Utilizing Administrative Data to Answer Causal Questions about Education Policies and Programs

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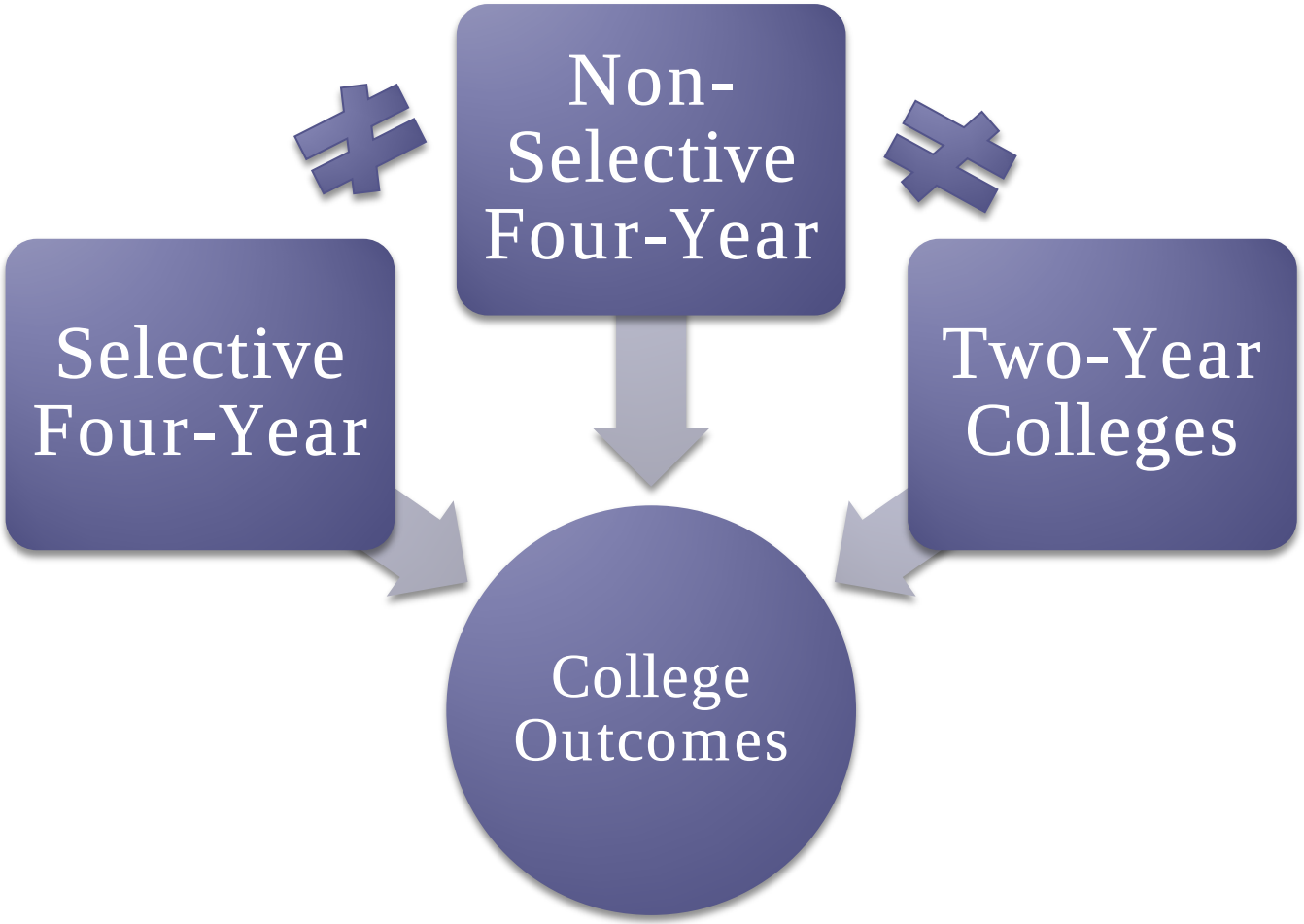
Presentation Outline

- Drawing Causality in Education Research
  - Challenges and new methods
- Quasi-experimental designs with California administrative data
  - A few examples

The challenge of drawing causality

- Educational destinations and programs are not randomly assigned to students
- Our desire is to determine how the outcomes for individuals who receive a treatment differ from what the outcomes would have been in the absence of the treatment.
- The Counterfactual—the condition to which individuals would have been exposed to in the absence of this treatment (program, policy, etc.)

