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AACSB Accreditation and Student Demand

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Abstract

We ask whether AACSB accreditation has a meaningful impact on university admissions. To do this, we explore 16 U.S. institutions which first achieved this certification recently. We, first, document a modest, but nonzero, impact on university-wide undergraduate applications, without any changes in first-year enrollment, price, or quality of the incoming student body. Restricting attention to business schools, while initial evidence suggests that the accreditation is associated with a decrease in enrollments, we show that this is complicated by non-parallel trends prior to accreditation. Compared to their comparison institutions, universities who seek out accreditation were experiencing flatter business enrollments. Correcting for the non-parallel trends, we fail to find evidence that AACSB accreditation halts this negative enrollment trend.

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1 Introduction

Higher education is an experience good. Potential students can be expected to find it difficult to assess the quality of the education they will receive from competing universities. Of course, the stakes are high as the present value of a college degree is substantial.[1] One way to address this informational problem is through the use of accreditation by external, third-party organizations. Accreditation agencies provide minimum quality standards, which are intended to address asymmetric information problems for consumers in the market.

For business education, the Association to Advance Collegiate Schools of Business (hereafter AACSB) is a nonprofit organization which sets quality standards and shares best practices for business schools around the globe. Achieving AACSB accreditation is generally viewed to be mark of excellence for a university.

Achieving the standards set by AACSB, though, is costly. Along with having an administrative structure to handle the required assessment activities, the accreditation requires standards on faculty, such as regulations on the use of non-Ph.D.s and continued research activity, which can increase the college's labor costs. Given this, many universities choose not to seek this status. On the other hand, currently 910 schools have the accreditation. It is crucial to identify whether AACSB has an impact on student demand. If obtaining it creates costs for the university but fails to promote student demand, then university leadership may want to avoid it. On the other hand, if it does provide this specific benefit, more administrators may view the expenses as worthwhile.[2]

There is reason for concern. For one, as stated, higher education can be thought of as an experience good. Consumers are not necessarily able to assess the value of the education prior to consuming it. Accreditation, then, can provide some of the needed information which shifts demand. If high school students, on the other hand, are unaware of the accreditation and how it affects educational quality, then it can create a cost without a benefit. In addition, one can view AACSB as a regulatory authority and, as such, public choice distortions can be a concern. For example, by requiring a high percentage of accounting classes being taught by research-active, Ph.D.-holding accounting professors, CPA-trained accountants with private practices but with time and willingness to teach, are crowded out. These CPA accountants command a lower wage as they can be viewed as imperfect substitutes. Additionally, it is not necessarily obvious that receiving a Ph.D. and focusing on research necessarily makes someone a better instructor in the classroom. In other words, a concern is that the accreditation acts to protect high faculty salaries and requires excessive spending on administrators. Again, AACSB accreditation can raise costs without generating higher quality student outcomes.[3]

[1] For an illustration, the Center on Education and Workforce at Georgetown University estimates that the net present value of a bachelor's degree at a private, nonprofit college is $838,000 and at a public university it is $765,000.

[2] There are, of course, other potential motivations such as enhanced educational quality, improved job placements and starting salaries, and alumni donations. We limit attention on one particular but important dimension within higher education institutions' objective functions.

[3] One may also want to consult the debate on whether accreditation allows for flexibility in strategic management of business colleges [Julian and Ofori-Dankwa, 2006, Romero, 2008].

To tackle this question, we explore the 16 U.S. universities that first obtained AACSB accreditation for their business programs during the 2015 to 2018 time period. To conduct the analysis, we focus on measurements of quantity demanded (applications and first-year enrollment), price (in-state and out-of-state total listed costs), and quality (SAT scores) of the institutions that first achieved AACSB accreditation for their business school between 2015 and 2018. Our objective is to provide a causal estimate of achieving the accreditation on these three categories of outcome variables. The challenge is that they are a non-representative sample of institutions and, therefore, identifying the proper counterfactual is a primary concern. We use the Synthetic Control Method (hereafter SCM) designed for formal, comparative case studies [Abadie and Gardeazabal, 2003, Abadie, 2021]. The method looks at a large donor pool of potentially similar institutions who also do not have AACSB accreditation. It picks a small subset of schools that match a "treated" university closely across numerous predictor variables such as student body size and composition, faculty size, retention rate, and endowment (to name a few). The synthetic is simply a weighted basket of other universities that have not been treated by the accreditation. Thus, each university achieving AACSB accreditation has a synthetic version of it created. The universities making up the synthetic are not affected by the accreditation and, therefore, the divergence observed after the universities obtain the certification becomes a measurement of the treatment effect. By conducting this analysis separately for each university, an average treatment effect can be calculated which identifies the causal impact.

