Balancing finances, politics, and public health: international student enrollment and reopening plans at US higher education institutions amid the COVID-19 pandemic

Melissa Whatley¹ · Santiago Castiello-Gutiérrez²

Accepted: 17 September 2021 / Published online: 6 October 2021
© The Author(s), under exclusive licence to Springer Nature B.V. 2021

Abstract

Drawing from resource dependence theory, this study explores the extent to which international student enrollment related to institutional decisions to shift to in-person instructional strategies during the COVID-19 pandemic. We focus our study particularly on July 2020, a time during which tensions around international students' legal status in the US were especially high. Our results suggest that leaders at private not-for-profit institutions were significantly more likely to shift instructional strategies to include more in-person instruction, thus allowing more international students to enroll but also placing at risk the health of individuals on their campuses and in their local communities. A similar result was not found for public institutions. These results speak to the extent to which private institutions in the US have become financially dependent on international students' tuition and have clear implications for the financial futures of US higher education institutions.

Keywords International students · COVID-19 · Campus reopening plans · Event history analysis · Resource dependence theory · Organizational theory

Early in 2020, news circulated worldwide about a new and highly infectious virus called the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that was causing a disease (COVID-19) with high mortality rates. As more cases began to appear, it became clear that the virus was not going to be easily contained. By early March, the world entered a standstill, forcing almost all schools worldwide, including higher education institutions (HEIs), to close, leaving nearly 2 billion students taking classes remotely (UNESCO-IESALC, 2020). In preparation for an unprecedented fall term, HEIs in the United States (US) began drafting reopening plans in late spring and early summer and included a variety of strategies for returning to instruction. Some plans called for instruction to remain entirely virtual while other plans involved a complete return to face-to-face. Other plans involved a combination of these two extremes, such as a hybrid or hyflex model.

✉ Melissa Whatley
melissa.whatley@sit.edu

¹ SIT Graduate Institute, 1 Kipling Rd., Brattleboro, VT 05302, USA

² University of Arizona, Tucson, USA

In drafting these plans, HEI leaders had the impossible task of making decisions about reopening while juggling public opinion, resisting government pressures, thinking about their institution's financial stability, and, most importantly, being mindful of the well-being of their students, faculty, and staff as well as that of their local community. Some skeptics of these plans thought that remaining virtual, whether fully or in part, was unnecessary and detrimental to students' learning. In contrast, others thought that HEIs planning to offer some in-person instruction were not doing enough to protect campus and community populations from the risk of contracting COVID-19. Several studies corroborated that HEIs had excellent potential to become "super spreaders" of the virus (see, for example, Lu et al., 2020).

In addition to campus and community health concerns, leaders also had to consider institutional finances in their reopening plans, since, in the US, a large proportion of institutional revenue comes from tuition. In this regard, HEIs felt pressured to reopen for in-person instruction, fearing that maintaining online educational formats would discourage students from enrolling. Some university presidents acknowledged how financial implications were key when designing their reopening plans (Diep, 2020; Lederman, 2020). A survey of 192 college and university presidents conducted in late April by the American Council on Education (ACE) showed that, across all sectors, most respondents selected "Fall or Summer enrollment" and "long-term financial viability" among their most pressing issues (Turk et al., 2020). However, the third most selected issue differed by sector: presidents at public 4-year institutions selected "emergency aid for students" while those at private 4-year institutions selected "laying off of faculty and/or staff." Therefore, while presidents at both public and private institutions perceived enrollment and long-term financial viability as pressing issues in the face of the pandemic, presidents at public institutions appeared to be more concerned with finding additional financial resources to further assist students, while those at private institutions seemed more concerned with the need to impose additional cost-cutting measures.

Financial pressure was often accompanied by political pressure to reopen. In their effort to persuade schools to reopen, government officials, affiliated with the Republican party, often threatened to cut funding for public schools that were not planning on fully reopening for in-person instruction in the fall (Baker et al., 2020). Even when national legislation to provide financial relief to HEIs was under consideration, initial messages from the U.S. President and the Secretary of Education tied aid to reopening costs to pressure institutions to resume in-person activities (Murakami, 2020). This position was contrary to other federal guidelines, such as from the Center for Disease Control (CDC), that advocated for "lowest risk" settings that meant that "faculty and students should engage in virtual-only learning options, activities, and events" (CDC, 2020, para. 4). Subsequent research has confirmed that politics, especially party affiliation, played an important role in institutional decision-making. Studies from Collier et al., (2020, 2021) and Felson and Adamczyk (2021) indicate that states with either a Republican governor or a Republican-controlled legislature were more prone to reopen for in-person instruction.

In July 2020, US Citizenship and Immigration Services (USCIS) added another complication to the decision-making of HEI leaders. At the beginning of the pandemic, USCIS had published a memorandum indicating an exception to their normal policy that required international students to enroll in face-to-face rather than online courses to qualify for a student visa. This exception allowed students who were already physically in the US to remain in the US even when all their classes shifted online. However, on July 6, 2020, USCIS reversed this exception to standard visa protocol. Suddenly, international students at institutions planning on remote instruction for the fall would have to change enrollment

plans, leave the country, or face “immigration consequences including, but not limited to, the initiation of removal proceedings” (ICE, 2020, p. 1). An outcry from international students themselves, faculty members, and international educators gave way to official HEI positions demanding the government keep the exception. In an unprecedented joint effort to reverse this policy, some HEIs began legal action against the government while hundreds more signed amicus briefs in support of those lawsuits. In a matter of 5 days, and before facing the courts, the federal government reversed course and announced that they would let students who began their degrees before fall 2020 to remain in/re-enter the country, even if all their classes would be taught virtually. However, it also specified that students already admitted and set to begin their degrees in the fall would not be given a visa if their institutions were not planning to offer face-to-face classes.

But what was behind such a rapid, strong, and unprecedented response from HEIs? Although institutions included in their arguments the cultural richness international students bring to campus, the strongest arguments used were financial ones. Higher education organizations such as ACE-released statements that spoke about the “economic contributions,” supported jobs, and the overall “value to the United States of being the destination of choice for the world’s most talented students and scholars” (ACE, 2020, para. 3). NAFSA: Association of International Educators has found that a large percentage of the dollars brought in by international students go directly to HEIs as tuition, room and board, and other education-related expenses (NAFSA, 2020a). Indeed, empirical research suggests that US HEIs have become increasingly dependent on revenue from international students in recent years, particularly considering declining financial support from other sources, such as state appropriations (Cantwell, 2015). Simply put, not having international students enroll in fall 2020 could mean a financial catastrophe for many colleges and universities in the US.

In this study, we explore the extent to which international student enrollment may have entered the decision-making of HEI leaders regarding reopening plans during July 2020. Specifically, we build upon resource dependence theory as a framework to understand if, how, and which HEIs changed their behavior (in this case, shifting reopening plans to include additional in-person instruction) in a way that would minimize the loss of tuition dollars from the enrollment of international students. We hypothesized that, if institutions are, in fact, dependent on the revenue gained from international student enrollments, the guidance from USCIS released in July 2020 could have encouraged HEI leaders to shift reopening strategies to include more in-person instruction above and beyond what they may have already been planning for their students. To this end, institutional leaders found themselves navigating a complex juggling exercise—how could they balance protecting the health of their students, constituents, and local communities, ensuring students’ access to services and quality education, protecting institutional finances, and protecting international students’ immigration status?

