

The Importance of Local Options in College Choice: Evidence from Community College Openings

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- The decision whether and where to attend college can have large impacts on long-term outcomes (Lovenheim and Smith, 2022)
- Many potential considerations for students making college choices
- One potentially important, less-studied factor: distance from home
- Likely to be more important for community college students, low-income students, and part-time students

How important is the availability of nearby community college options to college choice?

- Are students with more nearby community colleges options more likely to enroll in college?
- How do students' nearby college choice sets affect the type of college they attend?
- What are the effects on degree completion and earnings?

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I will use [community college openings](#) as variation in students' nearby college choices to study enrollment effects

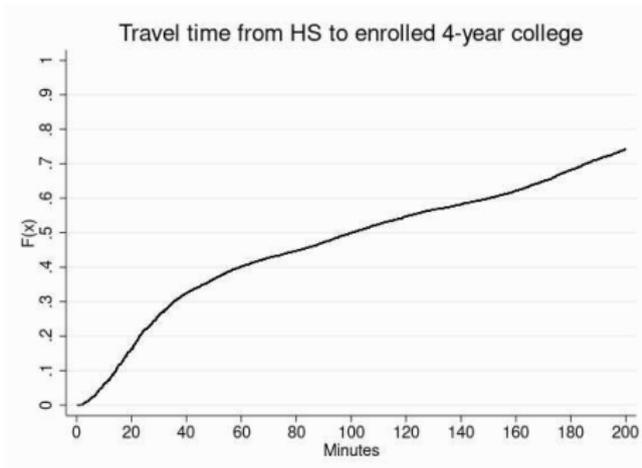
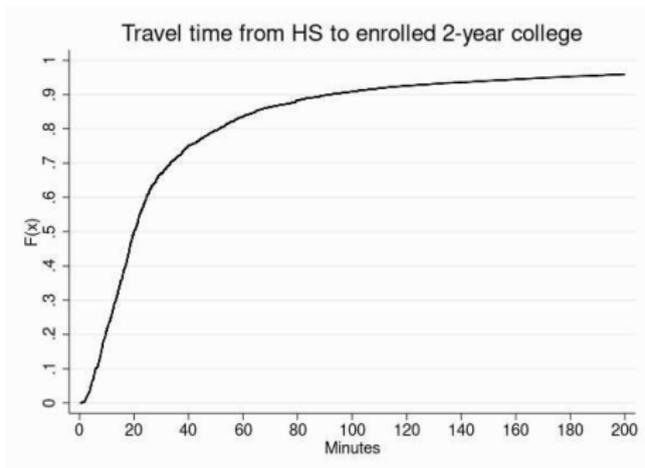
- **Relationship between college proximity and enrollment:** Card (1995), Long (2004), Doyle and Skinner (2016), Mountjoy (2022)
- **Education deserts:** Hillman (2016)
- **Effects of price changes on college enrollment:** See Deming and Dynarski (2009) for a summary of prev lit; Denning (2017) for community college-specific effects

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Two papers using college openings to study enrollment effects

- Frenette (2009) uses conversions of two-year colleges to four-year colleges in Canada; finds (almost) 1-1 substitution from two-year to four-year enrollment
- Lapid (2017) uses 3 opening CSU and 1 opening UC university; finds increased enrollment from nearby high schools to opening colleges, no change in other university enrollment

My contribution: Effects of opening 2-year colleges rather than 4-years



Additionally, I have more detailed enrollment data and longer-term outcomes (e.g. degree completion, earnings)

College Choice Framework

- Students maximize utility over all college options and the outside option (not attending)
- Utility from each college depends on college characteristics, student characteristics, and the match between the two
- Possible considerations include price, quality of education offered, social fit, etc.
- Distance from home may affect utility for several reasons
 - Commuting costs
 - Ability to live at home and save on rent
 - Ability to keep job or perform family obligations
 - Access to existing social networks

Challenges

- Naively, one could compare college enrollment rates of students who live near a college to those who live far from any colleges
- In general, these two groups are different
- Families who value college more may choose to live closer to colleges, which would bias the effect of distance on enrollment
- Areas with colleges may have stronger labor markets

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Solution: Use newly established colleges and compare college enrollment of students from nearby high schools **before and after** opening

To also account for local trends in enrollment that would have occurred without the new college, compare **nearby** high schools to **slightly further** high schools (difference in difference framework)

College Openings in Texas

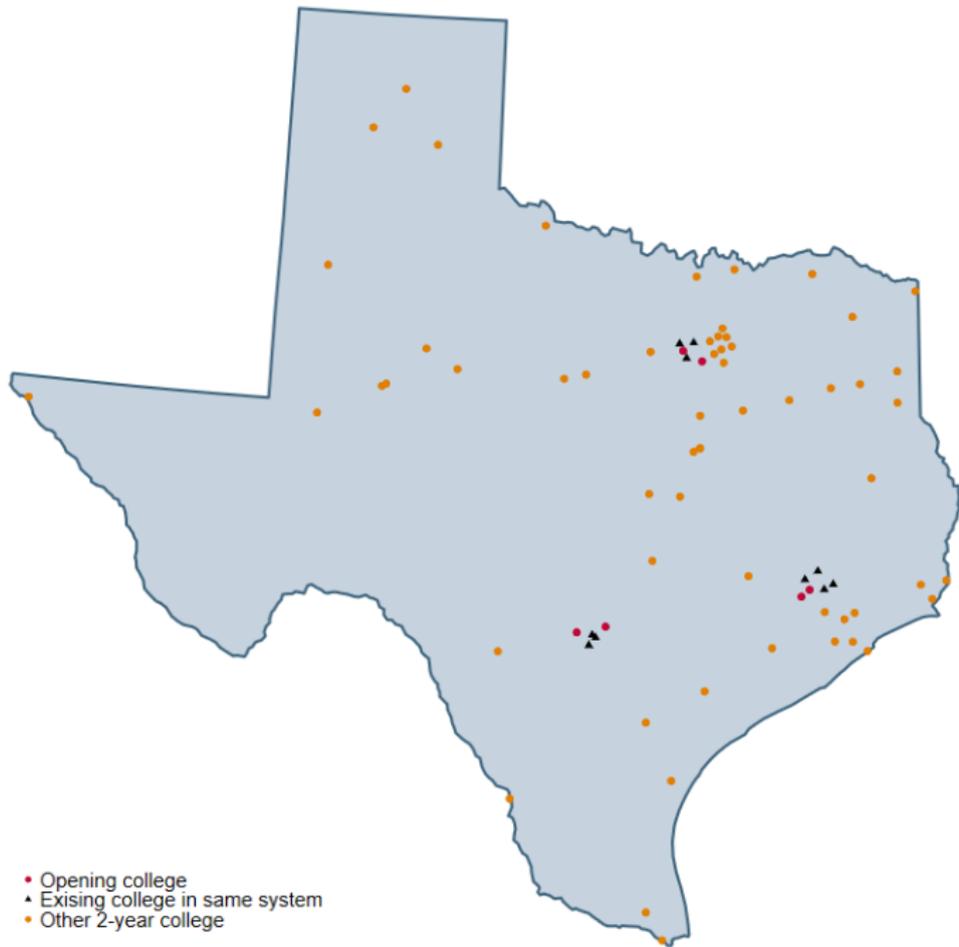
ID	Year	College
1	1997	Tarrant County SE
2	1999	Alamo NW Vista
3	2003	Lone Star Cy-Fair
4	2009	Alamo NE Lakeview
5	2010	Tarrant County Trinity River
6	2012	Lone Star University Park

