Affirmative Action and Student Effort

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Motivation

- Race-based affirmative action policies in higher education are widespread around the world.
- Widely seen as necessary for elite colleges to maintain racially diverse populations.
- Yet also extremely controversial.
  - Eight states have banned AA at all public universities.
  - Repeatedly subject to challenges in courts at the state and national level.
- Necessary to understand the costs and benefits of AA policies.

Effect on Students *Before* College

- Focus on the effects of affirmative action on students' pre-college human capital outcomes.
  - AA could *directly* affect students' perceived returns to effort.
  - AA could also indirectly increase perceived returns by increasing number of minority students observed being admitted to selective schools.
- Direction of the average effect of AA is theoretically ambiguous.
  - Likely to depend on location in the ability distribution.
  - For the highest ability students, lowering the threshold for admissions could *reduce* returns to effort (Coate and Loury, 1993).
  - For lower ability students, could *increase* returns to effort (Fryer and Loury, 2005; Cotten et al., 2015; Bodoh-Creed and Hickman, 2018; Khanna, 2018).

This Paper

- Exploit the timing of a court case that allowed Texas, Mississippi, and Louisiana public universities to start using racial preferences in admissions.

- Use 3 administrative data sets and 1 survey data set to analyze the effects of the policy change.

    1. **Panel of every student in Texas (TEA)**: Includes college applications, admission, graduation, attendance, and ability measures.
    2. **Panel of SAT scores at the race-state-year level.**
    3. **Survey**: Two cross-sections of Texas high school students: guidance counselor, parent, and student behavior.
    4. Panel of every student in a large urban TX district: high school grades.

- Methods: Difference-in-differences and synthetic control strategies.

This Paper

Introduction

Context

AA & Student Effort

Returns to Effort

AA & College Graduation

Mechanisms

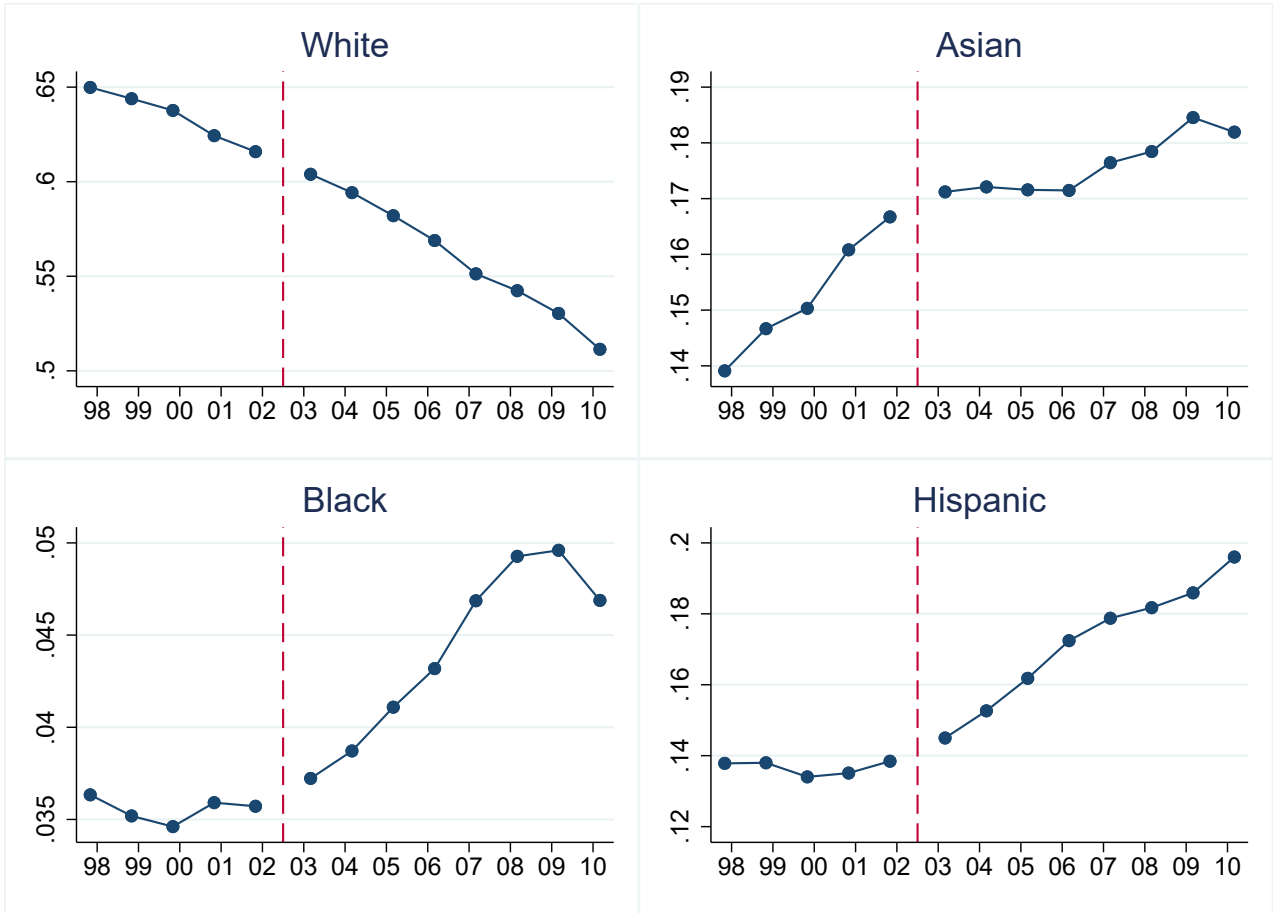
Conclusion

Background

- In 1996, U.S. Court of Appeals for the Fifth Circuit ruled in *Hopwood v. Texas* that public universities could not use race as a factor in deciding which applicants to admit.
  - Affected Texas, Louisiana, and Mississippi.
  - In response, TX passes top 10% rule in 1997.
- In **2003**, U.S. Supreme Court ruling in *Grutter v. Bollinger* abrogates *Hopwood v. Texas.*
  - Following *Grutter v. Bollinger*, public universities immediately expressed interest in re-instating racial affirmative action. Details
  - Outcome of the case was hard to predict. Details
  - The discussion was widely publicized in the national news. Details Figure

Did *Grutter v. Bollinger* Affect Enrollment?

Figure: Racial Composition of Enrollment at **UT Austin** by Year in IPEDS



▸ Total Enrollment in Universities of Texas

Empirical Strategy: College Applications

On sample of all Texas high school students (TEA), estimate

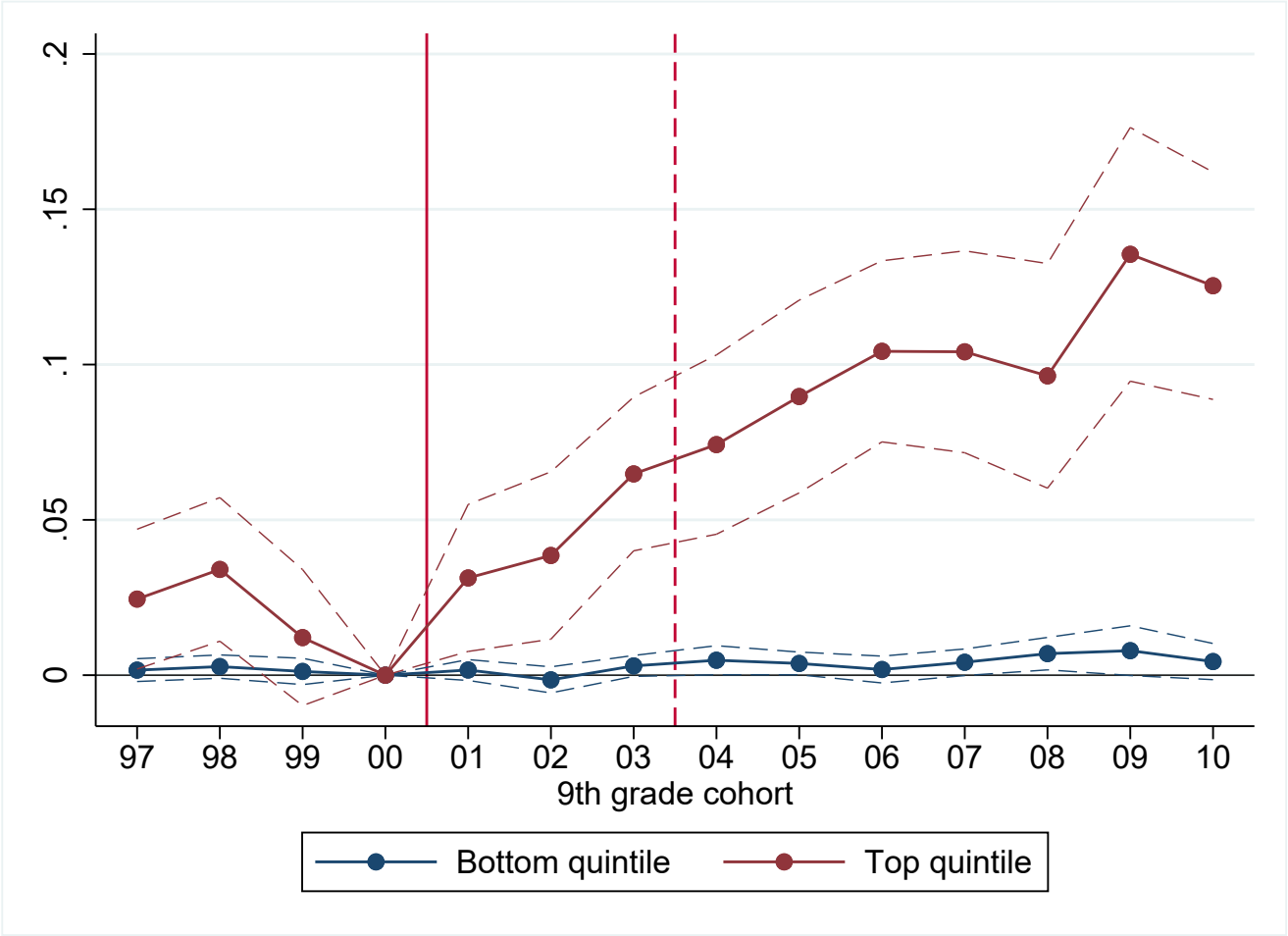
$$y_{dcea} = \beta_1 I_c^{Partial} \times I_e^{Minority} + \beta_2 I_c^{Full} \times I_e^{Minority} + \mathbf{\Gamma X_{dcea}} + \alpha_{dca} + \alpha_{dea} + \epsilon_{dcea}$$

where

- d denotes a district, c denotes a cohort, a denotes ability (quintile of grade 6 test score distribution), and e denotes an ethnic group.
- y_{dcea}: Number of "selective schools" (UT Austin, Texas A&M, Texas Tech, and U Houston) applied to.
- $I_c^{Partial}$: Indicator for partial exposure to AA (were in high school in 2003).
- I_c^{Full}: Indicator for full exposure to AA (started high school in 2004 or later).
- $I_i^{Minority}$: Indicator equal to 1 if black or Hispanic.
- α_{dca}: district by cohort by ability fixed effect.
- α_{dea}: district by ethnicity by ability fixed effect.

