Bridging K-12 Accountability and College Outcomes:

The Effect of Waiving NCLB Sanctions

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Introduction

- The 2001 No Child Left Behind Act (NCLB) required Title 1 funded schools to meet Annual Yearly Progress (AYP)
- For high schools, meeting AYP was based on test scores in grades 10 & 11 and graduation rates
- For Title 1 schools, consecutive years of failing AYP resulted in sanctions of escalating severity (e.g. school choice, redirect funding, governance change)
- In AY 2012, Kentucky received a waiver from NCLB; Title 1 schools were no longer subject to sanctions

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Research Question

Did college outcomes improve among students attending sanctioned schools after the NCLB waiver?

Motivation 1: Important Research Gap

- Substantial research concerning K-12 accountability and K-12 outcomes, such as test scores
  - Figlio et al. (2011) reviews over 50 studies
- Primary motivation for accountability relies on a bridge between K-12 achievement and long-run outcomes
- Much less is known regarding K-12 accountability and longer-run outcomes, such as college attendance
  - Goldrick-Rab and Mazzeo (2005); Price (2003)
- Literature on K-12 policies and long-run outcomes shows a disconnect between short- and long-run effects

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Research shows school accountability raises K-12 achievement. What about later outcomes? More research is needed.

Motivation 2: Principal-Agent Theory

- The folly of rewarding a, while hoping for b (Kerr, 1975; Gibbons, 1998)
- That which is more measurable gets emphasized
- Rewards effort and activities that contribute to what is measured
- Effort and activities that contribute to unmeasured outcomes may be neglected
- Weak, general incentive structures may achieve better results than strong, specific ones (Lazear, 1989)

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When schools are no longer subject to sanctions, outcomes important to the agent that are not explicitly included in accountability standards will improve.

Research Design

Hypothesis

College-going will increase among students attending sanctioned schools relative to non-sanctioned schools after the NCLB waiver.

- This paper examines outcomes of 12th-grade cohorts attending Kentucky high schools during AYs 2010-2013
- Employ diff-in-diff with matching to compare outcomes between sanctioned and similarly-performing non-sanctioned schools

Treatment & Control Pre & Post

- Assigning treatment
  - Treatment ($S = 1$): 26 Title 1 schools were subject to NCLB sanctions for failing AYP
  - Control ($S = 0$): 80 non-Title 1 schools were failing AYP but were not subject to sanctions
- Assigning treatment period
  - Kentucky was invited to apply for an ESEA waiver along with 10 other states
  - Submission made in November 2011; waiver granted in February 2012 (10 out of 11 states granted a waiver)
  - Unexpected delays pushed implementation of new accountability back to February 2013
  - Pre-waiver ($W = 0$): 2010 & 2011
  - Post-waiver ($W = 1$): 2012 & 2013

Common Trends in Covariates

Table: Means Comparisons of AYP-Failing Schools Pre- and Post-Waiver by Pre-Waiver NCLB Sanction Status

	Pre-Waiver (2010 & 2011)		
	Sanctions (1)	No Sanctions (2)	Diff (3)
Demographics			
Male	0.504	0.504	0.000
White	0.652	0.856	−0.204***
Black	0.274	0.089	0.184***
Hispanic	0.037	0.021	0.017**
FRPL	0.608	0.421	0.187***
SPED	0.020	0.017	0.003
LEP	0.015	0.005	0.010*
Gifted	0.132	0.227	−0.095***
Med HHI	3.921	4.098	−0.177***
Unemp	0.105	0.101	0.004
Fed rev	1.831	1.559	0.272***
State rev	5.210	5.249	−0.039***
Local rev	3.688	3.071	0.616***
Schools	80	26	
Students	37,462	9,402	

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

Common Trends in Covariates

Table: Means Comparisons of AYP-Failing Schools Pre- and Post-Waiver by Pre-Waiver NCLB Sanction Status

	Post-Waiver (2012 & 2013)		
	Sanctions (4)	No Sanctions (5)	Diff (6)
Demographics			
Male	0.509	0.508	0.002
White	0.652	0.855	−0.203***
Black	0.261	0.085	0.175***
Hispanic	0.047	0.025	0.022**
FRPL	0.635	0.472	0.163***
SPED	0.034	0.022	0.011
LEP	0.021	0.006	0.016**
Gifted	0.142	0.238	−0.095***
Med HHI	3.916	4.109	−0.192***
Unemp	0.105	0.101	0.004
Fed rev	1.548	1.204	0.344***
State rev	5.310	5.348	−0.038***
Local rev	3.740	3.090	0.650***
Schools	80	26	
Students	37,462	9,402	