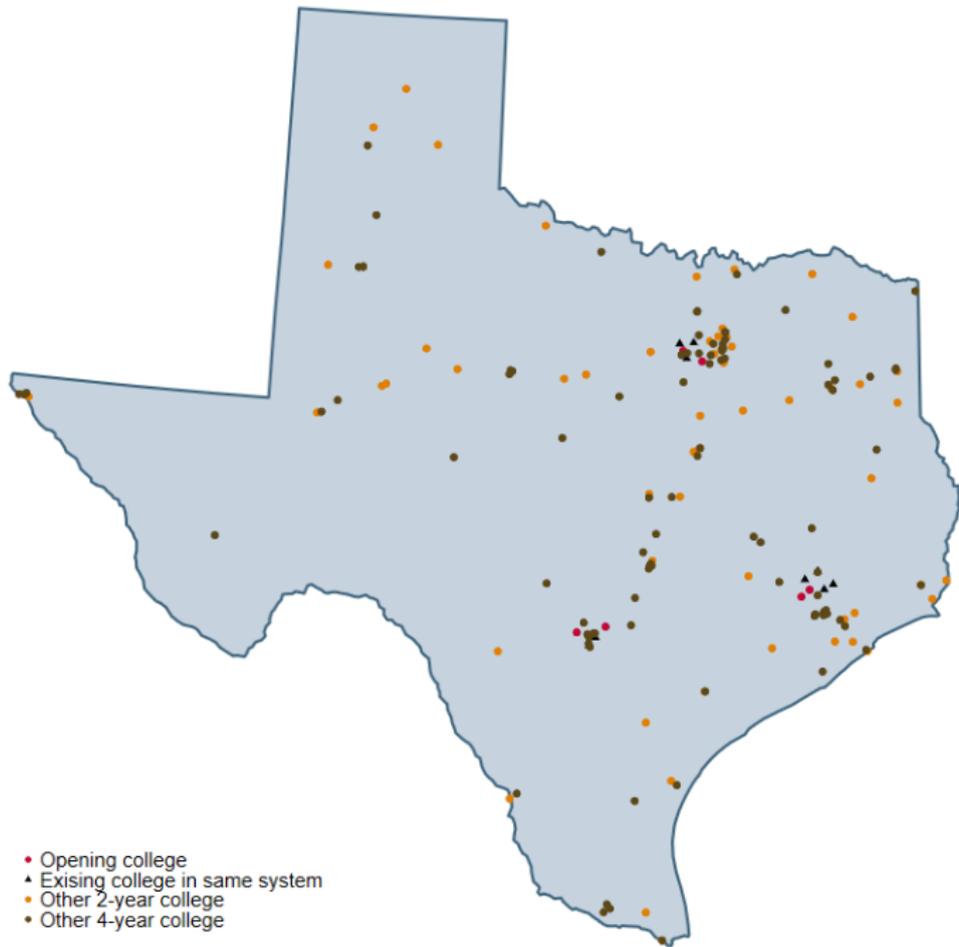
A new college could shift nearby students choices in 2 ways

- No college → New college
- Previously existing college → New college









Administrative data from Texas Education Research Center, 1994-2020

- TX public high schools: enrollment, graduation, standardized test scores, and free and reduced price lunch (FRPL) status
- TX public and private non-profit colleges: term-by-term enrollment, major, graduation, financial aid info (for all students who fill out FAFSA)
- Quarterly earnings from UI records

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Supplementary data

- IPEDS for college locations and characteristics
- CCD for high school locations
- Hand collected geocoordinates from Google Maps in the case of missing data
- Driving time between geocoordinates from Open Route Services

Sample Restrictions

TX public high school graduates (excluding charter schools), 1994-2019

- “Home” location proxied with high school location
- Enrollment measured within 1 year of graduation
- Multiple measures of degree completion within 2-8 years of HS graduation
- If missing test score, impute with 0 and include missing indicator variable