Did URMs Respond to AA? Number of Applications to Selective Universities

Figure: Number of Applications to Selective Universities (Relative to Whites)



▸ Any Application

Did URMs Respond to AA? Number of Applications to Selective Universities

		Percentile of grade 6 test score distribution				
	All students	Bottom quintile	2nd quintile	3rd quintile	4th quintile	Top quintile
	(1)	(2)	(3)	(4)	(5)	(6)
	Dep. Var.:Applications to selective colleges					
Partial treatment	0.0095***	0.0017	0.0020	0.0022	0.0145**	0.0276***
	(0.0027)	(0.0019)	(0.0025)	(0.0034)	(0.0066)	(0.0086)
Full treatment	0.0190***	0.0016	0.0044*	0.0145***	0.0344***	0.0429***
	(0.0033)	(0.0014)	(0.0025)	(0.0040)	(0.0057)	(0.0099)
Observations (cells)	97121	18380	20681	20974	19960	17126
R^2	0.913	0.492	0.646	0.738	0.798	0.838
Mean dependent variable	0.1584	0.0100	0.0376	0.0941	0.2120	0.4426
Demographic controls	X	X	X	X	X	X
District-by-cohort-by-ability FE	X	X	X	X	X	X
District-by-ethnicity-by-ability FE	X	X	X	X	X	X

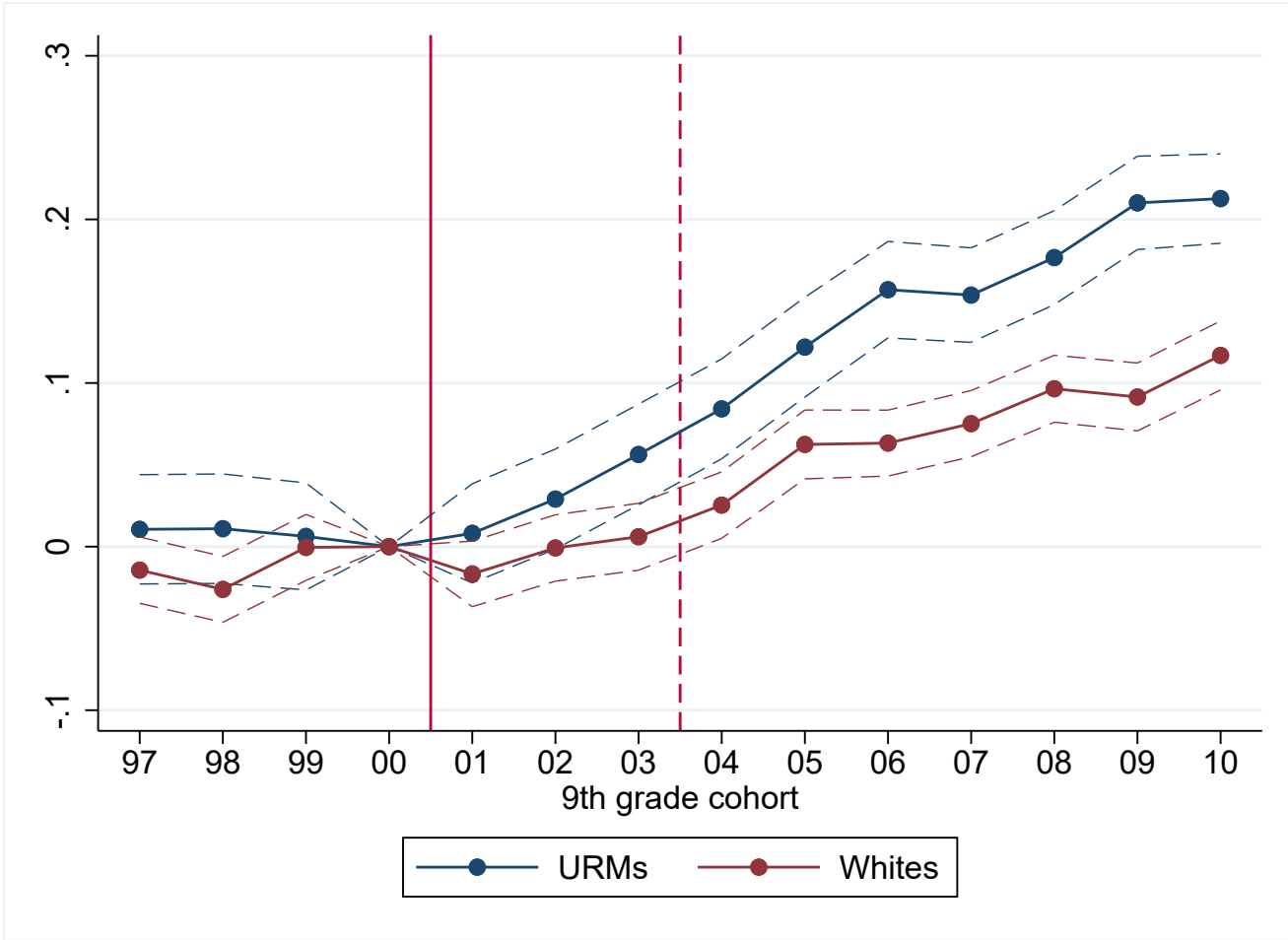
- Reject top and bottom quintile effects are the same for the fully treated at the 1% level.

Magnitude:
For fully treated minorities, 10% increase in likelihood of applying to at least 1 college, and 12% increase in number of selective TX colleges applied to.

▸ Any Application ▸ Exogeneous Ability ▸ Drop Houston and Dallas

Is the Relative Increase for Minorities Driven by Negative Effects on Whites?

Figure: Raw Trends in Applications to Selective Universities in the Top Quintile



▸ Applied Any

Applications Summary

- "First-stage" Evidence: Students respond on a margin that is easily malleable and directly related to the policy change.
- Effect concentrated among the top two quintiles of ability distribution.
- Effect kicks in immediately, suggesting URM students perception of likelihood of being admitted has changed ...
- ... but grows over time, as students have more time to adjust effort.

Advantages of the SAT

- Data is available nation-wide.
- Allows us to exploit state and time variation to separately estimate the effects of the re-instatement of affirmative action on URMs and whites.
  - Further test whether relative gains for minorities are due to losses to whites.
- Three strategies:
  - Difference-in-differences.
  - Triple-differences using racial variation.
  - Synthetic control group.

SAT Data

- Used publicly available pdf's of race-state-year average scores to construct a panel of data at the race-state-year level.
- Observe
  - SAT math.
  - SAT English.
  - Number of test-takers.
  - Combine with ACS counts to get share of eligible students who take the test.
- Weight by number of test-takers to simulate micro-data.

SAT Main Empirical Strategy: D-in-D

Estimate

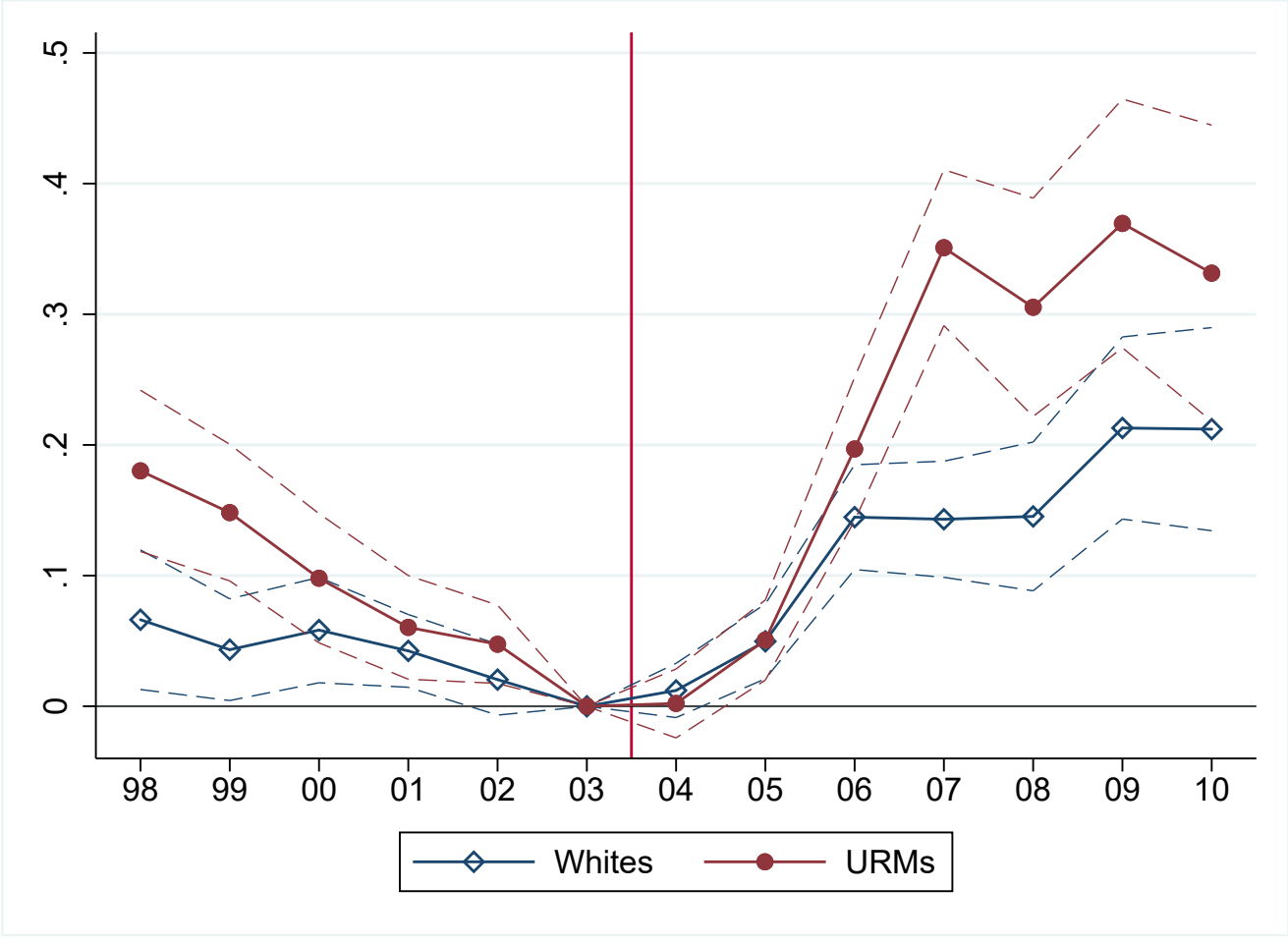
$$y_{sce} = \beta_1 I_c^{Post} \times I_s^{Treated\ State} + \mathbf{\Gamma X_{sce}} + \alpha_s + \alpha_e + \alpha_c + \epsilon_{sce}$$

where

- s denotes a state, c denotes a cohort, and e denotes an ethnic group.
- y_{sce}: SAT scores in math and verbal.
- I_c^{Post}: SAT taker after 2003 ruling.
- $I_i^{Treated\ State}$: Indicator variable equal to 1 if *Grutter v. Bollinger* reversed previous ban.
- α_c: cohort fixed effect.
- α_s: state fixed effect.
- α_e: ethnicity fixed effect.
- Estimate separately for minorities and whites to obtain separate AA effects.

SAT Results: Math

Comparing treated states with the rest of the US, separately by race



▸ Verbal

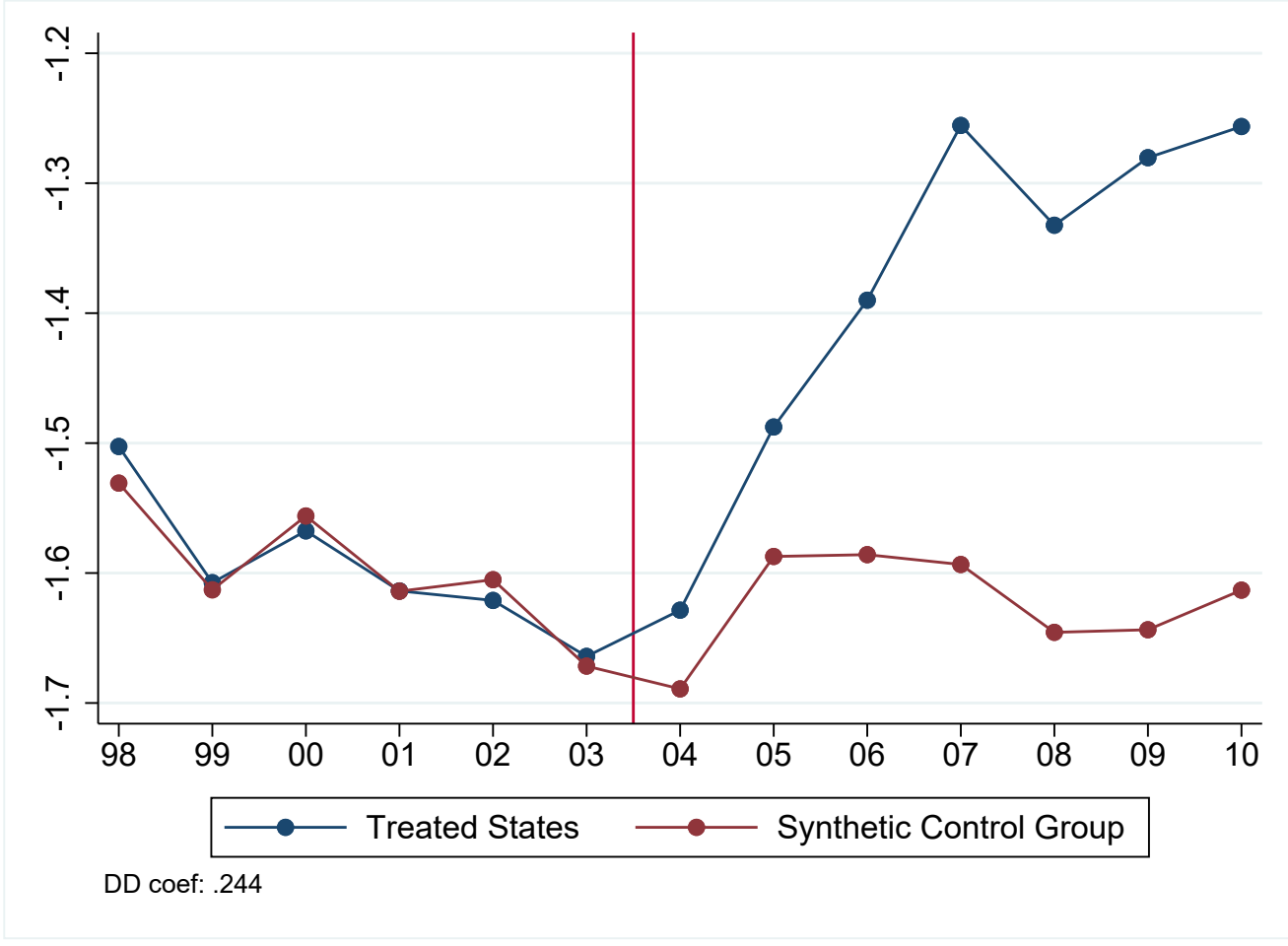
SAT Results

	Math	Verbal	# Test takers	% Test takers
	(1)	(2)	(3)	(4)
			Panel A: URMs	
DD coefficient	0.181***	-0.0197	531.8	0.0026
	(0.0340)	(0.0444)	(1162.0)	(0.0053)
Observations (cells)	1904	1901	1904	1116
R^2	0.844	0.795	0.802	0.877
State, year and ethnicity FE	X	X	X	X
			Panel B: Whites	
DD coefficient	0.0940***	0.0006	1546.0	0.0052
	(0.0225)	(0.0222)	(1268.7)	(0.0045)
Observations (cells)	663	663	663	561
R^2	0.968	0.971	0.987	0.978
State, year and ethnicity FE	X	X	X	X
			Panel C: Triple-Difference	
DDD coefficient	0.0901***	0.0274	-379.4	-0.0021
	(0.0198)	(0.0208)	(1071.8)	(0.0025)
Observations (cells)	2555	2552	2555	1677
R^2	0.998	0.998	0.999	0.993
State-by-year FE	X	X	X	X
State-by-ethnicity FE	X	X	X	X
Ethnicity-by-year FE	X	X	X	X

