency **gains** associated with policy interventions
- Especially true for *Minimum Quota* and the “stronger” *Preferential treatment PT2* ($p=0.08 / 0.03$ respectively, *Mann-Whitney tests*)
- Jonkheere test of ordered alternatives: Rejects equality of medians across treatments in favor of H_1 :
$$\theta_{CTR} \leq \theta_{PT1} \leq \theta_{REP} \leq \theta_{QUO} \leq \theta_{PT2} \quad (p < 0.01)$$

(with at least one strict inequality)

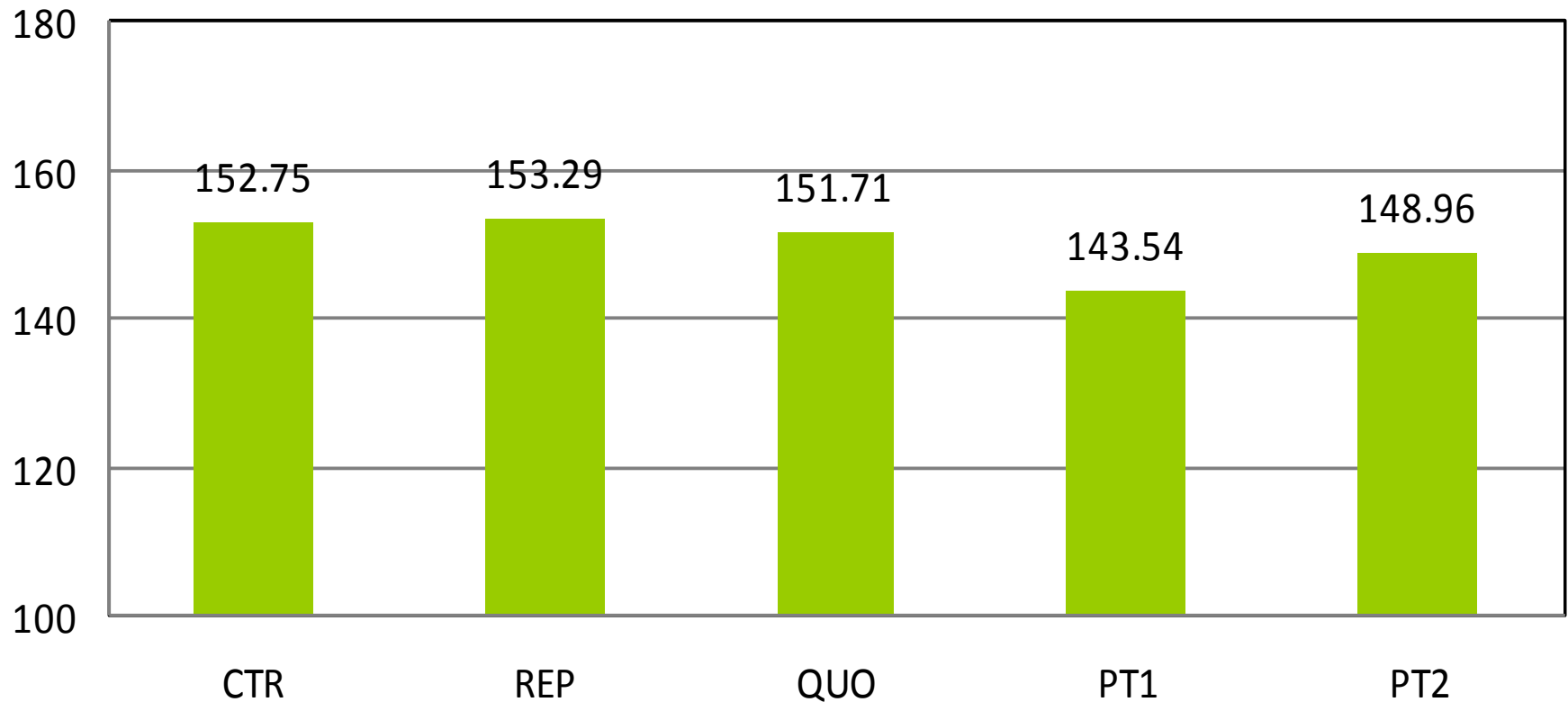
Post-tournament efficiency



- 2nd measure of post-tournament efficiency: *Total hypothetical group payoff* in Stage 6
- No efficiency costs or gains across treatments ($p > 0.6$, Kruskal-Wallis)
- No evidence of different choices across winners and losers, men and women, and regardless of expected rank