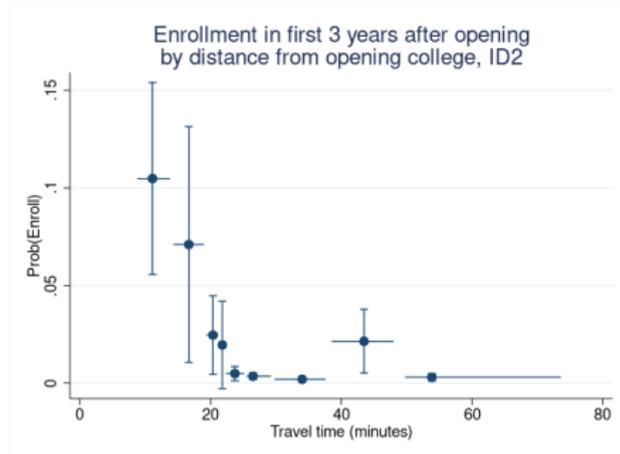
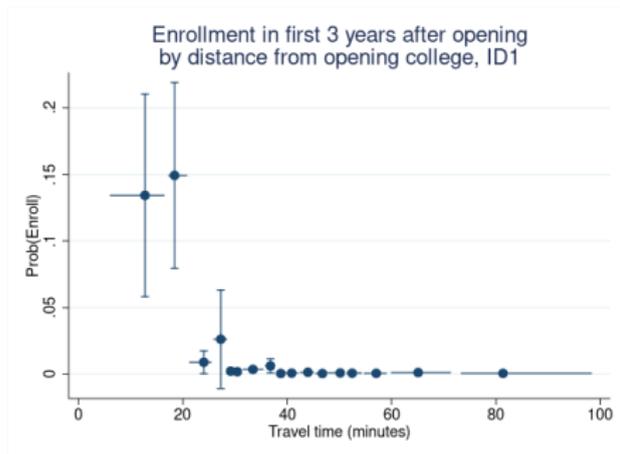
Defining treatment and control groups

- Students who live nearest to the opening college are the most likely to have their enrollment choices affected
- Control group should be similar to the treated group, but not be affected by the opening college

Defining treatment and control groups

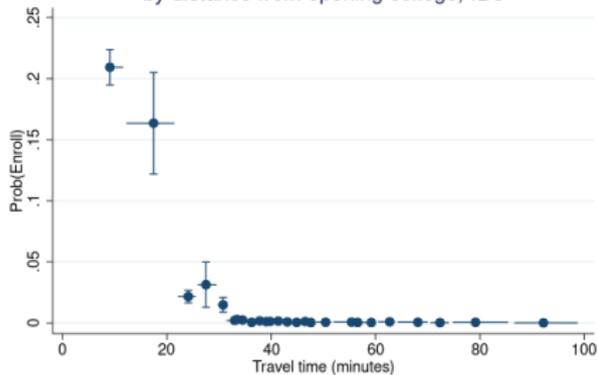
- Students who live nearest to the opening college are the most likely to have their enrollment choices affected
- Control group should be similar to the treated group, but not be affected by the opening college
- Ring method: inner treated ring(s), outer control ring based on distance from the treatment point
 - Used by Alexander et al. (2019,) Currie et al. (2015), many others
- How to pick the rings? Adapt methods from Butts (2022), Cattaneo et al. (2022)

Enrollment in opening colleges by distance

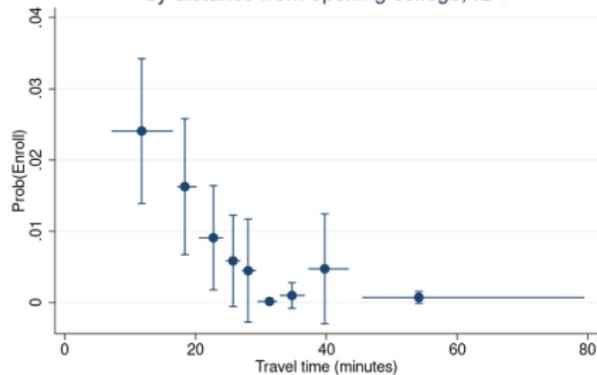


Plots created using partitioning-based binscatter least squares estimation with IMSE-optimal bins (Cattaneo et al., 2022)

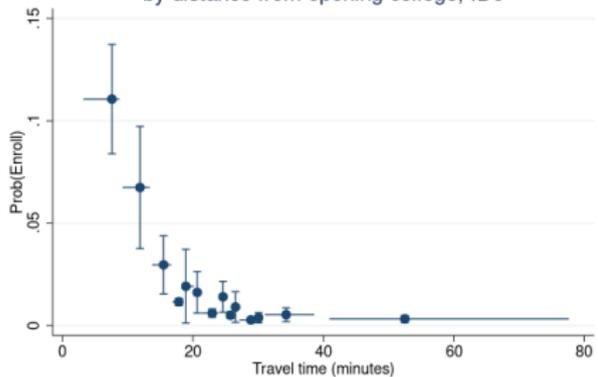
Enrollment in first 3 years after opening
by distance from opening college, ID3



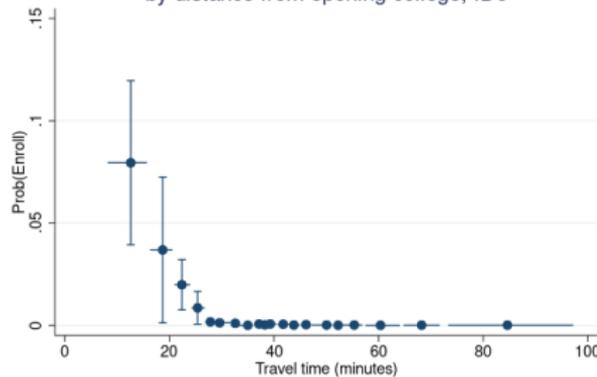
Enrollment in first 3 years after opening
by distance from opening college, ID4



Enrollment in first 3 years after opening
by distance from opening college, ID5



Enrollment in first 3 years after opening
by distance from opening college, ID6



Defining treatment and control groups

To simplify interpretation and maximize power, I define

- Treatment ring: high schools within a 20 minute drive of the opening college
- Control ring: high schools 20-40 minutes from the opening college, in the same commuting zone

Given the low local enrollment in Alamo NE Lakeview (ID4) and the lack of a dropoff in enrollment after 20 minutes, I drop it from the remaining analysis

Model and Assumptions

Following Borusyak, Jaraval, and Spiess (2022), I assume

- Generalized parallel trends: Untreated outcomes would evolve in parallel between treated and untreated groups, conditional on covariates
- No Anticipation: Treated group does not respond to treatment before it happens