Synthetic Control Group Approach: Math SAT

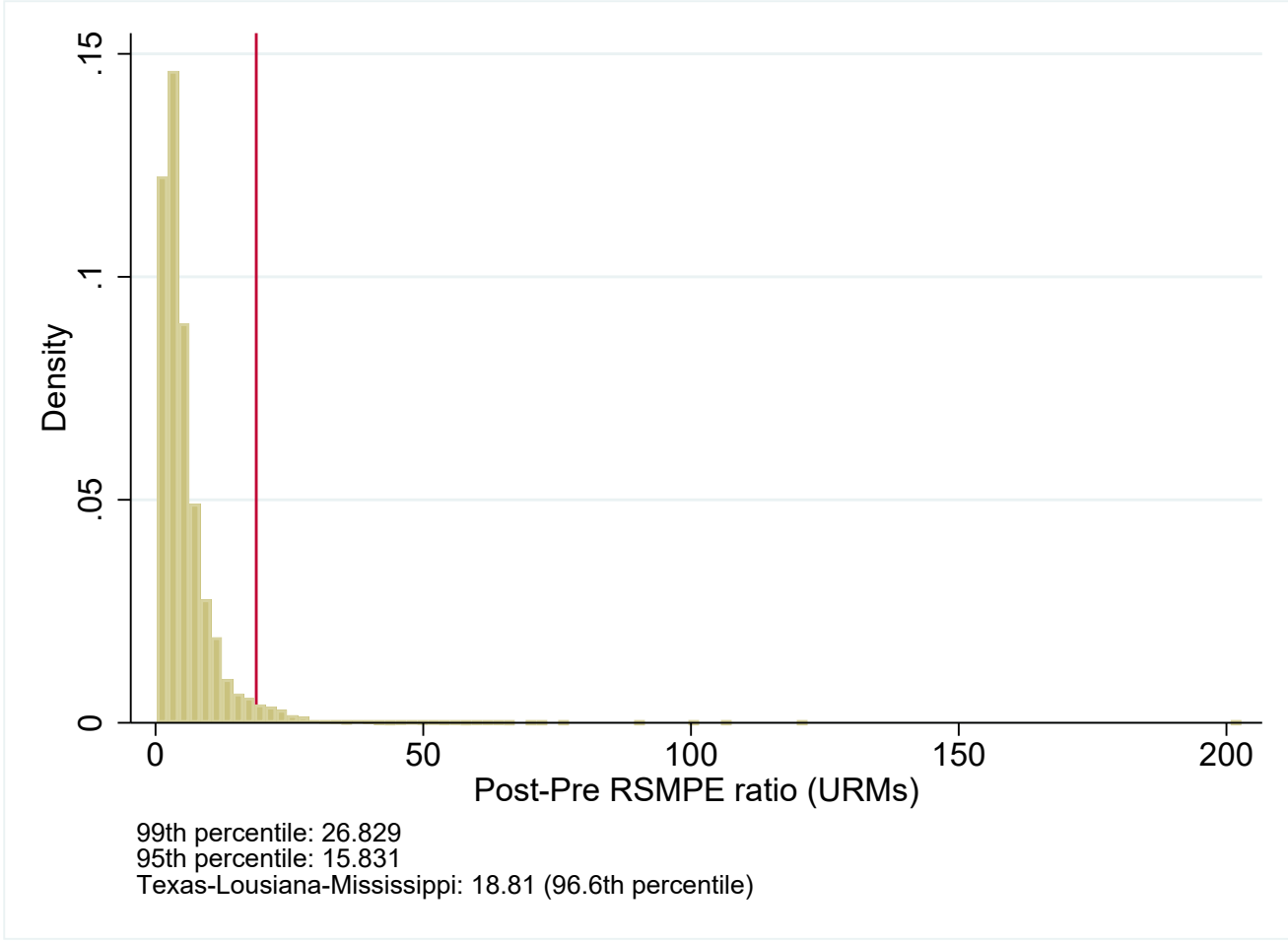
- Follows the approaches of Abadie et al. (2010) and Abadie and Gardeazabal (2003).
- Form one treated unit by taking a weighted average of the outcomes (by year and minority status) of Texas, Louisiana, and Mississippi.
- Use a weighted average of remaining states to create a synthetic control group.
- Choose weights for synthetic control group to minimize the sum of the squared differences between treated and control states' pre-treatment math SAT scores, verbal SAT scores, and demographic trends.
- Inference:
  - Form placebo treated groups with every combination of 3 of the remaining 47 states and re-estimate the model (Over 10,000 combinations).
  - Compare ratio of placebo-model's pre- and post-root mean squared prediction errors to the RMSPE for Texas, Louisiana, and Mississippi.

Synthetic Control Group Approach: URMs



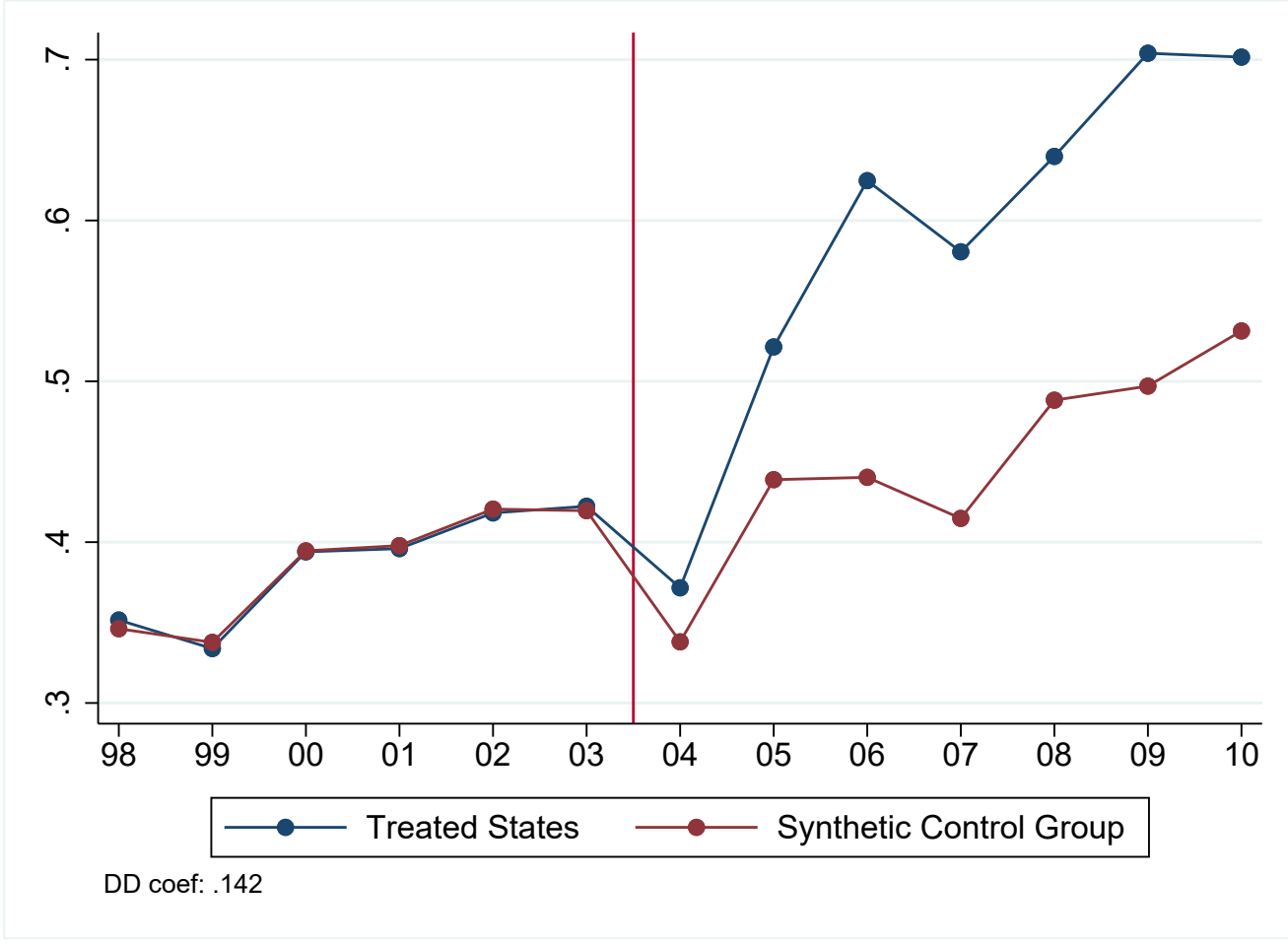
Synthetic control group: 33.2% (Oregon), 28.4% (New Jersey), 20.6% (California), and 17.8% (Pennsylvania)

Synthetic Control Group Approach: URMs (Inference)



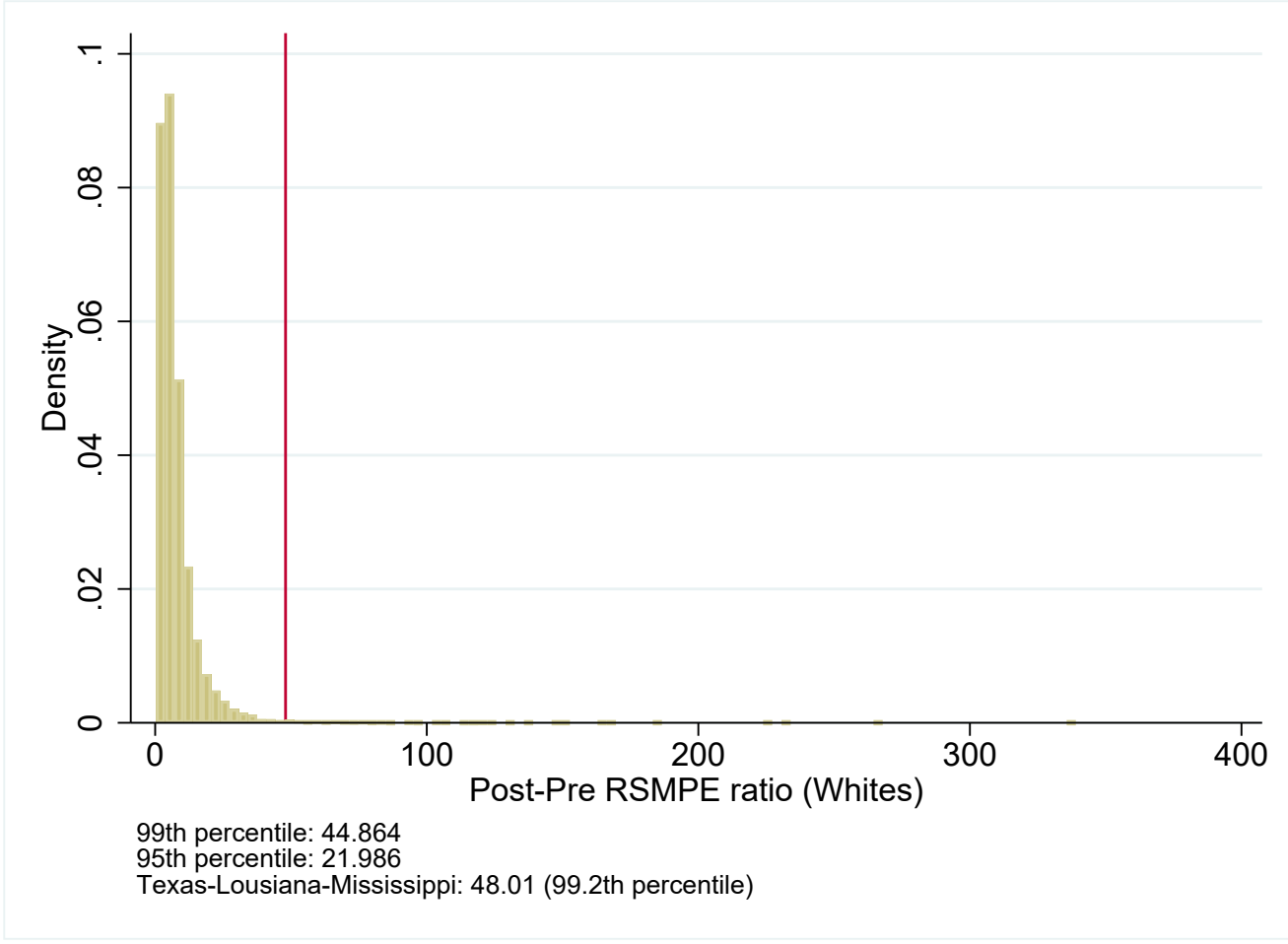
Indicates results are statistically significant at the 5% level.

