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C-SAIL Year 3 Convening: Longitudinal Outcomes Study Presentation

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The Center on Standards, Alignment, Instruction, and Learning (C-SAIL), funded from July 2015 through 2020 by the Institute of Education Sciences, examined how college- and career-readiness (CCR) standards were implemented, if they improved student learning, and what instructional tools measured and supported their implementation.

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C-SAIL Year 3 Convening: Longitudinal Outcomes Study Presentation

Abstract

Mengli Song presents Year 2 findings from the Longitudinal Outcomes Study at C-SAIL's second annual "A Conversation on College- and Career-Readiness Standards" in Washington, D.C. on April 27, 2018. This PowerPoint presentation corresponds to a presentation video available at c-sail.org/videos.

Keywords

college and career-ready standards, implementation, NAEP, assessment

Disciplines

Education | Educational Assessment, Evaluation, and Research

Comments

The Center on Standards, Alignment, Instruction, and Learning (C-SAIL), funded from July 2015 through 2020 by the Institute of Education Sciences, examined how college- and career-readiness (CCR) standards were implemented, if they improved student learning, and what instructional tools measured and supported their implementation.

Longitudinal Outcomes Study

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American Institutes for Research

Context & Study Purpose

- All 50 states and DC adopted new college- and career-ready (CCR) standards in math and ELA/literacy between 2007 and 2015.
- This study is intended to assess the effects of the CCR standards and aligned assessments on key student outcomes for all students and for key student subgroups (e.g., ELLs and SWDs).

Research Questions

1. Does implementing CCR standards result in increases in student college and career readiness?
2. Does the adoption of assessments aligned with CCR standards result in increases in student college and career readiness?
3. Does the effect of implementing CCR standards and aligned assessments **vary by student subgroup, subject, and grade level?**

Research Questions (cont.)

4. Is the effect of implementing CCR standards and aligned assessments on student learning **moderated by the policy attributes characterizing state implementation efforts?**
5. Is the effect of implementing CCR standards and aligned assessments on student learning **moderated by the extent to which state standards are aligned with assessments?**

Data & Measures: State-Level Student Outcome Data From NCES

- State-level NAEP scores in math and reading for grades 4 and 8

Math	Reading
Math composite score	Reading composite score
Subscale 1: algebra	Subscale 1: gaining information
Subscale 2: data analysis	Subscale 2: literary experience
Subscale 3: geometry	
Subscale 4: measurement	
Subscale 5: number properties	

» 9 ~ 12 waves of NAEP data available from 1990 through 2017

- High school graduation
- College enrollment

Analytic Approach

Comparative Interrupted Time Series (CITS) Design:

- Effects of CCR standards are assessed by comparing the change in the student achievement trend from before to after CCR adoption between “treatment” (T) and “comparison” (C) states.

Definitions of T and C States

- T and C states are defined based on the quality of states' prior content standards as measured by:
 - 1) **Prior Rigor Index**: a measure of the rigor of each state's 2010 standards (Carmichael et al., 2010)
 - 2) **Prior CCSS-Similarity Index**: a measure of the similarity between each state's 2009 math standards and the CCSS for math (Schmidt & Houang, 2012)
- **Assumption**: The CCR standards represented a stronger form of treatment for states whose prior standards were less rigorous and less like CCSS than for states whose prior standards were more rigorous and more like CCSS.

State Classification for CITS Analyses

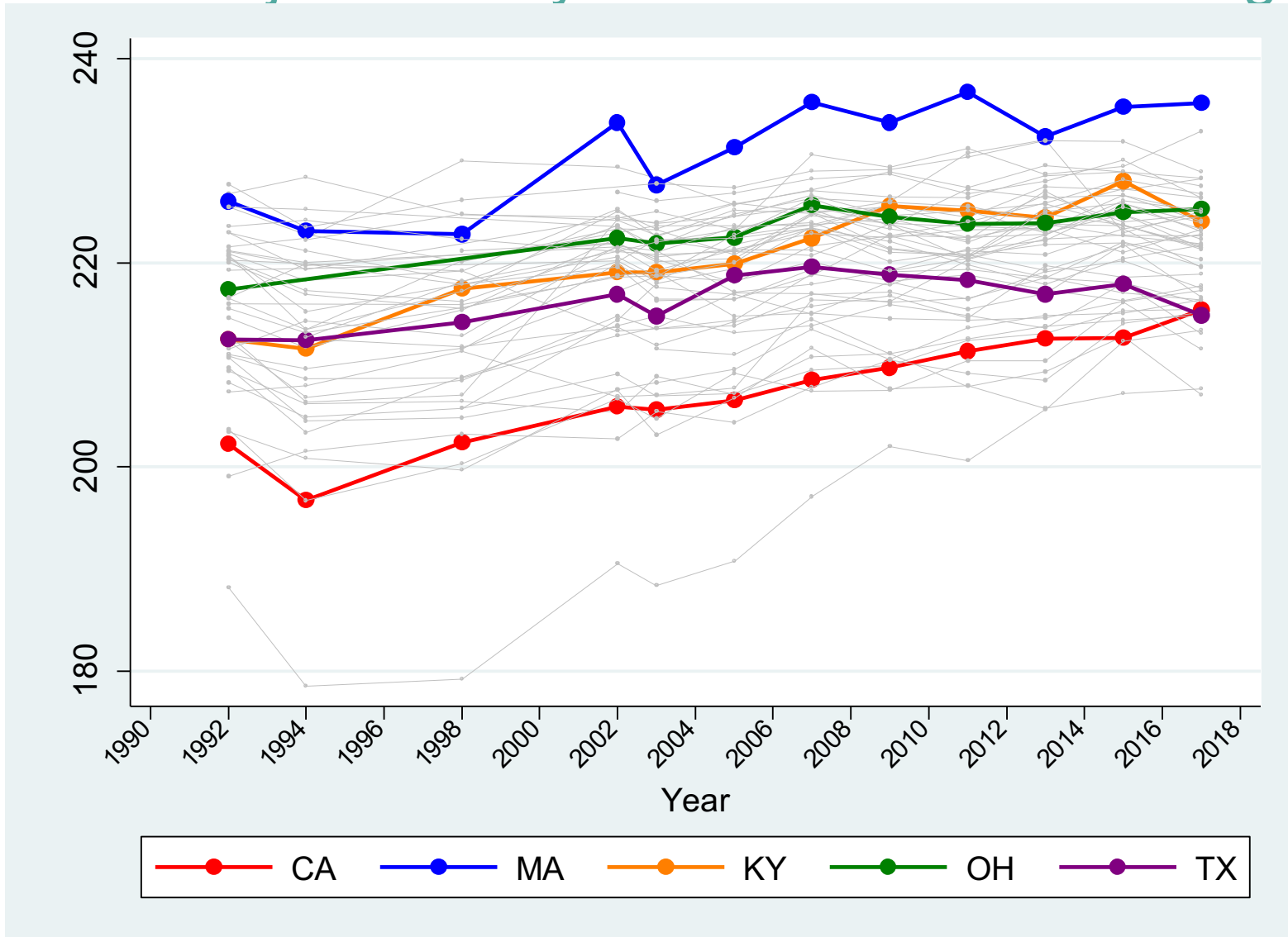
	Classification Based on Prior Rigor Index	Classification Based on Prior CCSS-Similarity Index
Scale	0-7 (7 = highest rigor)	1-5 (1=least like CCSS, 5=most like CCSS)
T states	States with a value of 0-3	States with a value of 1 or 2
C states	States with a value of 5-7	States with a value of 4 or 5
N of states in reading analyses*	17 T states; 12 C states	NA
N states in math analyses*	20 T states; 14 C states	14 T states; 12 C states

