What you know can't hurt you (for long): A field experiment on relative feedback performance information

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Introduction

- Feedback information on **individual performance** is often provided in many professional/educational environments:
  - Students get *report cards*.
  - Teachers get *teaching evaluations*.
  - Employees get *revenue/sales* data.

- In addition to this information, sometimes individuals may also receive information about their **performance relative to a reference group**
  - E.g., students learn their class rank

Feedback Information

- We are going to consider a setup where feedback on relative performance is private information:
  - Rankings are not made public
  - It is **not** "status" per se (e.g., different from *McDonald stars*)
- We focus on relative performance feedback information as extra information that facilitates social comparison:
  - Individual performance is compared with the performance of a reference group
- It is **not** explicitly rewarded (e.g., with a bonus)
  - No tournament reward scheme
- The treatment typically has two components:
  - The information itself
  - The agent will receive this information again in the future

Theory

- **No reaction to feedback**
  - Private information, not rewarded, no (obvious) consequence
- **Competitive Preferences**
  - *Kandel and Lazear (1992), Charness and Rabin (1999)*
- **Self-Perceived Ability**
  - *Tesser and Campbell (1980), Festinger (1954), Ertac (2006)*
- **Satisficing behavior**
  - *Simon (1956)*

- *Overall, the effect depends of **individuals' prior information** and their **preferences***

Empirical evidence

- **Lab experiments**
  - Azmat and Iriberri 2014
- **Natural experiments**
  - Blanes-i-Vidal and Nossol 2011
  - Azmat and Iriberri 2010
- **Randomized field experiment**
  - Barankay 2011

➔What is impact of receiving feedback on relative performance?

  - Priors? Preferences? Technology?

Our Approach

- Conduct a field experiment over three years (2010-2013) in a large university
- A cohort of students (approx. 1,000) were randomly assigned into treatment and control groups
- **Control:** Students receive information on their own performance (as is the norm)
- **Treatment:** Additionally, provide students with information on their relative performance

Timing

- We follow the 2009 cohort of students until graduation

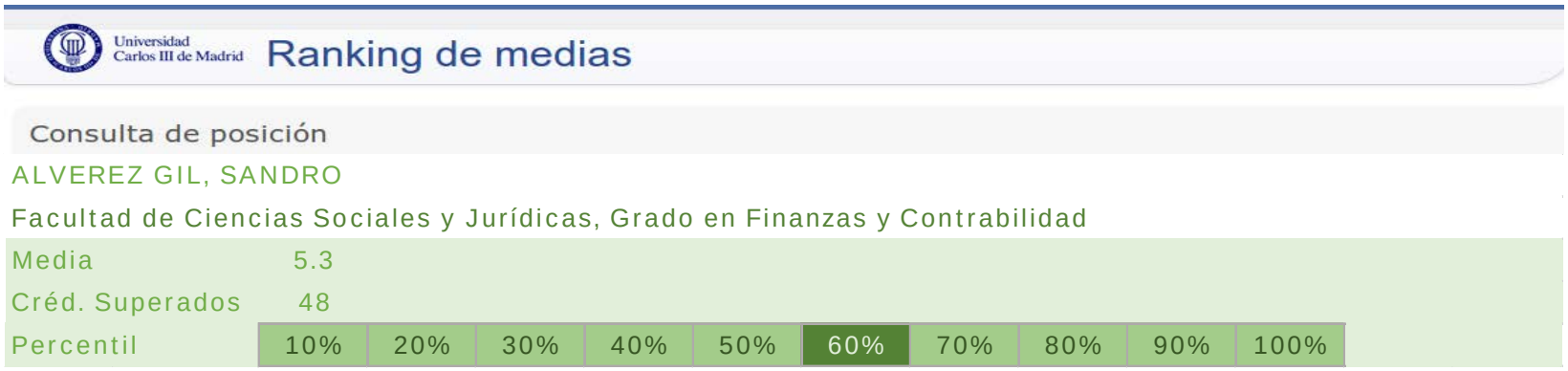
- 2009-2010 (1st year): **No treatment**
- 2010-2011 (2nd year): **Treatment** (twice)
- 2011-2012 (3rd year): **Treatment** (twice)
- 2012-2013 (4th year): **Treatment** (twice)

Our Study

- The treated student receive an email message from a corporate account saying:

"This email is part of a pilot project of academic assessment management. If you want to see your average grade, and your relative position in terms of average grade among the students that started the degree the same year you did, you can do it by clicking here:<link given>"

After logging in….



