

FOREIGN STUDENT SHARE AND ENROLLMENT CHANGES IN U.S. HIGHER EDUCATION DURING THE COVID-19 PANDEMIC

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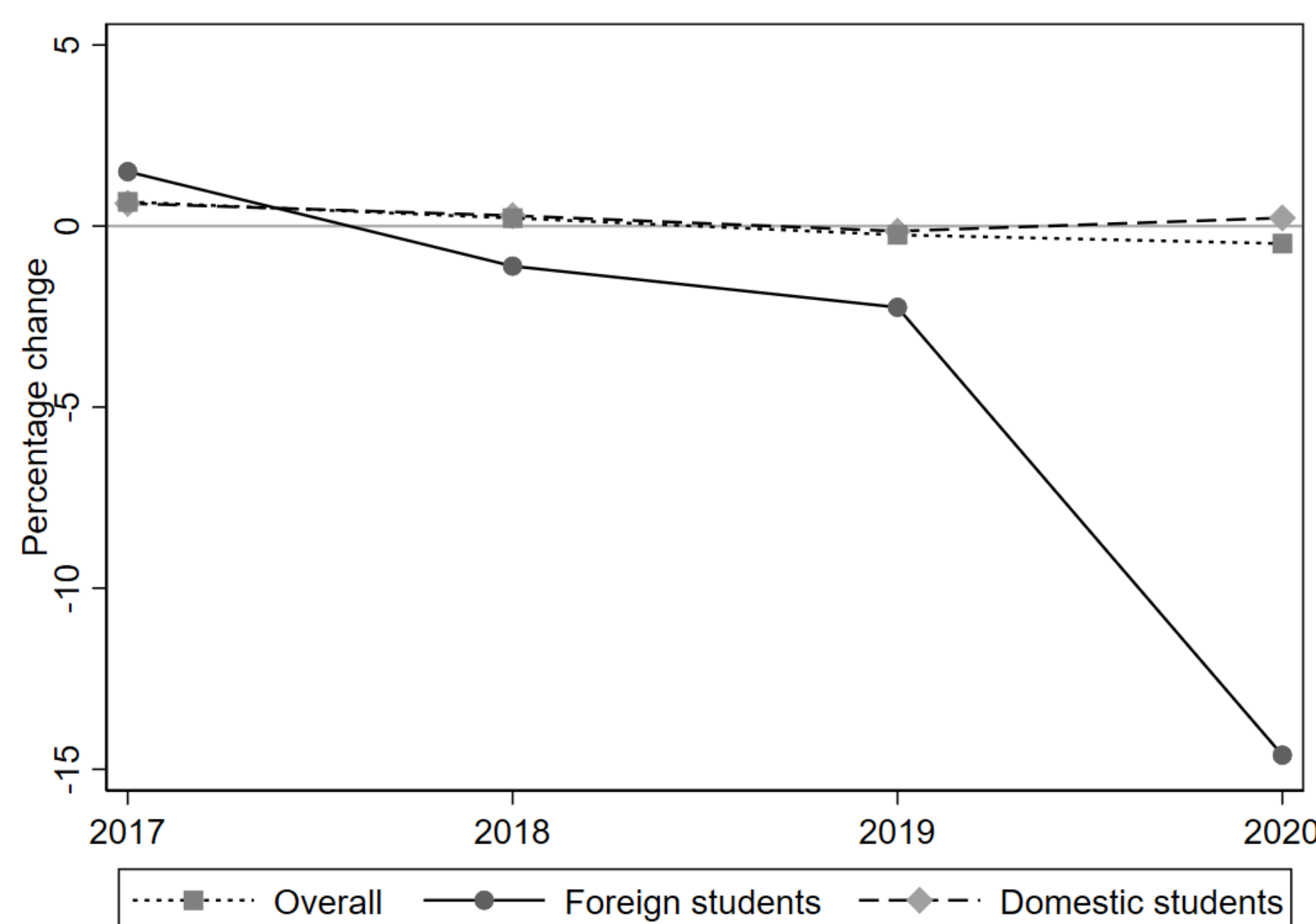
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Background

- Number of foreign students enrolled in U.S. colleges and universities increased over the past decades from 528,700 in 2000 to 974,000 in 2020.
- In Fall 2020, travel restrictions to and from the U.S. and changes in the student visa policy affected the number of international students studying in the U.S.
- Figure 1: number of international undergraduate students dropped by 15%. No changes in domestic student enrollment.
- COVID-19 pandemic as an exogenous enrollment shock to colleges and universities.