*Analysis samples were restricted to states that adopted CCR standards in 2010.

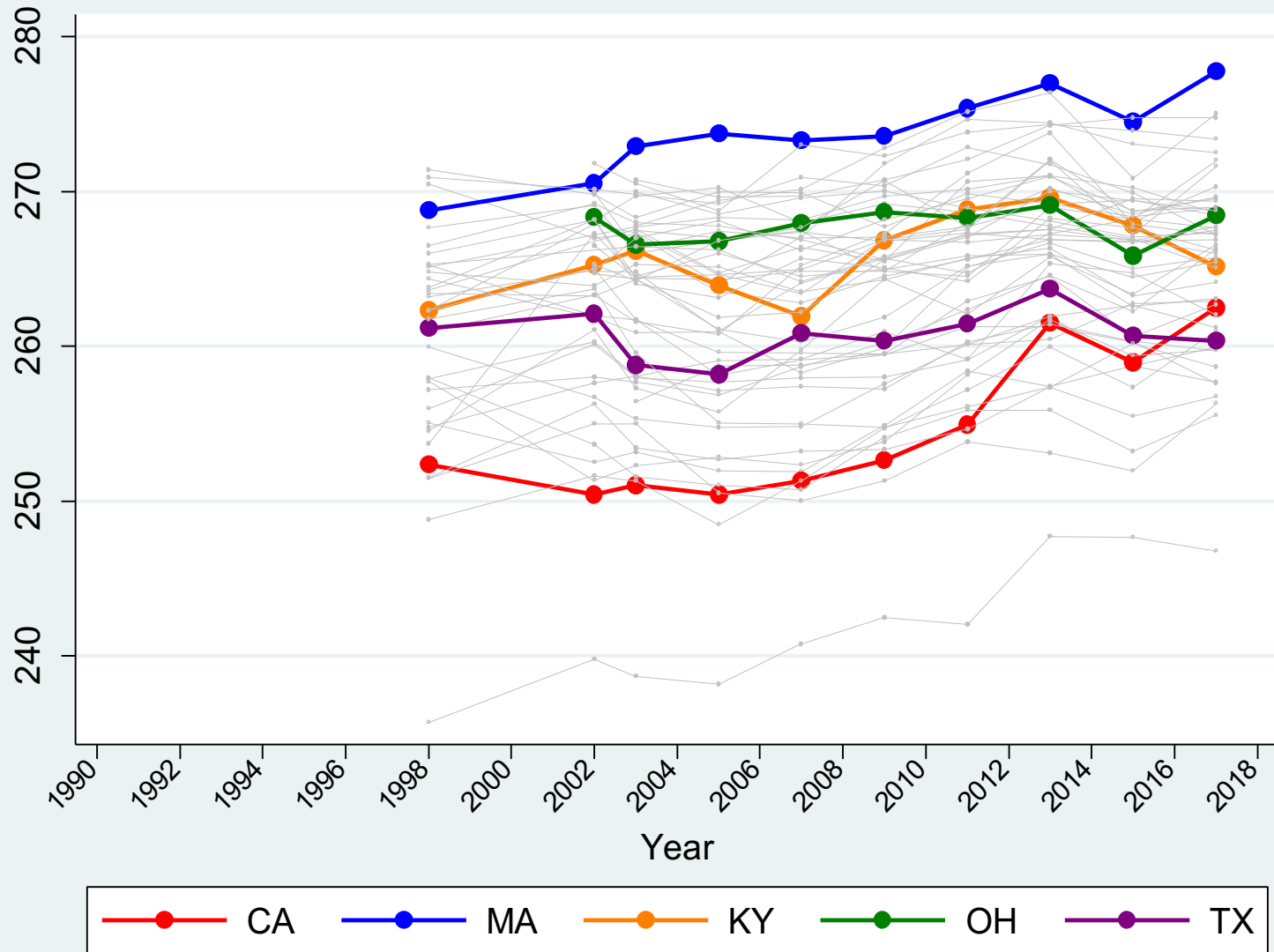
CITS Model

- **Model Specification:**
 - State-year-level regression, controlling for state and year fixed effects and time-varying covariates
 - Baseline slopes allowed to differ for T and C states
- **Estimates From CITS Model:**
 - Effects of CCR standards on student achievement 1, 3, 5, and 7 years after the 2010 adoption of the standards, representing effects at different time points as states were transitioning from initial adoption to full implementation.