Post-tournament efficiency

Total hypothetical group payoff in Stage 6, by treatment



Summary of main findings



- We compared four different schemes for the promotion of women in competition
- We found that *Preferential treatment* and *Minimum Quota* encourage women to compete, while the effectiveness of *Repetition* is weaker
- Women make choices closer to the optimum- while men compete too much
- The increased entry by women compensates for the pure selection effect for given performances, so that tournament efficiency does not suffer

Summary of main findings



- *Post-tournament group performance*: Evidence of efficiency gains as a result of implementing our schemes (especially *PT2* and *QUO*)
- Overall, our results suggest that *certain* policy interventions can be: (i) effective, (ii) efficient (in the sense of weakly increasing our measures of efficiency)

A follow-up: Support for affirmative action



- During a presentation in 2014, someone suggested that affirmative action is not widespread because there is plenty of resistance against it
- In particular from women!
- We thought this was an interesting and provocative idea and run an experiment to test it
- *“Affirmative action or just discrimination? A study on the endogenous emergence of quotas”* (with Brent Davis and Matthias Sutter, *Journal of Economic Behavior and Organization*, forthcoming)

Research questions



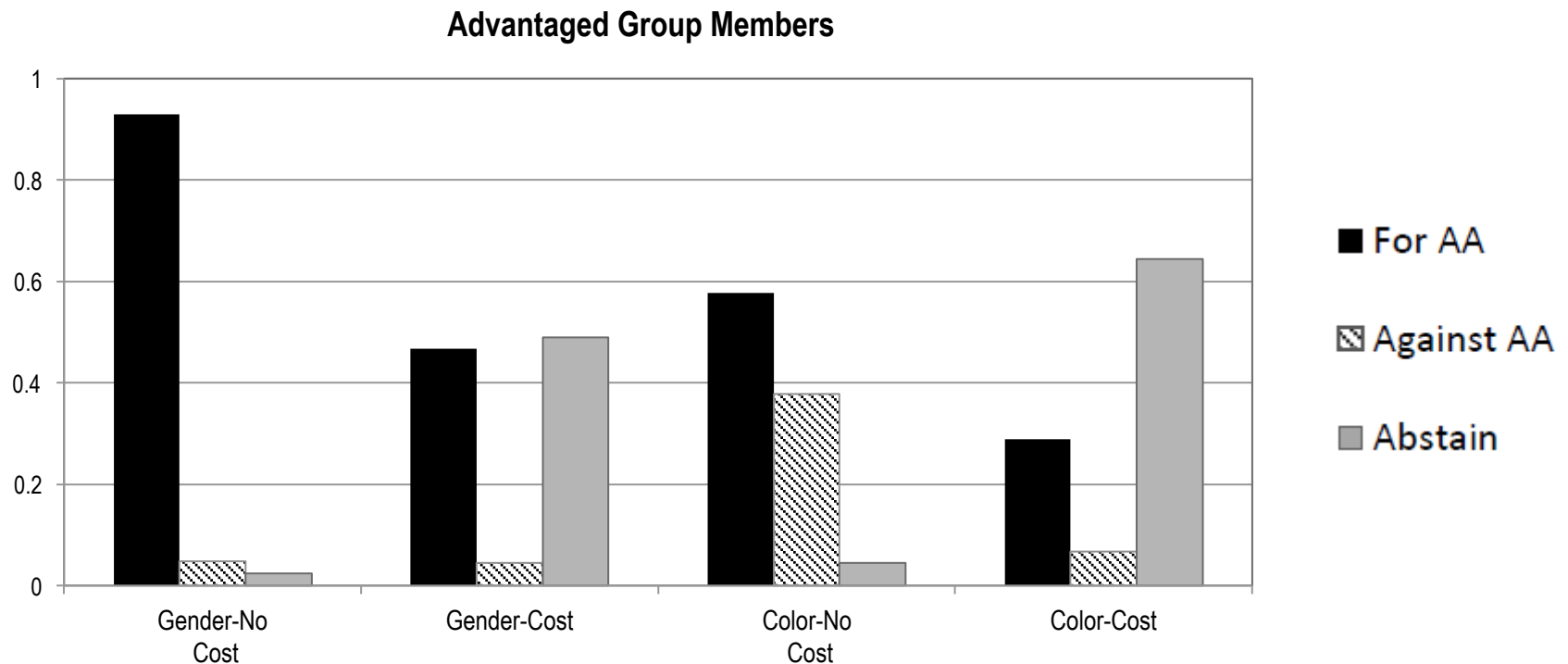
- Will affirmative action (a quota policy) be supported and endogenously implemented by workers/firms?
- Existing literature only looks at policies exogenously imposed (through regulation)
- Are there efficiency losses after an endogenous implementation of such a policy?
- Benchmark of comparison: Gender vs. an arbitrary criterion (pink/green members)