Ubiquitous selection problem that plagues education research



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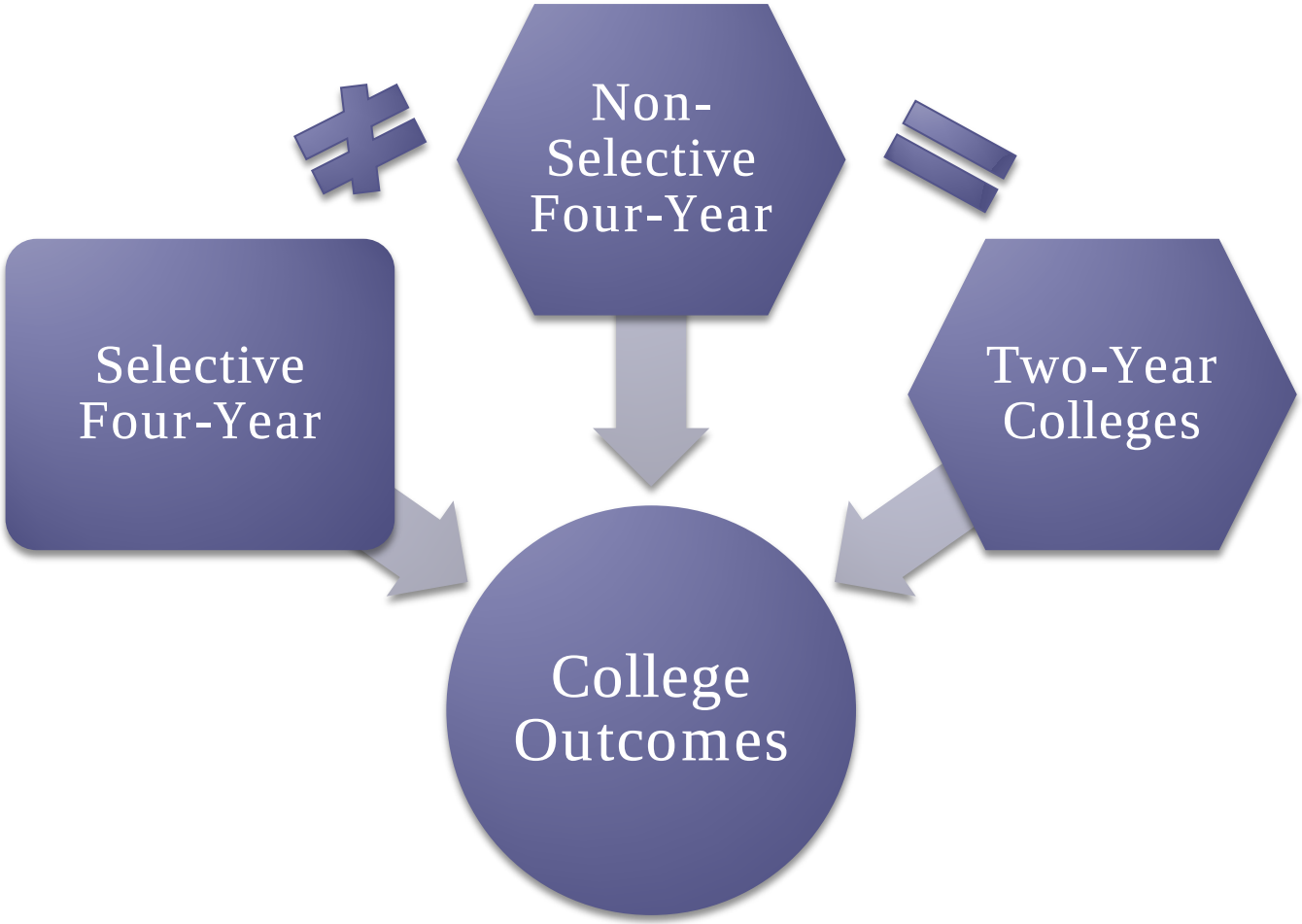


Establishing a Counterfactual

- The challenge is to determine how the outcomes for individuals who receive a "treatment" differ from what the outcomes would have been in the absence of the "treatment"

	Value of Outcome in Treatment Group	Value of Outcome in Control Group
Treatment Group (Four-Year Colleges)	Known	Unknown
Control Group (Community Colleges)	Unknown	Known

The Randomized Experiment & New Quasi-Experimental Approaches

- Randomized Experiments
  - Solve the problem of exogenous assignment
  - Groups are equal in expectation

- New quasi-experimental methods simulate the randomized experiment
- Capitalize on exogenous assignments to treatment; How?
  - Natural Experiments—utilize changes in policies that disrupt the status quo
  - Assignment to group is based on arbitrary cut-offs

Example 1: Admissions "Experiment"—UC's Guaranteed Transfer Option

- Mismatch hypothesis—students and colleges are often said to be "mismatched" when student academic ability is substantially lower (or higher) than the school mean.

Background

- Evidence on how such mismatches affect college completion is not conclusive.
  - Students are more likely to graduate if they attend institutions at which they are about average on measures of academic ability
  - Attending a more selective institution, regardless of relative academic preparation, is associated with higher graduation rates and future earnings

Why should selectivity matter?

- Peer effects—selective institutions may provide advantages through a more highly prepared set of peers
- Differential effects for disadvantaged students