Synthetic Control Group Approach: Whites



Synthetic control group: 42.5% (California), 40.8% (Florida), 8.3% (Pennsylvania), 6.2% (New York), and 2.2% (Indiana).

Synthetic Control Group Approach: Whites (Inference)



Indicates results are statistically significant at the 1% level.

SAT Summary

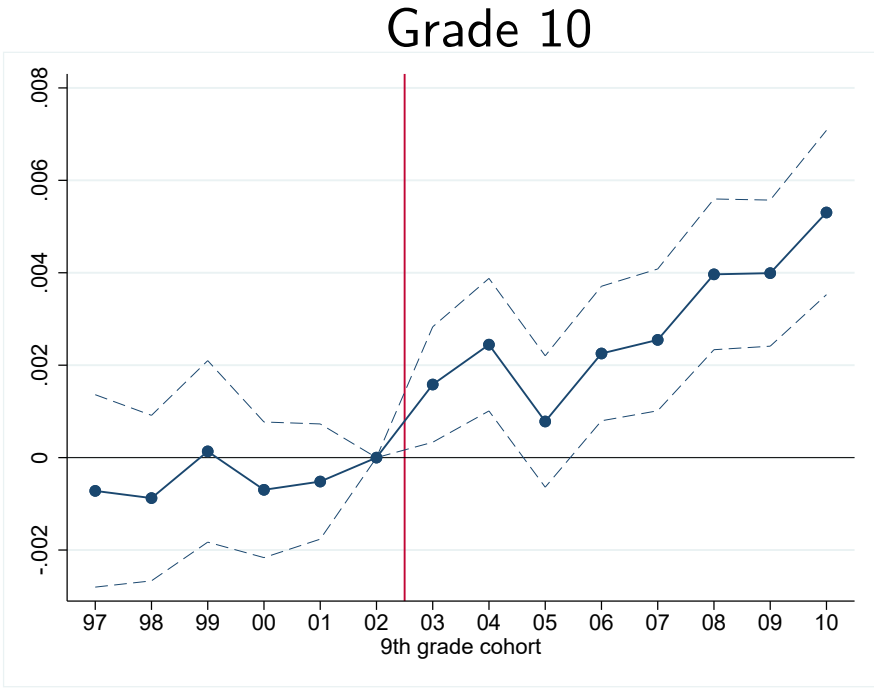
- Increases SAT scores in math for both URMs and whites, but effects are twice as large for URMs.
- Is the increase in scores for whites surprising?
- Not necessarily,
  - Intensified competition may increase white students' effort (on average) by increasing the returns to effort (e.g. Cotton et al., 2018).
  - Positive peer effects may improve white students' outcomes.
- Estimates of the change in URMs' outcomes relative to whites may be a lowerbound of the policy effect.

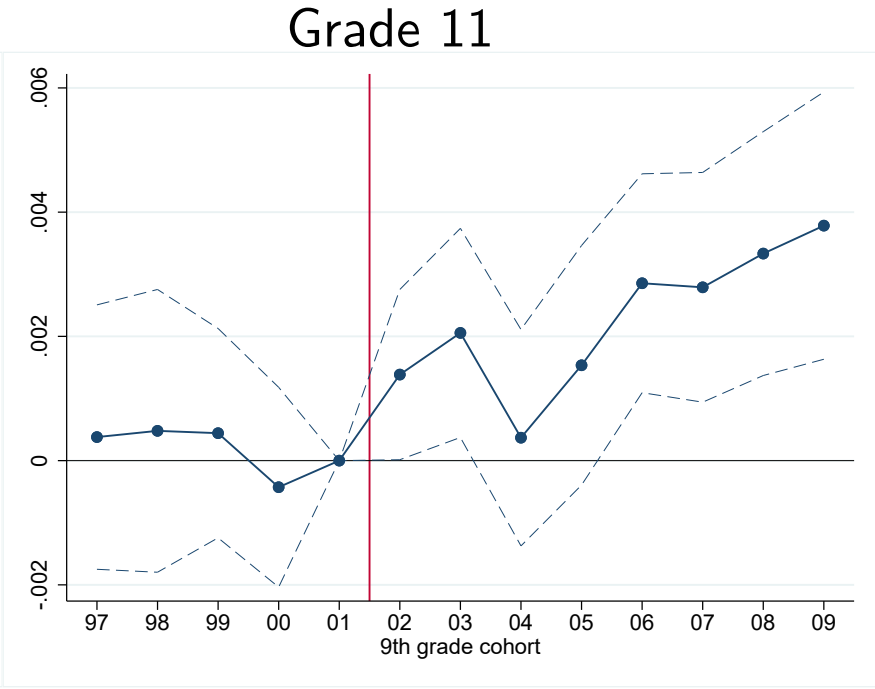
Return to Texas Administrative Datasets

SAT data doesn't allow us to examine heterogeneity by pre-treatment ability. Instead, exploit two administrative datasets from Texas:

1. Today: Texas wide (TEA) administrative data.
   - State-level test scores in 6th grade give location in the ability distribution.
   - Use the same empirical strategy for attendance and college graduation as for college applications.
2. In Paper: Supplemental data from a large, urban school district (LUSD).
   - Course grades Here
   - Test scores on the Stanford exam. Here

Days Present: TEA





Days Present in Grade 11: TEA

		Percentile of grade 6 test score distribution				
	All students	Bottom quintile	2nd quintile	3rd quintile	4th quintile	Top quintile
	(1)	(2)	(3)	(4)	(5)	(6)
	Dep. Var.: Attendance in grade 11					
Treated	0.0024***	0.0019	0.0012	0.0028***	0.0024***	0.0038***
	(0.0006)	(0.0014)	(0.0009)	(0.0009)	(0.0007)	(0.0006)
Observations (cells)	89849	16910	19120	19438	18532	15849
R^2	0.713	0.577	0.585	0.589	0.607	0.647
Mean dependent variable	0.9405	0.9199	0.9322	0.9409	0.9494	0.9596
Demographic controls	X	X	X	X	X	X
District-by-cohort-by-ability FE	X	X	X	X	X	X
District-by-ethnicity-by-ability FE	X	X	X	X	X	X

What is the Change in Returns to Effort?

Use TEA data to estimate:

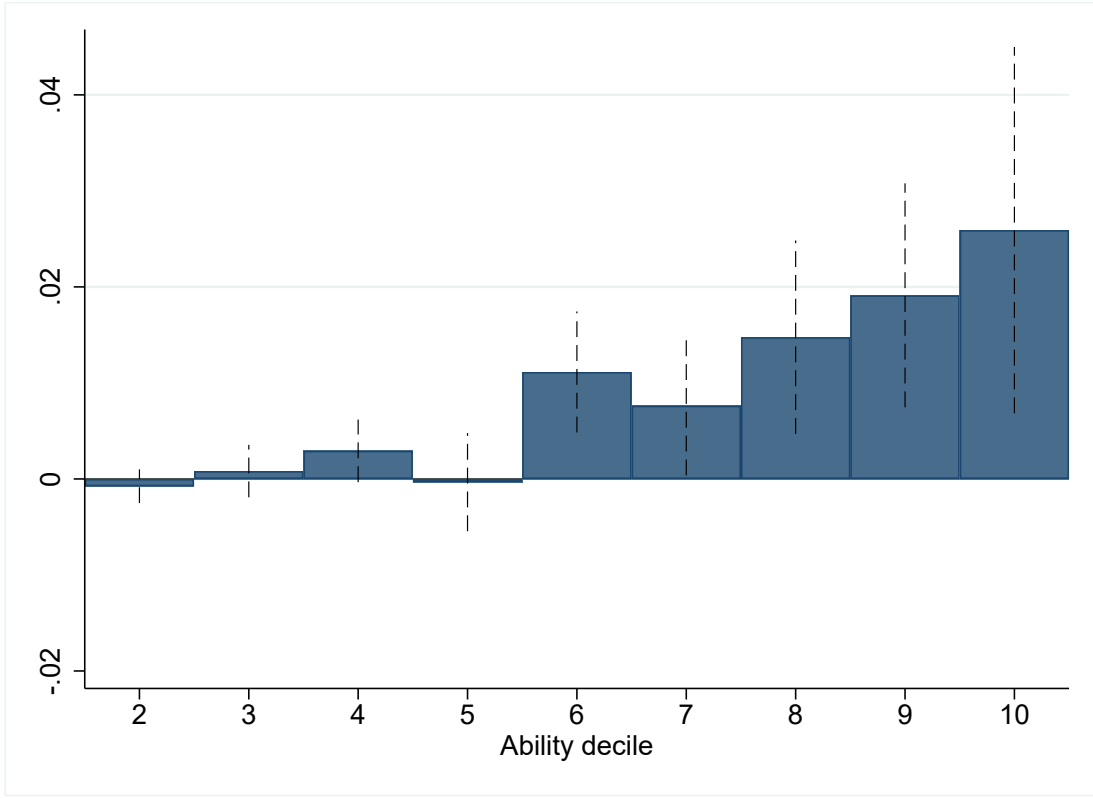
$$
\begin{aligned}
y_{dcea} = & \sum_k \beta_{1,k}(Minority_e \times PartTreat_c \times \mathbf{I_a}^{a \geq k}) \\
& + \sum_k \beta_{2,k}(Minority_e \times FullTreat_c \times \mathbf{I_a}^{a \geq k}) \\
& + \mathbf{\Gamma X_{dcea}} + \alpha_{dca} + \alpha_{dea} + \epsilon_{dcea}
\end{aligned}
$$

where

- a denotes a decile.
- y_{dcea} is a college admissions outcome
- $\mathbf{I_a}^{a \geq k}$ is an indicator variable if a student's ability decile $a \geq k$.
- $\beta_{2,k}$ captures change in effect on admissions of moving from decile $k-1$ to k.

What is the Change in Returns to Effort?

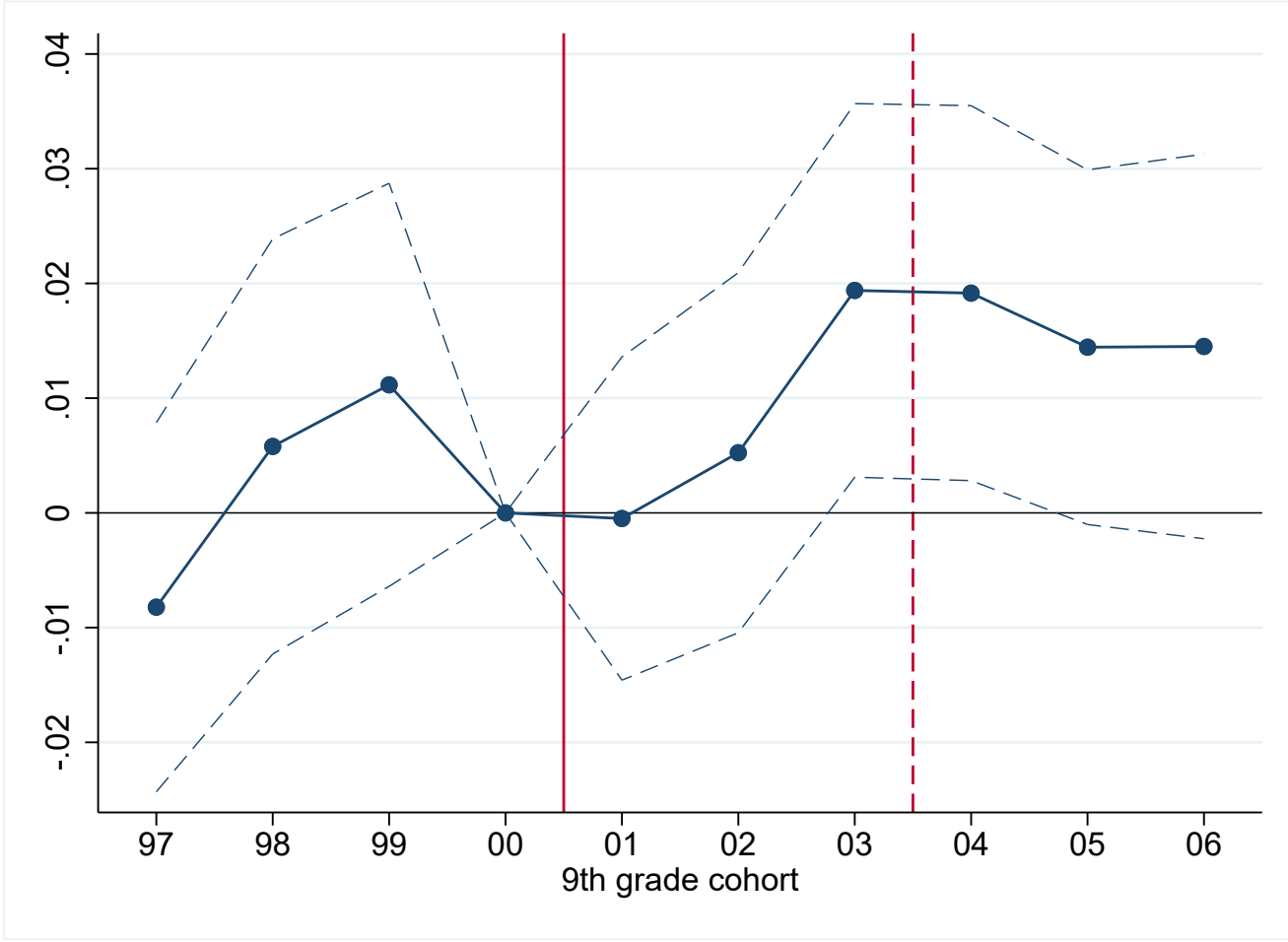
Figure: Change in Returns to Moving Up an Ability Decile in Admissions to Selective Texas Institutions



- Change in returns to effort and increases in effort occur in same part of the ability distribution.