Our Questions

What is the effect of relative performance feedback information on:

1. **Performance over time**
2. **Individual satisfaction**
3. **Labour market outcomes (not today!)**

Data

Outcome Variables

- Academic Performance: 2010-2013
  - Exams taken and exams passed
  - Accumulated GPA
  - Course choice

- Teaching Evaluations: 2010-2011
  - Overall satisfaction with the course
  - Number of hours of study
  - Grading is adequate

Other Variables

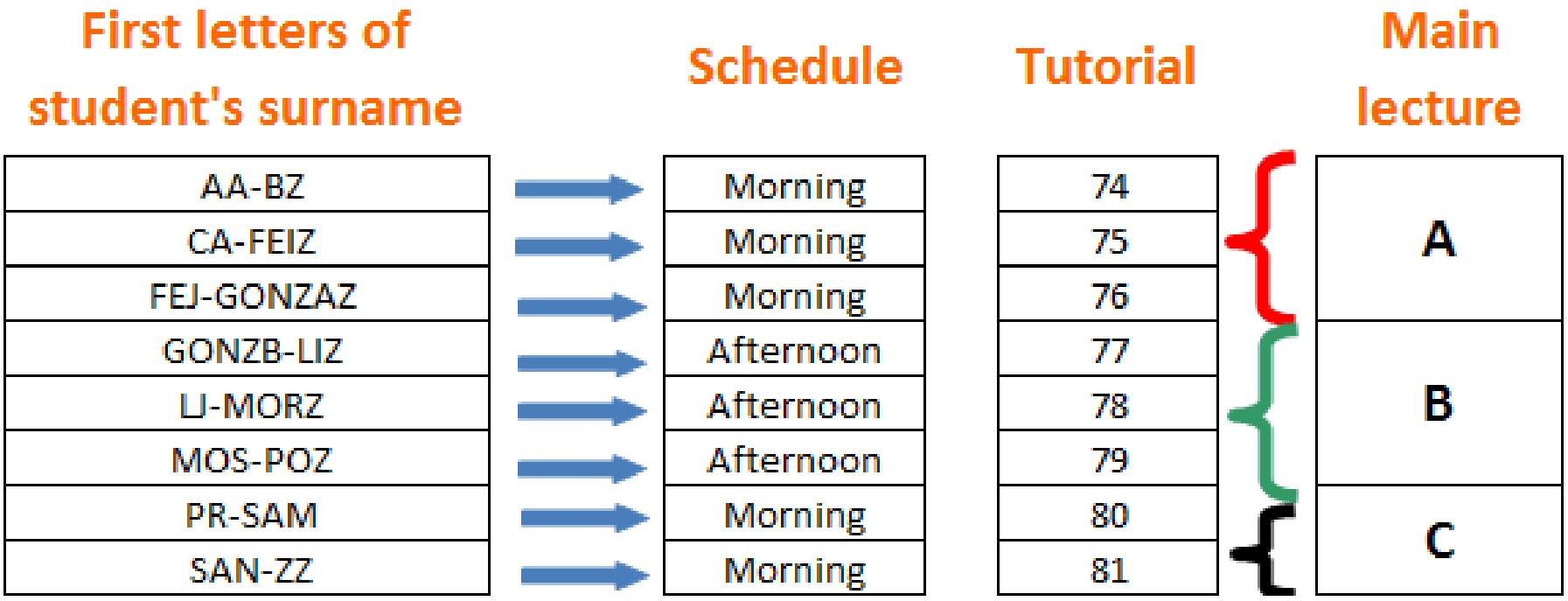
- Entry test score (similar to SAT)
- First year grades
- Gender
- Foreigner to institution
- Area of residence

Assignment to Treatment

Assignment of students to groups

Within each year, degree, campus and language, students are assigned to different lecture groups based on their surname

Example for 2010, first year, Business Administration, Getafe, Spanish



Assignment to Treatment (Groups)

	South Madrid		North Madrid	
	Treatment	Control	Treatment	Control
Finance and Accounting	1	1		
Economics	1	2		
Business	1	2	1	1
Law	1	2		
Law and Business	1	1	1	1

Assignment to Treatment (Students)

	South Madrid		North Madrid	
	Treatment	Control	Treatment	Control
Finance and Accounting	36	59		
Economics	47	187		
Business	60	121	40	35
Law	60	132		
Law and Business	50	49	61	40

Randomization

	Female	SAT	AGPA 1st Year	Percentile 1st Year	Credits 1st Year
Treatment	0.027	-0.102*	-0.0493	-0.0157	-0.518
	[0.0342]	[0.0565]	[0.0648]	[0.0188]	[1.108]
Constant	0.531***	7.276***	0.0179	0.543***	58.10***
	[0.0201]	[0.0330]	[0.0381]	[0.0111]	[0.651]
Observations	977	966	977	977	977
R-squared	0.024	0.333	0.128	0.002	0.07

Results

Is the treatment informative?