I parameterize the model as

$$Y_{it} = D_{it}\theta + \gamma_t + \phi_{s(i)} + t\rho_{cz(i)} + \beta_X X_{it} + \epsilon_{ist} \quad (1)$$

where,

Y_{it} = Outcome of interest

D_{it} = treatment indicator

γ_t and $\phi_{s(i)}$ = year and high school fixed effects

$t\rho_{cz(i)}$ = commuting zone-specific time trend

X_{it} = individual characteristics

Imputation estimator (Borusyak, Jaraval, and Spiess, 2022):

- 1 Within the untreated observations only, estimate γ , ϕ , ρ , and β by OLS in the regression

$$Y_{it} = \gamma_t + \phi_{s(i)} + t\rho_{cz(i)} + \beta_X X_{it} + u_{ist}$$

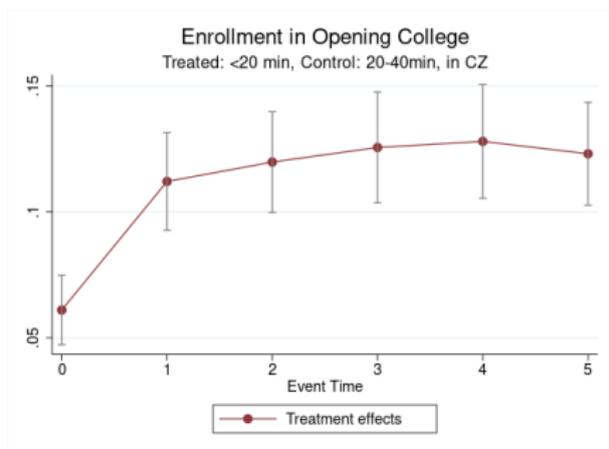
- 2 For each treated observation with $w_{it} \neq 0$, set $\hat{Y}_{it}(0) = \hat{\gamma}_t^* + \hat{\phi}_{s(i)}^* + t\hat{\rho}_{cz(i)}^* + \hat{\beta}_X^* X_{it}$ and $\hat{\tau}^* = Y_{it} - \hat{Y}_{it}(0)$ to obtain the estimate of τ_{it}
- 3 Estimate the target τ_w by a weighted sum of $\tau_{it}^* = \sum w_{it} \tau_{it}^*$

I focus on the estimation of dynamic treatment effects by relative time (opening year, 1 year after opening, 2 years after opening,...)

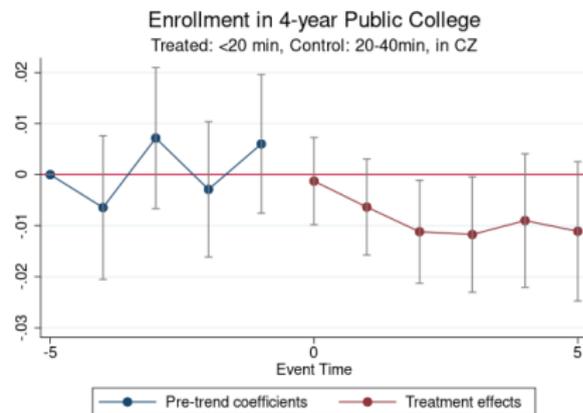
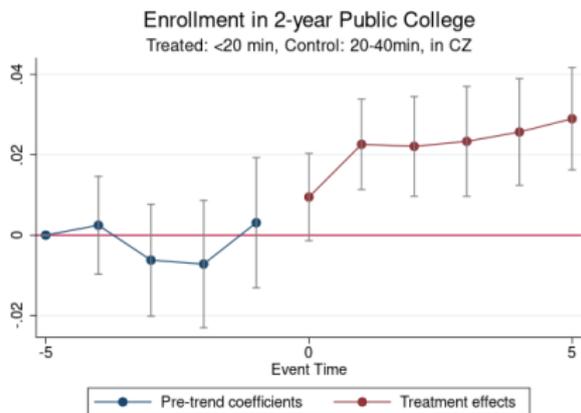
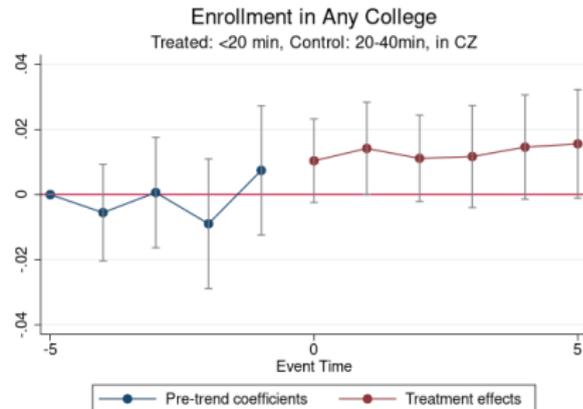
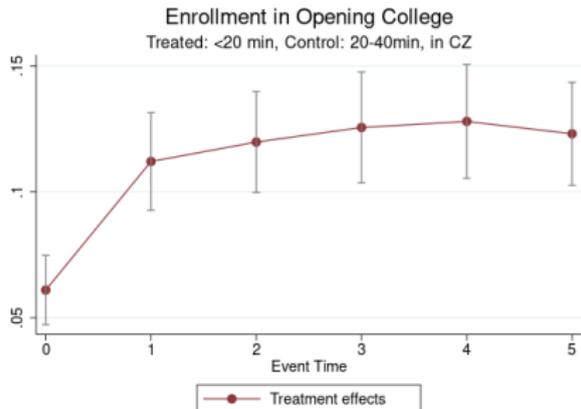
Testing for Parallel Trends

- To increase plausibility of parallel trends assumption, trim the sample to 5 years before and 5 years after opening
- Use robust pre-trend test using untreated observations only
- Pre-testing is done with a separate regression from the treatment effects estimation
- Pre-trend coefficients interpreted relative to period -5 which has been normalized to 0
- Treatment effect estimation always assumes parallel trends
- Interpretation of treatment coefficients is not relative to period -1 as in traditional event studies