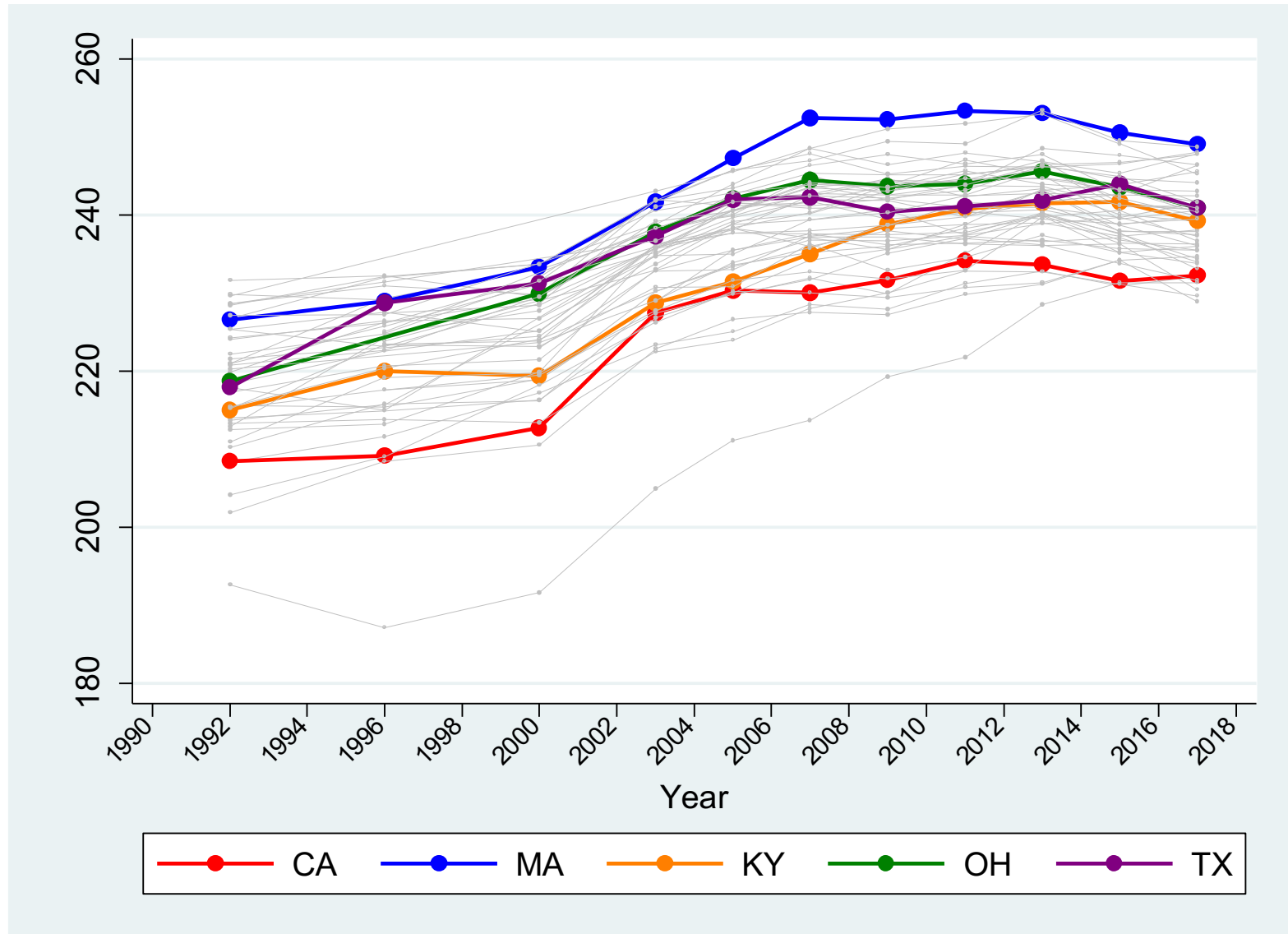
NAEP Trajectories by States: Grade 4 Reading



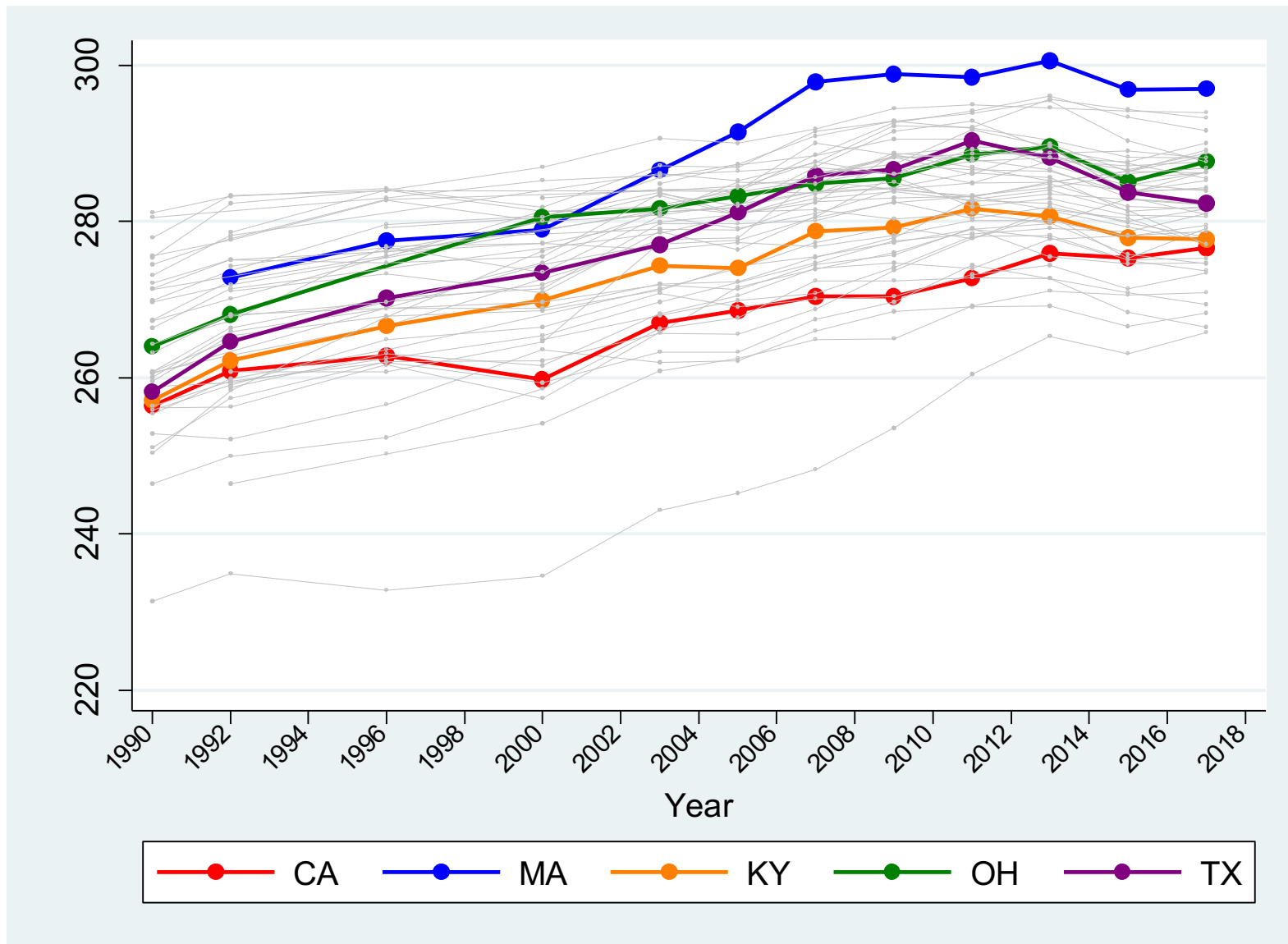
NAEP Trajectories by States: Grade 8 Reading