We first document a modest, but nonzero, impact of AACSB accreditation on university-wide undergraduate applications, but do not find effects on first-year enrollment, price, and student quality. Second, restricting attention to the business schools within these universities, initial evidence suggests that accreditation is associated with a decrease in business school enrollments. We then show that this estimate is distorted by non-parallel time trends prior to accreditation. That is, universities who seek out AACSB accreditation were experiencing flatter business enrollments, falling behind their comparison institutions, in the years leading up to accreditation. For illustration, compared to a baseline of 18 years prior, business school enrollment for the treated universities had declined by 5.4% leading up to the accreditation. The synthetics, on the other hand, had grown in enrollment by 107%. Correcting for these non-parallel trends, we fail to find evidence that AACSB accreditation reverses this negative trend.

Research on the impact of AACSB accreditation is rather sparse. The exception is Jacqmin and Lefebvre [2021]. They consider student satisfaction rankings of French business schools and provide evidence that receiving AACSB international accreditation improves the school's ranking. Hedrick et al. [2010] provides correlational evidence that business professor salary is greater at universities with the accreditation. Bastin and Kalist [2013] is unable to identify a statistically significant correlation between starting salaries and whether a graduate completed a AACSB certified program. Hunt [2014] discusses the lack of research on the topic. We add to this literature by considering its impact on applications and enrollment.

While research on the impact of AACSB is limited, there is existing research on the impact of other indicators of education quality. Luca and Smith [2013] use data from U.S. News and World Report College

Rankings and find that improvement in rankings leads to an increase in applications. Gibbons et al. [2015] use data from the UK's National Student Survey and find higher ratings result in slightly higher applications. Hurwitz and Smith [2018] find higher reported earnings in the U.S. Department of Education's College Scorecard result in an increase in the number of SAT scores sent to a school. Jacob et al. [2018] estimate a discrete choice model of college selection and find that most students value amenities such as student activities and dormitories, but higher-achieving students are more likely to value indicators of academic quality. Mulhern [2021] finds that students are more likely to apply to a school if they have access to that school's admission information. Thus, this research suggests that students are interested in obtaining information in their school-selection decision. This presumes that business school accreditation may well be a valuable indicator. It is this hypothesis that we explore.

A handful of studies in the economics of education have used SCM. For example, Bifulco et al. [2017] use it to estimate the effect of an intervention program within schools in Syracuse, NY. Bonander et al. [2016] uses SCM to evaluate research universities' effect on their regional economy. Ersoy [2020] documents a shift in college major choice from the Great Recession, and Bassock et al. [2016] evaluate the effects of pre-K programs on the child care market using SCM. It has been used to study college sport's effects. Johnson and McCannon [2021] considers the impact of the child sex abuse scandal at Penn State on applications and Lawson [2021] considers the death penalty applied on Southern Methodist University's football team. We use SCM for an important dimension to higher education administration − accreditation's impact.

Section 2 provides details of AACSB, explains the empirical methods to be used, and describes the data. Section 3 provides the results and Section 4 concludes.

2 Data, Methods, & Background

2.1 AACSB

AACSB is a global, nonprofit organization that strives to "improve the quality of business education around the world". Their goal is to be a platform that connects educators, students, and businesses to foster leadership and "create the next generation of great leaders".[4] They currently certify more than 900 accredited business schools worldwide.

Their accreditation process consists of becoming an educational member of AACSB. This requires the payment of an annual membership fee along with larger fees assessed when initially applying for membership.[5] An institution authorized to grant baccalaureate and/or graduate degree programs in business administration, management, or accounting is eligible. After becoming an educational member, the institution's application is reviewed by the Initial Accreditation Committee (hereafter IAC). A volunteer within the business school administration is assigned as a mentor to help develop an initial self-evaluation report

[4] Quotes from aacsb.edu.