Results: Small Increases in Overall Enrollment



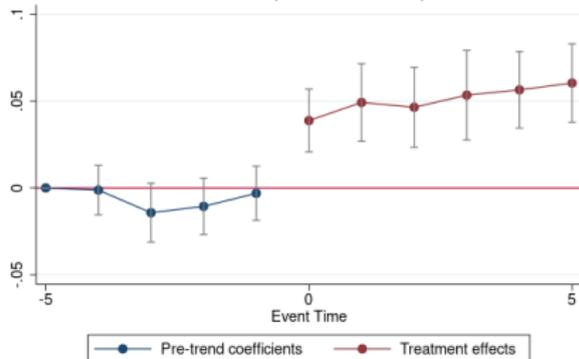
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Results: Students Enroll Closer to Home

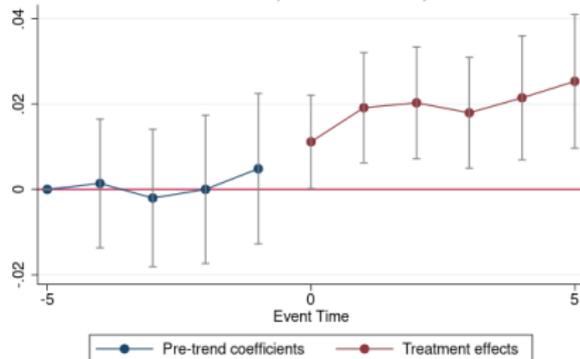
Enrollment in College within 20 minutes

Treated: <20 min, Control: 20-40min, in CZ



Enrollment in College within 60 minutes

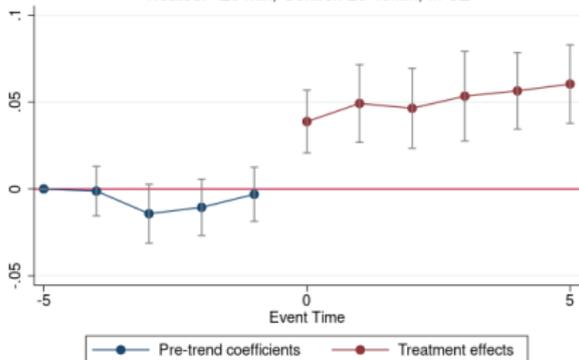
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Results: Students Enroll Closer to Home

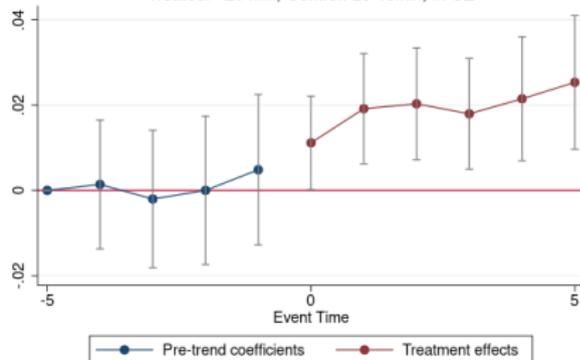
Enrollment in College within 20 minutes

Treated: <20 min, Control: 20-40min, in CZ



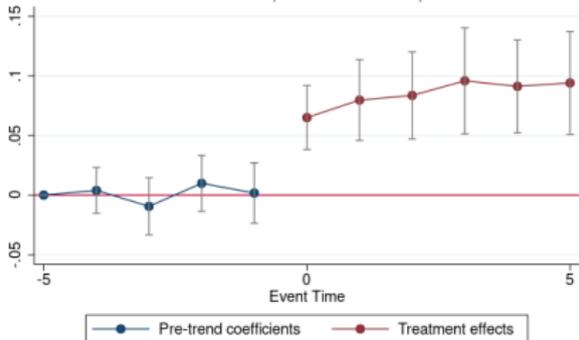
Enrollment in College within 60 minutes

Treated: <20 min, Control: 20-40min, in CZ



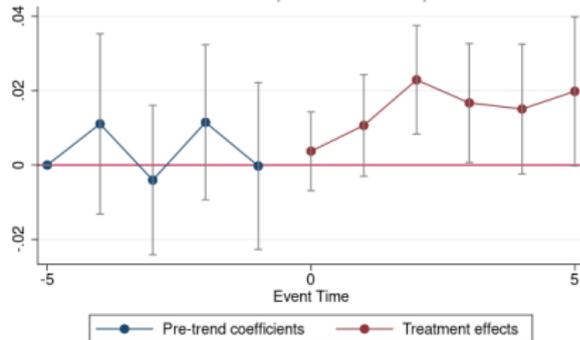
Enrollment in College within 20 minutes, Conditional on College Attendance

Treated: <20 min, Control: 20-40min, in CZ



Enrollment in College within 60 minutes, Conditional on College Attendance

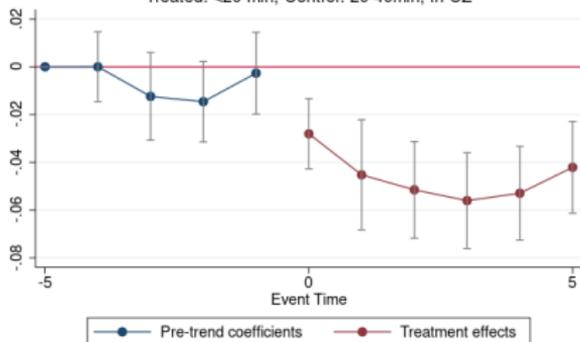
Treated: <20 min, Control: 20-40min, in CZ



Results: Substitution Away From Other Nearby Colleges

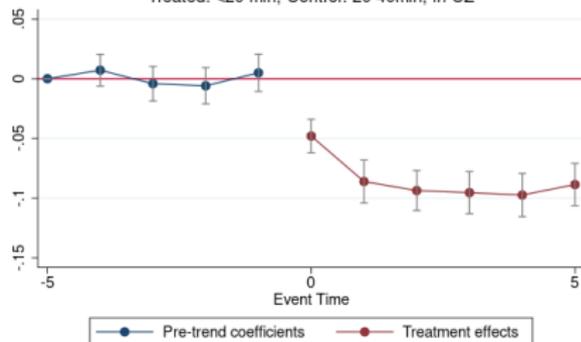
Enrollment in College within 20 minutes,
at Non-opening 2-year College