College Graduation

Figure: Top Ability Quintile Minorities' Likelihood of Graduating College



College Graduation

		Percentile of grade 6 test score distribution				
	All students	Bottom quintile	2nd quintile	3rd quintile	4th quintile	Top quintile
	(1)	(2)	(3)	(4)	(5)	(6)
Partial treatment	-0.0009	-0.0011	-0.0011	-0.0055	-0.0022	0.0098
	(0.0022)	(0.0018)	(0.0030)	(0.0036)	(0.0037)	(0.0063)
Full treatment	0.0046*	0.0006	0.0023	0.0033	0.0054	0.0141**
	(0.0025)	(0.0023)	(0.0031)	(0.0041)	(0.0049)	(0.0071)
Observations (cells)	68509	12933	14515	14809	14145	12107
R^2	0.890	0.556	0.640	0.690	0.708	0.707
Mean dependent variable	0.1688	0.0202	0.0695	0.1415	0.2398	0.3714
Demographic controls	X	X	X	X	X	X
District-by-cohort-by-ability FE	X	X	X	X	X	X
District-by-ethnicity-by-ability FE	X	X	X	X	X	X

- Reject that top and bottom quintile fully treated effects are the same at the 10% level.
- 5% increase in URM's college graduation.
- Captures joint effects of school matched to due to affirmative action and the increase in pre-college human capital investment.

Mechanisms in the THEOP Data

- Two cross-sections of high school students in Texas from 2002 (pre-affirmative action) and 2004 (post-affirmative action).
- Asked about demographics, college application behavior, and parent and guidance counselor behavior.
- Compare changes in minorities' to whites' responses from pre- to post-affirmative action.

Mechanisms in the THEOP Data

	(1) Time on Homework (Min.)	(2) Applied to First Choice College	(3) Parental Involvement	(4) Guidance From Counselor
Minority × *Post*2003	5.439**	0.047**	0.172	-0.025
	(2.496)	(0.023)	(0.166)	(0.018)
Mean for Whites Pre-2003	51.585	0.732	10.635	0.614
N	13,452	9,993	13,558	13,699
Adjusted R^2	0.061	0.024	0.038	0.026

- Student measures of effort increase, but parents' and guidance counselor's behavior does not appear to change.

Conclusion

- Across multiple data sets and identification strategies, find lifting the AA ban increased minorities' pre-college human capital investment.
- Effects were concentrated among students on the margin of attending selective universities.
- No evidence that students anywhere in the ability distribution adjusted their human capital investment down.
- Some evidence of positive effects on whites' pre-college human capital investment.
- Policy-makers should take into account effects of AA on minorities' pre-college human capital investment.

Response in Texas

- On the day of the ruling, UT Austin announced plans to ask the University of Texas Board of Regents to return to considering race in admissions.
- In August 2003, the University of Texas Board of regents voted to allow all campuses to return to using race in admissions.
  - Campuses: Austin, Arlington, Dallas, El Paso, Rio Grande Valley, San Antonio, Tyler, and Permian Basin.
- The Texas Tech Board of regents outlined similar plans in October 2003.
- Texas A&M explicitly stated they would not return to using racial preferences.

Back

Grutter v. Bollinger (2003)

- In a 5/4 decision, the U.S. Supreme Court struck down assigning points based on race but allowed public universities to continue to take race into account holistically.
- Outcome of the case was hard to predict:
  - *"Both sides think it's their best chance of winning the AA battle... O'Connor is the 5th vote but her moderate history does not indicate her direction."* - USA Today (December, 2002).
  - *"It will be a close decision. It can go either way"* – Mendoza of Mexican American Legal Defense and Educational Fund.
- Majority ruling expressed ambivalence about affirmative action policies:
  - *The Court takes the Law School at its word that it would like nothing better than to find a race-neutral admissions formula and will terminate its use of racial preferences as soon as practicable. The Court expects that 25 years from now, the use of racial preferences will no longer be necessary to further the interest approved today.*

Back

Grutter v. Bollinger (2003)

- Following the case, public universities in Texas, Mississippi, and Louisiana immediately expressed interest in re-instating racial affirmative action.
- The discussion was widely publicized in the national news.

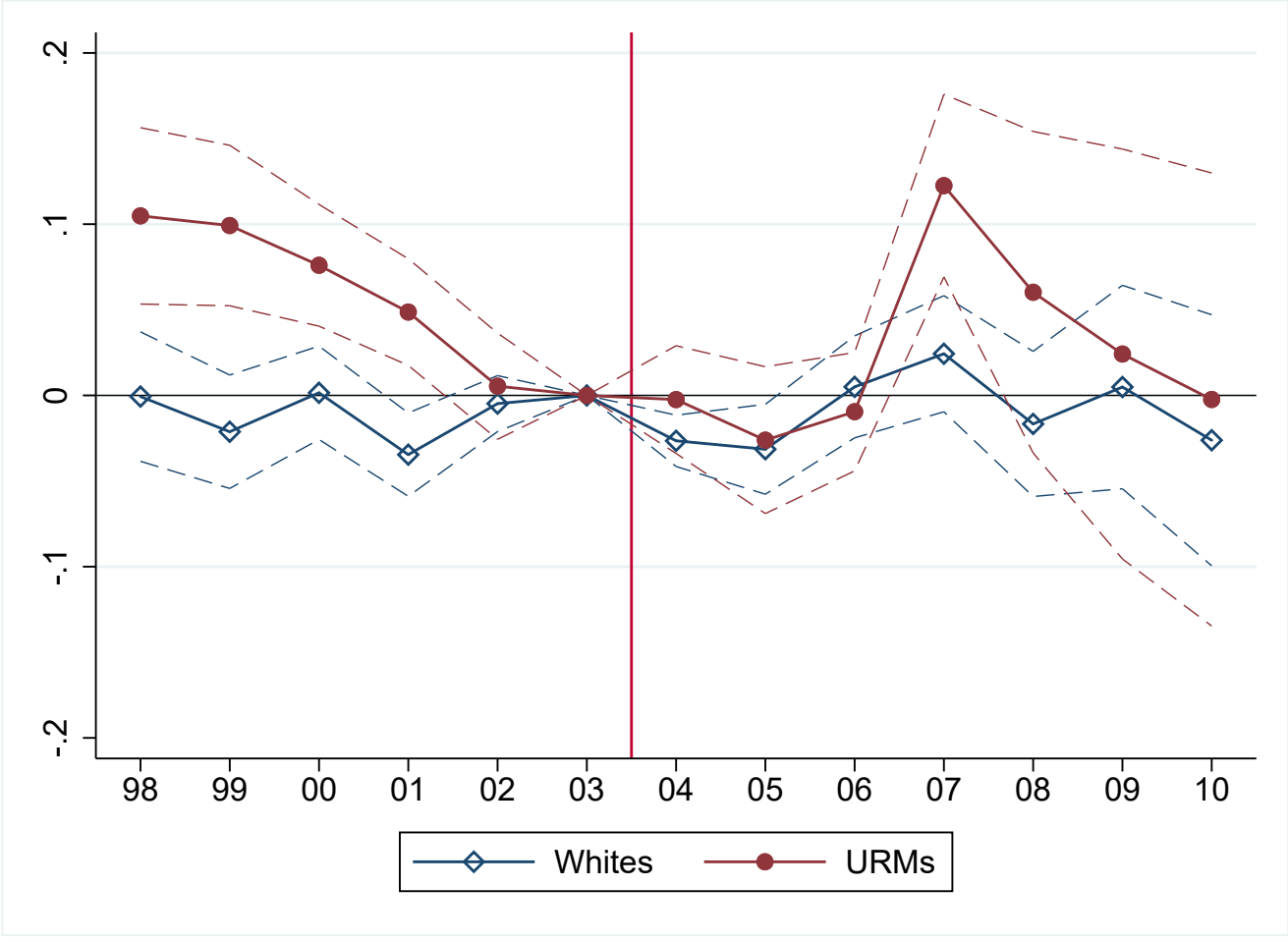
Figure: NBC News Coverage of *Grutter v. Bollinger* Verdict, Showing the President of UT Austin



- Also prompted a great deal of local debate
  - On June 29, 2003 (5 days after the ruling) *every* reader letter published in the *Austin-American Statesman* was about affirmative action.

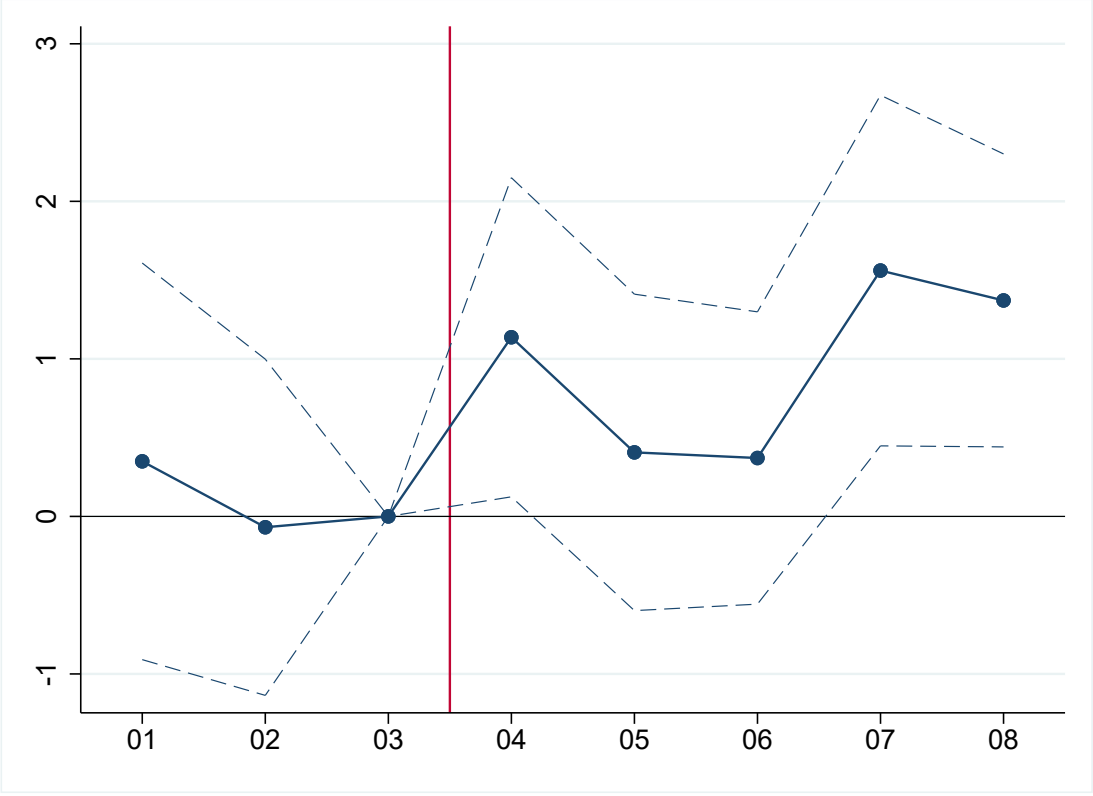
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SAT Results: Verbal



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Mean Grades: Urban School District



Grades are reported in percentage points.