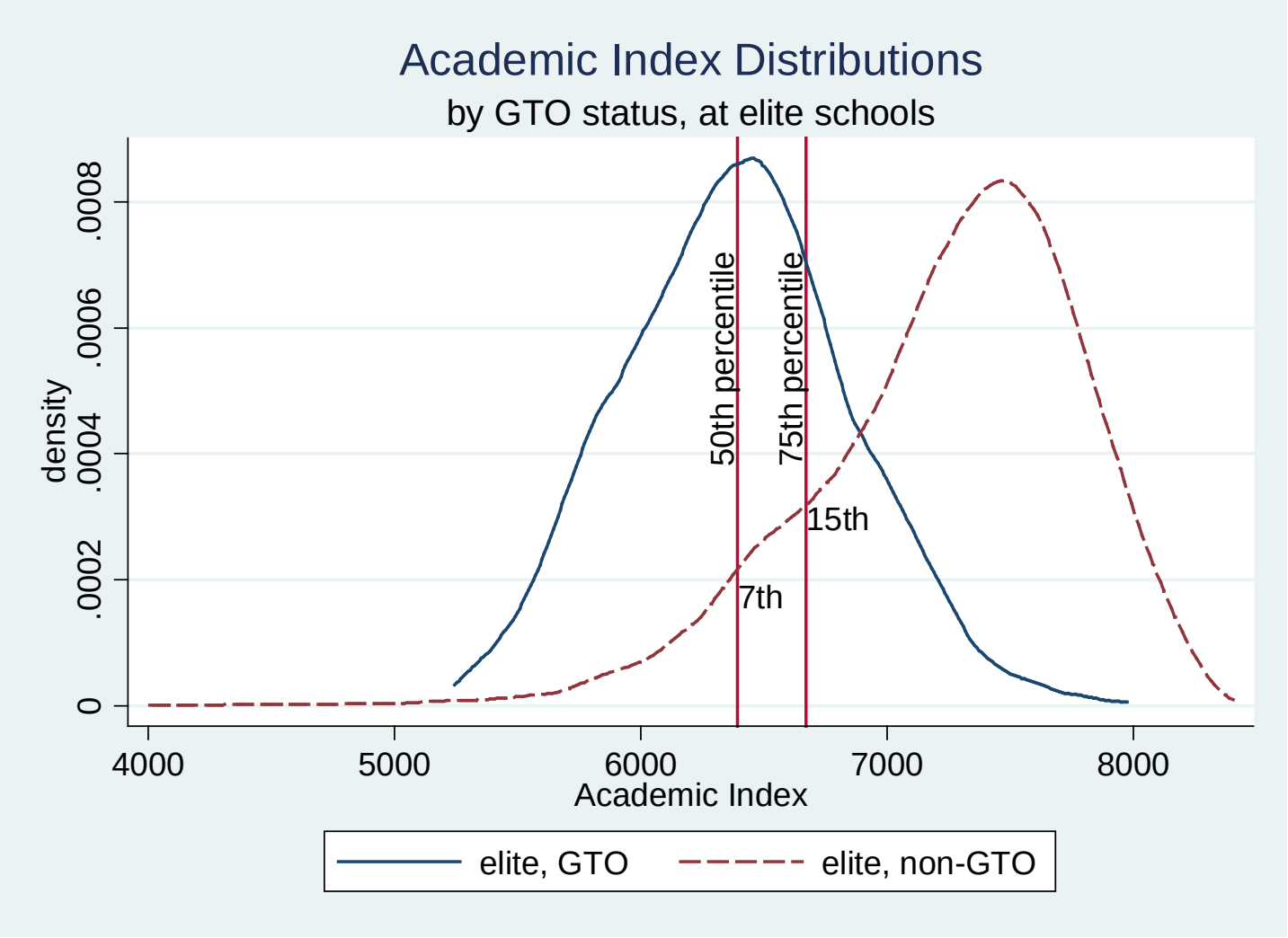
UC Guaranteed Transfer Option

- Budget cuts of 2004 admissions cycle led to UC eligible students being denied admission to UC
- Mandated by UC Office of the President, all campuses had to make GTO offers
- Budget restored later that spring, GTO students entered specified campuses in fall 2004 instead of two years later.

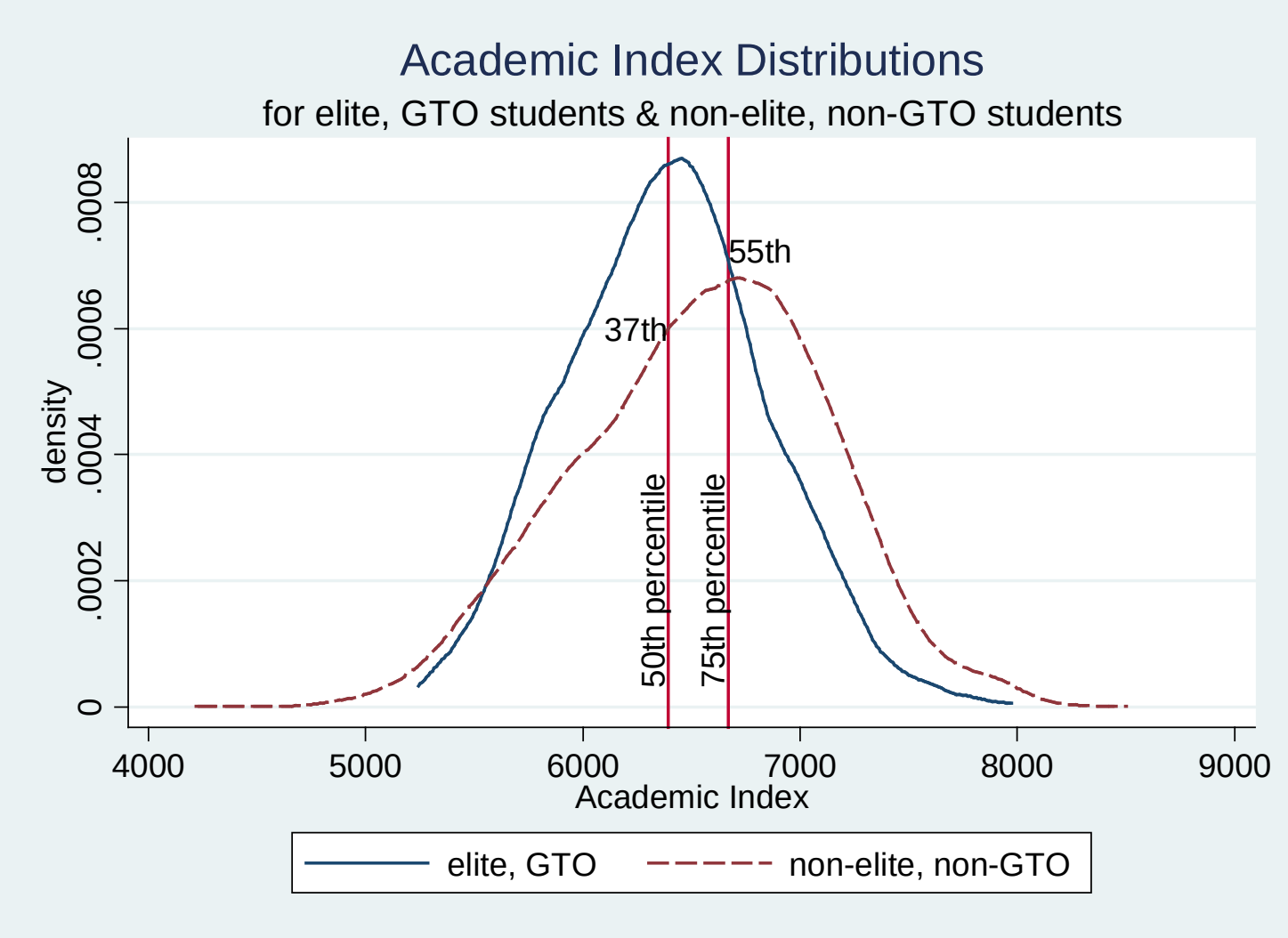
UC Guaranteed Transfer Option

- Who are the GTO students?
  - UC eligible students initially denied admission
- "Lottery Winners" in admission
  - GTO students admitted to the three elite campuses (Berkeley, Los Angeles, San Diego) Represent a unique opportunity to test the mismatch hypothesis.

