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Assessing the Impact of the PCFP on Student Achievement: Challenges and Opportunities

April 26, 2024

Agenda

- **The need for an impact analysis**

- **Challenges of inferring impact**

- **Effects of the PCFP on districts, schools, and students**

- **Assessing the impact of the PCFP on district-level outcomes**

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Benefits of Impact Analysis

An ideal causal analysis of the policy would test efficacy of policy levers

- **What should the weights be?**

  - Is there diminishing marginal return to concentrated funding?

- **For whom should the weights apply?**

  - FRPL vs. At-Risk

- **Schoolwide vs. targeted to applicable students?**

  - Ancillary services vs. core instruction

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Challenges of Inferring Impact

Exam Schools vs. Charters in Chicago

	Exam Schools	Noble Network
Black	.33	.44
Hispanic	.30	.52
White	.22	.02

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Impact on ACT Math	-0.11	0.34

Source: *Angrist, Pathak, & Zarate (2019)*

Effects of the PCFP on Districts, Schools, and Students

Compared to What?

- **Effect sizes are counterfactual statements**

  - The PCFP boosted math scores by 0.2 standard deviations

- **Compared to what?**

  - Compared to 2019 scores in the same district?

  - Compared to 2023 scores in districts that received less?

- **Level of analysis will dictate the comparison group**

  - District → school → student

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Student

- **What is the impact of the PCFP on EL, at-risk, and gifted students?**

- **Comparison group: students who do not generate funding**

- **Benefit**

  - EL, at-risk, and gifted students are clearly meant to be prime beneficiaries

- **Challenges**

  - Money can be spent on non-identified students as well

  - Spillovers from treated students ("peer effects")

School

- **What is the impact of PCFP revenue on school-level outcomes?**

- **Comparison group: schools with lower level of funding**

- **Benefit**

  - Intra-school spillovers and schoolwide spending don't lead to biased treatment estimates

- **Challenge**

  - School-level PCFP revenue is correlated with unobservable determinants of student achievement

  - Unable to assess student mobility (e.g., score "increase" due to differential selection)