Background and literature review

COVID-19 reopening plans

To the best of our knowledge, this is the first study to empirically link international student enrollment to US HEIs’ plans to reopen campuses during the COVID-19 pandemic. However, several studies have investigated institutional reopening plans from a campus

and community health perspective. Many of these studies presented models that advised against reopening campus to in-person instruction due to the high risk of an increase in COVID-19 cases (Baxter et al., 2020; Benneyan et al., 2020; Yamey & Walensky, 2020). For example, Yamey and Walensky (2020) warned against any plans that relied mostly on students' personal responsibility. Assuming universities' tentative reopening plans to model 5 months of data, Benneyan et al. (2020) concluded that the risk of increased infections and mortality, both on campus and in the local community, was highly unpredictable, depending on factors such as chance and human behavior.

The predictions of many of these studies were unfortunately confirmed. For example, Li et al. (2020) found an increase in confirmed COVID-19 cases in counties with a higher number of students returning to a HEI with an in-person or hybrid mode of instruction. In a very similar study, Andersen et al. (2020) corroborated these findings, showing an increase in COVID-19 incidences in counties where a college or university reopened for face-to-face instruction. Most importantly, their study showed cases increased within the campus's local community after reopening. In this regard, Lu et al.'s (2020) study of 30 HEIs indicated how institutions saw an increase in cases on campus 2 weeks after reopening, which institutions were somehow able to control. What institutions were not able to control, however, was the spike in cases in their surrounding neighborhoods.

The public health implications of reopening a HEI campus for in-person or hybrid instruction are clear. While institutions may have felt confident in their abilities to contain a potential outbreak among students on campus, they had little control over what happened in local communities external to campus. Current research suggests that the implications of a re-opened HEI campus for local communities were indeed dire. In addition to the moral choice facing campus leaders when considering possible reopening plans, these leaders had to consider the future of their relationship with the local community, which would be damaged depending on the leader's choice of reopening strategy. Some institutional community partners feared an increase in COVID-19 cases after the reopening of an HEI, while other actors feared that if institutions remained closed, the local economy would suffer (Harris, 2020). In one of the most publicized conflicts (Seltzer, 2020), a housing company pressured two universities to reopen their dormitories by reminding them how the common practice of public–private housing partnerships does not grant institutions “the unilateral right to (i) take actions that would either (a) prevent students at the Institutions from living on Campus, or (b) have the intent and effect of discouraging students at the Institutions from living on campus” (Wilson to Vice Chancellor, 2020, para. 3).

COVID-19 and international students in the US

Other studies on the impact of the COVID-19 pandemic on HEIs have linked reopening plans to possibilities of exacerbating current inequities among the vulnerable populations around and within campuses (for example, Harper, 2020), including international students (see Castiello-Gutiérrez & Tozini, 2020; Fischer & Whatley, 2020; Tozini & Castiello-Gutiérrez, 2020).

When campuses were forced to close in March 2020 and students were sent “home,” international students—particularly those living on-campus—were put in a complicated position. Many students did not have relatives in the US nor did they have another place to live that did not involve travel to their home country. Amid an international wave of travel restrictions, insurmountable prices to fly, and the risk of getting infected or infecting others, most international students decided to stay in the US (Martel, 2020). Conditions

for these students were not optimal. While it has been widely documented that many international students struggle to find community in their host country (see Khanal & Gaulee, 2019 for an extensive review), an event like a pandemic that forces people to isolate can be even more detrimental to students' mental health (ACHA, 2020). During spring 2020, colleges and universities across the US became "ghost towns" (Burke, 2020, para. 30), leaving international students without access to many essential services such as dining halls, exercise/recreation areas, and tutoring and counseling centers. By this logic, reopening campuses for fall 2020 could be positive for international students, who are often more dependent on on-campus resources compared to their domestic counterparts. However, reopening campuses does not necessarily imply a return to face-to-face instruction, as required by the USCIS guidance that was released in July 2020.

International students and institutional finances

Campus leaders also had to consider the state of institutional finances when making decisions about reopening, particularly regarding international student enrollment. Early in the pandemic, NAFSA (2020b, p. 2) estimated that HEIs would lose at least US\$3 billion "due to anticipated international student enrollment declines for fall 2020." This financial situation was made even more complex for campus leaders in July 2020 with changes in USCIS guidance.

Several studies have discussed the financial importance of international student enrollment at US HEIs. NAFSA has estimated that international students contribute nearly \$40 billion dollars to the US economy, with a considerable percentage going directly to HEIs in the form of tuition, room and board, and other education-related expenses (NAFSA, 2020a). Although there is substantial variation among different types of institutions, research and doctoral universities in the US receive greater net tuition revenue from enrolling more new international undergraduates (Cantwell, 2015). At the graduate level, HEIs with the highest research activity also benefit from enrolling international students in terms of acquiring highly skilled yet underpaid research labor, an indirect financial benefit for institutions (Cantwell et al., 2018; Lee & Cantwell, 2012). Taylor and Cantwell (2015, 2019) show that by enrolling a larger proportion of doctoral students from overseas, US HEIs benefit both financially and reputationally.

In terms of the immediate monetary benefits from tuition, Heckman and LaFontaine (2010) predicted a decade ago that, given the natural demographic decline of college-age people domestically, the US would have to turn to overseas talent to maintain enrollment trends. As data show, between 2010 and 2020, total enrollment at US HEIs declined 3.5%, but the number of international students increased 55%—from 690,923, representing 3.4% of total enrollment, to 1,075,496, representing 5.5% enrollment (IIE, 2020). Some HEIs in the US have begun to depend so strongly on tuition from international students that, for example, in 2017, the University of Illinois at Urbana Champaign paid \$424,000 for an insurance policy which would provide coverage in the event of "a significant drop in tuition revenue from Chinese students" (Bothwell, 2018, para. 1).

While previous research provides clear evidence of a financial dependency of HEIs on international students' tuition, the current study goes deeper to explore the extent to which HEIs are willing to change their policies to accommodate international student enrollment, even in the context of the moral implications of returning to face-to-face instruction in the middle of a public health crisis, a decision that was most certainly one of life and death for many individuals. This study contributes to the literature on institutional incentives to

enroll international students in a political and social context that deters international students from attending US HEIs (Castiello-Gutiérrez & Li, 2020; Mathies & Weimer, 2018; Rose-Redwood & Rose-Redwood, 2018).

Theoretical framework

Oftentimes, issues related to the study of the attraction and retention of international students at US HEIs are framed under an academic capitalism approach since it “predicts HEIs will seek to generate revenue from international students even when all other financial conditions are constant” (Cantwell, 2015, p. 516). However, academic capitalism does not explain the lengths to which an institution will go to maintain this source of revenue. Therefore, the question of how HEIs’ quest for revenue from international student tuition can shape institutional behavior is best responded to using resource dependence theory (RDT). RDT explains how organizations react and adapt to their external environment, including its contingencies and externalities (Pfeffer & Salancik, 2003). It also states that organizations become dependent on—and therefore will seek to get—“critical resources” (p. 3) from the external environment. RDT establishes that, pushed to seek external resources, organizations will alter their behavior by implementing certain actions and making specific decisions that facilitate the acquisition of resources (Nienhüser, 2008).

Within the realm of higher education, RDT has been widely used to explain how colleges and universities organize their structure, how they are administered, and how they alter their behavior. As explained by Fowles (2014), when HEIs look for alternative sources of revenue, they enter an implicit bargain that shapes their actions and “steers faculty and administrators in new directions that are potentially at odds with institutional missions” (p. 284). In our study, we are interested in understanding to what extent reliance on tuition from international students might push an institution to change reopening plans even when such a change puts the institution at odds with its mission towards service to the community (whether defined locally or globally), given the high risk of reopening a college campus during a pandemic.