[5] Annual fee is currently $5350 for business programs with an additional $3650 per year if the accounting program is assessed separately. Fees for institutions seeking initial accreditation can be as large as almost $35,000. See aacsb.edu/educators/accreditation/business-accreditation/fees for details.

(hereafter iSER). When the institution has its application approved and a mentor has been assigned to them it pays the IAC acceptance fee and the initial accreditation fee. The institution will then submit their iSER along with a strategic plan to the IAC for review. The iSER generally takes a year or two to complete. The review results in either the iSER being accepted, requiring a revision and resubmission, or being denied.

The accreditation process is designed to validate institutions with a quality business education and impressive research. The principles and expectations accredited schools must adhere to are reviewed when a school applies for accreditation and are continually evaluated by the Accreditation Council.

Accredited institutions are expected to encourage and support ethical behavior and integrity among their students, faculty, and staff. They are expected to have a positive societal impact which is included in the school's mission and strategic plan. AACSB expects schools to be mission-driven by having mission-related activities within their strategic plan. Accredited universities are expected to have a global mindset that is cognizant of other cultures and values. Diversity and inclusion are an important aspect of the accreditation process. All of the principles mentioned are an integral part of the accreditation process and once an institution becomes accredited they are expected to their adherence to AACSB's principles and standards.

Every accredited university undergoes periodic peer review. The college is expected to be dedicated to consistent improvement that produces high-quality outcomes. The ability to adjust curriculum content and faculty skill sets as business education trends evolve and employer feedback is received is important in the accreditation process.

In these reviews, AACSB evaluates business schools in three broad dimensions: (1) strategic management and innovation; (2) learner success; and (3) thought leadership, engagement, & societal impact. Strategic management assessment includes strategic planning; physical, virtual, & financial resources; and faculty & professional staff resources. Learner success is evaluated on curriculum; assurance of learning procedures; learner progression; and teaching effectiveness & impact. The final category includes measuring the impact of scholarship and the institution's societal impact. For a university to succeed in its accreditation/re-accreditation it must verify its achievements in each of these areas.

For an example, AACSB categorizes faculty members into four groupings: scholarly academics, scholarly practitioners, practice academics, and instructional practitioners. Typically 40% of the school's faculty need to be scholarly academics. These faculty are expected to have terminal degrees in their area of teaching and maintain an active, impactful research agenda.

To identify those institutions who have recently achieved accreditation, we use the press releases archived on AACSB's web site. We focus on the 2015 to 2018 time period, restrict attention to U.S. institutions of higher education, and consider the business school accreditation rather than the complementary accounting certification. One institution, Georgia Gwinnett College, has severely limited data availability across numerous variables and, hence, cannot be used in the analysis. Our analysis focuses on the 16 treated higher education institutions listed in Table 1.

[Table 1 about here.]

This is a diverse list of institutions. It includes regional public institutions, elite private universities, technology-focused institutions, and small, regional private colleges. Our empirical analysis must account for the wide diversity in the market.

2.2 Synthetic Control Method

This paper employs the Synthetic Control Method introduced by Abadie and Gardeazabal [2003]. The objective is to create a formalized case study. The idea is to use a set of predictor variables on a donor pool of units to create a synthetic version of a treated unit. Prior to the treatment, the synthetic is constructed to match the treated unit as closely as possible. As the synthetic is not affected by the treatment, the divergence between the synthetic and actual unit in the years after the treatment becomes the measurement of the treatment's causal impact.

To formalize, suppose there are J available control units that are not exposed to the intervention (i.e., institutions without AACSB accreditation). These make up our "donor pool". Let T_0 be the last time period prior to the treatment. Thus, $t = 1, ..., T_0$ are the pre-treatment periods and $t = T_0 + 1, ..., \overline{T}$ are the treated periods.