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Common Trends in Covariates

Table: Means Comparisons of AYP-Failing Schools Pre- and Post-Waiver by Pre-Waiver NCLB Sanction Status

	Diff-in-Diff (6)-(3) (7)	Matched Sample Diff-in-Diff (8)
Demographics		
Male	0.002	0.006
White	0.001	0.002
Black	−0.009	−0.008
Hispanic	0.005	0.005
FRPL	−0.025**	−0.021
SPED	0.009	0.000
LEP	0.006	0.005
Gifted	−0.000	−0.002
Med HHI	−0.015	0.000
Unemp	0.000	−0.028
Fed rev	0.072*	0.050
State rev	0.001	0.027
Local rev	0.034	0.048
Schools	106	52

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

Common Trends in Covariates

Table: Means Comparisons of AYP-Failing Schools Pre- and Post-Waiver by Pre-Waiver NCLB Sanction Status

	Diff-in-Diff (6)-(3) (7)	Matched Sample Diff-in-Diff (8)
Achievement		
ACT	0.0	0.024
GPA	0.00	0.013
Grad	0.030**	0.027**
College outcomes		
College	0.021**	0.024*
Full-time	0.025***	0.029**
First GPA	−0.05	0.021
Spring	0.010	0.016
Persist	−0.013	−0.002
Schools	80	52

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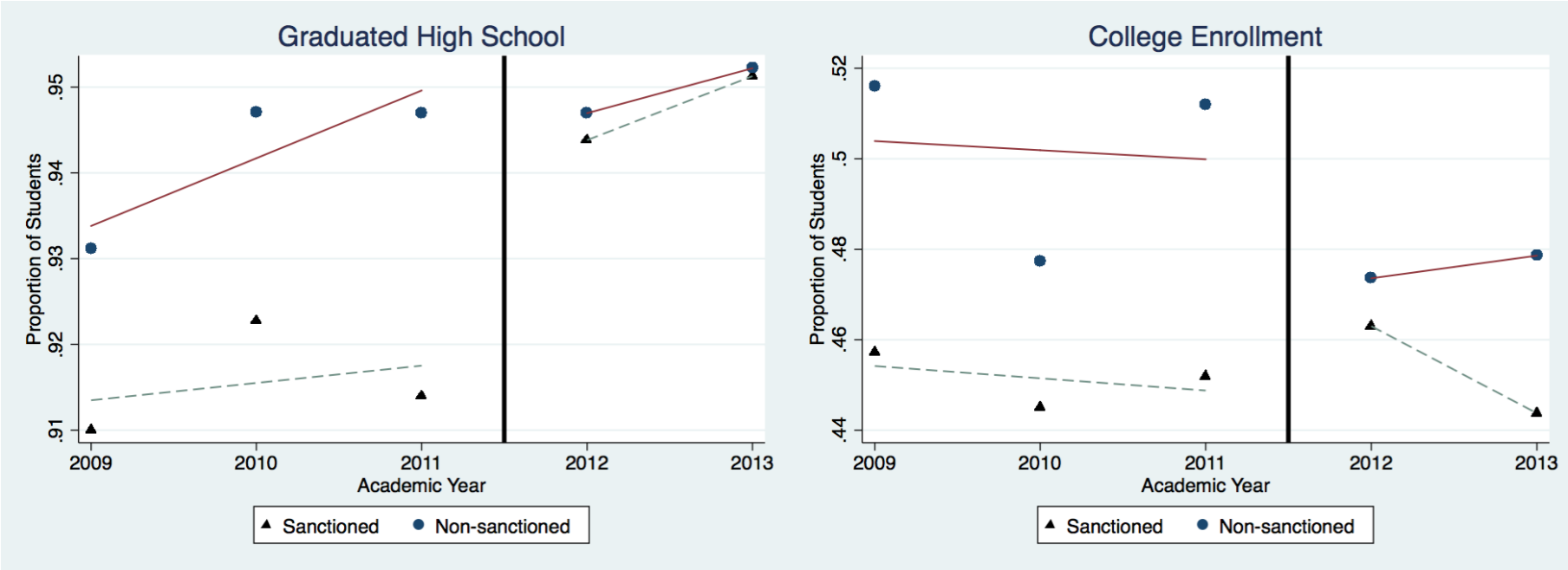
Common Trends in Outcomes