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Large Urban School District: Grades

	All students			Ability distribution		
				Bottom tercile	Middle tercile	Top tercile
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	0.8770***	1.0024***	0.9552***	0.8816*	0.3996	1.3859***
	(0.3086)	(0.2979)	(0.3114)	(0.5102)	(0.3906)	(0.4207)
Lagged dep. var. (grade 8)		0.5552***				
		(0.0092)				
Observations	61089	46346	92847	15874	15621	14776
R^2	0.226	0.345	0.784	0.189	0.224	0.208
Mean dependent variable	78.67	79.48	81.11	75.79	79.49	83.46
S.D. dependent variable	8.67	7.80	7.37	7.43	6.99	6.97
School-by-year FE	X	X	X	X	X	X
Ethnicity FE	X	X		X	X	X
Demographic controls	X	X		X	X	X
Student FE			X			
Grade-by-year FE			X			
Grade-by-ethnicity FE			X			

- .1 sd increase in minorities' grades; .15 sd effect for top tercile.

Back

Mechanisms in the THEOP Data

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- Asked about demographics, college application behavior, and parent and guidance counselor behavior.
- Compare changes in minorities' to whites' responses from pre- to post-affirmative action.

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Student measures of effort increase, but parents' and guidance counselor's behavior does not appear to change.

Back

Spillovers in Application Behavior

Use TEA data to estimate separately by race:

$$\begin{aligned} y_{dce} =& \beta_1 I_c^{Partial} \times URM\ Share_s + \beta_2 I_c^{Full} \times URM\ Share_s + \mathbf{\Gamma X_{sce}} \\ &+ \alpha_s + \alpha_c + \epsilon_{sce} \end{aligned}$$

where

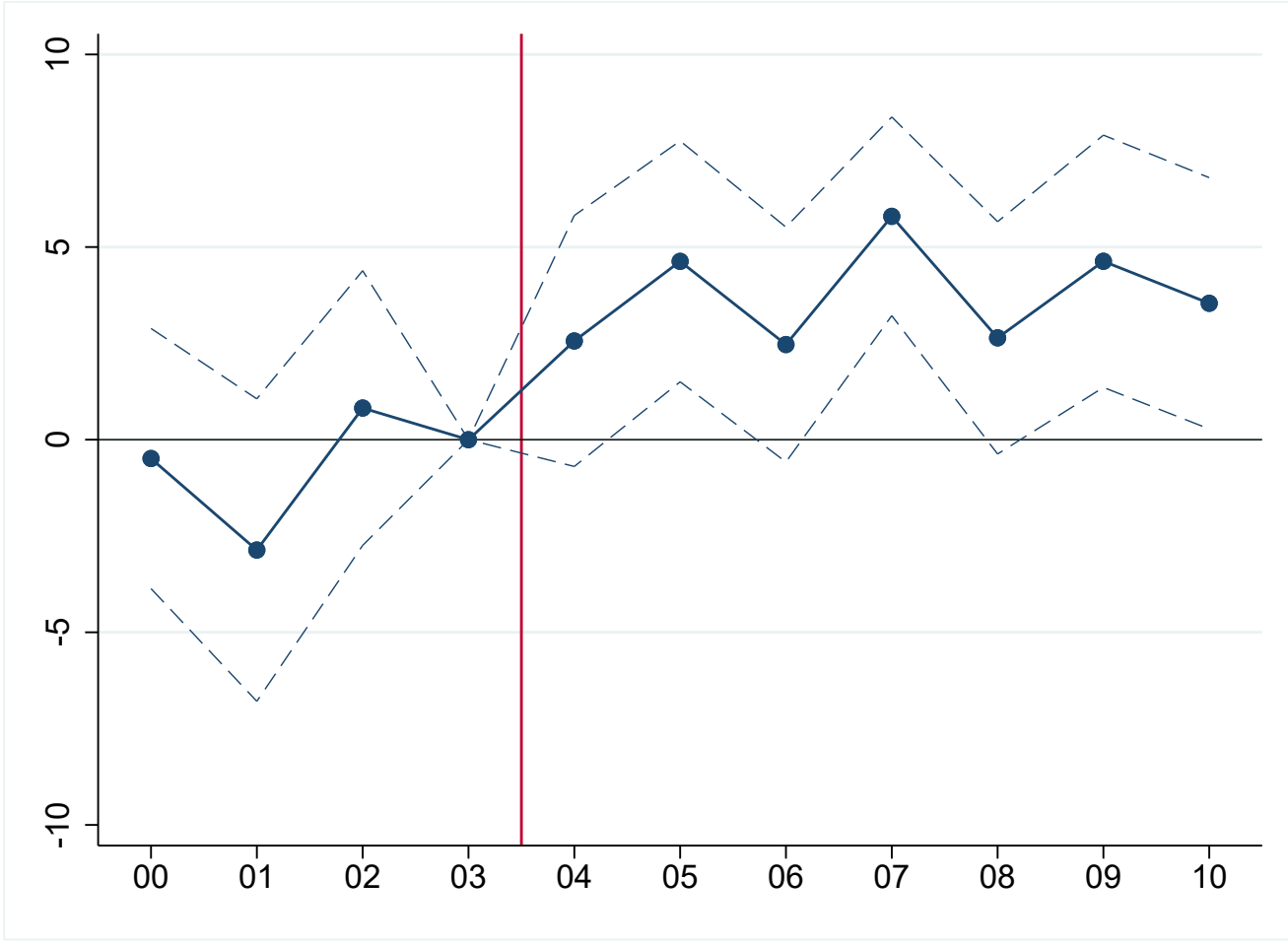
- s denotes a school, c denotes a cohort, and e denotes an ethnic group.
- y_{sce}: Application behavior measures.
- $I_c^{Partial}$: Indicator variable for partial exposure to AA.
- I_c^{Full}: Indicator variable for full exposure to AA.
- α_c: cohort fixed effect.
- α_e: ethnicity fixed effect.
- α_s: school fixed effect.

Spillovers in Application Behavior

	Sample					
	All		Whites	Minorities	Blacks	Hispanics
	(1)	(2)	(3)	(4)	(5)	(6)
	Dep. Var.: Applications to selective colleges					
$I_c^{Partial} \times URMShare_s$	0.0096**	0.0172	0.0017	-0.0001	0.0157**	-0.0040
	(0.0039)	(0.0124)	(0.0069)	(0.0043)	(0.0069)	(0.0049)
$I_c^{Full} \times URMShare_s$	0.0248***	0.0221	0.0101	0.0258***	0.0550***	0.0170***
	(0.0053)	(0.0156)	(0.0098)	(0.0050)	(0.0075)	(0.0057)
Observations (cells)	45746	41693	18014	27462	10343	16836
R^2	0.842	0.917	0.907	0.728	0.708	0.775
Mean dependent variable	0.1250	0.1270	0.2008	0.0675	0.0873	0.0606
School FE	X	X	X	X	X	X
Cohort FE	X		X	X	X	X
Ethnicity FE	X		X	X	X	X
Cohort-by-district FE		X				
Ethnicity-by-district FE		X				

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Stanford: Urban School District



Scores are reported in percentiles.

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Stanford: Urban School District

		Ability distribution		
	All students	Bottom tercile	Middle tercile	Top tercile
	(1)	(2)	(3)	(4)
	Dependent variable: Stanford Test Scores (grade 11)			
Treated	4.7801***	4.2109***	4.6267***	7.3731***
	(1.1352)	(1.2879)	(1.5648)	(1.4314)
Observations	58096	15486	15347	14620
R^2	0.444	0.455	0.487	0.464
Mean dependent variable	49.40	42.24	50.49	59.99
S.D. dependent variable	25.74	23.38	24.00	23.76
School-by-year FE	X	X	X	X
Ethnicity FE	X	X	X	X
Demographic controls	X	X	X	X

- .19 sd increase in minorities' scores; .30 sd effect for top tercile.

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Did URMs Respond to AA? Any Application

		Percentile of grade 6 test score distribution				
	All students	Bottom quintile	2nd quintile	3rd quintile	4th quintile	Top quintile
	(1)	(2)	(3)	(4)	(5)	(6)
	Dep. Var.: Application to any college					
Partial treatment	0.0078***	0.0086***	0.0046	0.0011	0.0086*	0.0222***
	(0.0026)	(0.0027)	(0.0035)	(0.0044)	(0.0052)	(0.0075)
Full treatment	0.0286***	0.0101***	0.0132***	0.0263***	0.0432***	0.0545***
	(0.0035)	(0.0027)	(0.0035)	(0.0051)	(0.0054)	(0.0086)
Observations (cells)	97121	18380	20681	20974	19960	17126
R^2	0.915	0.798	0.824	0.814	0.803	0.781
Mean dependent variable	0.2785	0.0789	0.1595	0.2505	0.3708	0.5330
Demographic controls	X	X	X	X	X	X
District-by-cohort-by-ability FE	X	X	X	X	X	X
District-by-ethnicity-by-ability FE	X	X	X	X	X	X

- Reject top and bottom quintile effects are the same for the fully treated at the 1% level.

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Dropping Houston & Dallas to Control for the Charter School Movement

		Percentile of grade 6 test score distribution				
	All students	Bottom quintile	2nd quintile	3rd quintile	4th quintile	Top quintile
	(1)	(2)	(3)	(4)	(5)	(6)
	Applications to selective colleges					
Partial treatment	0.0094***	0.0025	0.0008	0.0020	0.0146**	0.0295***
	(0.0028)	(0.0018)	(0.0024)	(0.0036)	(0.0070)	(0.0087)
Full treatment	0.0213***	0.0022*	0.0041*	0.0162***	0.0381***	0.0495***
	(0.0028)	(0.0013)	(0.0025)	(0.0038)	(0.0052)	(0.0093)
Observations (cells)	96281	18212	20513	20806	19792	16958
R^2	0.911	0.470	0.623	0.720	0.790	0.835
Mean dependent variable	0.1598	0.0094	0.0356	0.0910	0.2092	0.4422
Test: Bottom quintile = Top quintile						
Partial treatment: p-value [F-stat]				0.0029 [8.9553]		
Full treatment: p-value [F-stat]				0.0000 [25.4628]		
Demographic controls	X	X	X	X	X	X
District-by-cohort-by-ability FE	X	X	X	X	X	X
District-by-ethnicity-by-ability FE	X	X	X	X	X	X

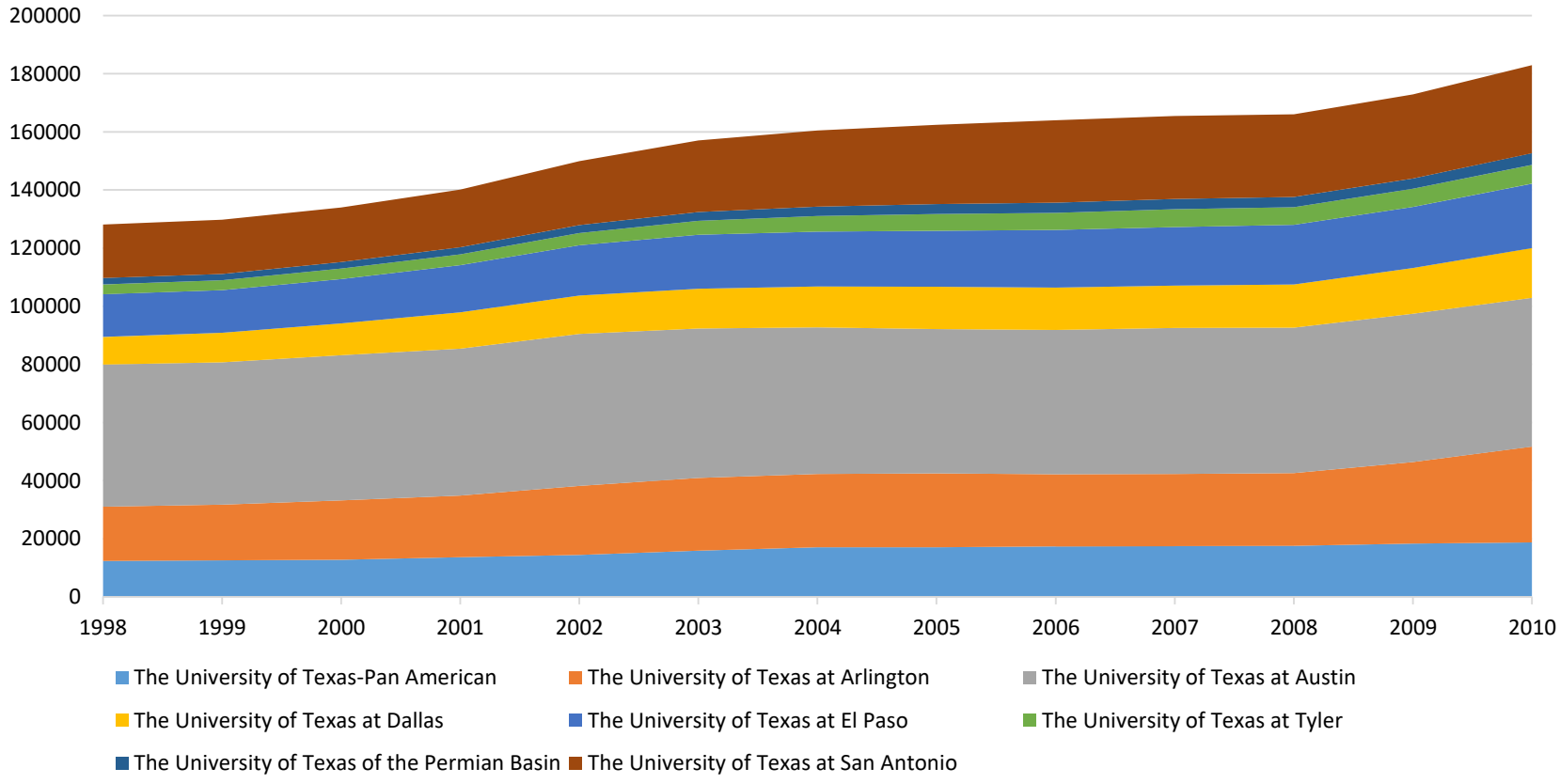
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Dropping Cohorts Without Pre-Policy Ability Measures