- Task: count 0s in a table of 1s and 0s for 5 minutes
- **Stage 1:** Piece rate, subjects earn € 0.50/table
- **Stage 2:** Tournament in groups of six, top two in group earn €1.50/table, other four earn nothing
- **Stage 3: Vote** in favor of **affirmative action**, against, or abstain. 50% of votes required to implement policy. Then participate in **tournament**.
- **Stage 4:** Team production, entire team earns 0,50€/table completed

- **Affirmative action in Stage 3:**
 1. By *Gender* (3 men and 3 women; at least one woman has to be among the winners – same as QUO from Balafoutas and Sutter, 2012)
 2. By Random Attribute (*Color*)
 - each group member randomly assigned as a pink (advantaged) or green (disadvantaged) group member; group has 3 pink group members and 3 green group members
- **Voting:** Costless vs. costly (€1)

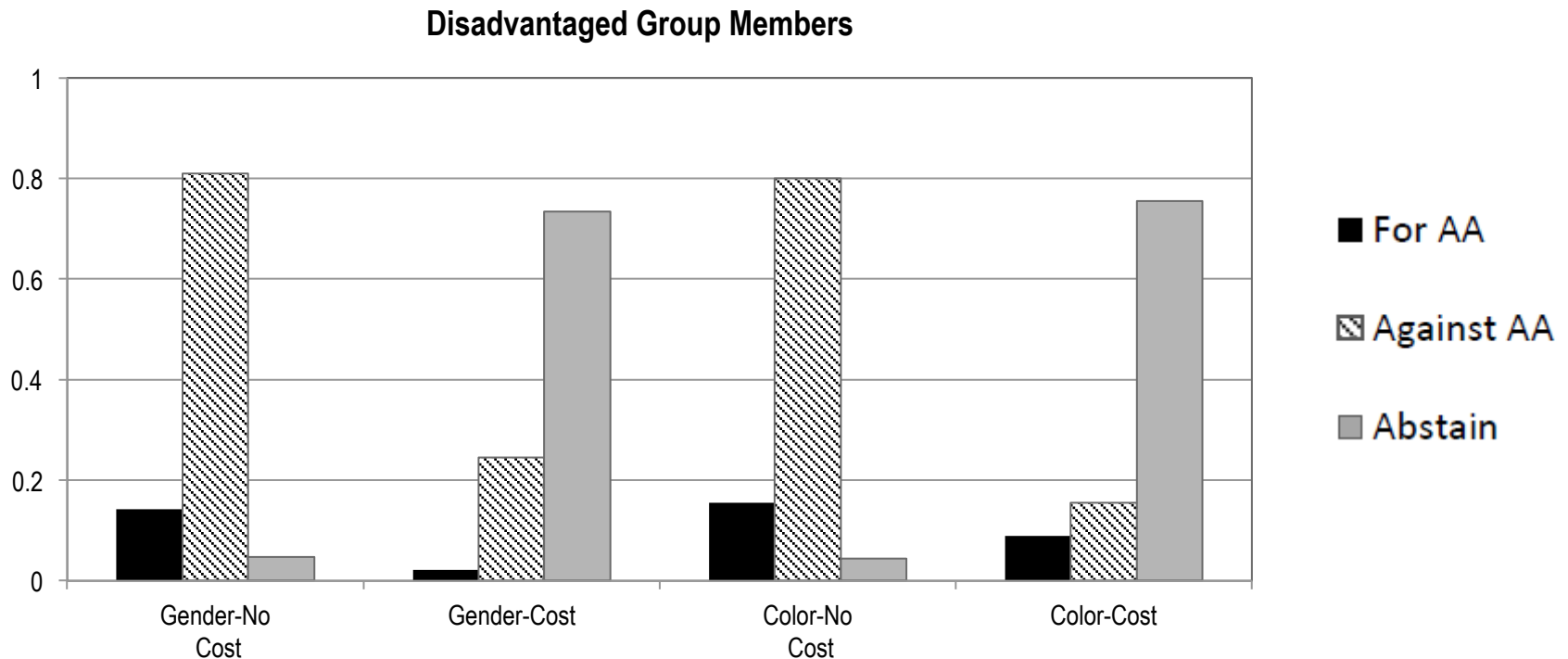
Results – Voting

- Almost universal support for AA by women in *Gender* when voting is costless
- Much less support for AA by pink members than by women; many pink members vote against the policy



Results – Voting

- 80% of disadvantaged group members vote against the policy when it is costless
- Most men vote against AA in *Gender* when voting is costless, but there is some support for the policy



Results – AA Implementation



Performance in Stage 3

- No difference in *Gender*
- In *Color*:
 - **Advantaged members** have a much higher productivity in AA
 - **Disadvantaged members** have a much higher productivity in No AA

	Gender		Color	