Researchers have also used RDT to explore institutional decision-making regarding student enrollment specifically. Jaquette (2013, p. 515) calls for “contemporary analyses of organizational change...[to] focus on the enrollment economy.” He argues that in the US, some colleges (especially those with weak market positions) drift from their original mission(s) to become comprehensive universities based on their quest for different funding sources. Salazar (2019) demonstrated how public institutions neglect their mission to enroll students from their own community by recruiting instead full-tuition-paying out-of-state students, a category that might also include international students. Building upon Jaquette’s and Salazar’s work, we are interested in understanding whether enrollment, in this case of international students, drove HEIs to make decisions that might contradict their mission towards the greater common good during summer 2020.

Among the first empirical studies to analyze organizational responses to RDT in higher education was Tolbert’s (1985) seminal work. In addition to showing how HEIs in the US context are dependent on—and shaped by their seeking of—external resources, Tolbert finds significant differences in the effect of resource dependency among public and private institutions. This finding is especially relevant to our study since we also explore and find differences among public and private HEIs regarding the relationship between international student enrollment and changes in institutional reopening plans in July 2020. Specifically,

we expected that private institutions would have felt more pressure to change instructional strategies to allow international student enrollment, given the recent financial precarity of many of these institutions compared to their counterparts in the public sector (Fain, 2019; Hess, 2018; Kelchen, 2020). Despite common notions that depict private colleges as elitist and wealthy institutions, the reality is that most private HEIs in the US are struggling to survive.

In their comprehensive analysis of inequalities within the higher education sector in the US, Taylor and Cantwell (2019, p. 93) identify that almost eight out of nine private colleges fall into a “vulnerable” classification which includes less selective and more tuition-dependent institutions. This precarity makes institutions vulnerable to the risk of closing. Between 2017 and 2021, the number of public 4-year colleges and universities eligible to award federal financial aid has grown 1.7% while the number of private not-for-profit 4-year institutions has declined 2.2% (NCES, 2021). Kelchen (2020) found that the most significant predictors of a private nonprofit college’s closure are a decrease of at least 10% in full-tuition equivalent (FTE) enrollment, as well as a 10% decrease in total revenue; two events institutions feared would be true in the context of the COVID-19 pandemic.

Research questions

While previous literature has documented US HEIs’ dependency on international students’ tuition, the extent to which HEIs are willing to alter their behavior (e.g., changing reopening plans to accommodate international students’ enrollment) to keep this source of funding remains understudied. Using a RDT lens, this study fills this gap by exploring whether international student enrollment significantly predicted an institutional shift in return-to-instruction plans from less to more in-person strategies during July 2020—the month with the highest uncertainty in terms of the spread of the virus and immigration policies affecting international students. The specific research questions that guide this study are:

- (1) To what extent does international student enrollment predict an institution’s likelihood of altering fall 2020 instructional plans to include more in-person instruction?
- (2) Given differences in their dependencies on external entities for funding, are there differences in this relationship for public and private not-for-profit institutions?
- (3) Within the broader category of private not-for-profit institutions, are there certain institutional characteristics, particularly selectivity and tuition reliance, that lend themselves to a greater likelihood of altering fall 2020 instructional plans to include more in-person instruction?

Method

Data

The data that we used to explore the relationship between international student enrollment and changes in higher education institutions’ reopening plans during July 2020 derived from three primary sources. First, daily information about institutional reopening plans for public and private not-for-profit 4-year institutions came from the College Crisis Initiative (C2i), a research initiative at Davidson College that has tracked institutional responses to the COVID-19 crisis since March 1, 2020 (for more information, see <https://collegecri>

[sis.org/](#)). C2i began collecting data on reopening plans in June 2020, prior to the month of interest in this study. To collect these data, researchers at the College Crisis Initiative first manually checked all institutional websites to record their initial reopening plans on the first day of data collection. On subsequent days, a spider, a web crawler that automatically checks the written content on webpages, conducted a daily search of each institution's website for changes in an extensive list of previously defined keywords that would signal a change in the institution's reopening plan (e.g., "COVID-19," "reopening," "face-to-face," "fall"). If this spider detected any change in the language of an institution's website, a researcher then manually checked the website content and recorded any change in the institution's reopening plan, marking the exact day that the institution's instructional plan changed.

In this study, we use a panel dataset, with institutions represented 31 times, once for each day of July 2020—the peak of immigration uncertainties for international students in the US. Our dataset comprised 1968 institutions that were not already fully online before the pandemic, 723 public institutions and 1245 private not-for-profit (for a total of 61,008 institution-day observations).

Outcome variable

For our study, we were interested in a change in an institution's reopening plan that involved a shift to more in-person instruction, our outcome variable. This binary indicator could be defined in several ways, such as a shift from fully online learning to a hybrid model of course delivery, a shift from a hybrid model to fully in-person course delivery, or a shift from no reopening plan to one that involved an in-person learning component (i.e., hybrid course delivery, primarily or fully in-person instruction). In other words, any shift in instructional delivery that involved a commitment to additional in-person teaching represented a shift that would facilitate international student enrollment.

Predictor of interest and covariates

Our predictor of interest, the logged percentage of total student enrollment comprised of international students, was derived from a second data source, the National Center for Education Statistics' IPEDS (Integrated Postsecondary Education Data System) survey data. Unfortunately, IPEDS does not include a measure of international student enrollment specifically, but rather classifies international students in the broader category of non-resident students, a category that also includes non-US citizens who are in the US under a status that does not allow them to remain indefinitely (such as those under the Deferred Action for Childhood Arrivals (DACA) policy).¹ To this end, we take IPEDS' non-resident category as a proxy for international student enrollment.

¹ Although researchers have attempted to estimate the number of DACA students, DACA-eligible students, and undocumented students enrolled at US higher education institutions (see for example Feldblum et al., 2020), an estimate that would allow us to calculate international student enrollments based on IPEDS' broader non-resident enrollment category, no consensus has emerged in the literature as to how such an estimate is best obtained. This task is made even more difficult due to the wide variety of policies implemented in US states governing the enrollment of DACA recipients and other non-US citizens (Burns, 2018), thus complicating how these students are included (or not) in federal datasets such as IPEDS.

We additionally derived several covariates for our study from IPEDS, namely whether the institution offered graduate degrees (defined as Master's, Doctoral, or advanced professional degrees), the region of the US where an institution was located, whether the institution was located in a rural area,² whether the institution had experienced a steep enrollment decline over the previous academic year (defined as a decline in enrollment of 10% or greater, following Kelchen, 2020),³ the percentage of an institution's total revenue that was tuition/fee revenue (often referred to as tuition reliance and used as a proxy for an institution's financial precarity), and, in the case of public institutions, the percentage of total revenue consisting of state appropriations.⁴ This information came from datasets representing the 2017–2018 academic year for financial variables and Fall 2018 for all other variables (and Fall 2017, in the case of our enrollment decline variable, which required two years of data to calculate).

Since these variables are collected annually for inclusion in IPEDS, they do not vary over time during the period of observation in this study (July 1–31, 2020) and were consequently classified as time-invariant covariates for analytic purposes. IPEDS was also our data source for determining if an institution was a public or private not-for-profit 4-year institution. As part of this study's first dataset, C2i provided an additional time-invariant covariate representing whether the institution was in a state with a Republican (GOP) governor. We included this covariate to account for political pressure that an institution's leader might feel to reopen campus for face-to-face instruction. Finally, one of our covariates that did vary over time during our period of observation was the daily cumulative COVID-19 case counts in the county where an institution of higher education was located. This information was taken from a third data source, the New York Times' COVID-19 data files (for more information, see <https://developer.nytimes.com/covid>). These data files draw from state and local governments, as well as health departments, with the goal of providing a complete record of the COVID-19 outbreak.

We included in our dataset an additional variable accounting for an institution's selectivity, defined as the number of applicants that it admitted, derived from IPEDS data. Because this variable was unreported for 173 private institutions in the dataset, we did not include this variable in our primary analyses, but rather used it in one of our robustness checks, described in the following section.