Figure 1: %Changes in enrollment by residency status at public institutions



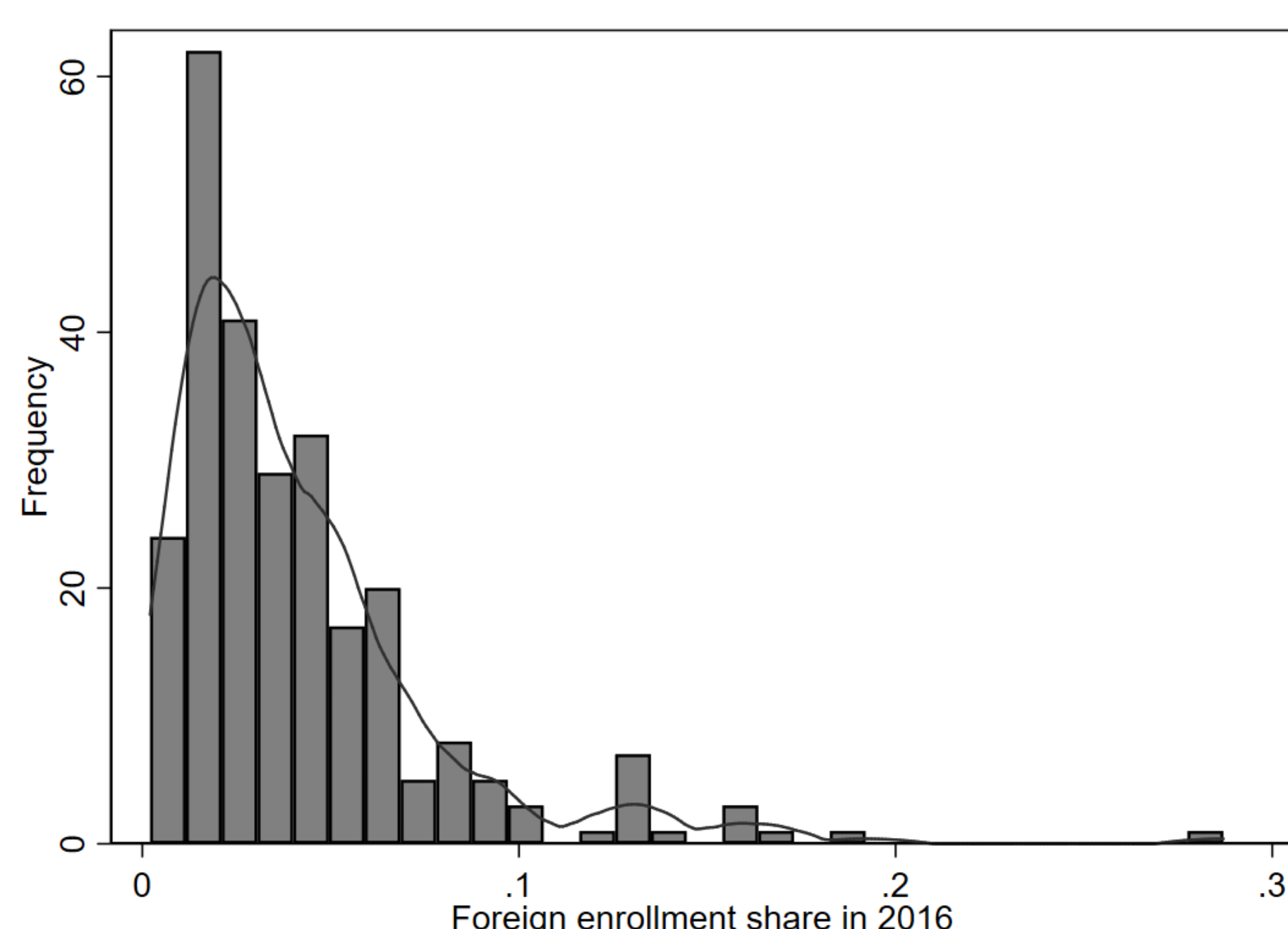
Research questions are:

- Does the pre-COVID share of international students affect enrollment changes at public colleges and universities during the pandemic?
- What are the effects of the pandemic on student enrollment across residency status (e.g., domestic and foreign students)?
- How have postsecondary institutions responded to the sharp decline in international student enrollment?