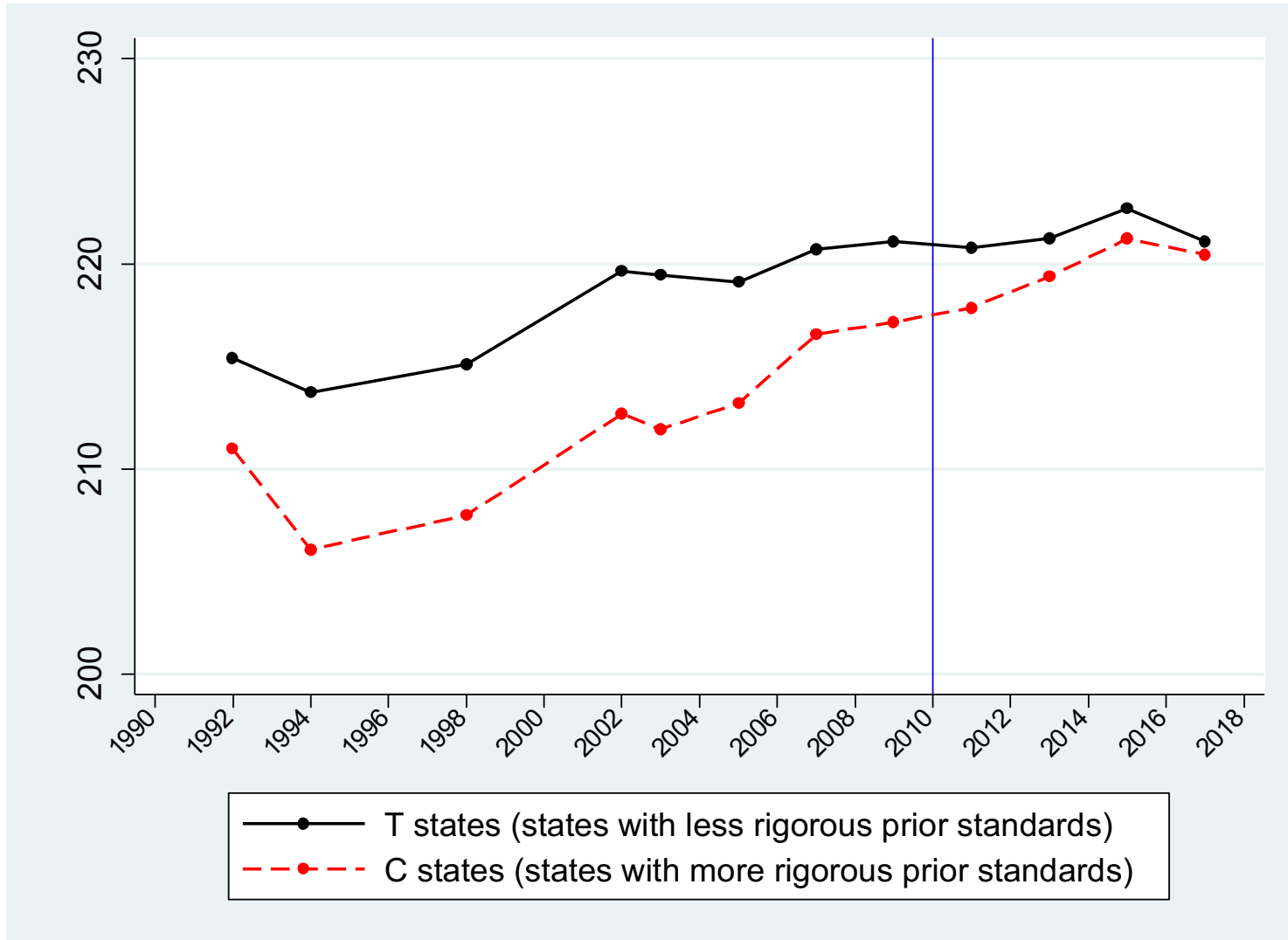
NAEP Trajectories by States: Grade 4 Math