Taken together these covariates fall into two primary categories: those that potentially relate to an institution's likelihood of reopening regardless of its financial precarity and possible reliance on international student enrollment and those that relate directly to the extent to which an institution is resource dependent. Covariates in this first category include

² This variable refers to whether an institution was located in an area defined as a "rural territory" for US Census purposes and derives from the US Census Bureau's Population Division urban-centric locale codes.

³ Note that 28 institutions did not have recorded enrollment counts in the previous academic year and were dropped from analyses.

⁴ In the case of institutions whose financial information was reported along with a system office or a main campus (the well-known parent/child issues in IPEDS Finance Surveys; Jaquette & Parra, 2014), percentages for the parent (reporting) institution were assumed for the child institutions. This assumption was made after exploring several parent/child pairs to ensure that percentages remained approximately the same for all child institutions when disaggregating financial information proportionally by enrollment. After this adjustment, financial information was missing for only one institution, a private not-for-profit: The Chicago School of Professional Psychology at Los Angeles. This institution is dropped from all analyses. The United States Merchant Marine Academy was also excluded as this institution is not associated with a particular US region, and we expected that characteristics of an institution's geographic location, most notably the number of COVID case counts in its general vicinity, would impact decisions about instructional format.

whether the institution offered graduate degrees, GOP gubernatorial status, county-level COVID case counts, geographic region, and rurality of the institution. This latter variable in particular speaks to population density in an institution's geographic location, which may have related to the spread of COVID-19. Variables in the second category include the percentage of revenue from tuition/fees, percentage of revenue from state appropriations (for public institutions), and whether the institution had experienced a sharp decrease in enrollment (defined as a 10% drop) in the past year.

Analysis

Because our outcome variable, a change in reopening plans that involved a switch from less to more in-person instruction, is one that happens over time, we estimated two primary sets of event history models, one for public institutions and another for private not-for-profit institutions. This analytic approach is used to explore events that unfold over time (in our case, a switch in instructional methods), can incorporate both time-variant and time-invariant covariates, and can be used to predict both if an event happens (at any point in time) while also accounting for when the event happens (Box-Steffensmeier & Jones, 2004; DesJardins, 2003). The result of an event history model is a hazard rate, representing the probability that an event will occur at a point in time, given that it has not happened yet (DesJardins, 2003).

In general, an event history model explores each point in time during which an event can occur, called the risk period, and then evaluates whether one of two outcomes happens: success or failure. In our case, this model explores each day of July 2020 and evaluates the relationship that our predictor of interest (the logged percentage of non-resident students enrolled at an institution), as well as our covariates, have on whether an institution changed instructional approach to incorporate more face-to-face learning (failure). If at a given point in time an observation fails (if an institution switches instructional approach), that observation exits the group of observations at risk of failure, the risk set, and is no longer considered in the model's estimation. If the observation does not fail (no switch in reopening plans), then it remains in the risk set and continues to the next risk period.

We specifically used Cox proportional hazard models to analyze the relationship between the logged percentage of non-resident students and changes in reopening plans. Instead of assuming a functional form for the hazard rate, this approach to event history modeling relies on the data itself to predict it (Box-Steffensmeier & Jones, 2004). An additional advantage of Cox modeling is that it can accommodate multiple failures within the risk set at the same time, meaning that multiple institutions switching instructional methods on the same day is not an issue for the model. The probability of failure, the hazard rate $h(t)$, is defined as in Eq. (1):

$$h(t) = \Pr(T = t_i | T \geq t_i, x) \quad (1)$$

Here, T represents time (in this study, days), and t_i is the specific day when institution i switched instructional strategy. In other words, this equation says that the hazard rate is the probability of failure ($T = t_i$) conditional on the institution's having not failed previously ($T \geq t_i$), that is, conditional on the institution's comprising part of the risk set. Covariates can be entered into this model as additional conditions, aside from membership in the risk set, represented as x in (1) (Box-Steffensmeier & Jones, 2004). For each group of institutions (public and private), we ran our Cox model twice, once with and once without covariates.

The hazard rate that a Cox model estimates is defined as a conditional logit, that is, the likelihood of an event occurring conditional on survival until the current risk period, as in Eq. (2):

$$Pr(T \geq t_i, x) = \exp(\alpha_i + \beta x_i) / (1 + \exp(\alpha_i + \beta x_i)) \quad (2)$$

Here, β is a vector of coefficients corresponding to both the predictor of interest (in our case, the logged percentage of non-resident students enrolled at an institution) and covariates, both time-varying and time-invariant. α_i represents a constant that can vary over time (DesJardins, 2003).

Robustness checks

In addition to these primary analyses, we conducted a series of robustness checks that acknowledge that, in addition to concerns about international student enrollment, higher education institutions were concerned about domestic student enrollment leading up to fall 2020, another financial consideration for institutional leaders. These additional analyses disaggregated total enrollment into international and domestic student enrollment and entered the log of each of these numbers into our Cox models separately. All other details of these analyses were the same as our primary analyses. The results of these analyses were strikingly similar to those of our primary analyses regarding international student enrollment, described in the following section. For this reason, we provide the results of these robustness checks in [Appendix A](#) but do not discuss them in detail here.

Finally, to answer our third research question, we further probed our models for private institutions specifically. As outlined previously, recent literature suggests that certain types of private not-for-profit institutions were in a more precarious financial situation (Kelchen, 2020; Taylor & Cantwell, 2019; Zemsky et al., 2020) even prior to the pandemic and thus might have been more susceptible to pressures to re-open for in-person instruction so as not to lose international student enrollment. For this reason, we divided private institutions into tertiles based on two key variables: tuition reliance (the percentage of total revenue comprising tuition and fees) and selectivity (the percentage of applicants that were admitted). This approach created three groups of roughly equal numbers based on these two variables, and we subsequently ran the same analyses (with covariates) described above on each group of institutions individually. This approach resulted in six additional models, three for each tuition reliance tertile and three for each selectivity tertile.

Results

Descriptive statistics

During July 2020, 77 (approximately 11%) of the 723 public institutions switched their instructional plans for fall 2020 to include more in-person instruction, while 128 (approximately 10%) of the 1245 private not-for-profit institutions did so. Figure 1 displays these shifts in instructional strategy over time for public (dark grey) and private (light grey) institutions. Visually speaking, there is a clear increase in these shifts, particularly at private not-for-profit institutions, starting on July 6, 2020, the date that USCIS announced its policy changes.

Fig. 1 Number of switches to additional in-person instruction per day in July 2020

Table 1 Descriptive statistics for time-invariant covariates

Variable	Public institutions (<i>N</i> = 723)				Private institutions (<i>N</i> = 1245)			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Percent non-resident students	3.76	4.11	0.00	27.33	6.21	10.44	0.03	100.00
Percent of revenue from tuition/fees	27.14	13.42	0.00	72.82	54.11	21.65	0.00	100.00
Percent of revenue from state appropriations	25.46	13.85	0.00	66.32				
10% enrollment decline	0.12				0.21			
Selectivity ^a	71.51	17.49	14.04	100.00	65.17	21.86	0.00	100.00
Offered graduate programs	0.64				0.42			
GOP governor	0.46				0.43			
New England	0.06				0.10			
Mid-East	0.15				0.22			
Great Lakes	0.14				0.16			
Plains	0.09				0.11			
Southeast	0.26				0.23			
Southwest	0.10				0.06			
Rocky Mountains	0.06				0.02			
Far West	0.15				0.10			
Rural	0.08				0.07			

^a*N* = 532 for publics and 1072 for privates

Table 1 provides additional descriptive information regarding the variables included in our analyses. On average, public institutions served a smaller percentage of non-resident students (3.76%) compared to private institutions (6.21%). At public institutions, around 27% of revenue came from student tuition and fees while an additional 25% came from

state appropriations, on average. At private institutions, tuition and fees accounted for an average of 54% of total revenues. While around 12% of public institutions had experienced an enrollment decline of 10% or more over the course of the past academic year, this was true for 21% of private institutions. Private institutions were somewhat more selective compared to public institutions, admitting around 65% of applicants compared to 72% at public institutions. Around 64% of public institutions offered graduate programs, while around 42% of private institutions did so. Public and private institutions were similarly located in states with a GOP governor, with 46% of public institutions and 43% of private institutions in states under GOP leadership. Overall, institutions in both groups were similarly distributed according to geographic region and rurality.