- Do students actually access the information (i.e., take-up rate)?
- Who accesses the information?
- How informed are students about their relative performance **before** the treatment?
- How informed are treated (and non-treated) students **after** the treatment?

Take-up of Information

Who checks the information?		
Female	0.106**	0.085*
	[0.047]	[0.045]
AGPA		0.145***
		[0.021]
Entry grade		-0.060*
		[0.034]
Constant	0.665***	0.238
	[0.034]	[0.216]
Observations	354	347
R-squared	0.084	0.182

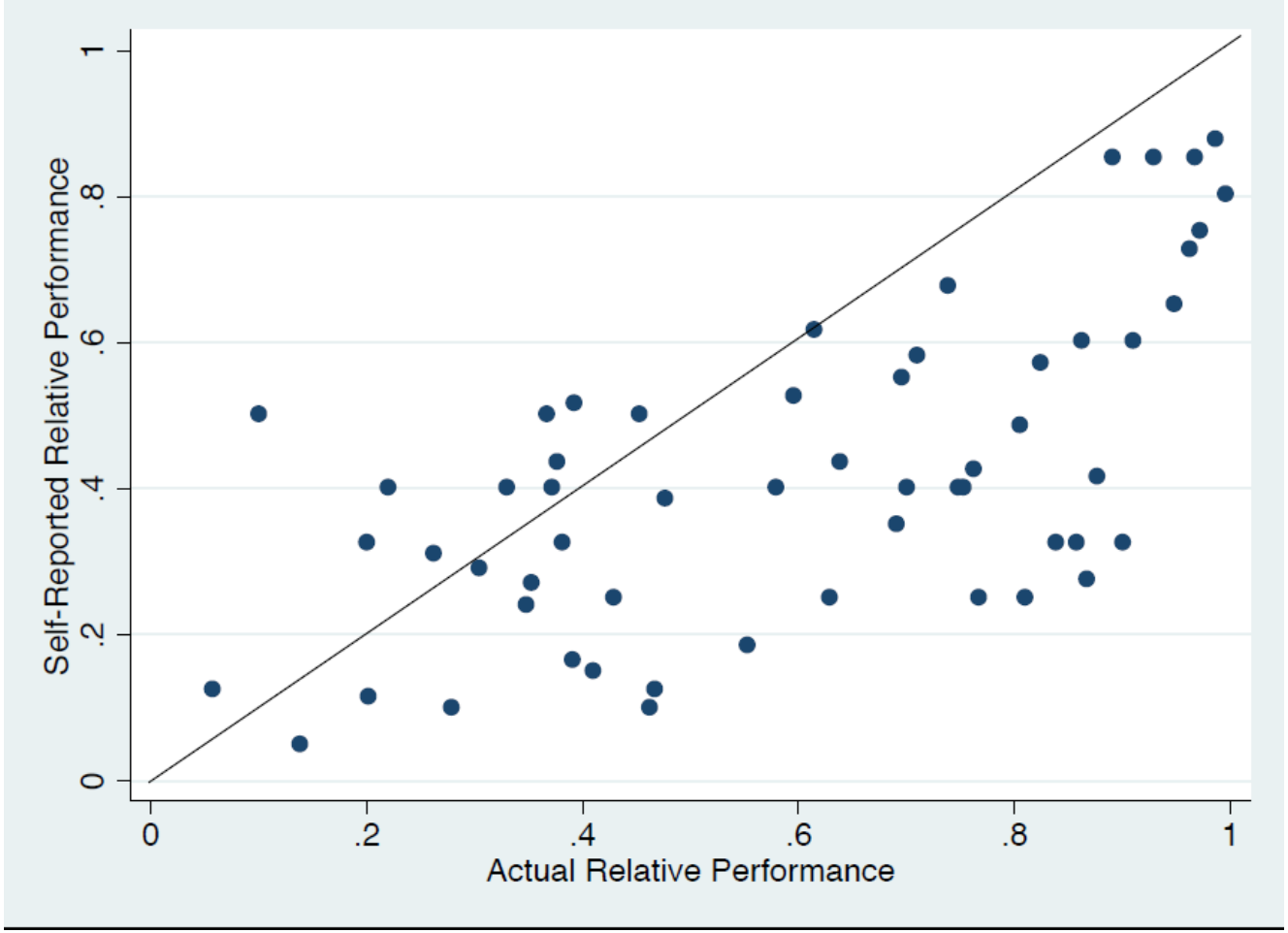
Self-Assessment

BEFORE EXPERIMENT:

- Survey the 2010 cohort at beginning of their second year students (Economics degree only)

We ask: *"When you enrolled one year ago in this degree your cohort included 300 students. If we were to rank all students in this cohort by their Accumulated Grade Point Average (AGPA), such that number 1 is the student with the highest AGPA and number 300 is the student with the lowest AGPA. In which position do you think you would be?"*

Self-Assessment Before Treatment



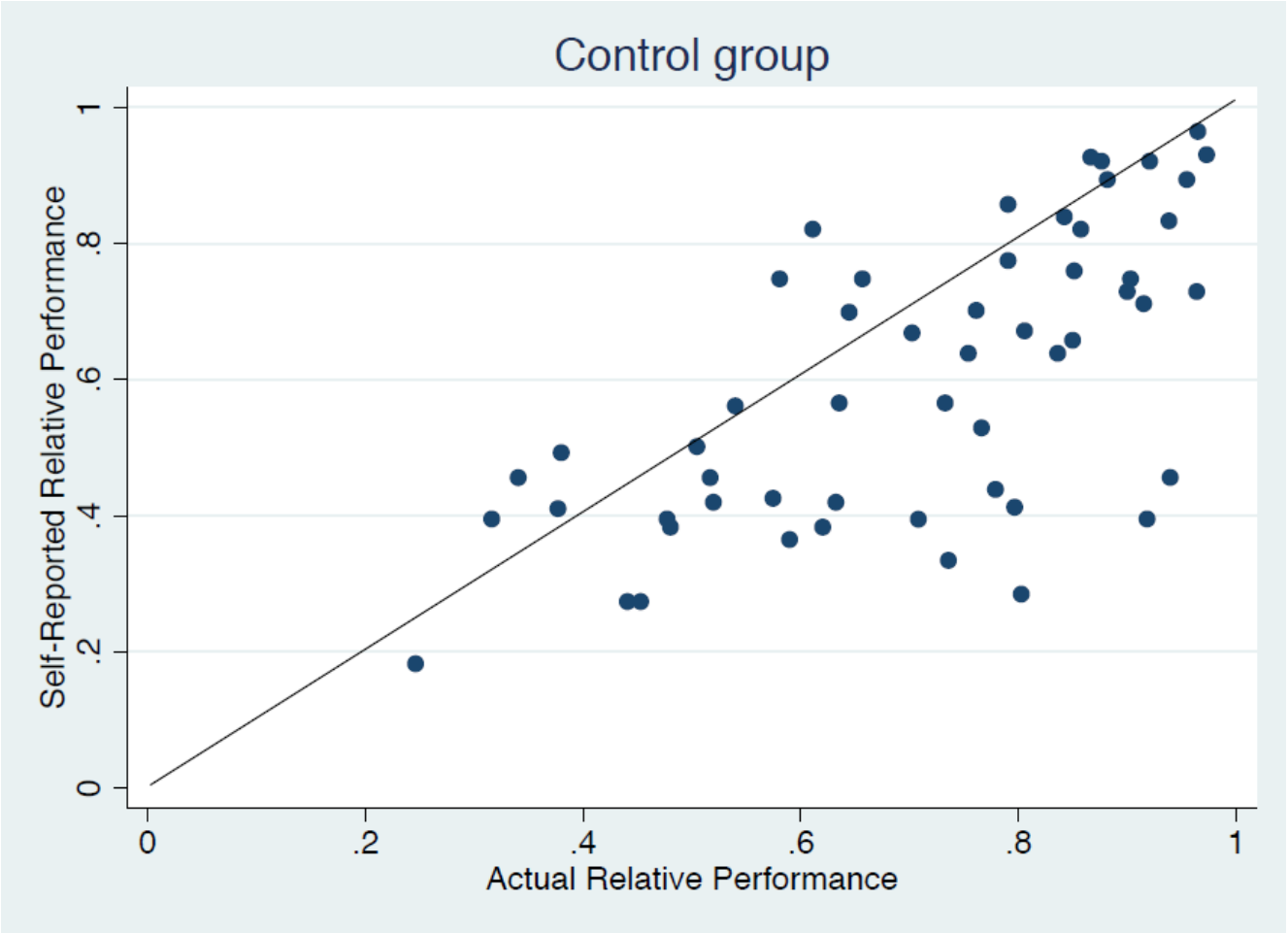
Average error: -0.18; Absolute error: 0.22

Self-Assessment

AFTER TREATMENT:

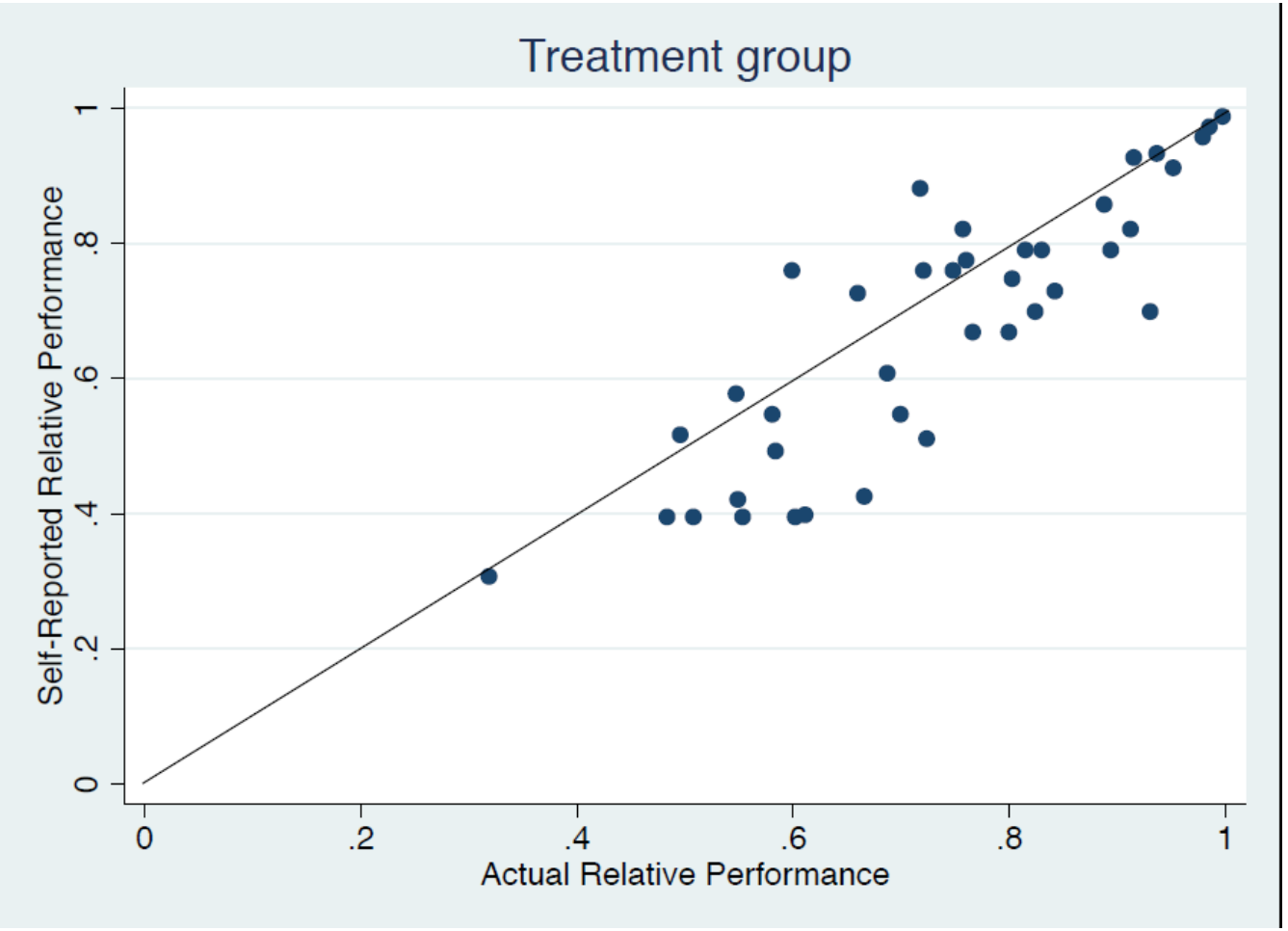
- Survey the 2009 cohort at the end of their fourth year (summer 2013)
- Economics and Business degrees only
- Includes **treatment** and **control** groups