Descriptive Statistics—GTO and Non-GTO at Elite Institutions



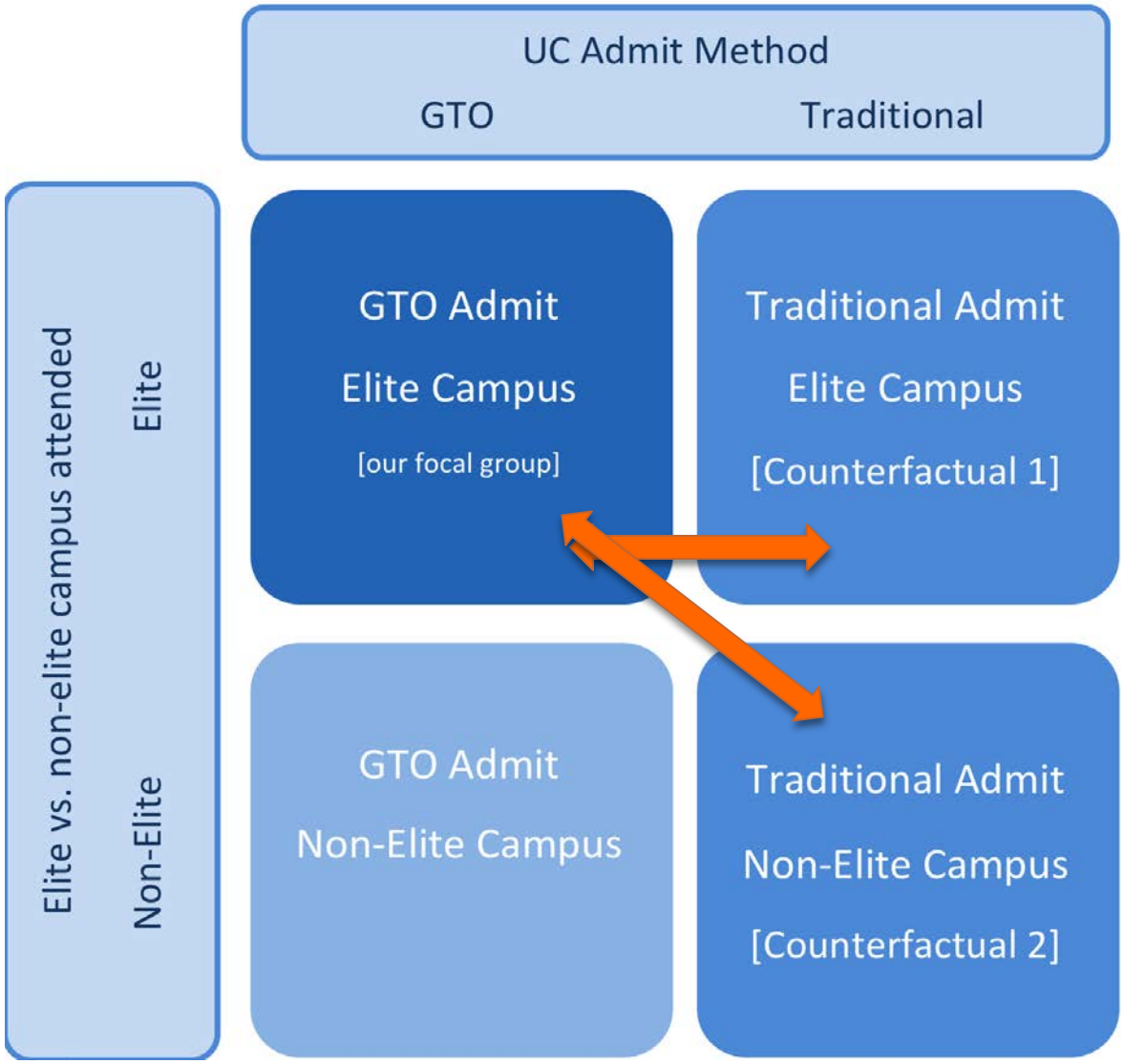
Descriptive Statistics—GTO at Elite Institutions compared with Non-GTO at Non-Elite



Research Questions

- Do GTO students at elite UC institutions have similar persistence and performance outcomes as:
  - (1) students at these selective institutions who were admitted via the traditional admissions process?; and
  - (2) students observationally similar to the GTO admits who applied to and attended less selective UCs?