Not surprisingly, at both public and private institutions, the average number of COVID case counts in the county where the institution was located, our only time-variant predictor, was higher at the end compared to the beginning of July. On July 1, the average cumulative county-level COVID case count for public institutions was 9577, while this average for private institutions was 19,999. On July 31, these averages were 14,080 and 26,544, respectively.

Primary event history models

Results of our primary event history models for public 4-year institutions (see the first two columns of results in Table 2) suggest no significant relationship between the percentage of non-US resident students and a shift towards in-person instruction during July 2020. Indeed, location in a state with a GOP governor appears to be the only significant predictor of this shift. More specifically, GOP gubernatorial leadership was associated with an approximate 88% increase in the likelihood of a public institution changing instructional strategy on a given day relative to the likelihood at public institutions in states without a GOP governor.

Private not-for-profit 4-year institutions, on the other hand, present a different story (see columns three and four in Table 2). At these institutions, increases in the percentage of non-resident enrollments were significantly and positively related to a shift towards a reopening plan that incorporated more in-person instruction. For example, a shift from 6% (the average non-resident enrollment at private not-for-profit institutions) to 7% non-resident enrollment was related to an approximate 18% increase in the likelihood that the institution would shift reopening plans on a given day ($p < 0.01$ in both models). In contrast to public institutions, gubernatorial party affiliation was not a significant predictor of a shift in instructional strategy for private institutions. However, private institutions in the Great Lakes region were less likely to shift instructional strategies compared to institutions in New England ($p < 0.05$). For private institutions, cumulative county-level COVID case counts were also significantly related to a shift in instructional strategy, with an increase in cases related to a small decline in the likelihood of additional in-person instruction ($p < 0.05$).

Robustness checks

Table 3 summarizes the results from our event history models exploring data from private not-for-profit institutions divided into tertiles based on tuition reliance and selectivity. The first three columns of this table correspond to tuition reliance and are organized from least to most reliant. The last three columns of this table correspond to selectivity

Table 2 Hazard ratios corresponding to cox proportional hazard models predicting a switch from less to more in-person instruction during July 2020

	Public 4-year institutions		Private not-for-profit 4-year institutions	
Percent non-US resident (logged)	0.913 (− 1.20)	0.876 (− 1.30)	1.201** (3.48)	1.177** (2.81)
Percent revenue from tuition/fees		1.004 (0.44)		1.001 (0.14)
Percent revenue from state appropriations ^a		0.994 (− 0.69)		
10% enrollment drop		1.022 (0.06)		0.884 (− 0.50)
Institution serves graduate students ^b		1.383 (1.08)		1.168 (0.83)
GOP governor		1.878* (2.04)		0.759 (− 1.16)
County-level COVID case counts (logged)		1.000 (− 0.76)		0.999* (− 2.08)
Mid-East		1.842 (0.86)		0.639 (− 1.31)
Great Lakes		1.040 (0.06)		0.385* (− 2.53)
Plains		1.217 (0.27)		0.659 (− 1.13)
Southeast		2.585 (1.56)		0.628 (− 1.46)
Southwest		1.576 (0.68)		1.391 (0.85)
Rocky Mountains		1.981 (0.92)		0.278 (− 1.24)
Far West		0.432 (− 0.89)		0.598 (− 1.28)
Rural		1.180 (0.38)		
<i>N</i> observations	20,580	20,560	35,613	35,613
<i>N</i> subjects	723	723	1245	1245
<i>N</i> failures	77	77	128	128
Log likelihood	− 502.534	− 486.899	− 899.626	− 890.187

Note that the reference group for the region is New England. Z-statistics are in parentheses

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

^aApplicable to public institutions only

^bDerived from Carnegie classification, equal to 1 if an institution is classified as doctoral or master's granting

and are organized from most to least selective. Due to space limitations, we do not include results for covariates in these tables but note that the same covariates entered into our primary analyses are included in these models. Tables with full results including all covariates are available in [Appendix B](#).

Regarding tuition reliance, these models suggest that international student enrollment was not significantly related to a shift in reopening plans in the least tuition-reliant group of private institutions (the first tertile) or the middle category of tuition reliance (the second tertile) but was positively and significantly related to a shift to in-person instruction among institutions in the third tertile—that is, the most tuition reliant of these institutions. At institutions in this group, a change from 6 to 7% international student enrollment (again, 6% is the average international student enrollment at private not-for-profit institutions) was related to an approximate 21% increase in the likelihood of an instructional shift ($p < 0.05$). Turning to selectivity, international student enrollment was not significantly related to a shift in reopening plans that included more in-person instruction at institutions in the most selective or the least selective tertiles. However, in

Table 3 Hazard ratios corresponding to Cox proportional hazard models (with covariates) predicting a switch from less to more in-person instruction during July 2020—private not-for-profit institutions divided into tertiles by tuition reliance and selectivity

	Tuition reliance			Selectivity		
	Tertile 1 (mean tuition reliance = 29.90)	Tertile 2 (mean tuition reliance = 54.95)	Tertile 3 (mean tuition reliance = 77.46)	Tertile 1 (mean selectivity = 40.48)	Tertile 2 (mean selectivity = 67.48)	Tertile 3 (mean selectivity = 87.63)
Percent non-US (logged)	1.02 (0.15)	1.19 (1.62)	1.26* (2.34)	1.15 (1.11)	1.31* (2.15)	1.18 (1.57)
Covariates?	Yes	Yes	Yes	Yes	Yes	Yes
N observations	11,870	11,804	11,939	10,277	9972	10,144
N subjects	415	415	415	358	357	357
N failures	43	45	40	35	48	39
Log likelihood	−246.370	−257.815	−227.727	−197.419	−266.376	−213.563

Z-statistics are in parentheses

* $p < 0.05$

the middle tertile, a change from 6 to 7% international student enrollment was associated with a 22% increase in the likelihood of a shift to more in-person instruction.

Limitations

A primary limitation of this study is that for our international student enrollment predictor, we had to use a proxy category that included other non-US residents. Although an imperfect estimate, the IPEDS measure that we used represents the most complete information currently available on international student enrollment at US HEIs. A second limitation is that, while RDT predicts that HEIs are dependent on the revenue they get from international student enrollment, not the enrollment itself, publicly available data is only available regarding the latter. An important assumption of our study is that there is a direct relationship between international student enrollment and institutional revenue. Lastly, while our results are suggestive of certain relationships in our data, primarily between gubernatorial leadership and reopening plans for public institutions and between international student enrollment and these plans for private not-for-profit institutions, our results are not causal and should not be interpreted as such. That is, while our results indicate the presence of certain pressures on institutional leadership when considering reopening strategies, we cannot say for certain that international student enrollment was the primary or even one among many defining factors in leaders' ultimate decisions.

Discussion

This study's purpose was to explore the extent to which international student enrollment may have entered the decision-making of US HEI leaders regarding reopening instructional plans during the COVID-19 pandemic. Our study focused particularly on July 2020 given unforeseen shifts in policy guidance from USCIS. Theoretically, our study speaks to the extent to which dependence on revenue from international student enrollment enters the decision-making of HEI leaders, under the assumption that enrollment and revenue are related. Whether and how to reopen a campus during the COVID-19 pandemic represented a difficult decision for institutional leaders, who had to balance issues related to institutional mission, campus health and safety, rhetoric from vocal politicians, and institutional finances in their decision-making. USCIS's abrupt decision to end the ability of international students to stay in the US if their institution shifted to entirely virtual instruction made this decision-making even more complex for institutional leaders.