Let $\mathbf{W} = (w_1, ..., w_j)'$ be a $J \times 1$ vector where each w_j is a non-negative weight assigned to a single control unit out of the J donor units. The vector of weights sum to one. Also, there are K predictor variables. Define $\mathbf{X}_1$ as a $K \times 1$ vector containing values for these predictor variables for the treated unit. Similarly, $\mathbf{X}_0$ is the $K \times J$ matrix containing these same predictor variables for the J control units. The optimal counterfactual uses the vector of weights, $\mathbf{W}^*$, which minimizes $\|\mathbf{X}_1 - \mathbf{X}_0\mathbf{W}\|$. In other words, the synthetic is a weighted basket of a subsample units from the donor pool. It is constructed to match the treated unit as closely as possible across the outcome variables and predictor variables in the periods prior to the treatment.

The goal of the synthetic's construction is to be able to estimate the outcome variable's time path for the treated unit if the intervention were to not occur. Let $Y^0_{1,t}$ be this counterfactual outcome for the treated unit at time t, $Y^1_{1,t}$ be the actual observed outcome for the treated unit, and $Y_{j,t}$ be the observed outcome for donor j. Therefore, the method estimates $Y^0_{1,t}$ by $Y^0_t = \sum_{j=1}^{J} w^*_j Y_{j,t}$. The estimated average treatment effect is $Y^1_{1,t} - Y^0_t$ for periods $t > T_0$. Hence, the divergence between the actual treated unit and its synthetic in the periods after the intervention is the treatment effect of interest.

The SCM is ideal for this environment. Institutions of higher education differ substantially. There are important vertical product differentiation dimensions (i.e., quality), but also relevant horizontal product differentiations (e.g., public vs. private vs. private-religious). It would be inappropriate to compare these 16 universities to the set of all other higher education institutions in the US. In fact, recognizing the product differentiation in the market, it is common practice for institutions to list schools they view as peer institutions in self-evaluations. SCM formalizes this process by identifying a subsample of institutions who, collectively, match the university across numerous measurable variables as closely as possible. Thus, by building a data set of these institutions and their synthetics we are able to compare those treated to their observationally-equivalent institutions (akin to avoiding "comparing apples to oranges"). Consequently, treatment can be thought of as essentially random in the panel data set, which allows for causal identification.[6]

2.3 Data

Our primary data source comes from the National Center for Education Statistics. It provides the Integrated Postsecondary Education Data System (hereafter IPEDS).[7] IPEDS provides comprehensive data on colleges and universities across the United States.

Regarding the donor pool, our objective is to identify a set of institutions of higher education that are presumably similar to the universities that seek AACSB accreditation prior to doing so. It is important that they also do not seek or have the accreditation. To select our donor pool, we choose to use the list of business schools that have ACBSP accreditation (i.e., Accreditation Council for Business Schools and Programs). This organization focuses on business schools that emphasize teaching and learning and does not necessarily emphasize research activities. Many of the universities in our sample that obtain AACSB accreditation had ACBSP certification beforehand. Thus, we feel it makes up a reasonable donor pool. This list is trimmed due to data availability as some do not report some data to IPEDS. There are 185 institutions in our donor pool.

Regarding outcome variables, we focus on three dimensions to an institution's applications: quantity, price, and quality. Regarding quality, IPEDS provides the 25th percentile and the 75th percentile scores for entering first-year students on both the SAT Math and the SAT Reading assessments.[8] Regarding price, IPEDS provides the total listed price for in-state students and out-of-state students separately. This includes room and board expenses, along with tuition.[9] Regarding quantity, IPEDS provides the total number of undergraduate applications and the total enrollment of first-year students. Further, these two values are decomposed by gender. Hence, along with the totals, we calculate the proportion of the applications and enrollment that are female. We will use the gender distributions to aid in the optimal synthetic's identification. We limit attention to the 2001-20 time period as outcome variables have full coverage over this time frame.