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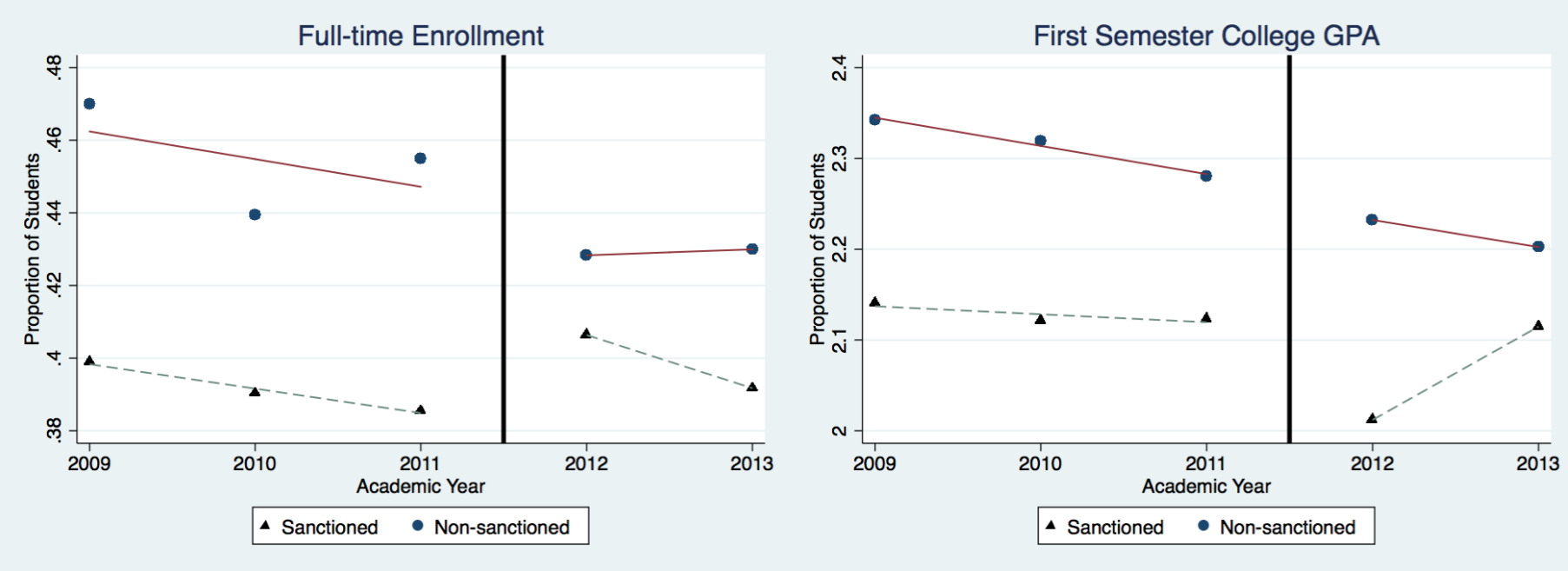