Our primary results suggest that at private not-for-profit, but not at public, US HEIs the percentage of international students enrolled was a significant predictor of a change in reopening instructional plans during July 2020. This finding reflects administrative differences in the nature of the resource dependencies of public and private institutions (Tolbert, 1985). Descriptively, private HEIs were in counties with higher average COVID-19 case counts at the beginning of July 2020 (around 20,000 compared to around 10,000 for public institutions), perhaps explaining our result that COVID-19 case counts were related to reopening instructional plans at these institutions. In addition to this public health context, our event history results indicated that the higher the percentage of international students enrolled at private not-for-profit institutions, the more likely an institution was to shift to include more in-person instruction in its reopening plan during this month. This result proved to be robust to the inclusion of covariates, including additional measures of

an institution's financial precarity (i.e., tuition dependence and recent steep enrollment declines), and alternative model specifications (see [Appendix A](#)).

Private institutions may have chosen to reopen for additional face-to-face instruction for several reasons. Descriptively, private HEIs enrolled a higher percentage of international students compared to their public counterparts prior to the pandemic (an average of 6% compared to an average of 4%). Leaders at private institutions may have thought they were making the best decision for international students' well-being given their reliance on on-campus resources (Bista, [2016](#); Sherry et al., [2010](#)). They also might have feared that after actively attracting large numbers of international students, continuing to offer a (perceived) less-optimal virtual instruction (while charging the same tuition) would be a disservice to the high expectations that international students typically have about their educational experience abroad. Alternatively, resource dependence theory would suggest that these institutions chose to reopen for additional face-to-face instruction because they are dependent financially on the tuition dollars that come along with international student enrollment (Cantwell, [2015](#)). In other words, private institutions had more to lose than their public counterparts. Coupled with a mission to serve their state and local communities, public institutions may have been more responsive to local needs and other external factors rather than the needs of students coming from abroad.

Given that many private not-for-profit institutions were in a financially precarious situation prior to the pandemic (Kelchen, [2020](#); Taylor & Cantwell, [2019](#)), USCIS guidance in July 2020 gave leaders of these institutions, who were already concerned about institutional financial survival, essentially no choice but to reopen for in-person instruction if they intended to enroll international students. Our robustness checks indicate that this situation was especially relevant for private not-for-profit institutions that were more reliant on tuition and that were not among the most or least selective. The findings regarding tuition dependency align with recent news of concern among leaders of private not-for-profit institutions regarding institutional finances and the potential for closure or merger (Fain, [2019](#); Hess, [2018](#)). With an average of close to 6% of their enrollment comprising non-US residents, and given previous literature that shows an increased risk of closure 2 years after a 10% loss in enrollment (Kelchen, [2020](#)), it seems safe to assume that leaders of institutions in a more financially precarious situation felt they must sacrifice other aspects of institutional mission, and even the safety and health of community and campus populations, to maintain the long-term vitality of their campus and the revenue lifeline reflected in international student enrollment. Regarding selectivity, we admit that our results may appear counterintuitive and without a logical explanation. To this point, we remind readers that we were missing selectivity data for 173 of the 1245 private institutions included in our dataset. When dividing these institutions into tertiles based on this variable, which inherently means running analyses on smaller subsets of data, this missing data had the potential to produce inaccurate results. This situation would be particularly true if institutions with missing data would have fallen on one extreme of the selectivity spectrum or the other. For this reason, we ultimately put little faith in the accuracy of these results.

Our results present additional information regarding factors that may have impacted leaders' decision-making regarding institutional reopening plans during the COVID-19 pandemic. Perhaps surprisingly, given that the pandemic was primarily a public health crisis, cumulative COVID-19 case counts in the county where an institution was located was not a significant predictor of a shift in reopening plans for public HEIs. This result suggests that these institutions either did not consider the prevalence of the virus in their local communities when making reopening decisions or that they had already considered this factor prior to or planned to consider it after July 2020. In either case, it is somewhat surprising

that this factor did not emerge as a significant predictor of whether a public institution made the decision to offer additional in-person instruction during the month immediately prior to a return to instruction for the fall 2020 term at many HEIs.

This result may also be related to our finding that, among public institutions, location in a state with a GOP governor significantly and positively predicted the likelihood that it would shift to offering additional in-person instruction. This result confirms the findings of other recent work that explores institutional reopening plans (Andersen et al., 2020; Collier et al., 2020, 2021; Felson & Adamczyk, 2021) and suggests that institutional leaders in some states were under considerable political pressure to reopen for in-person instruction, despite the health risks involved (Collier et al., 2020, 2021; Felson & Adamczyk, 2021). Indeed, our models indicate that political factors weighed more heavily than public health itself at the average public 4-year institution.

Implications

Our study has important implications for the funding of HEIs in the US, and in particular private not-for-profit ones. As has been well-documented, many of these institutions increasingly find themselves in a situation of financial precarity (Taylor & Cantwell, 2019), a situation that has likely been exacerbated during the COVID-19 pandemic. Our results suggest that this financial precarity, and specifically the dependence of these institutions on international student enrollment, can have very clear implications for public health, not only on their campus, but also in local communities, many of which are comprised of populations that are especially vulnerable to the most negative consequences of the pandemic (Benneyan et al., 2020; Harper, 2020). In the short term, providing these institutions with financial relief needed to weather the pandemic without having to make crucial decisions that can mean the difference between life and death for members of the campus and local community is an essential step. This financial relief could be provided at the state or federal level.

In the long term, leaders at all institutions, but particularly private not-for-profits, must take a careful look at institutional funding streams to avoid having to make similarly difficult decisions in the face of future crises. Contingency plans that provide well-considered instructions for how to operate should the viability of several funding streams suddenly change at the same time, as was the case at the onset of the COVID-19 pandemic, represent one possible step towards ensuring that future leaders do not have to choose between doing what is best for local and campus communities and what keeps institutions afloat financially. It is important to consider that international student enrollment represents one among many resource streams that the pandemic put in jeopardy for US HEIs.

Regarding international student enrollment, in particular, leaders must also take a critical approach to questioning why they recruit international students to attend their institutions in the first place. If these students are brought to campus solely for revenue purposes, questions arise as to how well served these students are once they arrive on campus. Of course, there is nothing inherently wrong with recruiting international students to study at US HEIs, and the positive economic implications of these students coming to study in the US can be tremendous for both institutions themselves and local communities, both of whom also benefit from interaction with international students in other, non-financial ways (Ata et al., 2017). However, if international students are not provided with opportunities and resources that enable their success, then institutions risk violating a primary component of their purpose: to provide a high-quality education to all enrolled students.

Conclusion

This study's results suggest a financial dependency on international student enrollment at private not-for-profit institutions in the US, a dependency that was highlighted and perhaps exacerbated by the COVID-19 pandemic. While this study provides insight into one aspect of HEIs' financial dependence on revenues from their external environment (Pfeffer & Salancik, 2003), certainly additional dependencies in the context of the pandemic are worth exploring in future research. For example, while our results suggested that public institutions were more susceptible to political pressure to reopen compared to private not-for-profit institutions, these institutions may have been subject to other pressures that factored into their reopening plans, thus laying bare resource dependencies that were not entirely obvious pre-pandemic. For example, at the University of Georgia, instruction on campus during the fall 2020 term was modified considerably from pre-pandemic circumstances (although this institution did offer face-to-face instructional options), but the football team was scheduled to play almost an entire season's worth of games with in-person spectators (Towers, 2020). Clearly, the COVID-19 pandemic spurred a dramatic shift in the external environment on which HEIs depend for resources, thus providing context for better studying and understanding the nature of these dependencies and how they might be better addressed by future institutional leaders.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s10734-021-00768-7>.