Analytic Strategy



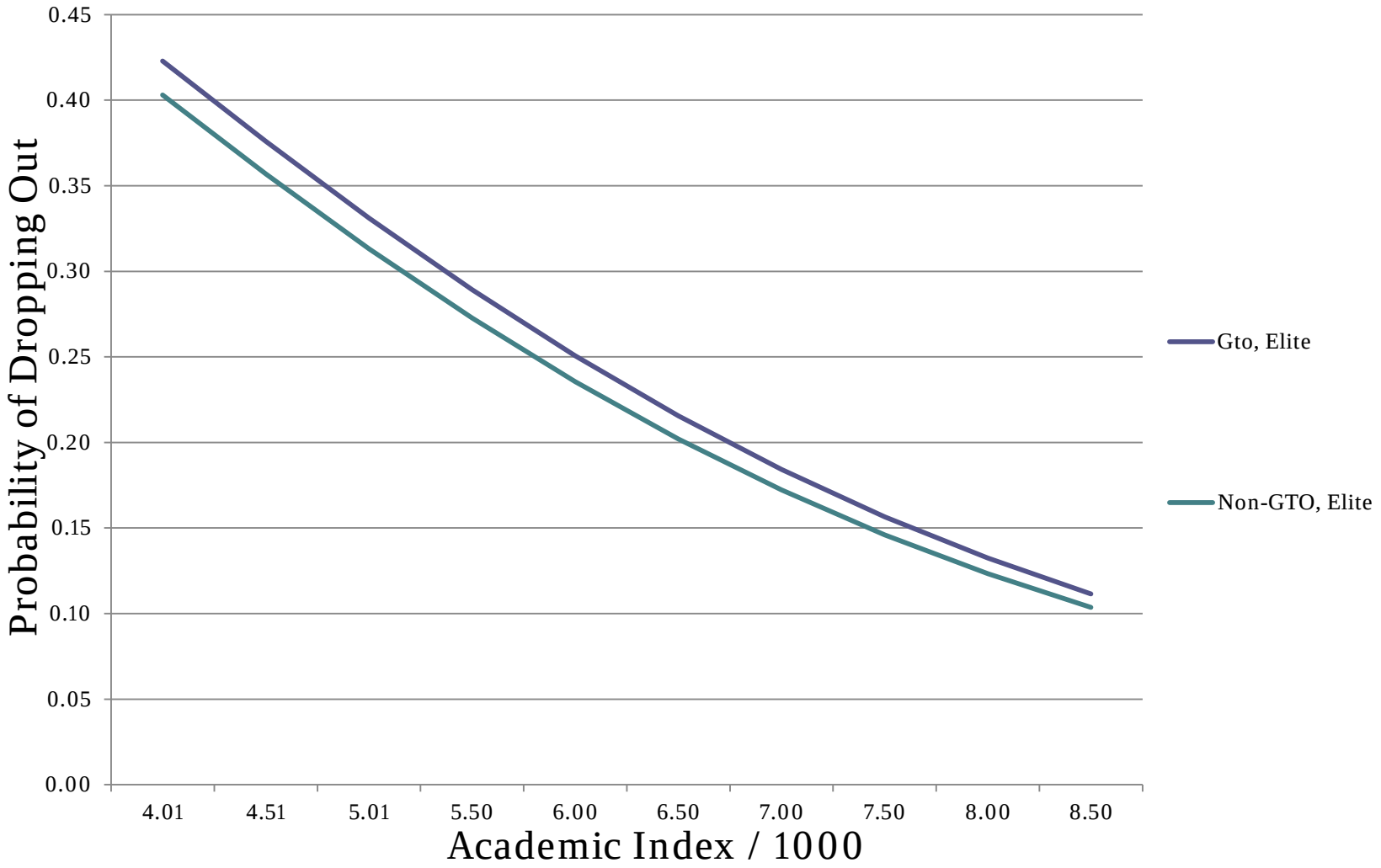
Analytic Strategy

- Data—UC Office of the President
- Outcomes—Persistence, Cumulative GPA, and Accumulated Credits
- Compare GTO students at Elite Campuses to two counterfactual states:
  - Non-GTO at Elite Campuses
  - Non-GTO at Non-Elite Campuses
- Add the following controls:
  - Academic credentials
  - Demographic characteristics
  - Application patterns (self-revelation)

Findings

- There is a very small penalty to mismatch between GTO students and traditional admits at elite institutions
  - less than one-half of a grade point average
  - About 7 fewer credits by the end of year one
  - Similar risk to dropping out
- There is a very small penalty to mismatch between GTO students at elite campuses when compared to traditional admits at non-elite campuses
  - 1/4th of grade point average
  - About 5 fewer credits by the end of year one
  - *Lower* risk of dropping out

Predicted Hazard of Dropping Out



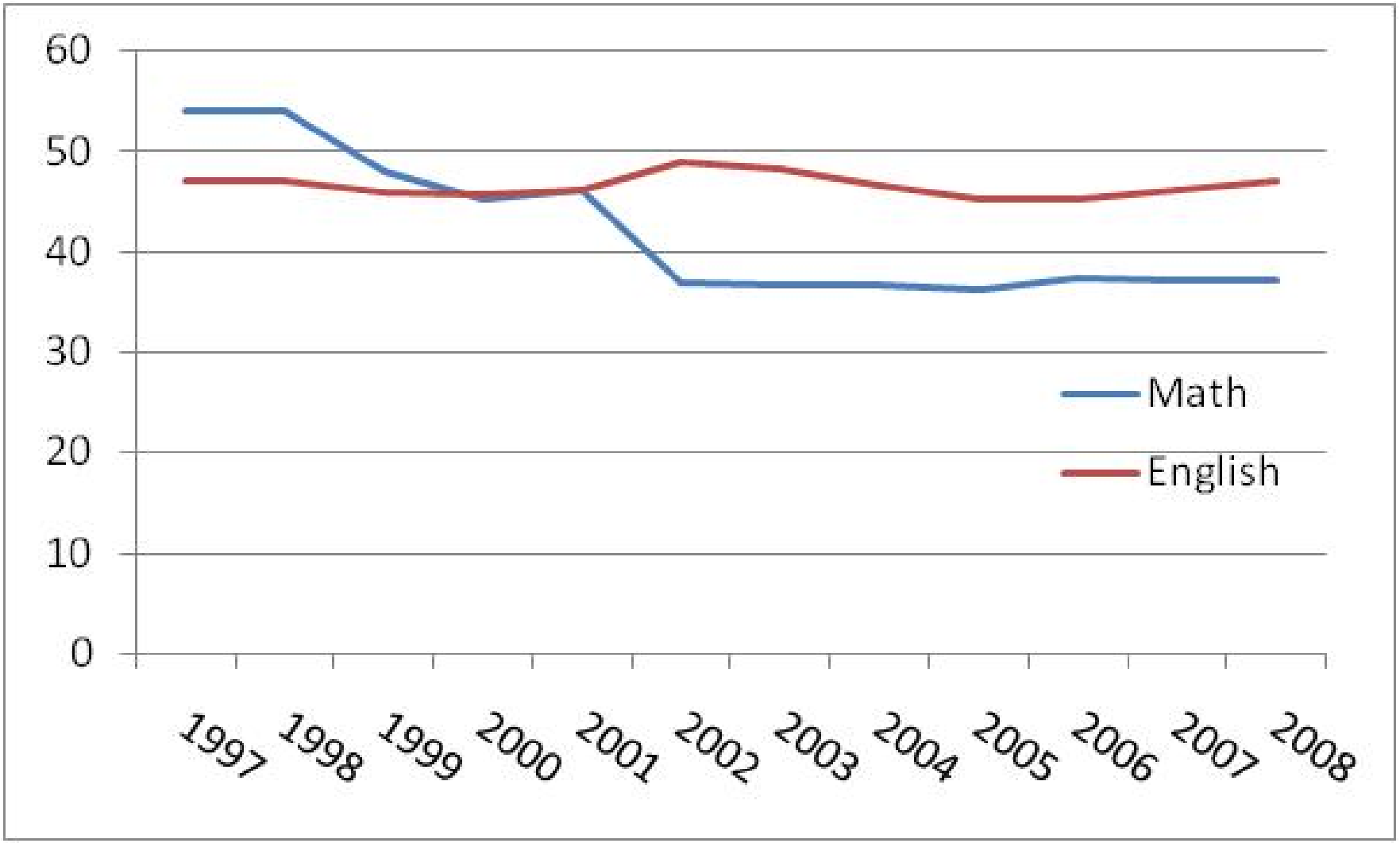
Findings

- So mismatch hypothesis somewhat right, but where it matters the least
  - Mismatch slightly reduces GPA and cumulative credits
  - However, mismatch does not reduce persistence