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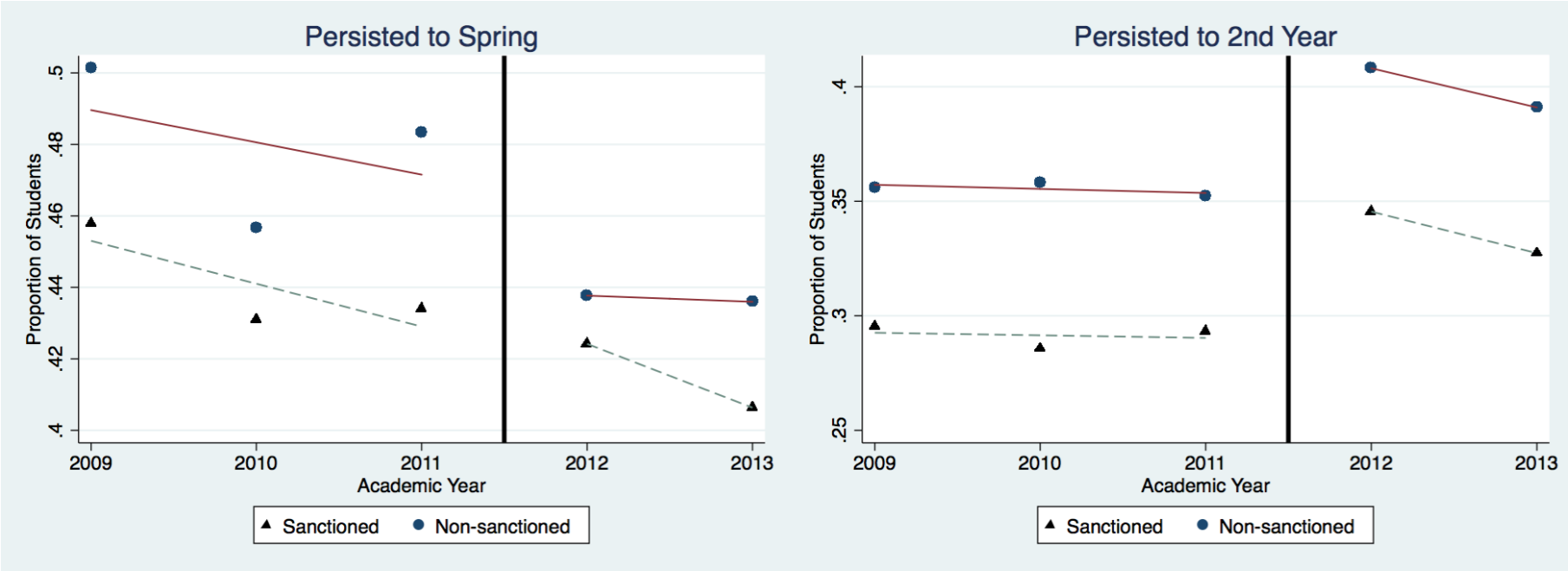

Regression-Adjusted DID

- Non sanctioned schools provide a valid counterfactual for sanctioned schools

$$y_{ist} = \beta_0 + \beta_1 S_{is} + \beta_2 W_t + \beta_3 (S_{is} \times W_t) + \beta_4 X_{ist} + \alpha_s + \theta_t + \varepsilon_{ist},$$

- $y =$ outcome of interest for student i in school s at year t
- $S = 1$ if treated
- $W = 1$ if post-waiver
- $X =$ student-level covariates
- $\alpha =$ school fixed effects
- $\theta =$ time fixed effects

Results - Overall average effect of waiver

Table: The Effect of ESEA Waivers on High School Graduation and Postsecondary Enrollment

	Graduated		Any College		Full-Time	
	(1)	(2)	(3)	(4)	(5)	(6)
S	−0.0200	–	−0.0210	–	−0.0279	–
	(0.0145)	–	(0.0177)	–	(0.0192)	–
W	−0.0005	−0.0004	−0.0348***	−0.0342***	−0.0491***	−0.0477***
	(0.0067)	(0.0070)	(0.0125)	(0.0125)	(0.0103)	(0.0105)
S × W	0.0206	0.0207	0.0198	0.0192	0.0248**	0.0242**
	(0.0132)	(0.0135)	(0.0119)	(0.0119)	(0.0107)	(0.0109)
Fixed Effects	N	Y	N	Y	N	Y
Observations	36,385					

The sample is all first-time twelfth graders attending the restricted sample of 52 matched public high schools during academic years 2010-2013. Estimates derived from a linear probability model (OLS). Standard errors in parentheses are clustered at the school level.

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

Results - Effect by sanction severity

In order of increasing severity: **I**mprovement Plan, **C**orrective Action, **R**estructuring

Table: Effect of ESEA Waiver by Sanction Severity

	Graduated		Any College		Full-Time	
	(1)	(2)	(3)	(4)	(5)	(6)
I × W	0.0089	0.0080	−0.0061	−0.0065	−0.0057	−0.0061
	(0.0080)	(0.0081)	(0.0127)	(0.0131)	(0.0112)	(0.0110)
C × W	0.0090	0.0088	0.0182	0.0216	0.0248**	0.0285**
	(0.0082)	(0.0083)	(0.0138)	(0.0152)	(0.0123)	(0.0135)
R ×W	0.0297	0.0296	0.0283**	0.0253*	0.0331**	0.0300**
	(0.0222)	(0.0224)	(0.0140)	(0.0137)	(0.0130)	(0.0131)
Fixed Effects	N	Y	N	Y	N	Y
Observations	36,385					

Sample is the same as in Table 4. Number of schools by sanction type were as follows: I=5, C=7, and R=14. Estimates derived from a linear probability model (OLS). Standard errors in parentheses clustered at the school level.