		Percentile of grade 6 test score distribution				
	All students	Bottom quintile	2nd quintile	3rd quintile	4th quintile	Top quintile
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Application to any college (within 4 years of grade 9)					
Partial treatment	0.0082***	0.0085***	0.0047	0.0016	0.0090*	0.0238***
	(0.0026)	(0.0027)	(0.0036)	(0.0044)	(0.0052)	(0.0073)
Full treatment	0.0169***	0.0031	0.0048	0.0125**	0.0254***	0.0438***
	(0.0035)	(0.0030)	(0.0040)	(0.0058)	(0.0059)	(0.0085)
Observations (cells)	68509	12933	14515	14809	14145	12107
R2	0.915	0.788	0.815	0.810	0.802	0.781
Mean dependent variable	0.2603	0.0659	0.1414	0.2312	0.3499	0.5107
	Panel B: Application to a selective college (within 4 years of grade 9)					
Partial treatment	0.0097***	0.0018	0.0022	0.0024	0.0145**	0.0297***
	(0.0027)	(0.0019)	(0.0025)	(0.0035)	(0.0067)	(0.0085)
Full treatment	0.0187***	0.0019	0.0046	0.0151***	0.0304***	0.0449***
	(0.0038)	(0.0016)	(0.0030)	(0.0049)	(0.0073)	(0.0105)
Observations (cells)	68509	12933	14515	14809	14145	12107
R2	0.913	0.469	0.630	0.738	0.800	0.837
Mean dependent variable	0.1484	0.0079	0.0331	0.0877	0.1994	0.4158
Demographic controls	X	X	X	X	X	X
District-by-cohort-by-ability FE	X	X	X	X	X	X
District-by-ethnicity-by-ability FE	X	X	X	X	X	X

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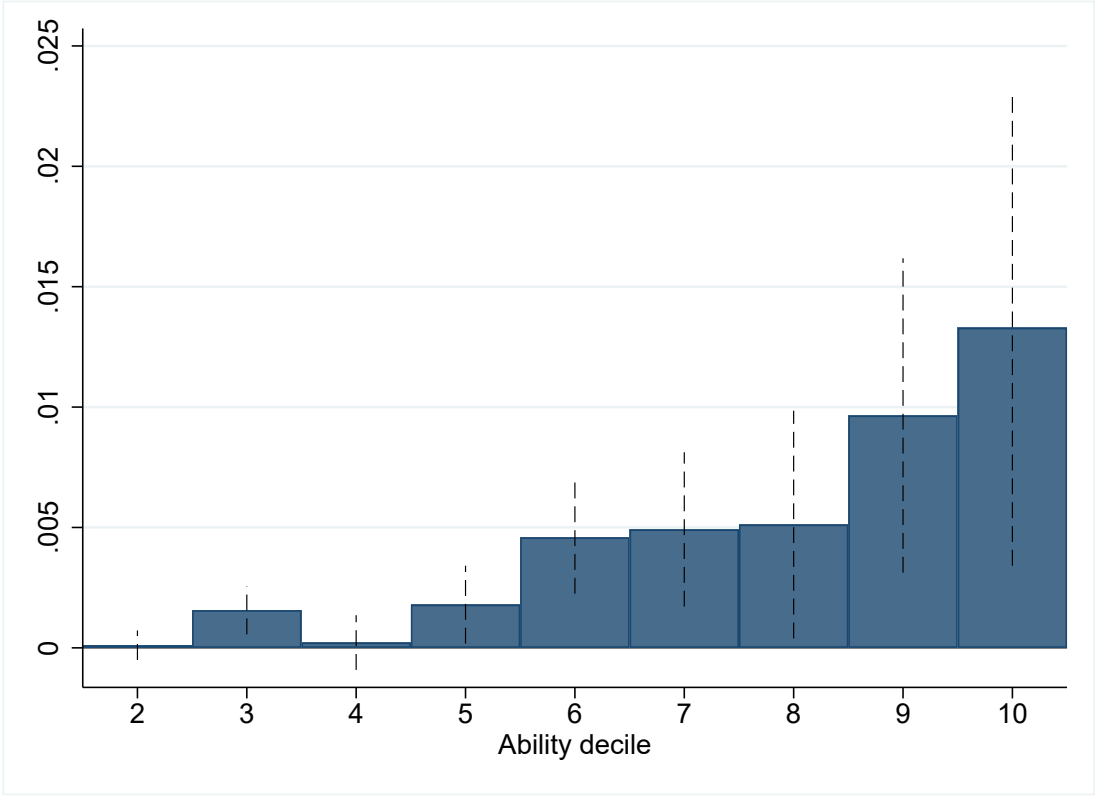
Enrollment in Universities of Texas Over Time



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Change in Returns to Effort for UT Austin

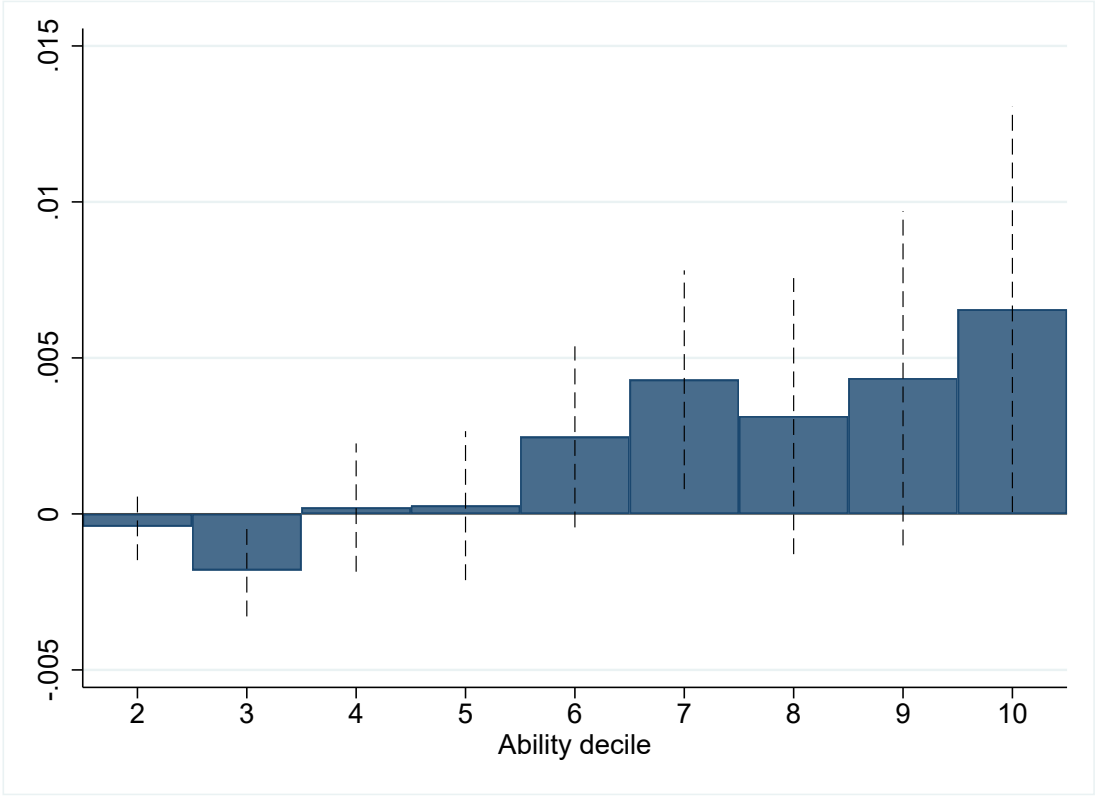
Figure: Change in Returns to Moving Up an Ability Decile in Admissions to UT Austin



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Change in Returns to Effort for Texas Tech

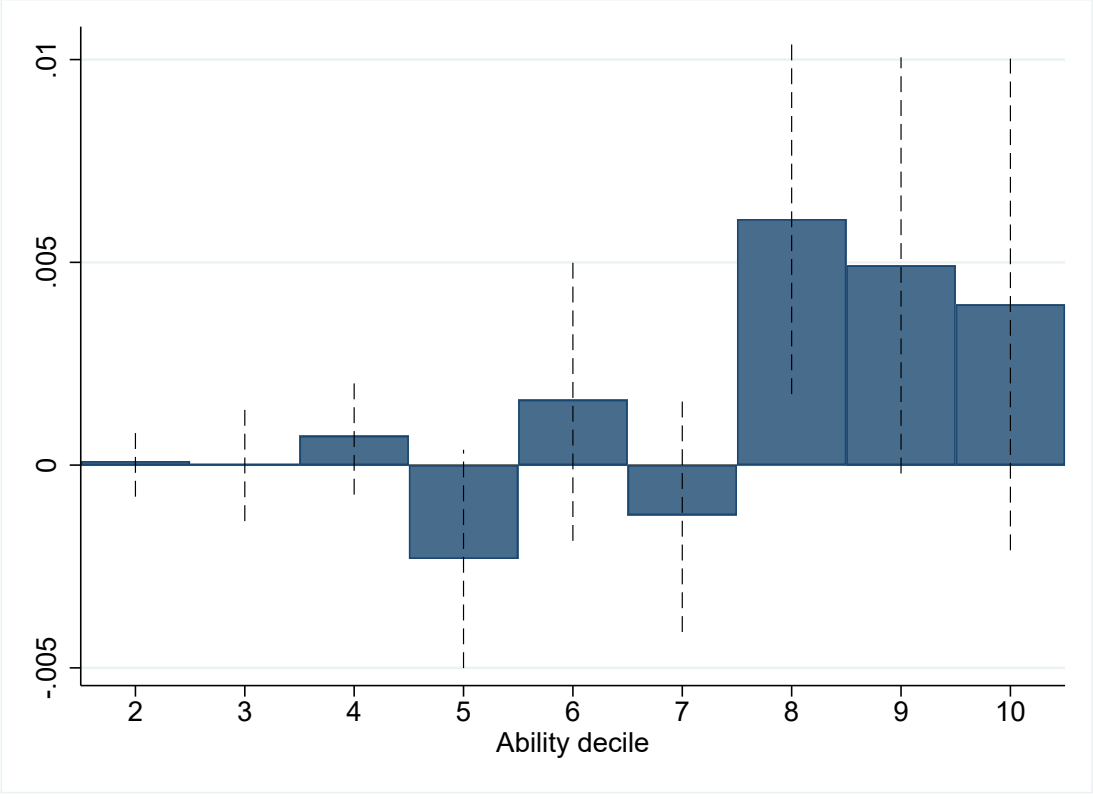
Figure: Change in Returns to Moving Up an Ability Decile in Admissions to TX Tech



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Change in Returns to Effort for University of Houston