NAEP Trajectories by States: Grade 8 Math

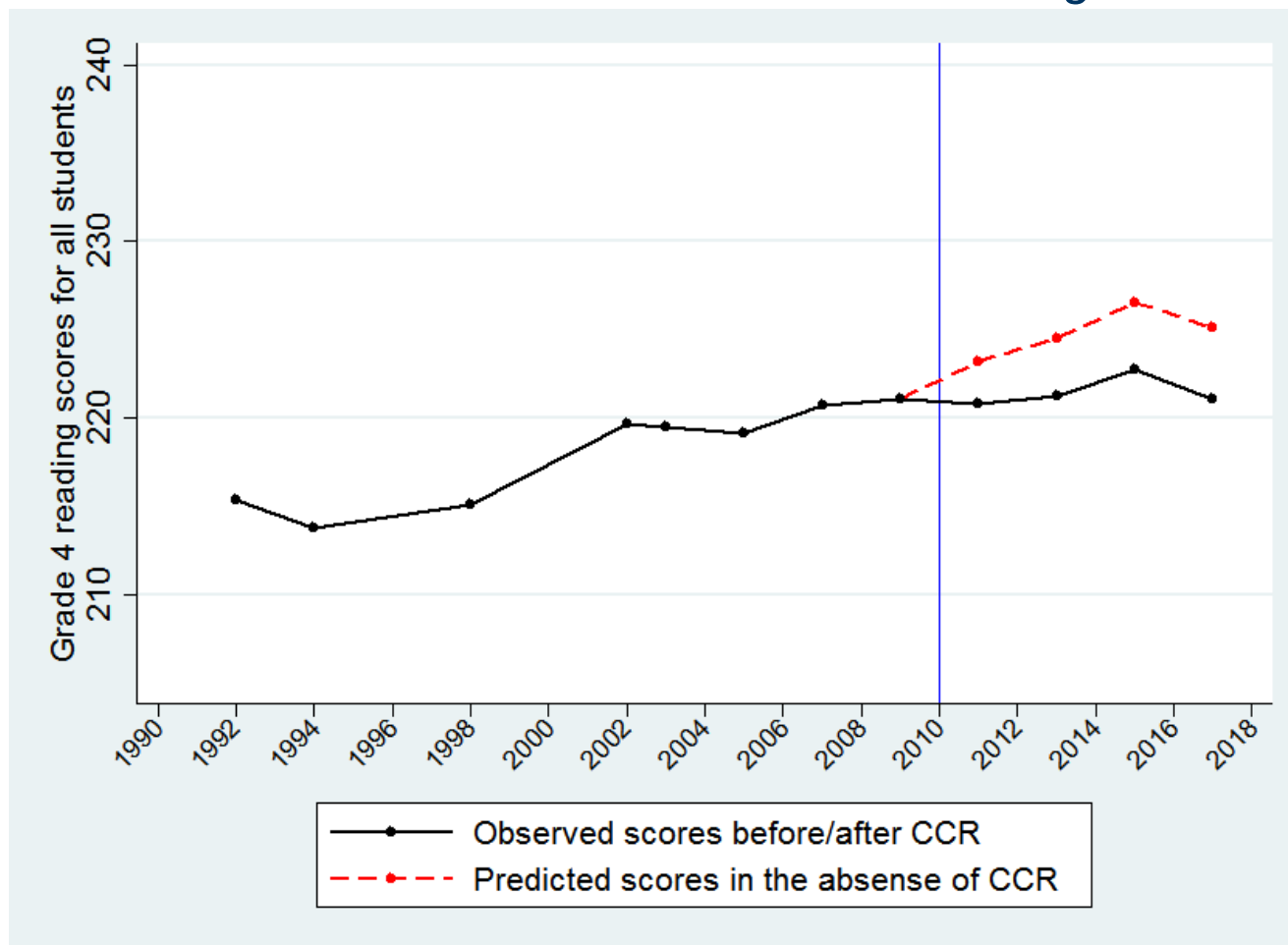


Observed NAEP Grade 4 Reading Achievement Trends for T and C States Based on the Prior Rigor Index



Effects of CCR Standards: Grade 4 Reading

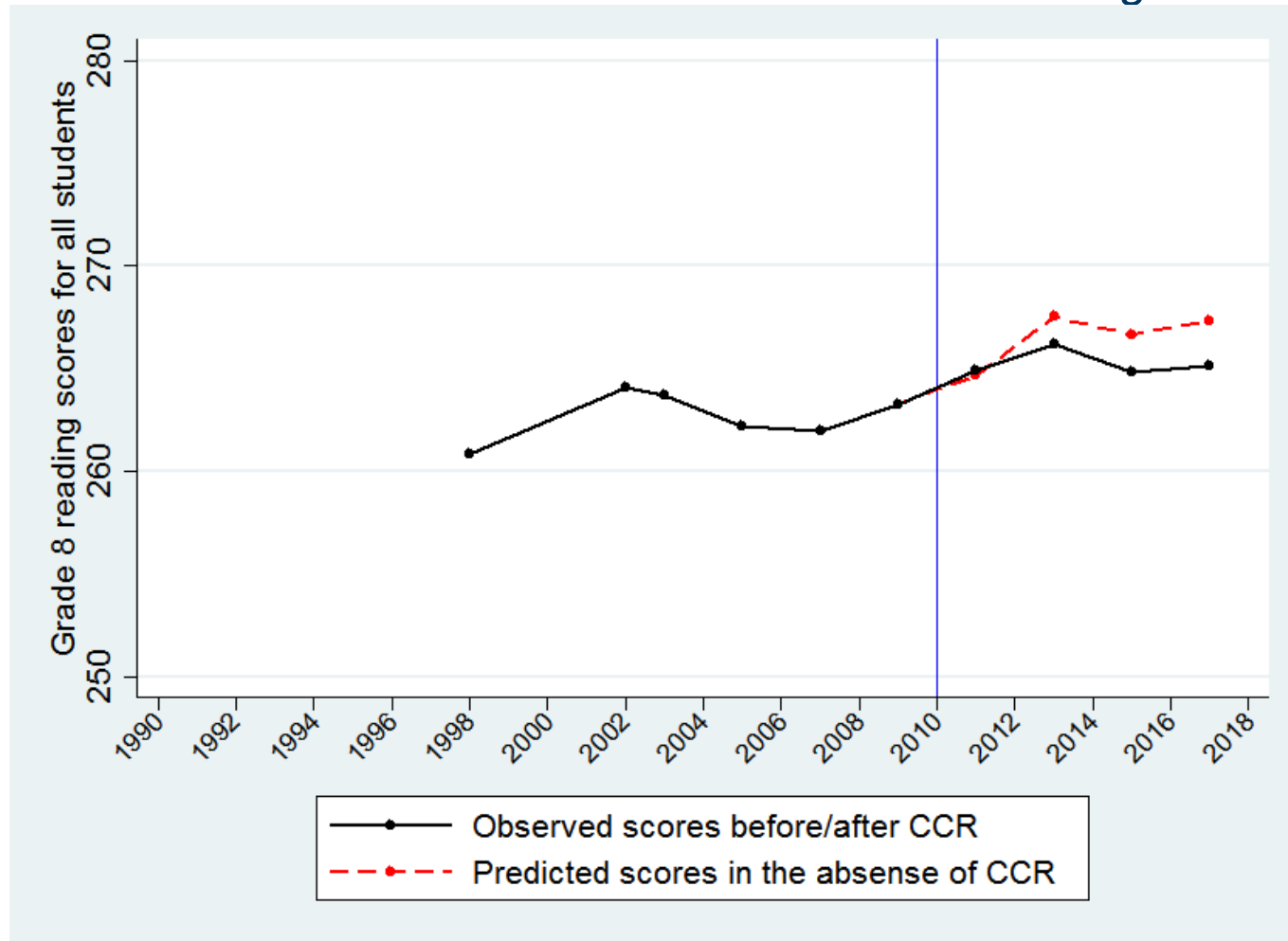
NAEP Scores for T States Identified Based on *Prior Rigor Index*