Self-Assessment After Treatment: Control Group



Average error: -0.11; Absolute error: 0.15

Self-Assessment After Treatment: Treatment Group



Average error: -0.06; Absolute error: 0.09

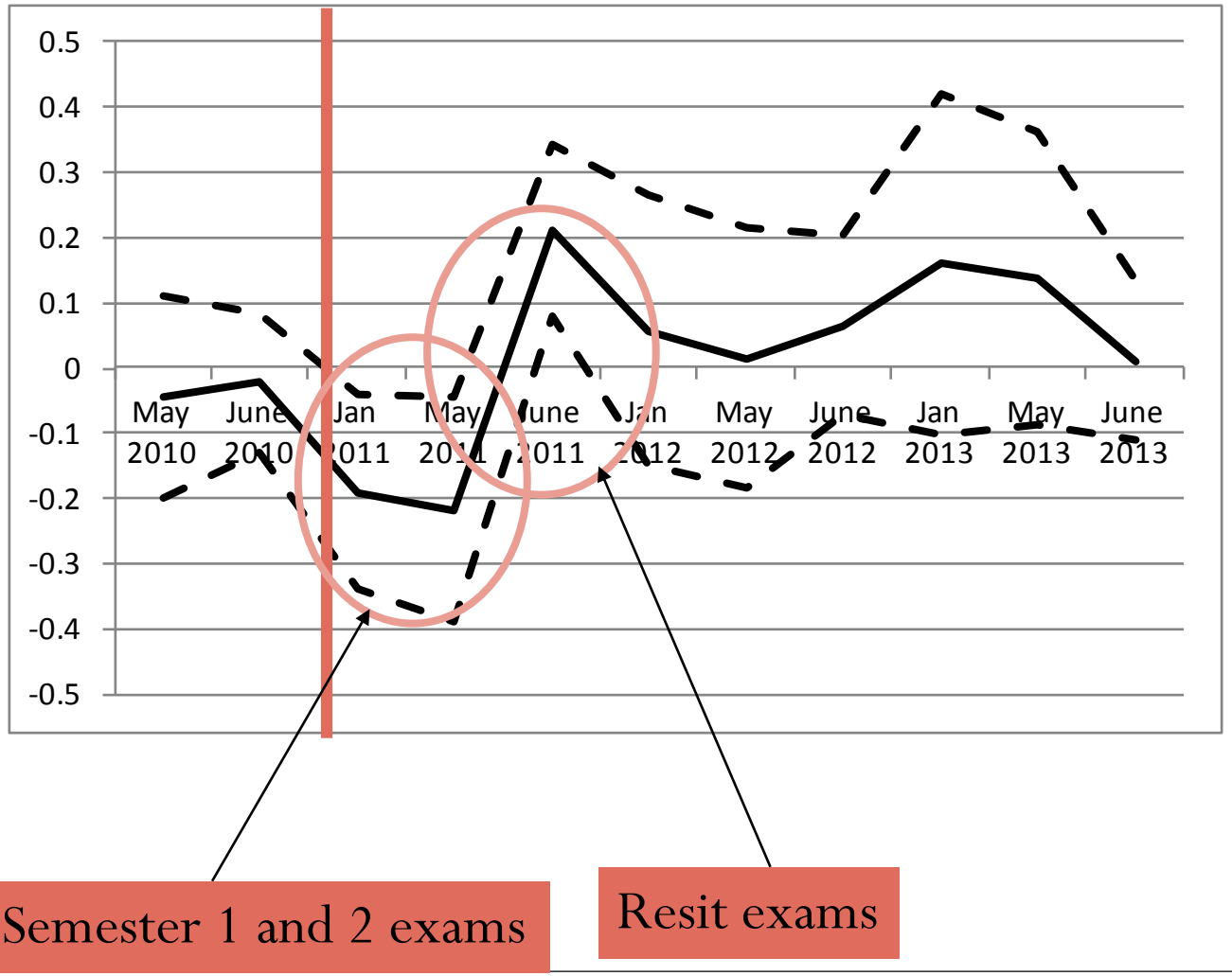
Feedback Effect on Academic Performance

- Effect on Performance:

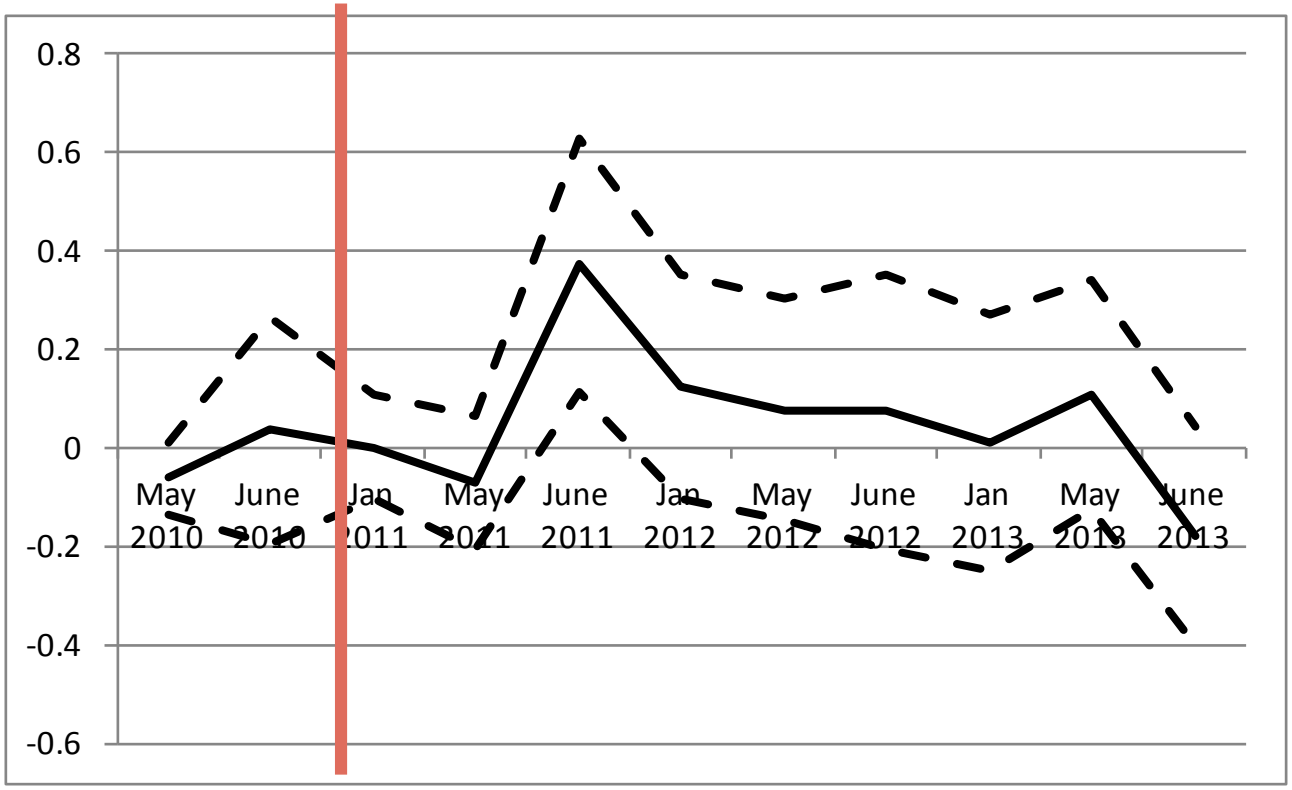
$$Y_{s,d,g,t+i} = \alpha + \beta Y_{s,t} + \gamma Treatment_{d,g} + \mathbf{X_d}\boldsymbol{\lambda} + \varepsilon_{s,d,g,t+i}$$