Acknowledgements We are grateful for the feedback of a number of individuals over the course of developing this study, most importantly Riley Acton, Robert Kelchen, Chris Marsicano, Charlie Mathies, Jamie Monogan, and two anonymous reviewers. All remaining errors are our own.

References

- ACE. (2020). *Statement by ACE President Ted Mitchell on ICE Guidance on International Students*. News Room. Retrieved from <https://www.acenet.edu/News-Room/Pages/Statement-by-ACE-President-Ted-Mitchell-on-ICE-Guidance-on-International-Students.aspx>. Accessed 20 Jan 2021.
- ACHA. (2020). *Supporting Vulnerable Campus Populations During the COVID-19 Pandemic*. Retrieved from https://www.acuho-i.org/Portals/0/doc/ACHA_Supporting_Vulnerable_Populations_During_the_COVID-19_Pandemic_August2020.pdf?ver=2020-08-24-091601-087. Accessed 20 Jan 2021.
- Andersen, M. S., Bento, A. I., Basu, A., Marsicano, C., & Simon, K. (2020). College openings, mobility, and the incidence of COVID-19 cases. *MedRxiv*, 2020.09.22.20196048. <https://doi.org/10.1101/2020.09.22.20196048>.
- Ata, A. W., Tran, L. T., & Liyanage, I. (Eds.). (2017). *Educational reciprocity and adaptivity: International students and stakeholders*. Routledge.
- Baker, P., Green, E. L., & Weiland, N. (2020). Trump threatens to cut funding if schools do not fully reopen. *The New York Times*. Retrieved from <https://www.nytimes.com/2020/07/08/us/politics/trump-schools-reopening.html>. Accessed 20 Jan 2021.
- Baxter, A., Oruc, B. E., Keskinocak, P., Asplund, J., & Serban, N. (2020). *Evaluating scenarios for school reopening under COVID19*. <https://doi.org/10.21203/rs.3.rs-54082/v1>.
- Benneyan, J. C., Gehrke, C., Ilies, I., & Nehls, N. (2020). Potential community and campus Covid-19 outcomes under university and college reopening scenarios. *MedRxiv*, 2020.08.29.20184366. <https://doi.org/10.1101/2020.08.29.20184366>.
- Bista, K. (2016). *Campus support services, programs, and policies for international students*. IGI Global.
- Bothwell, E. (2018). Insuring against drop in Chinese students. *Inside Higher Education*. Retrieved from <https://www.insidehighered.com/news/2018/11/29/university-illinois-insures-itself-against-possible-drop-chinese-enrollments>. Accessed 20 Apr 2021.

- Box-Steffensmeier, J. M., & Jones, B. S. (2004). *Event history modeling: A guide for social scientists*. Cambridge University Press.
- Burns, R. A. (2018). *Event history analysis of in-state residency tuition policies for undocumented students in American higher education*. Unpublished doctoral dissertation. University of Georgia.
- Burke, L. (2020). 'A Ghost Town.' *Inside Higher Education*. Retrieved from <https://www.insidehighered.com/news/2020/04/20/students-campus-talk-about-experiences>. Accessed 20 Jan 2021.
- Cantwell, B. (2015). Are international students cash cows? Examining the relationship between new international undergraduate enrollments and institutional revenue at public colleges and universities in the US. *Journal of International Students*, 5(4), 512–525.
- Cantwell, B., Lee, J. J., & Mlambo, Y. A. (2018). International graduate student labor as mergers and acquisitions. *Journal of International Students*, 8(4), 1483–1498.
- Castiello-Gutiérrez, S., & Li, X. (2020). We are more than your paycheck: The dehumanization of international students in the United States. *Journal of International Students*, 10(3), i–iv.
- Castiello-Gutiérrez, S., & Tozini, K. (2020). Universities as global villages: Supporting international students on campus. *NAFSA Trends and Insights, December*. Retrieved from <https://www.nafsa.org/sites/default/files/media/document/trends-insights-december-2020.pdf>. Accessed 20 Jan 2021.
- CDC. (2020). *Considerations for institutions of higher education*. COVID-19. Retrieved from <https://www.cdc.gov/coronavirus/2019-ncov/community/colleges-universities/considerations.html>. Accessed 20 Jan 2021.
- Collier, D., Fitzpatrick, D., Dell, M., Snideman, S., Marsicano, C., & Kelchen, R. (2021). We want you back: Uncovering the influences on in-person instructional operations in Fall 2020. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3778772>
- Collier, D., Fitzpatrick, D., Snideman, S., & Marsicano, C. (2020). "What'd We Miss?": An initial analysis of politics, demographics, and COVID-19 rates in colleges' resumption of instructional operations for fall 2020. *APSA Preprints*. <https://doi.org/10.33774/apsa-2020-4c0f2>
- DesJardins, S. L. (2003). Event history methods: conceptual issues and an application to student departure from college. In *Higher education: Handbook of theory and research* (pp. 421–471). Springer.
- Diep, F. (2020). Its plan is risky, its community is vulnerable, and cases are surging. Why is this university reopening? *The Chronicle of Higher Education*, 1–10. Retrieved from <https://www.chronicle.com/article/its-plan-is-risky-its-community-is-vulnerable-and-cases-are-surfing-why-is-this-university-reopening>. Accessed 20 Apr 2021.
- Fain, P. (2019). *Private conversations about private college closure*. Inside Higher Ed. Retrieved from <https://www.insidehighered.com/news/2019/11/19/private-collegesconvinced-company-scuttle-release-list-projected-college-closures>. Accessed 20 Apr 2021.
- Feldblum, M., Hubbard, S., Lim, A., Penichet-Paul, C., & Siegel, H. (2020). *Undocumented students in higher education: How many students are in U.S. colleges and universities, and who are they?* Presidents' Alliance for Higher Education and Immigration and New American Economy. Retrieved from <https://www.presidentsimmigrationalliance.org/wp-content/uploads/2020/07/Undocumented-Students-in-Higher-Education-April-2020.pdf>. Accessed 20 Apr 2021.
- Felson, J., & Adamczyk, A. (2021). Online or in person? Examining college decisions to reopen during the COVID-19 pandemic in Fall 2020. *Socius*, 7, 1–16. <https://doi.org/10.1177/2378023120988203>
- Fischer, H., & Whatley, M. (2020). *COVID-19 impact research brief: International students at community colleges*. Retrieved from <https://www.nafsa.org/sites/default/files/media/document/covid-19-impact-research.pdf>. Accessed 20 Jan 2021.
- Fowles, J. (2014). Funding and focus: Resource dependence in public higher education. *Research in Higher Education*, 55(3), 272–287.
- Harper, S. R. (2020). COVID-19 and the racial equity implications of reopening college and university campuses. *American Journal of Education*, 127(1), 153–162.
- Harris, K. (2020). America's college towns are facing an economic reckoning. *Bloomberg*. Retrieved from <https://www.bloomberg.com/news/articles/2020-08-21/what-the-pandemic-is-doing-to-college-towns>. Accessed 20 Apr 2021.
- Heckman, J. J., & LaFontaine, P. A. (2010). The American high school graduation rate: Trends and levels. *The Review of Economics and Statistics*, 92(2), 244–262.
- Hess, A. (2018). *Harvard Business School professor: Half of American colleges will be bankrupt in 10 to 15 years*. CNBC. Retrieved from <https://www.cnbc.com/2018/08/30/hbsprof-says-half-of-us-colleges-will-be-bankrupt-in-10-to-15-years.html>. Accessed 20 Apr 2021.
- IIE. (2020). *COVID-19 effects on U.S. higher education campuses: New realities for global student mobility in summer and fall 2020*. Retrieved from <https://www.iie.org/Research-and-Insights/Publications/COVID-19-Effects-on-US-Higher-Education-Campuses-Report-3>. Accessed 20 Jan 2021.