Example 2: California's Early Assessment Program

- Context
  - High college remediation rates
  - Align high school standards and assessments with the skills required for success after high school
- Where should remediation occur?
  - Bridge between K-12 schooling and college readiness
  - Role of secondary schools or community colleges, but not BA-granting institutions.
- Costs associated with remediation
  - "Paying Double"
  - Estimated cost of remediation at 4-year colleges is over $500 million (Strong American Schools, 2008)

Remediation Need at California State University—Rate Systemwide



Early Assessment Program Overview

- Goals of EAP:
  - Provide an early signal to students about their college readiness
  - CSU collaboration with secondary school community
  - Provide 12th grade interventions
- Components of EAP:
  1. 11th grade testing (early assessment)
  2. Professional development for teachers
  3. Supplemental preparation for students

Overview of EAP Testing Component

- Assessment:
  - Optional 15 questions on the mandatory 11th grade CST
  - Additional items developed by CSU faculty
  - Score based on CST augmented with EAP items
- Signal:
  1. Exempt
  2. Non-Exempt
  3. Conditional Exempt (in math only)

Research Questions

- How does participation in the Early Assessment Program affect students' probability of requiring remedial coursework in college?

- How has school level participation in the Early Assessment Program influenced school outcomes, in particular 11th grade test scores?

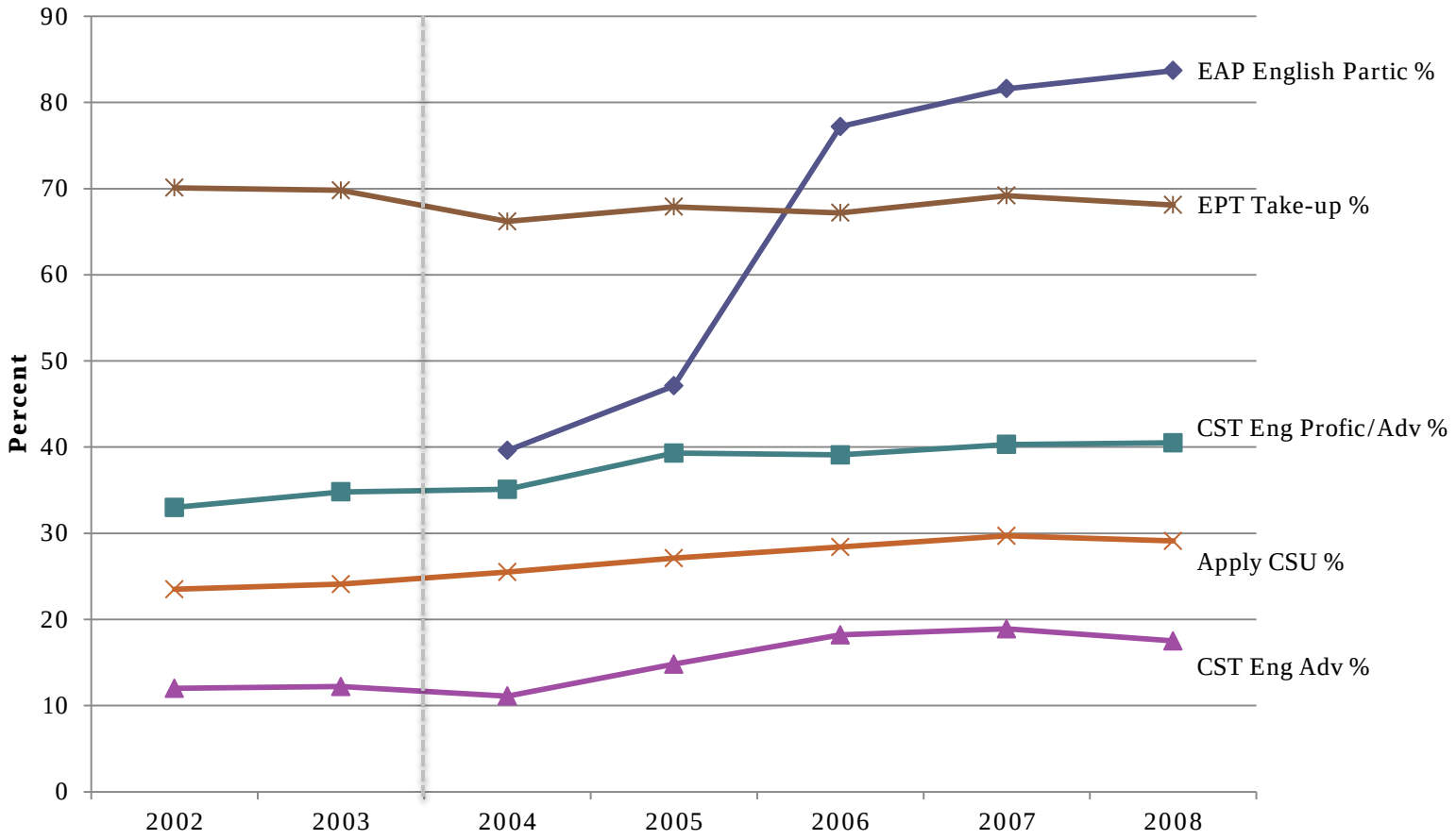
Data

- California Department of Education
  - EAP participation and test results
  - School Characteristics
- CSU Office of the Chancellor
  - Application information
  - Remediation assessments
  - Other college outcomes