ES: 1-year effect = -0.07^{**} ($p < .01$); 3-year effect = -0.09^* ($p < .05$);
5-year effect = -0.10^* ($p < .05$); 7-year effect = -0.11^* ($p < .05$)

Effects of CCR Standards: Grade 8 Reading

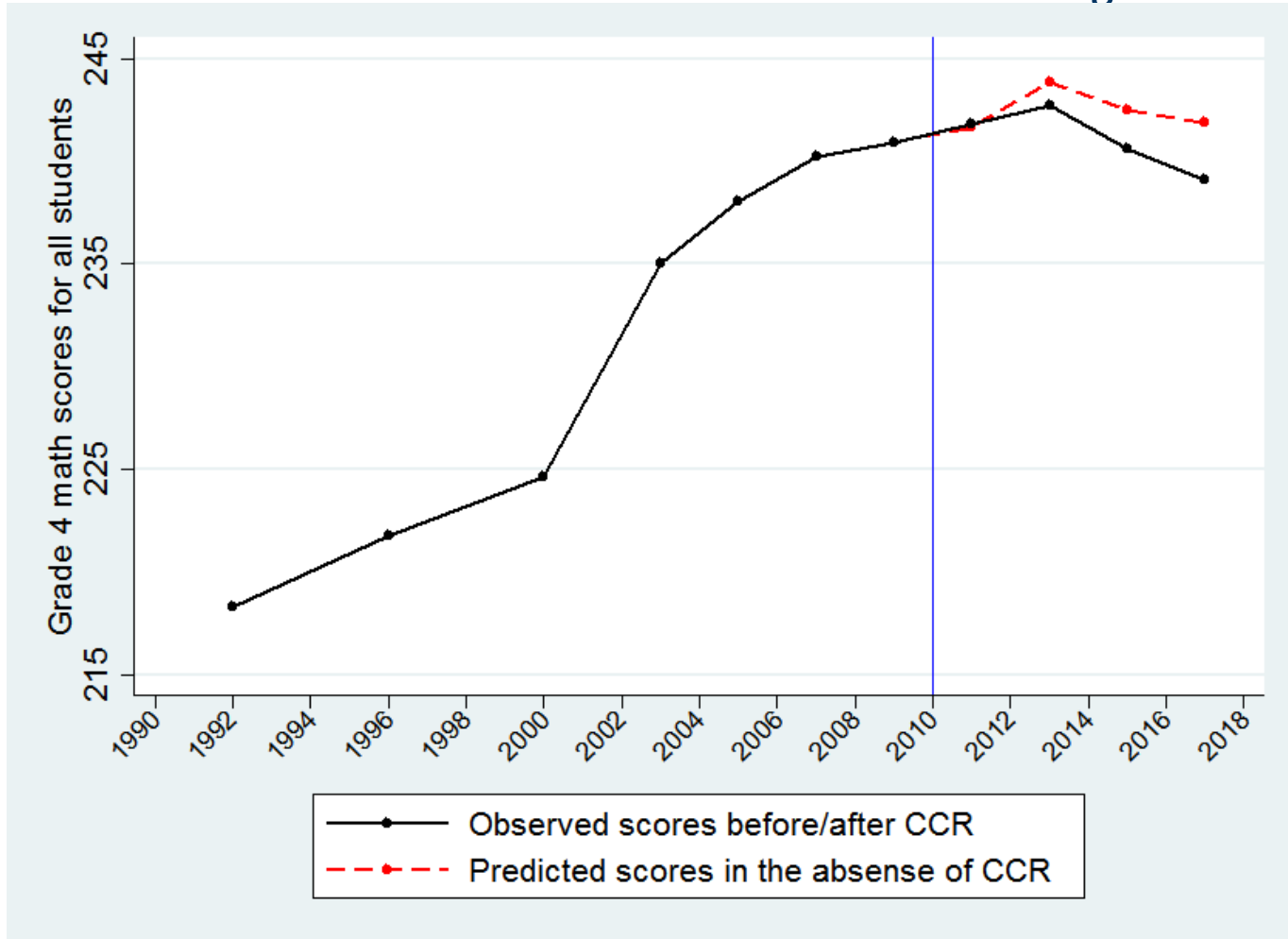
NAEP Scores for T States Identified Based on *Prior Rigor Index*



ES: 1-year effect = 0.01; 3-year effect = -0.04; 5-year effect = -0.05; 7-year effect = -0.06