Data

- Integrated Postsecondary Education Data System (IPEDS): I use a sample of 261 public four-year institutions from Fall 2016 to Fall 2020
- Domestic and foreign enrollment from the IPEDS Fall Enrollment survey. Share of foreign student enrollment computed at the base year 2016.
- Figure 2: the mean of the share of international students in the base year 2016 is 4.2% and the standard deviation is 3.6%.

Figure 2: Pre-COVID foreign enrollment share distribution



Empirical Strategy

- Estimate a difference-in-differences model to estimate the effect of share of foreign student on post-COVID enrollment at public institutions.

$$\% \Delta Y_{st} = \beta_0 + \beta_1 d_{2020} \times \% Foreign_s + \beta_2 \% Foreign_s + X_s \gamma_X + \delta_t + \epsilon_{st}$$

- $\% \Delta Y_{st}$ is the year-over-year percentage change in enrollment at university s in the fall semester of year t by residency status.
- $\% Foreign_s$ is the share of international students at school s in the base year.
- d_{2020} is a year 2020 dummy variable. δ_t denotes year fixed effects.
- Institutional characteristics X_s include Carnegie Classification, institution size category, institution state, and degree of urbanization.

- To check the parallel trends assumption, estimate an event-study model:

$$\% \Delta Y_{st} = \beta_0 + \sum_{y=-3}^0 \alpha_y \mathbf{1}(t - t^* = y) \times \% Foreign_s + X_s \gamma_X + \delta_t + \epsilon_{st}$$

for $t \in \{2016, \dots, 2020\}$ and $t^* = 2020$.

Results

- Table 1 columns (1)–(3): no differential effects on the enrollment of domestic students.
- Columns (4)–(6): a positive differential effect of pre-COVID share of international students on foreign student enrollment in 2020.
- For institutions with a 4 pp higher foreign student share (\approx s.d. of foreign student share) in the pre-COVID period, the estimate of 0.698 corresponds to an enrollment increase of 2.8 pp.
- This positive differential effect does not imply an overall positive enrollment effect on foreign undergraduate students during the pandemic.