Performance of student *s*, enrolled in degree *d* and group *g*, at time *t+i*

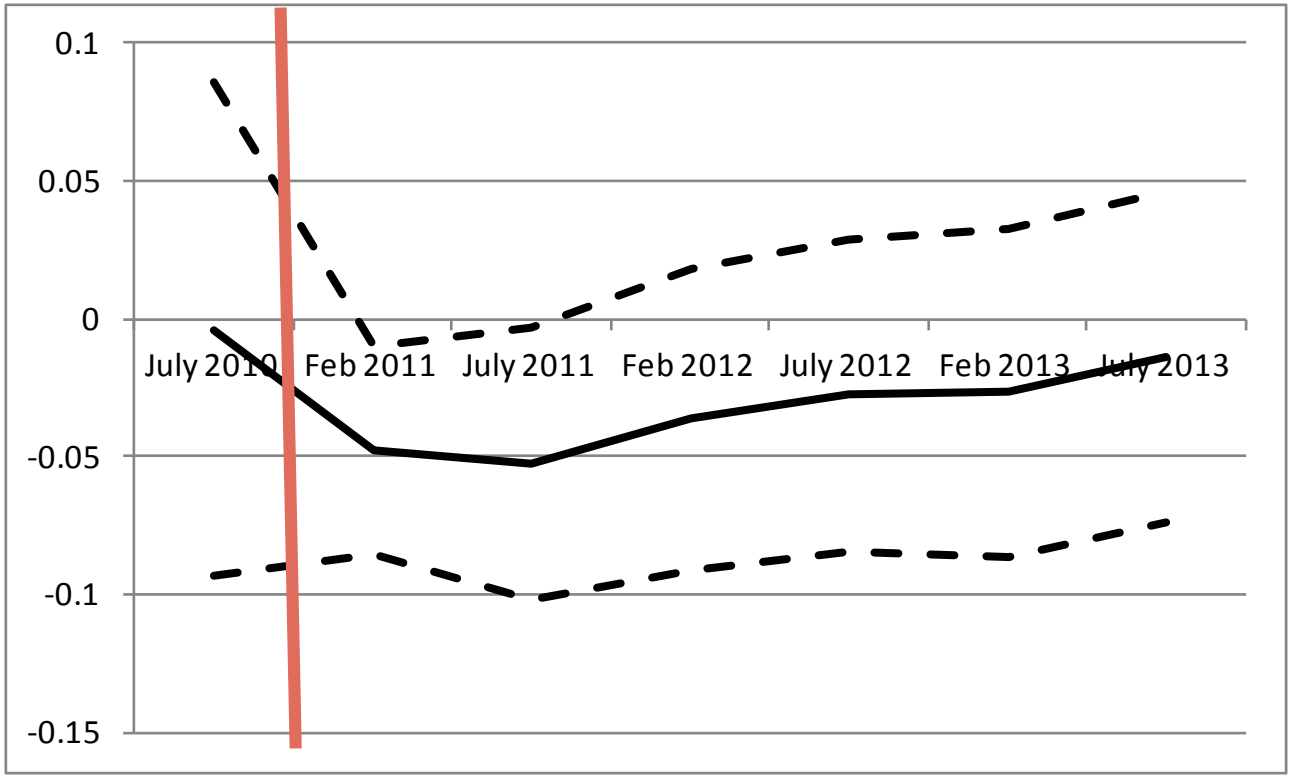
Exams Passed



Exams Taken


0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
May 2010
June 2010
Jan 2011
May 2011
June 2011
Jan 2012
May 2012
June 2012
Jan 2013
May 2013
June 2013

Accumulated GPA



Heterogeneity analysis

Dep. variable: Exams passed the 2nd year

Sample:	Overall	Good News	Bad News	Female	Male	Above Mean	Below Mean
Treatment	-0.408**	-0.448*	-0.020	-0.465*	-0.324	-0.363	-0.308
	(0.179)	(0.224)	(0.369)	(0.263)	(0.259)	(0.266)	(0.235)
N	977	729	248	528	449	442	535

Other performance variables

- **Dropout**
  - No effect
- **Graduation rate**
  - No effect
- **Choice of electives**
  - No effect of treatment on the selection of "easy" versus "difficult" course

Student Satisfaction

- Students complete teaching evaluations twice a year.
- The timing is such that:

Student Evaluation	Feedback Information	Exam Period	Student Evaluation

- Evaluations are anonymous but we can identify the treatment and control groups
- Can only do it for 2nd year
  - 3rd and 4th year students take electives

Feedback Effect on Student Satisfaction

- Effect on Performance:

$$Y_{m,d,g,t+i} = \alpha + \gamma Treatment_{d,g} + \mathbf{X_d}\boldsymbol{\lambda} + \varepsilon_{m,d,g,t+i}$$

Satisfaction, hours of study, or ***ease of course*** for student enrolled in module **m**, degree **d** and group **g**, at time **t+i**

Results: Student Satisfaction

	Pre-Treatment Semester			**Post-Treatment Semester**		
	Hrs of Study	Satisfaction	Course Ease	**Hrs of Study**	**Satisfaction**	**Course Ease**
Treatment	0.126	0.0134	-0.000141	**0.153**	**0.296*** **	**0.117**
	[0.0680]	[0.121]	[0.103]	**[0.109]**	**[0.109]**	**[0.121]**
Constant	2.866***	3.868***	3.556***	**2.939*** **	**3.508*** **	**3.104*** **
	[0.0409]	[0.0740]	[0.0631]	**[0.0459]**	**[0.0833]**	**[0.0798]**
Observations	182	182	182	**165**	**165**	**165**
R-squared	0.143	0.028	0.088	**0.139**	**0.09**	**0.09**

Other Analysis

- **Placebo regressions**
  - No impact of treatment on other cohorts (unaffected by treatment)
- **Analysis of using as IV assignment to treatment**
  - Coefficients are 30 percent larger
- **Randomisation inference (Rosenbaum 2002)**
  - Standard errors slightly larger (6% significancy level)

Summary and Conclusion

Summary

- Students appear to be uniformed about the relative performance and tend to be underconfident
- Providing feedback has:
  - **Positive effect** on self-reported student satisfaction
  - **No significant effect** on self-reported effort
  - **Negative effect** on performance
- Effects on performance are short-term and disappear after first year of treatment
- No long-term effect on the likelihood to graduate or GPA at end of degree

Conclusion

- The impact of feedback of relative performance may depend crucially on individuals' **prior information** and their **preferences**
  - Field experiments might be very useful

- What can we learn about **students' preferences**:
  - Competitive preferences? Apparently not
  - Satisficing heuristics? Perhaps

Thanks!