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District

- **What is the impact of PCFP revenue on district-level outcomes?**

- **Comparison group: ??**

Assessing the Impact of the PCFP on District-level Outcomes
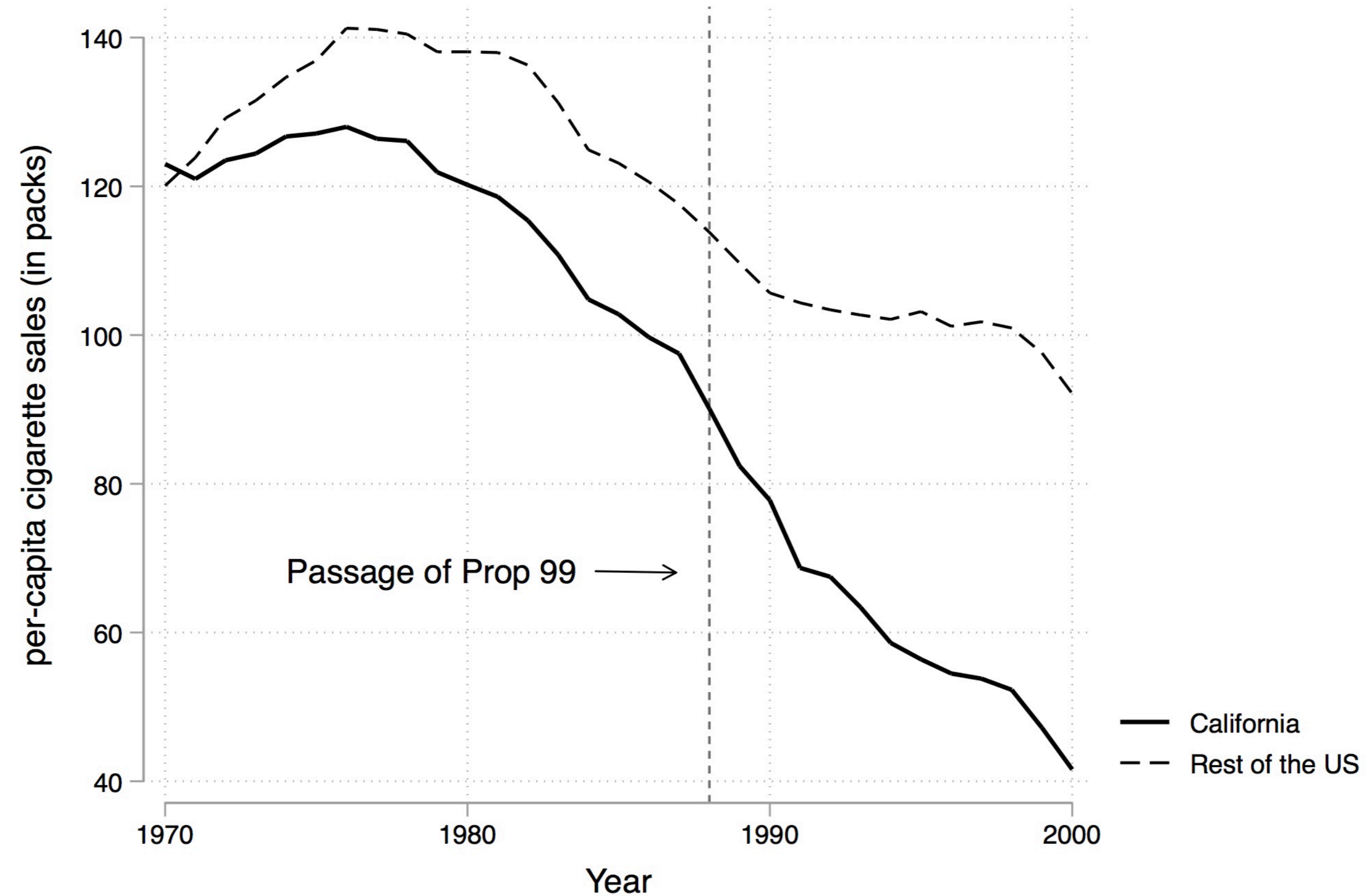
Impact Analysis

- **Compared to what?**

  - Compared to 2019 scores in the same district?

  - Compared to 2023 scores in districts that received less?

- **What would have happened in each district had the PCFP not occurred?**

  - We need an "alternate" Clark, Washoe, Carson City, etc.

  - Use similar districts from other states

Overview of Synthetic Control Model

- **Used to estimate the impact of an intervention or policy change in an observational setting (compared to an experiment)**

- **Model is used to construct a comparison group that is statistically similar to the treated group using weighted shares of other groups that were not treated**

# Observational difference: California compared to the rest of the U.S.

Example Applications of Synthetic Control

Analysis of the impacts of Proposition 99, a cigarette tax on cigarette sales in California

- States were matched on GDP, share of the population aged 15–24, retail prices, beer consumption, and cigarette sales per capita in earlier years

- A synthetic California was created using data from Utah (33%), Nevada (23%), Montana (20%), Colorado (16%), and Connecticut (7%)