	AA	No AA	AA	No AA
Advantaged	8.49	9.22	8.98	7.33
Disadvantaged	8.48	9.22	8.43	9.81

Mean Performance in Stage 3 by Policy Implementation, Treatment and Group Status.

1. Efficiency measured as the performance of the two selected winners: No efficiency losses in *Gender*; Small efficiency losses in *Color*
2. Efficiency in the post-tournament team task (Stage 4): No losses in any treatment

Summary of 2nd study



- Support for quota policy much stronger along the gender dimension than along arbitrary (and unfair) characteristic
- Reactions to policy based on color, leading to some reduction in efficiency; no negative effects in *Gender*
- *Our takeaway message: AA is seen differently than mere discrimination. If quota policy is justified, it receives more support and is more efficient*

Thank you for listening!

Stage 3 choices: Probit analysis

	(1)	(2)
<i>female</i>	-0.864 ***	-0.476
<i>female_RE</i>	0.151	0.474
<i>female_AA</i>	0.651	0.574
<i>female_P1</i>	0.935 **	0.424
<i>female_P2</i>	1.372 ***	1.187 ***
<i>RE</i>	0.075	0.261
<i>AA</i>	-0.073	-0.129
<i>P1</i>	-0.216	0.030
<i>P2</i>	-0.355	-0.309
<i>prob_win</i>		0.675 ***
<i>guesswin</i>		0.907 ***

Post-tournament efficiency



- More specific observations:
 - (1) Male losers who thought their rank was 1 or 2 produce relatively *more* in Stage 5 when a scheme is in place (compared to CTR). Significant only in PT2.
($p=0.04$, Mann-Whitney)
 - (2) Female winners do not increase or decrease their Stage 5 performance (compared to CTR), regardless of expected rank