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

Robustness

- Falsely assigned treatment one year prior to actual treatment: null results
- Allowed for school-specific trends (interacting school and time fixed effects)

Table: Effect of Waiver Using School-Specific Trends

Dependent Variable	(1)	(2)
Any college	0.0192	-0.0132^{***}
	(0.0119)	(0.0019)
Full-time	0.0242^{**}	0.0334^{***}
	(0.0109)	(0.0020)
School Effects	*Y*	*Y*
Time Effects	*Y*	*Y*
School Trends	*N*	*Y*
Observations	36,385	36,385

Standard errors in parentheses were clustered at the school level.

Heterogeneous Effects - Pre-Waiver Probability of Full-time Enrollment

- Used pre-waiver cohorts to regress full-time enrollment on student characteristics
- Predicted probability of full-time enrollment for all students (pre and post cohorts)
- Stratified sample into deciles of full-time enrollment probability

Table: Effects of Waiver by Decile of Pre-Waiver Full-time Enrollment Probability

Decile	(1)	(2)	(3)	(4)	(5)
W	−0.0192	−0.0098	−0.0318	−0.0447**	−0.0773***
	(0.0100)	(0.0129)	(0.0215)	(0.0184)	(0.0232)
S × W	0.0247*	−0.0244	0.0520**	0.0327	0.0262
	(0.0128)	(0.0180)	(0.0253)	(0.0360)	(0.0340)
Decile	(6)	(7)	(8)	(9)	(10)
W	−0.0347	−0.0465	−0.0640**	−0.0462**	0.0014
	(0.0227)	(0.0236)	(0.0251)	(0.0210)	(0.0145)
S × W	0.0123	0.0215	0.0495	0.0222	0.0044
	(0.0318)	(0.0301)	(0.0378)	(0.0322)	(0.0237)
Observations	3639				

Estimates of equation 1 using the matched sample. Standard errors in parentheses are clustered at the school level.

Heterogeneous Effects - Income and Race

- Increase in full-time enrollment appears to have been concentrated among non-poor and white students

Table: Effects of Waiver on Full-time Enrollment by Student Demographics

	FRPL	Non-FRPL	White	Black
	(1)	(2)	(3)	(4)
W	-0.0274^{***}	-0.0496^{***}	-0.0404^{***}	-0.0342^{***}
	(0.0075)	(0.0121)	(0.0088)	(0.0122)
S $\times$ W	0.0035	0.0443^{**}	0.0258^{**}	0.0018
	(0.0112)	(0.0178)	(0.0112)	(0.0166)
Observations	21201	15184	26856	7087

Standard errors in parentheses clustered at the school level.

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

Conclusions

- Consistent with Principal-Agent, the demands of NCLB sanctions diverted resources from activities that contribute to college enrollment
- After the waiver, sanctioned schools saw statistically and economically significant increases in college enrollment
- Raises more questions concerning what standards to include in K-12 accountability and tradeoffs with equity

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Motivates Future Research

- Did implementation of KY's new model affect college outcomes?
- What are the mechanisms at work here?
- Can better alignment with college standards mitigate the potential neglect of college enrollment activities?

Thank you!

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Common Trends in Outcomes

Table: Pre-waiver parallel trends test

	Graduated (A)	Any College (B)	Full-time (C)	GPA (D)	Spring (E)	Second Year (F)
2009 × S	−0.0137	−0.0019	0.0010	0.0443	−0.0070	−0.0017
	(0.0283)	(0.0155)	(0.0159)	(0.0540)	(0.0176)	(0.0211)
2010 × S	−0.0120	−0.0285*	−0.0210	0.0539	−0.0253	0.0125
	(0.0278)	(0.0170)	(0.0166)	(0.0761)	(0.0170)	(0.0203)
Observations	30,139	30,139	30,139	30,139	11,118	12,900

The sample is all first-time twelfth graders attending the restricted sample of 52 matched public high schools during academic years 2009-2011. Estimates derived from a linear probability model (OLS). Base year comparison is 2011. Standard errors in parentheses are clustered at the school level.

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