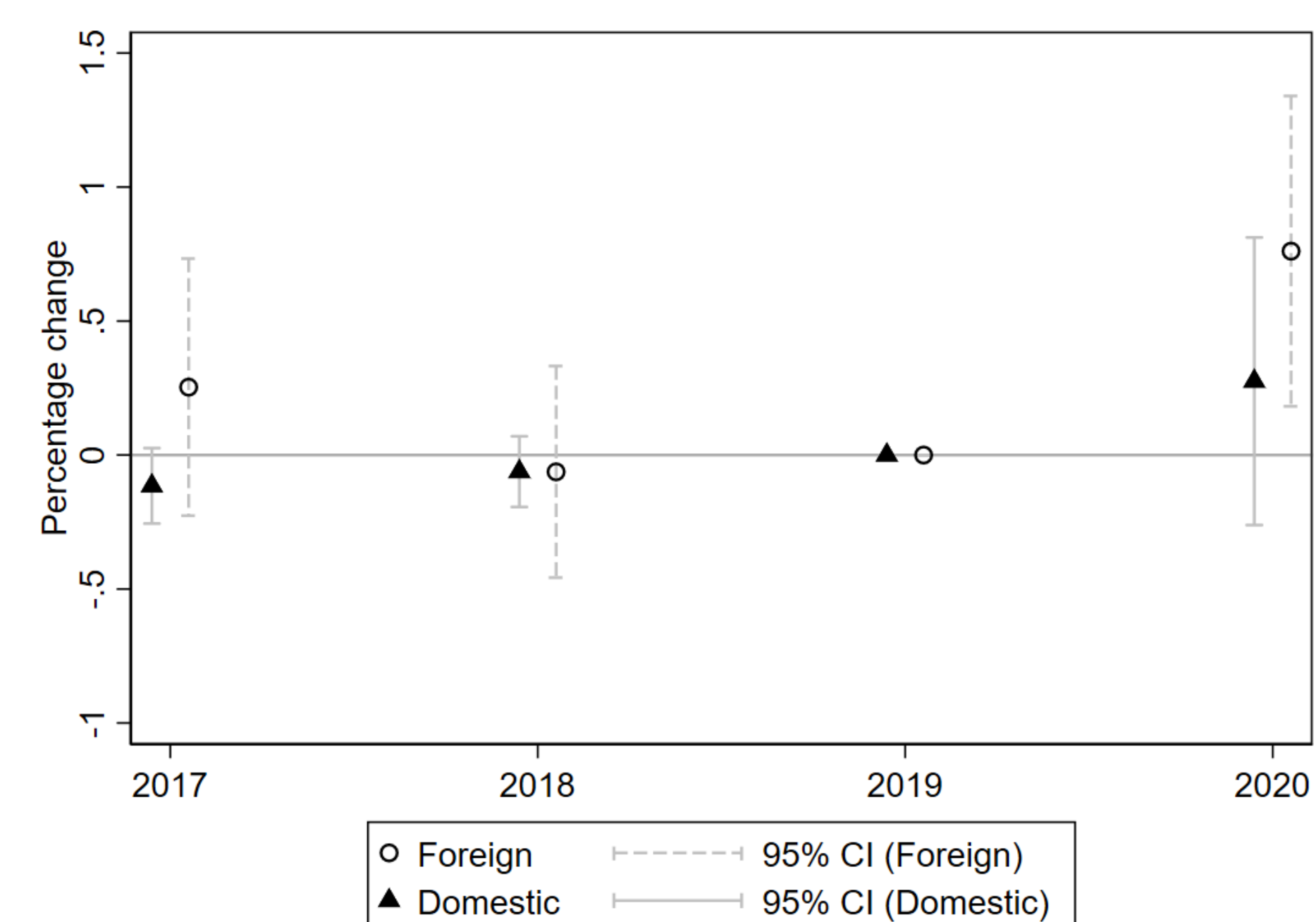
Table 1: Effect on undergraduate enrollment by residency status

Dep. variable	Domestic			Foreign		
	(1)	(2)	(3)	(4)	(5)	(6)
$\% \Delta$ enrollment						
$\% Foreign \times 2020$	0.349 (0.306)	0.334 (0.289)	0.334 (0.290)	0.682*** (0.249)	0.695*** (0.257)	0.698*** (0.259)
Institutions	261	261	261	261	261	261
Observations	1,044	1,044	1,044	1,044	1,044	1,044
R-squared	0.051	0.239	0.273	0.181	0.307	0.322
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects		Yes	Yes		Yes	Yes
Institutional Char.			Yes			Yes

Notes: All regressions are weighted by the number of total enrollment

- Figure 3: all the coefficients ($\hat{\alpha}_y$) before 2020 are not statistically different from zero. No effect on domestic enrollment in 2020
- Positive and statistically significant effect of the share of international students on the foreign student enrollment in Fall 2020

Figure 3: Event-study model estimates by residency status



Discussion

- Potential channels
 - A higher share of international students is associated with a higher per-student expense on student services
 - ⇒ institutions with a higher pre-COVID share of international students may have proactively implemented policies to improve foreign student retention.
 - Mode of instruction in Fall 2020? ⇒ I do not find the effects of in-person or online instructions on foreign student enrollment retention.
- Future research: effects on universities' revenues and expenses
 - Institutions with higher pre-COVID shares of international students are more likely to be financially dependent on tuition revenue from foreign students, making them more vulnerable to events affecting foreign students' enrollment, such as the COVID-19 pandemic.

Note: This poster is prepared for 2023 AEA/ASSA Annual Meeting. E-mail address: siewon.kim@ttu.edu