Treated: <20 min, Control: 20-40min, in CZ



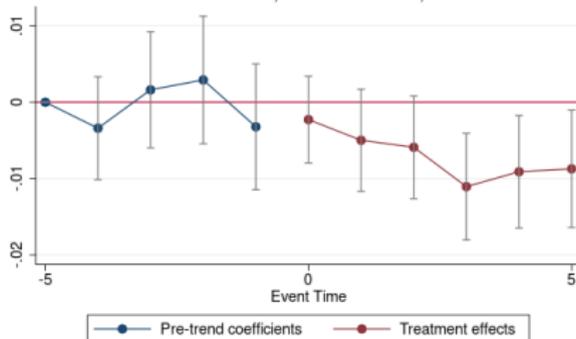
Enrollment in College within 60 minutes,
at Non-opening 2-year College

Treated: <20 min, Control: 20-40min, in CZ



Enrollment in College within 60 minutes,
at 4-year Public College

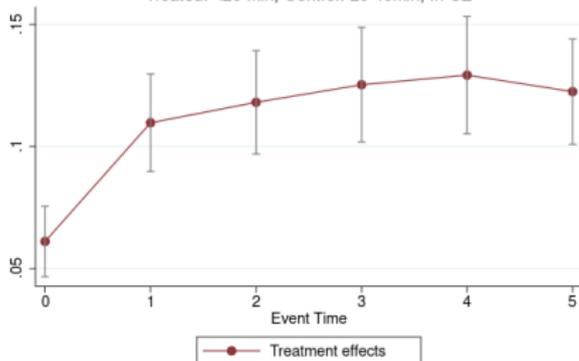
Treated: <20 min, Control: 20-40min, in CZ



Results are Similar with Balanced Panel

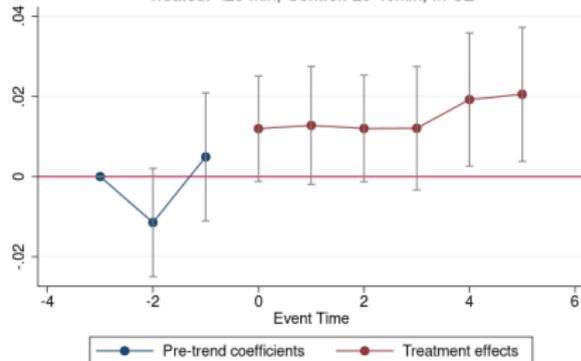
Enrollment in Opening College, Balanced Sample

Treated: <20 min, Control: 20-40min, in CZ



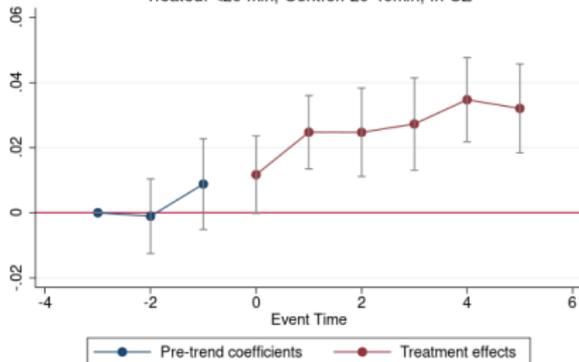
Enrollment in Any College, Balanced Sample

Treated: <20 min, Control: 20-40min, in CZ



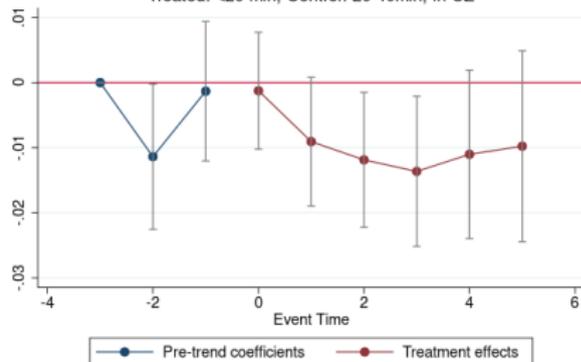
Enrollment in 2-year Public College, Balanced Sample

Treated: <20 min, Control: 20-40min, in CZ



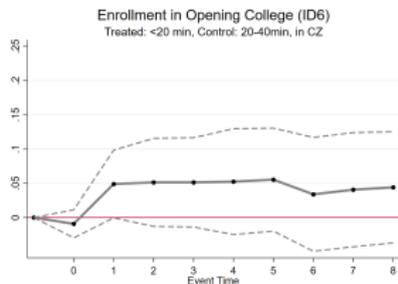
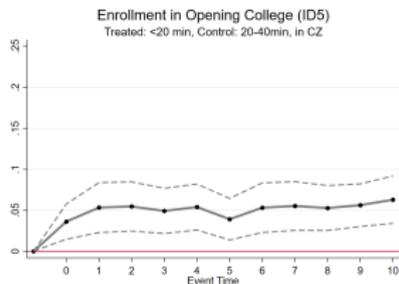
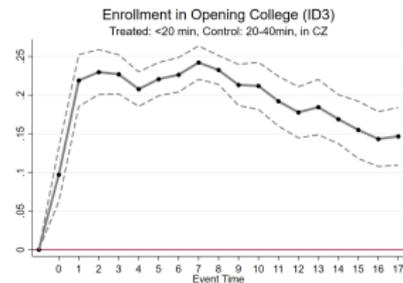
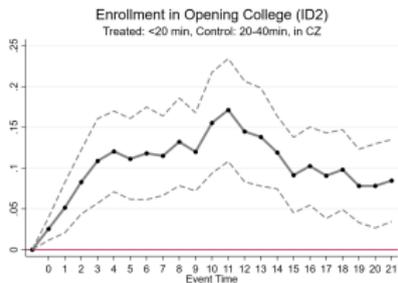
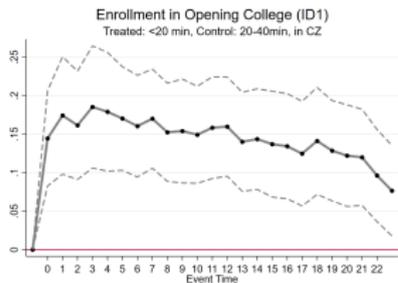
Enrollment in 4-year Public College, Balanced Sample