- Immigration and Customs Enforcement (ICE). (2020). *Broadcast Message Number: 2007–01: COVID-19 and Fall 2020*. Retrieved from <https://web.archive.org/web/20200706195010/.https://www.ice.gov/doclib/sevis/pdf/bcm2007-01.pdf>. Accessed 20 Jan 2021.
- Jaquette, O. (2013). Why do colleges become universities? Mission drift and the enrollment economy. *Research in Higher Education*, 54(5), 514–543.
- Jaquette, O., & Parra, E. E. (2014). Using IPEDS for panel analyses: core concepts, data challenges, and empirical applications. In M. B. Paulsen (Ed.), *Higher education: Handbook of theory and research* (Vol. 29, pp. 467–533). Springer.
- Kelchen, R. (2020). *Examining the feasibility of empirically predicting college closures*. The Brookings Institution.
- Khanal, J., & Gaulée, U. (2019). Challenges of international students from pre-departure to post-study. *Journal of International Students*, 9(2), 560–581.
- Lederman, D. (2020). Presidents fear financial, and human, toll of coronavirus. *Inside Higher Education*. Retrieved from <https://www.insidehighered.com/news/survey/college-presidents-fear-financial-and-human-toll-coronavirus-their-campuses>. Accessed 20 Apr 2021.
- Lee, J. J., & Cantwell, B. (2012). The global sorting machine: An examination of neoracism among international students and postdoctoral researchers. In *Universities and the public sphere: Knowledge creation and state building in the era of globalization* (pp. 47–63). Taylor and Francis.
- Li, Y., Ma, C., Tang, W., Zhang, X., Zhu, J., & Nallamothu, B. K. (2020). Association of university reopening policies with new confirmed COVID-19 cases in the United States. *MedRxiv*, 2020.12.11.20247353. <https://doi.org/10.1101/2020.12.11.20247353>.
- Lu, H., Weintz, C., Pace, J., Indiana, D., Linka, K., & Kuhl, E. (2020). Are college campuses super-spreaders? A data-driven modeling study. *MedRxiv*, 2020.12.18.20248490. <https://doi.org/10.1101/2020.12.18.20248490>.
- Martel, M. (2020). *COVID-19 effects on U.S. higher education campuses: From emergency response to planning for future student mobility*. Retrieved from <https://www.iie.org/Connect/COVID-19/>. Accessed 20 Jan 2021.
- Mathies, C., & Weimer, L. (2018). A changing narrative for international students? The potential influence of Brexit and Trump. In D. Proctor & L. E. Rumbley (Eds.), *The future agenda for Internationalization in Higher Education: Next generation insights into research, policy, and practice* (pp. 144–152). Routledge.
- Murakami, K. (2020). Will push to reopen threaten aid? *Inside Higher Education*. Retrieved from <https://www.insidehighered.com/news/2020/07/16/uncertainty-over-aid-higher-education-possible-next-coronavirus-relief-bill>. Accessed 20 Jan 2021.
- NAFSA. (2020a). *Losing Talent 2020: An economic and foreign policy risk America can't ignore*. Retrieved from <https://www.nafsa.org/sites/default/files/media/document/nafsa-losing-talent.pdf>. Accessed 20 Jan 2021.
- NAFSA. (2020b). *NAFSA 2020 Financial Impact Survey*. Retrieved from <https://www.nafsa.org/sites/default/files/media/document/2020-financial-impact-survey.pdf>. Accessed 20 Jan 2021.
- National Center for Education Statistics. (2021). *Number of Title IV institutions, number changing Title IV status, number changing level or control of institution, and percentage change, by sector of institution: United States and other U.S. jurisdictions, academic years 2017–18 to 2020–21*. Retrieved from IPEDS Data Explorer website: <https://nces.ed.gov/ipeds/search>.
- Nienhüser, W. (2008). Resource dependence theory: How well does it explain behavior of organizations? *Management Revue*, 19(1/2), 9–32.
- Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*. Stanford University Press.
- Rose-Redwood, C., & Rose-Redwood, R. (2018). Building bridges across the international divide: Fostering meaningful cross-cultural interactions between domestic and international students. *Journal of International Students*, 8(3), 1328–1336.
- Salazar, K. G. (2019). *The wealth and color of off-campus recruiting by public research universities [unpublished doctoral dissertation]*. The University of Arizona.
- Seltzer, R. (2020). Housing developer pressured universities on fall plans. *Inside Higher Education*. Retrieved from <https://www.insidehighered.com/news/2020/08/07/housing-developer-reminded-universities-about-project-debt-they-mulled-fall-plans>. Accessed 20 Apr 2021.
- Sherry, M., Thomas, P., & Chui, W. H. (2010). International students: A vulnerable student population. *Higher Education*, 60(1), 33–46. <https://doi.org/10.1007/s10734-009-9284-z>
- Taylor, B. J., & Cantwell, B. (2015). Global competition, US research universities, and international doctoral education: Growth and consolidation of an organizational field. *Research in Higher Education*, 56(5), 411–441. <https://doi.org/10.1007/s11162-014-9355-6>

- Taylor, B. J., & Cantwell, B. (2019). *Unequal higher education: Wealth, status, and student opportunity*. Rutgers University Press.
- Tolbert, P. S. (1985). Institutional environments and resource dependence: Sources of administrative structure in institutions of higher education. *Administrative Science Quarterly*, 30, 1–13.
- Towers, C. (2020). UGA plans for football as usual this fall. *Atlanta Journal-Constitution*. Retrieved from <https://www.ajc.com/sports/college/uga-plans-for-football-usual-this-fall/8A7qHAK9bwoMql89MDkAXI/>. Accessed 20 Jan 2021.
- Tozini, K., & Castiello-Gutiérrez, S. (2020). The effects of COVID-19 on international students' well-being and the role of social and university support. *2020 Conference on International Higher Education*.
- Turk, J. M., Soler, M. C., & Vigil, D. (2020). *College and university presidents respond to COVID-19: April 2020 pulse point survey*. Retrieved from <https://www.acenet.edu/Documents/Presidents-Respond-COVID19-April2020.pdf>. Accessed 20 Jan 2021.
- UNESCO-IESALC. (2020). *El coronavirus-19 y la educación superior: impacto y recomendaciones*. Retrieved from <https://www.iesalc.unesco.org/2020/04/02/el-coronavirus-covid-19-y-la-educacion-superior-impacto-y-recomendaciones/>. Accessed 20 Jan 2021.
- Wilson to Vice Chancellor. (2020). *Letter regarding Amended and Restated Master Concession Agreement for the Leasing and Development of Student Housing (Phase 1) between the Board of Regents of the University of System of Georgia (the "BOR") and Corvias Campus Living—USG, LLC ("Concessionaire") dated May 13, 2015, as further amended (the "Phase 1 Student Housing MCA")*. Retrieved from https://www.insidehighered.com/sites/default/server_files/media/Georgia-Corvias-Letter_0.pdf. Accessed 20 Apr 2021.
- Yamey, G., & Walensky, R. P. (2020). COVID-19: Re-opening universities is high risk. *The British Medical Journal (BMJ)*, 370, m3365. <https://doi.org/10.1136/bmj.m3365>
- Zemsky, R., Shaman, S., & Baldrige, S. C. (2020). *The college stress test: Tracking institutional futures across a crowded market*. Johns Hopkins University Press.

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.