Effects of CCR Standards: Grade 4 Math

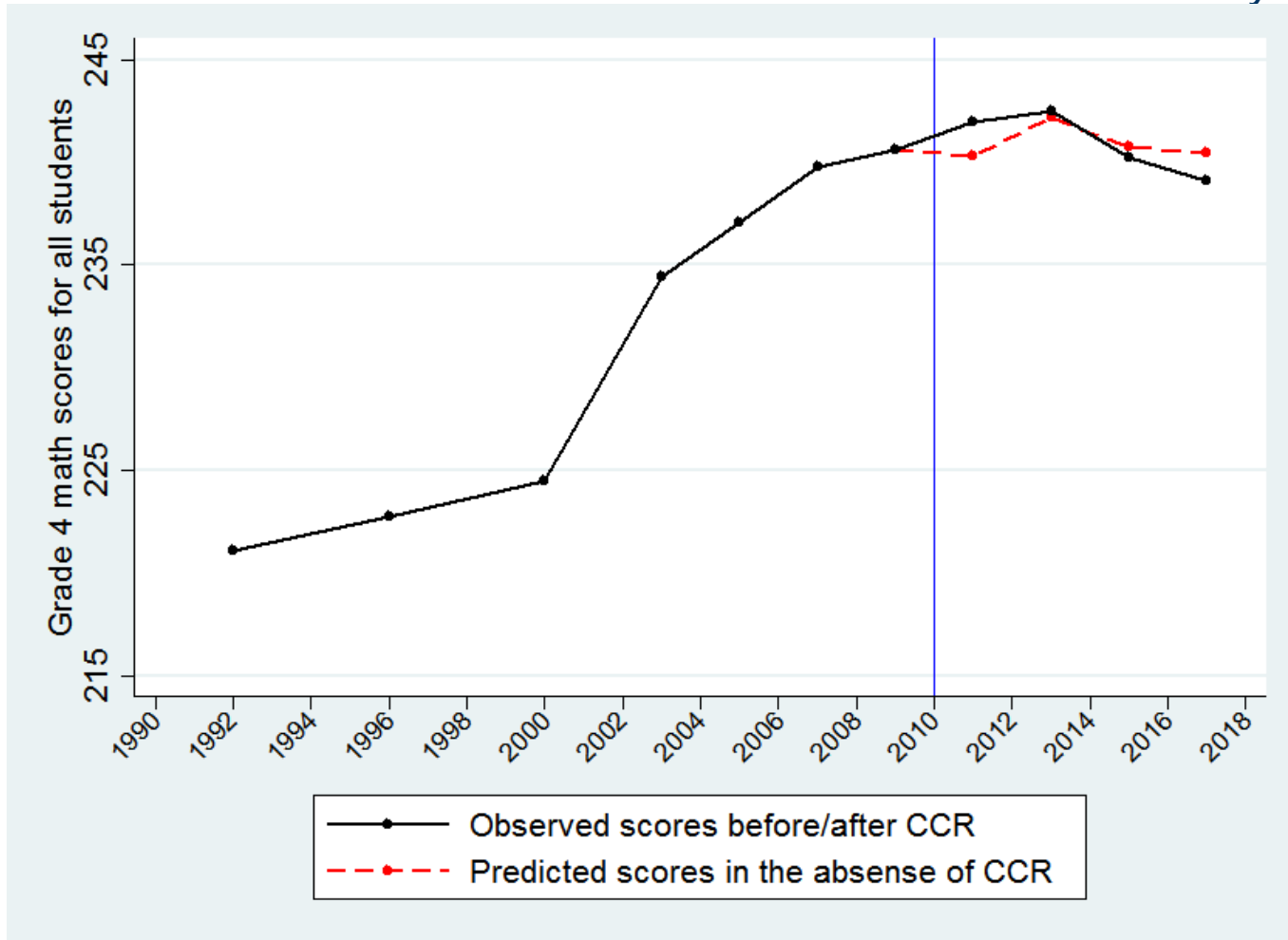
NAEP Scores for T States Identified Based on *Prior Rigor Index*



ES: 1-year effect = 0.01; 3-year effect = -0.04; 5-year effect = -0.06; 7-year effect = -0.09

Effects of CCR Standards: Grade 4 Math

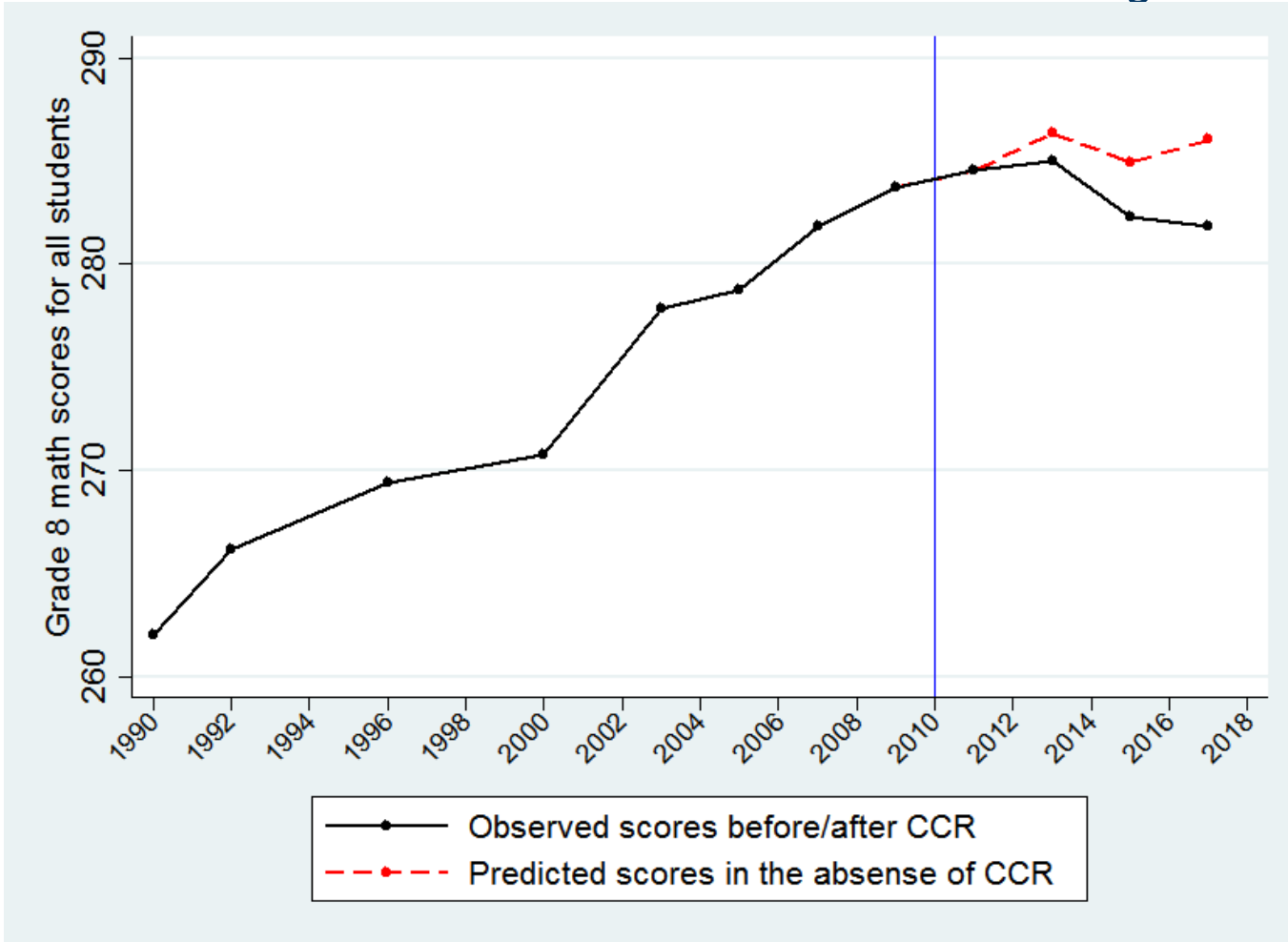
NAEP Scores for T States Identified Based on *Prior CCSS-Similarity Index*