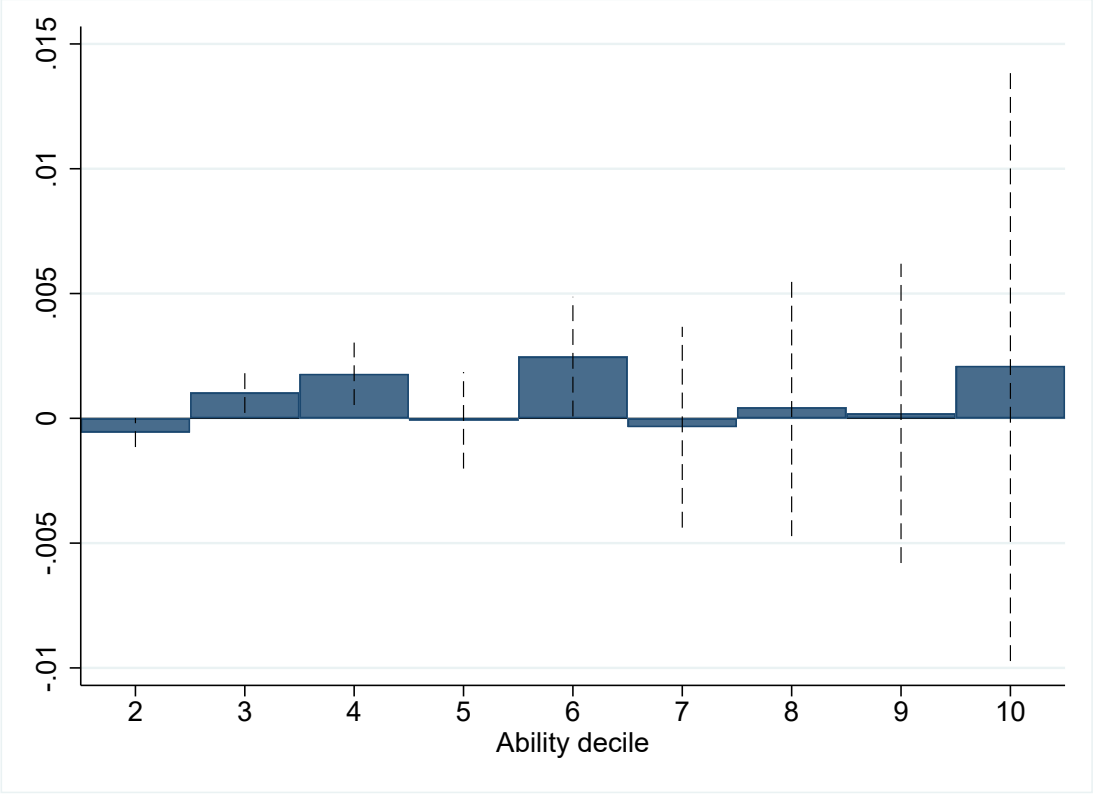
Figure: Change in Returns to Moving Up an Ability Decile in Admissions to University of Houston



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Change in Returns to Effort for TAMU

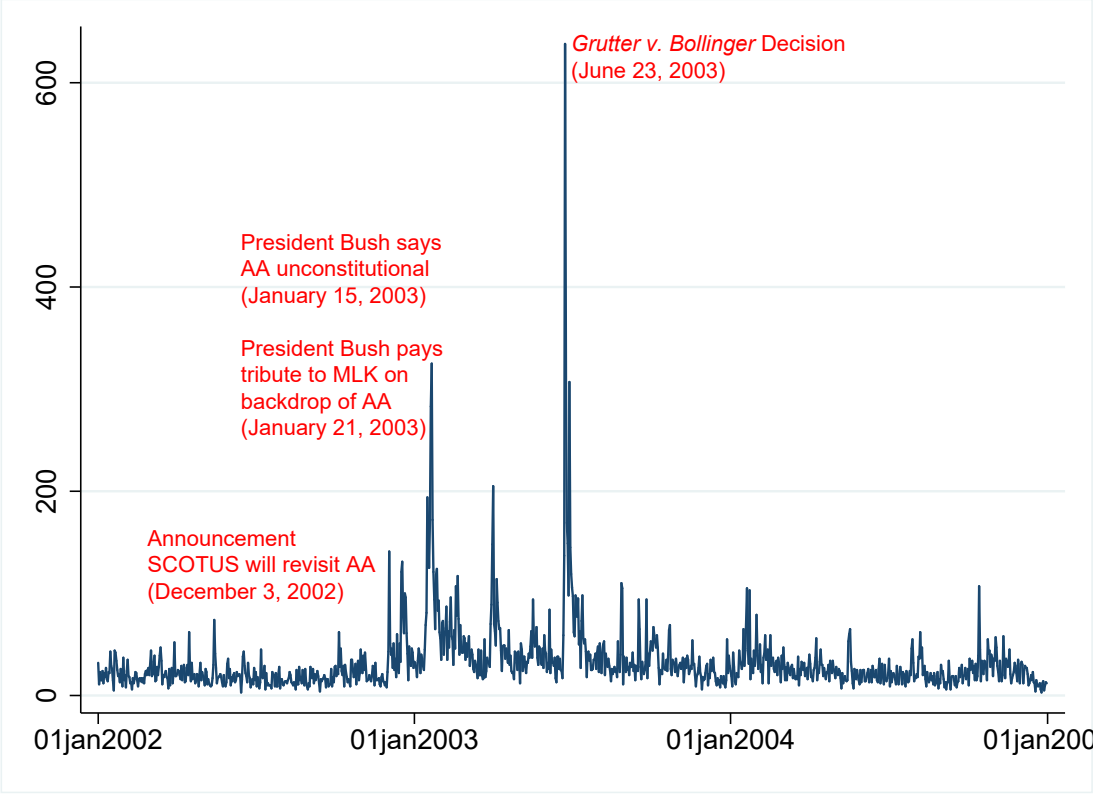
Figure: Change in Returns to Moving Up an Ability Decile in Admissions to TAMU



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Mentions of Affirmative Action in the News

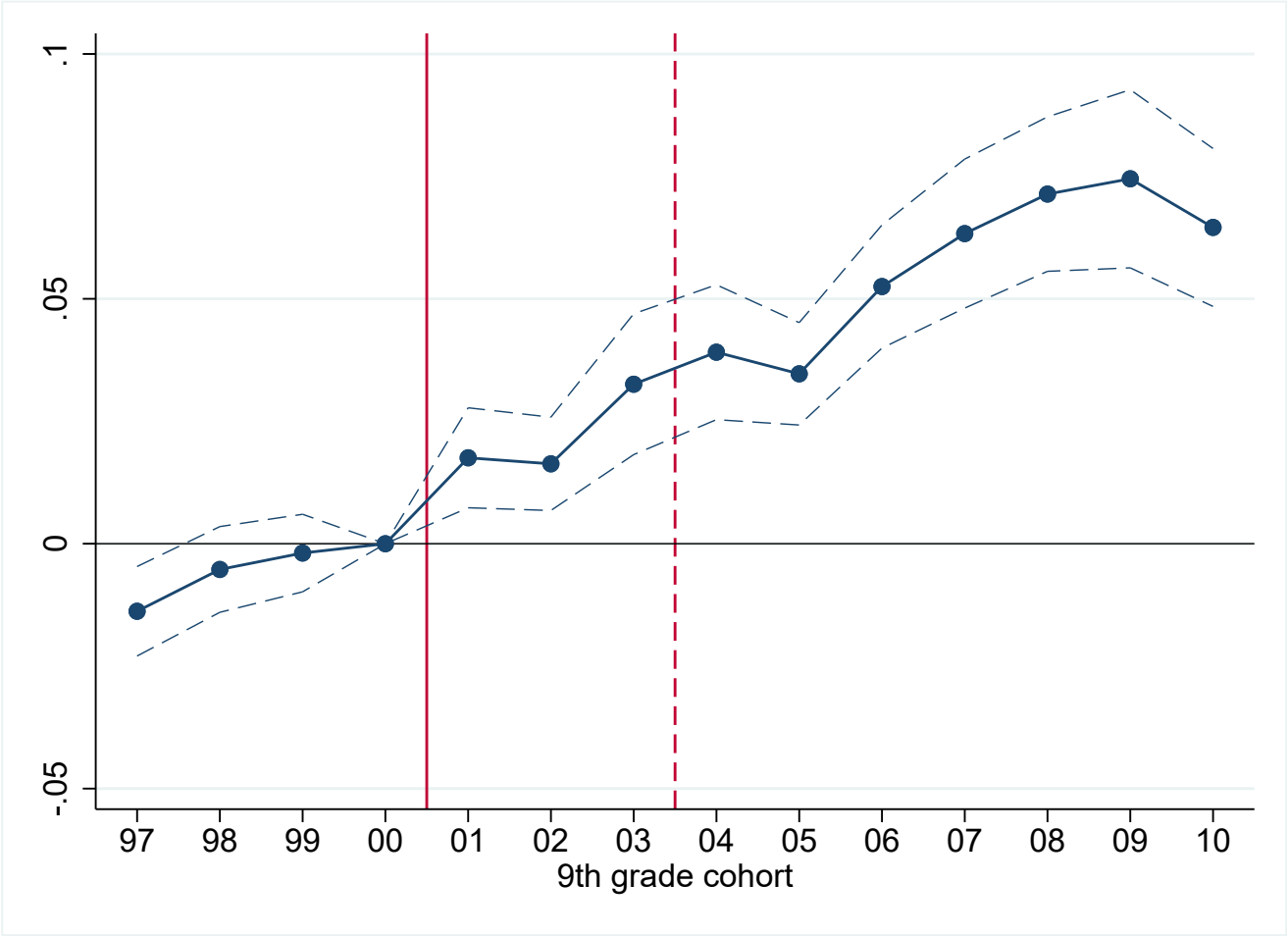
Figure: Number of Articles Mentioning Affirmative Action by Day, 2002-2004



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Did URMs Respond to AA? Applied to Any 4-Year University

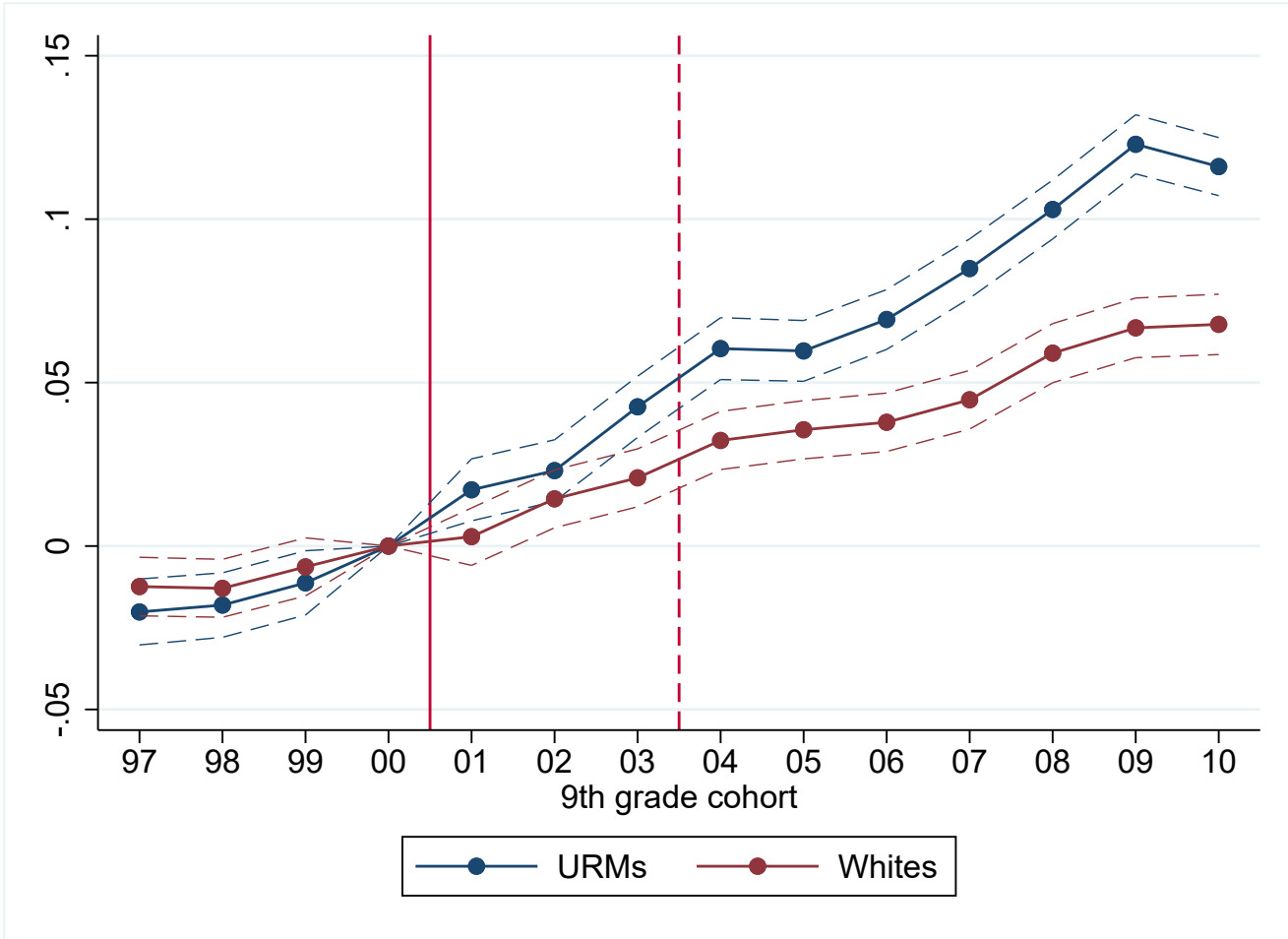
Figure: Applied to Any 4-Year University (Relative to Whites)



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Is the Relative Increase for Minorities Driven by Negative Effects on Whites?

Figure: Raw Trends in Applications to Selective Universities in the Top Quintile



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