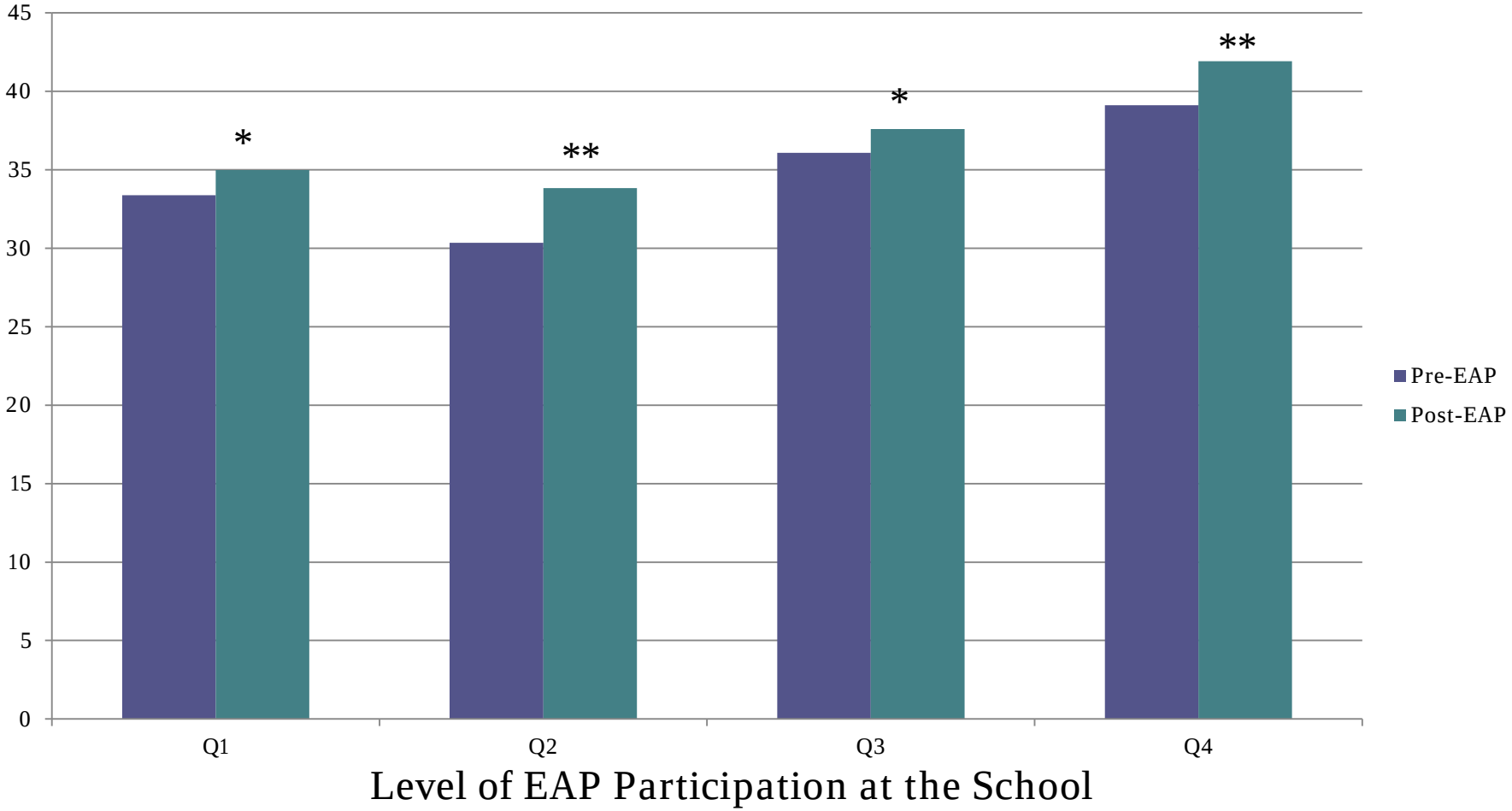
Analytic Strategy

- Model remediation need for first-time freshman in Math and English, respectively, as a function of:
  - Individual characteristics
  - Attributes of individual's high school
  - EAP availability
  - Participation in EAP
- Investigate selection into EAP at the individual and school level
- Among those that participate in EAP, model college application behavior as a function of EAP signal (Exempt/Non-Exempt)

Mean School Percentages on Outcomes



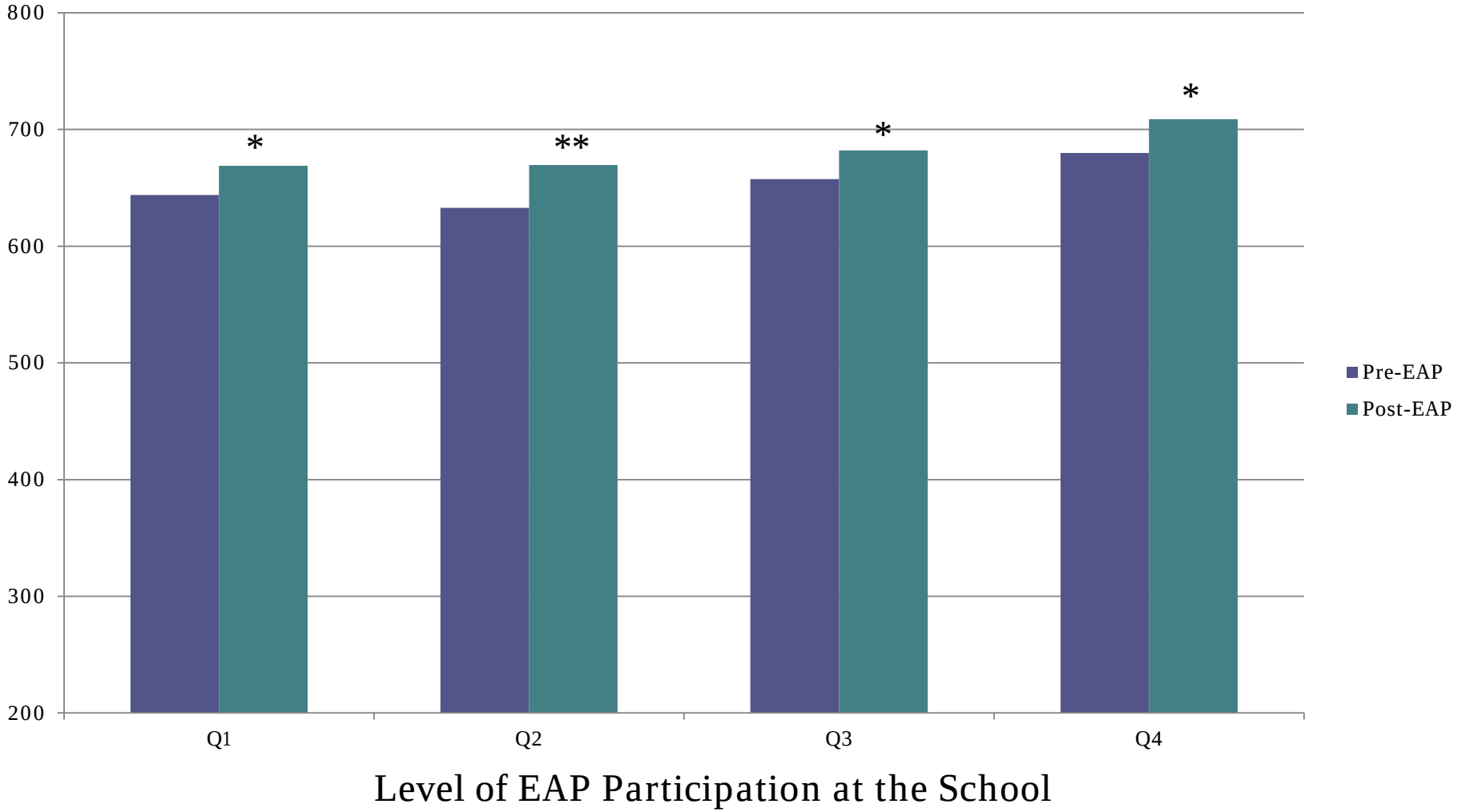
Results
Fitted Values for **CST Proficiency**
from Interrupted Time Series