Source: *Abadie, Diamond, & Hainmueller (2010)*

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California compared to a *synthetic* control *California* constructed of shares of other states
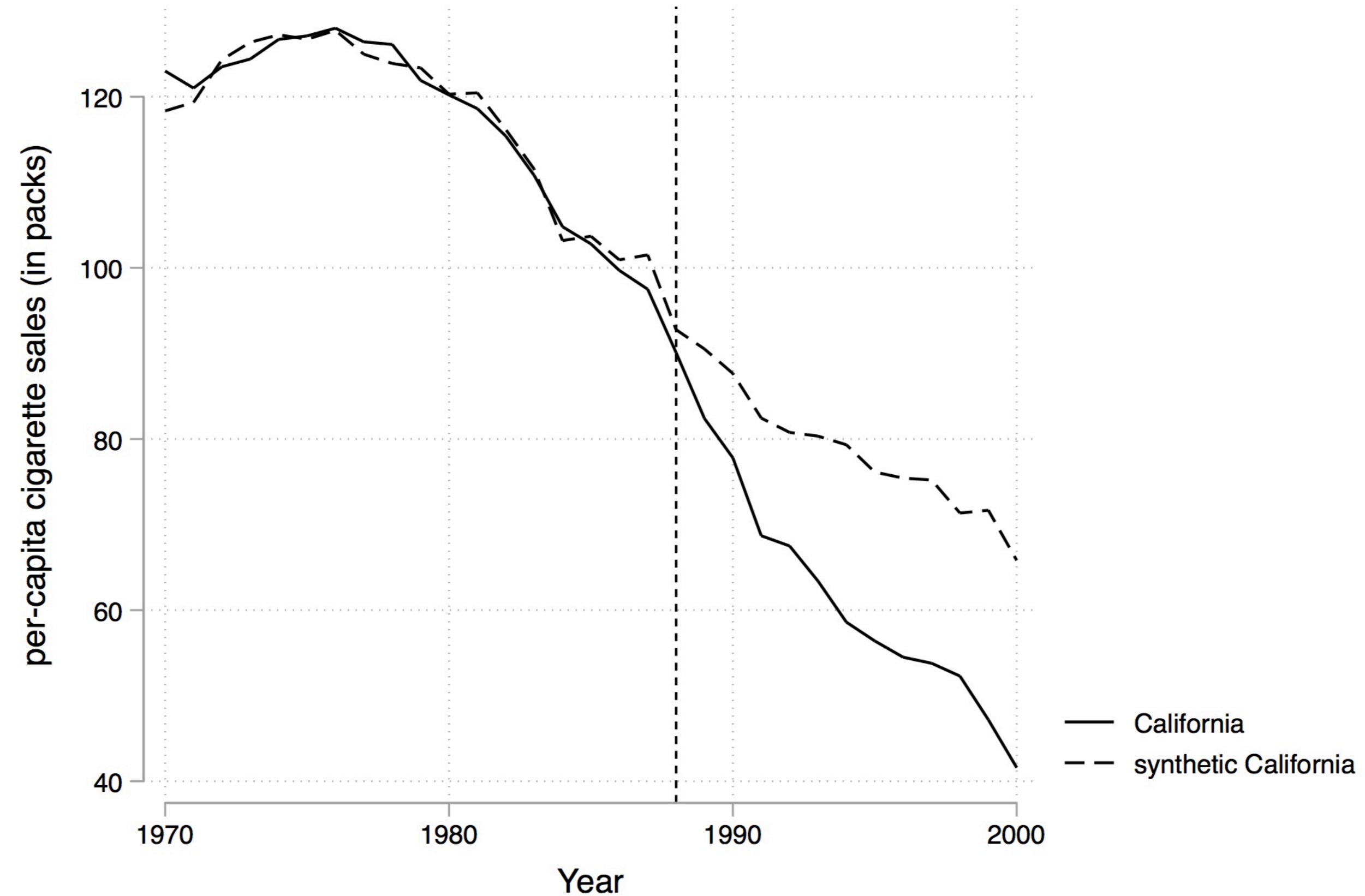
Measures to match school districts

Economic Characteristics

- Unemployment

- GDP or income

- Economic activity related to tourism or gaming

COVID-19

- Case counts

- In-person enrollment or modality

Policy Landscape

- Exclude states with recent funding formula changes

District Characteristics

- Urbanicity

- District size

- Academic performance in math and English

- Per pupil spending

- Composition of the student population by demographic characteristics,

  - Race, socioeconomic status, students with disabilities, English learners, etc.

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Stanford Education Data Archive

Dataset that links data sources on student outcomes for within- and across-state comparisons in educational outcomes

- EdFacts data on Mathematics and Reading/Language Arts

- State-reported accountability data

- Expressed in a standardized scale by linking state-specific data with National Assessment of Educational Progress (NAEP) data

Most recent data published in March 2024 is the first to include data on post-2020 outcomes

Addressing the impacts of COVID-19

Significant variation in COVID-19 case rates, access to in-person schooling in first years of new funding formula

- Therefore, exposure to impacts of new funding formula also varied

Using school-level data from the COVID-19 School Data Hub, we can control for the following:

- Learning modality (virtual, hybrid, in-person)

- Enrollment by learning modality

- COVID-19 case counts among students and/or staff