ES: 1-year effect = 0.06; 3-year effect = 0.01; 5-year effect = -0.02; 7-year effect = -0.04

Effects of CCR Standards: Grade 8 Math

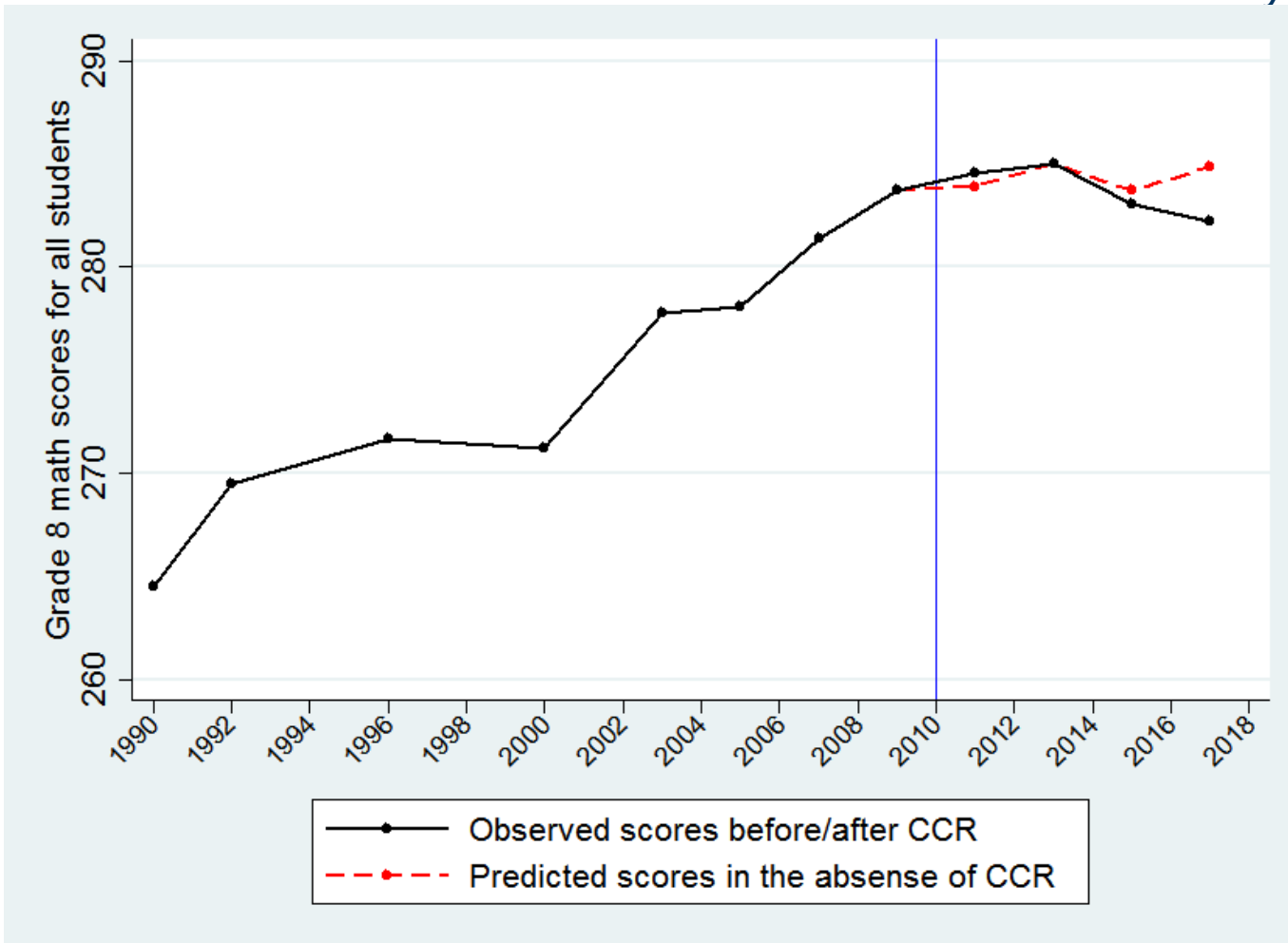
NAEP Scores for T States Identified Based on *Prior Rigor Index*



ES: 1-year effect = 0.00; 3-year effect = -0.04; 5-year effect = -0.07; 7-year effect = -0.11* (p < .05)

Effects of CCR Standards: Grade 8 Math

NAEP Scores for T States Identified Based on *Prior CCSS-Similarity Index*



ES: 1-year effect = 0.02; 3-year effect = 0.00; 5-year effect = -0.02; 7-year effect = -0.07

Effects of CCR Standards: NAEP Subscales

- Results for the two NAEP reading subscales and five math subscales are generally consistent with the results for the NAEP composite scores.

Effects of CCR Standards: SWDs

Timing of effect	Grade 4 reading	Grade 8 reading	Grade 4 math	Grade 8 math
1-yr effect	-0.03	-0.05	0.10*	0.00
3-yr effect	0.00	-0.11	0.02	-0.11
5-yr effect	-0.04	-0.14	0.00	-0.15
7-yr effect	-0.03	-0.21	0.00	-0.23

Notes: Results are based on T and C states defined by the *Prior Rigor Index*.

* $p < .05$

Potential Reasons for Lack of Significant Positive Effects of CCR Standards

- CCR standards **may not have been well implemented.**
 - Most of the results reflect early effects given the extended implementation timeline (typically 3-5 years to reach full implementation)
 - Challenges in implementing CCR standards
- CCR standards **may be no more effective** at improving student achievement than prior standards.

Potential Reasons for Lack of Significant Positive Effects of CCR Standards (cont.)

- **Results need to be interpreted with caution given study limitations.**
 - Lack of a true “no-treatment” comparison group given the timing of CCR adoption across states
 - Less-than-perfect alignment between NAEP and CCR standards