Treated: <20 min, Control: 20-40min, in CZ

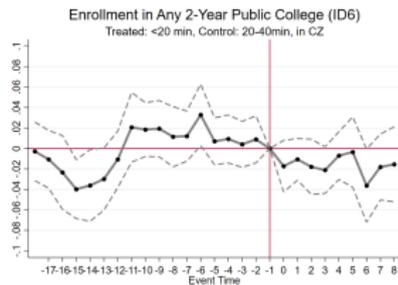
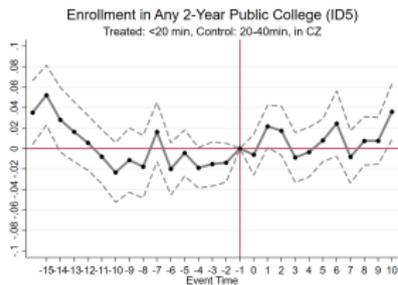
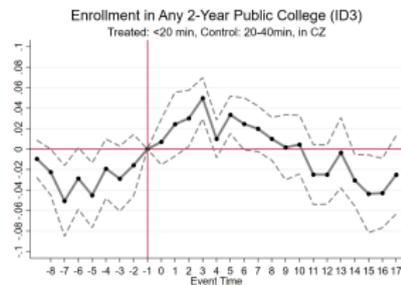
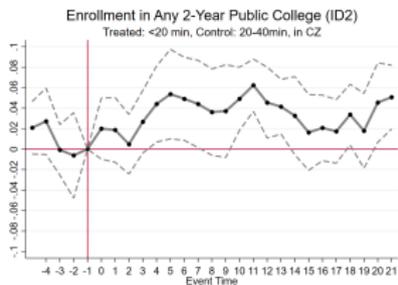
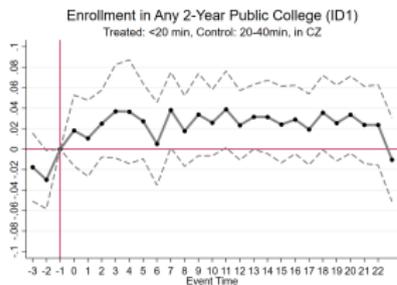


Results: Heterogeneity Across Opening Colleges

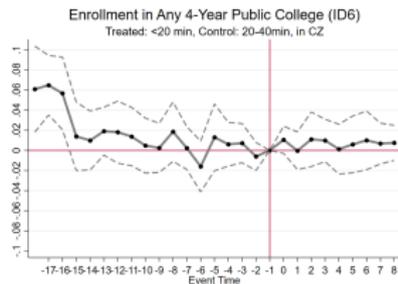
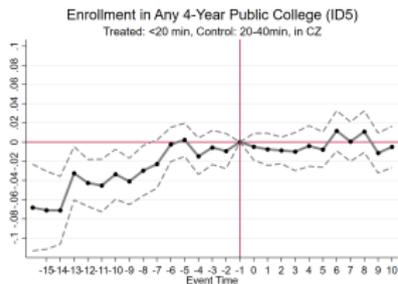
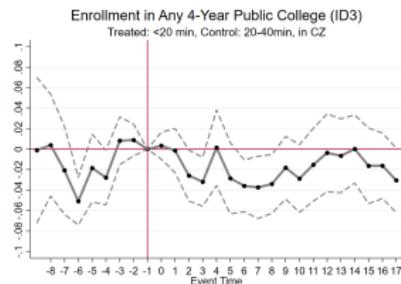
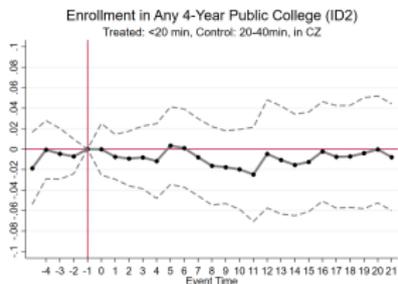
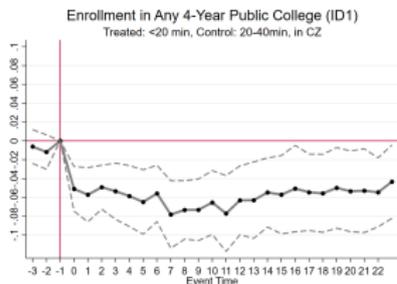
Estimated using two-way fixed effects with period -1 normalized to 0



Results: Enrollment in Any 2-Year Public College



Results: Enrollment in Any 4-Year Public College

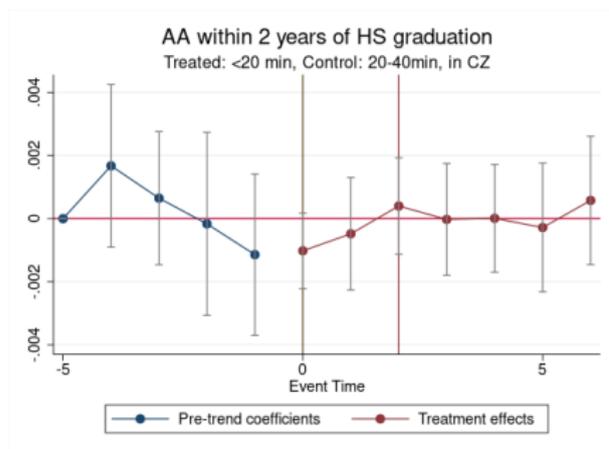


Results: Degree Completion

Note about degree completion within X years:

- The cohorts who graduated from HS less than X years before the college opened are still treated (with a different treatment)
- They may be induced to transfer from another college to the new one
- Or, maybe they didn't go to college right away after high school but decide to enroll when the new college opens
- Both treatment years are marked in the figures