Results

Fitted Values for **API**

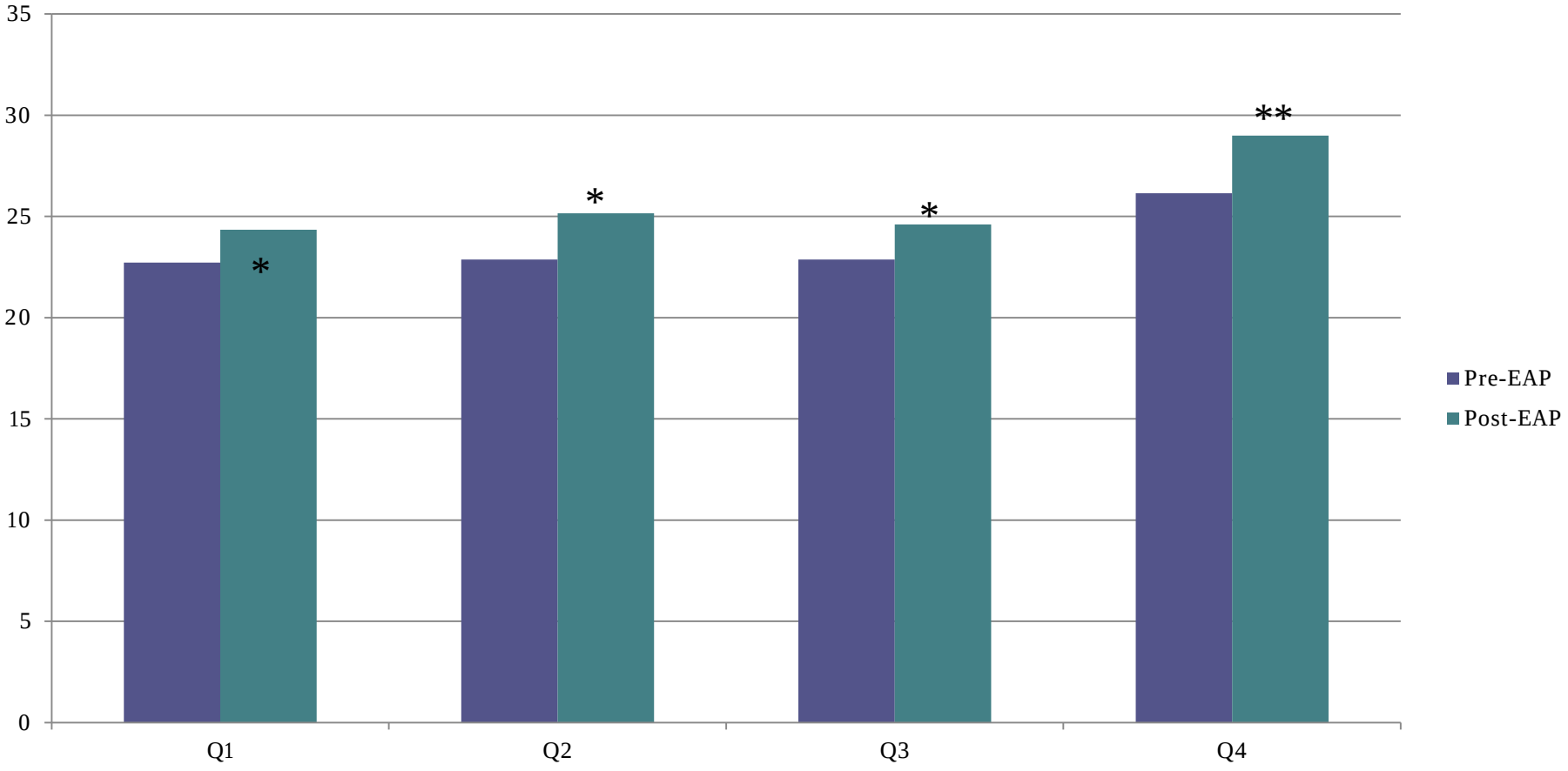
from Interrupted Time Series



Results

Fitted Values for **CSU Application**

from Interrupted Time Series



Level of EAP Participation at the School

Results: Why the increase in test scores? A Difference in Difference Approach

	EAP Q1		EAP Q2		EAP Q3		EAP Q4	
Grade	10th	11th	10th	11th	10th	11th	10th	11th
Pre	32.76	32.45	33.81	33.81	33.54	36.66	42.76	43.06
Post	34.66	34.39	35.80	35.80	36.07	38.97	46.93	46.63
Difference	**1.89**	**1.94**	**1.99**	**2.53**	**2.36**	**2.27**	**4.17**	**3.57**
DID		**0.05**		**0.53**		**-0.09**		**-0.60**
DIDID				**0.49**		**-0.14**		**-0.64**

Conclusions

- Participation in EAP does modestly improve school outcomes (and student outcomes, from other work not shown)
- Mechanism does *not* appear to be through increasing individual stakes on 11th grade assessments.

New Work: Investigating the Multiple Missions of Community Colleges

- Transfer Function of the Community Colleges
  - Student Transfer Achievement Reform Act (Senate Bill 1440, 2010)
  - Did policy lead to improved outcomes (e.g. increased transfers, quicker time to degree)?

- Workforce Development at Community Colleges
  - Changes to funding structure of non-credit courses
  - Did incentives lead to changes in composition of enrollees and improve participants' outcomes?