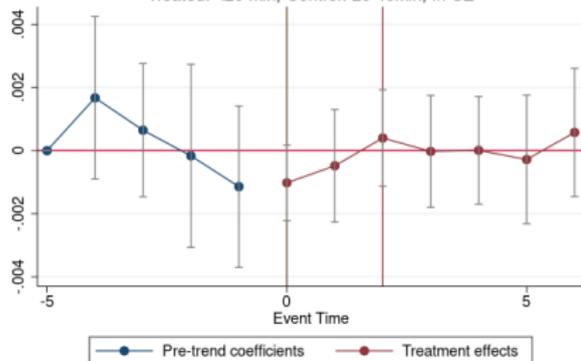
AA Degree Completion



AA Degree Completion

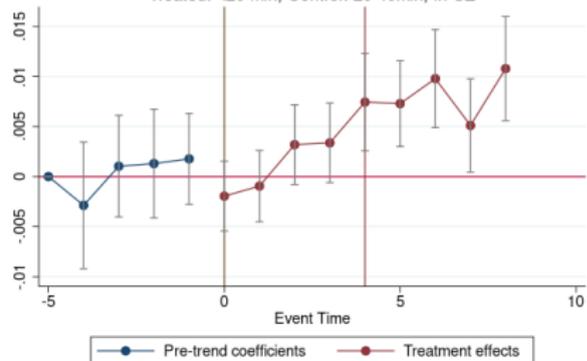
AA within 2 years of HS graduation

Treated: <20 min, Control: 20-40min, in CZ



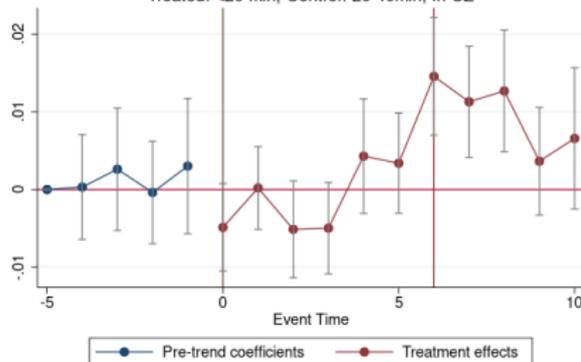
AA within 4 years of HS graduation

Treated: <20 min, Control: 20-40min, in CZ



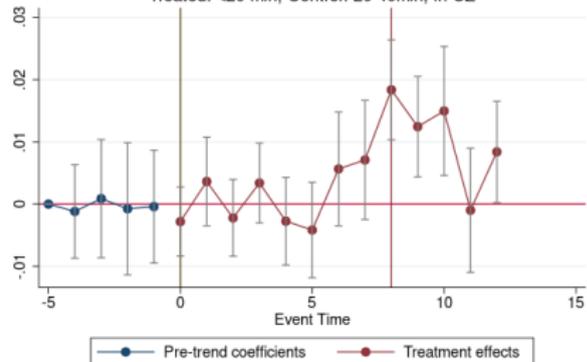
AA within 6 years of HS graduation

Treated: <20 min, Control: 20-40min, in CZ

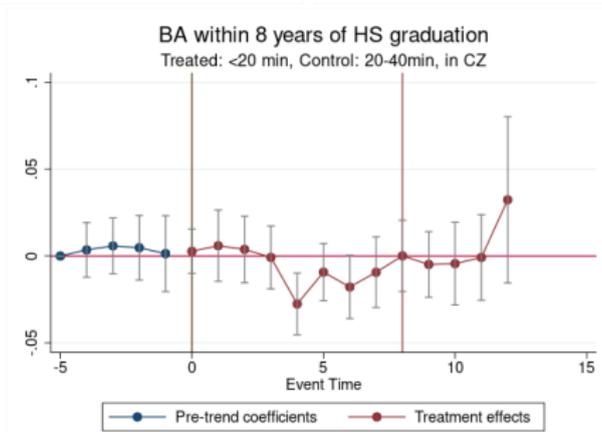
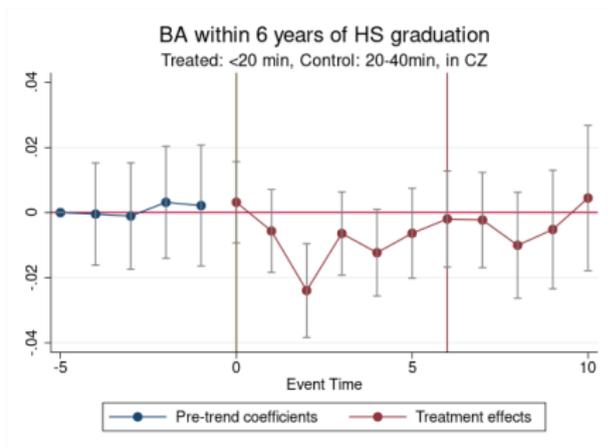
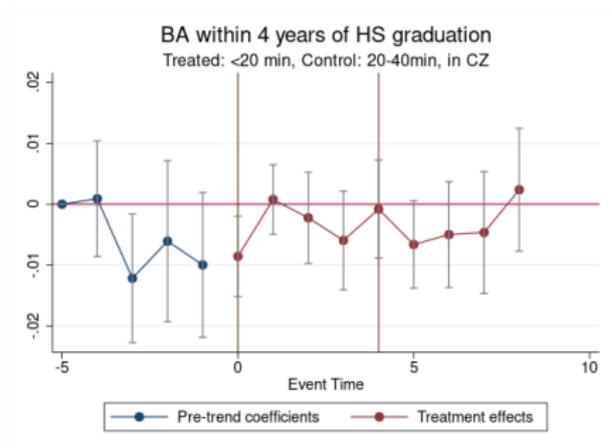


AA within 8 years of HS graduation

Treated: <20 min, Control: 20-40min, in CZ



BA Degree Completion



Conclusion

- A new college opening within 20 minutes led to small overall increases in college enrollment
- Most students attending the new college substituted away from other local colleges
 - Primarily away from other 2-year colleges but there some evidence of substitution away from 4-years
- Important context: new colleges are only about 10 minutes closer than existing colleges for treated students

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- A new college opening within 20 minutes led to small overall increases in college enrollment
- Most students attending the new college substituted away from other local colleges
 - Primarily away from other 2-year colleges but there some evidence of substitution away from 4-years
- Important context: new colleges are only about 10 minutes closer then existing colleges for treated students
- The addition of a nearby 2-year college increased AA degree completion within 4-8 years of high school graduation
- BA degree completion did not change meaningfully, suggesting that initial diversion of 4-year students did not have long-term effects
- Future work will focus on impacts on transfer, employment and earnings