As mentioned, missing values do occasionally arise. If a university in our donor pool does not provide consistent data on these outcome variables, then that school is removed from the analysis.[10] On the other hand, if there is one (or just a few) year(s) with missing information, a linear interpolation is used to fill in the missing observation. Regarding the predictor variables, we use a number of measurements to capture important dimensions of an institution of higher education. For the financial health, we use the university's endowment. Data are available for the 2003-19 time period. Further, we use the number of students on campus receiving Pell grants (covering 2008-20). Regarding the student body, we use the total undergraduate

[6] As will be explored, this is possible only if the treated and controls are following parallel trends in the pre-treatment periods.
[7] https://nces.ed.gov/ipeds/use-the-data
[8] Coverage of the ACT scores are too limited to use in the analysis.
[9] It does not account for price discounting and scholarships received. Thus, it should be thought of as a list price.
[10] Most deletions occurred due to lack of reporting of SAT scores. An additional two universities were removed due to missing price, one due to missing faculty size, and three due to missing endowment information.

enrollment and the percentage of the undergraduate student body who is female as predictors. These are available for the full time period studied. We also use the proportion of the undergraduate student body who is White, the percentage who report to be of Hispanic descent, and the proportion of the student body who are foreign born (nonresident alien). These three measures are available over the 2010-20 time period. Regarding the academic environment, we collect the faculty size (available over the 2012-20 time period), student-to-faculty ratio (available over the 2008-20 time period), and the undergraduate student retention rate (available over the 2003-20 time period). Hence, we have a total of twelve predictor variables to be used in the analysis.

As with the outcome variables, linear interpolations are conducted to fill in any missing values. Thus, the donor pool used in our analysis consists of 185 universities that do not have AACSB accreditation for their business schools and report data to IPEDS. Table 2 provides the descriptive statistics pooling the 16 treated universities with the other 185 universities used in the donor pool over the years with available information.

[Table 2 about here.]

There is quite a bit of variation in the size of the universities and the composition of the student body in the data set. Hence, a method which can select the appropriate comparisons is imperative.

3 Results

First, we describe the process used to construct the synthetics. From this, we will estimate the treatment effect of AACSB accreditation on the university. Finally, we will dig specifically into business school enrollments and evaluate AACSB accreditation on them.

3.1 Construction of the Synthetics

First, we take each treated university and separately estimate its synthetic. Since there is variation in the time range of the data set's coverage, we limit the analysis to data since 2001. Each of the eight outcome variables are used, along with the twelve predictor variables for each year prior to that university's treatment.[11] Table 3 presents the makeup of each university's synthetic.

[Table 3 about here.]

There is a diverse set of schools that make up each institution's synthetic. On average, there are 6.9 institutions included in each synthetic, but the number ranges from one to as many as twelve. The weight placed on them range from as little as 0.002 to as much as 1.000.

[11] There are a few exceptions. A handful of the treated universities are lacking information on outcome variables or predictor variables. For example, Metro St. - Denver does not provide price information. Its synthetic is constructed without using these two outcome variables. Four universities (Northeastern Illinois, Troy, Western Connecticut St., and Wisconsin - Stevens Point) have numerous missing years of SAT information. Since that is an important outcome variable for these treated schools, rather than fill in missing information with a linear interpolation we choose to construct the synthetics without using SAT scores for these four.

Table 4 evaluates how similar the constructed synthetics are to the universities they are supposed to be tracking. To do this, we present the mean values over the 2001 to 2015 time period (where all institutions in the sample do not have accreditation) for the actual and synthetic version of each, along with presenting the same for the full donor pool. Table 4 presents.

[Table 4 about here.]

For almost every variable, just looking at the years before any of the institutions in the sample obtained AACSB accreditation, the synthetics look substantially more similar to the actual universities than the full donor pool. Therefore, comparing the treated units to their synthetics can be expected to be a more valid exercise than comparing them to the full donor pool.

3.2 Causal Effect of Accreditation on the University

In the appendix, we provide results depicting each university, comparing its outcomes to its synthetic, separately. For ease of presentation, though, we aggregate the 16 treated universities and the 16 synthetics. Time is re-centered so that $t = 0$ is the first year with accreditation. Hence, negative time values denote the number of years prior to accreditation and positive time values are the number of years since accreditation. Figure 1 depicts only those time periods where all 16 schools have data. Since some institutions in our study do not receive accreditation until 2018, only the academic years starting in 2019 ($t = 0$) and 2020 ($t = 1$) are available for the post-treatment time periods. An institution receiving AACSB accreditation in 2015, on the other hand, has five years of treated periods from 2016 ($t = 0$) to 2020 ($t = 4$). Also, since we have numerous universities of differing size, the aggregated values used in each time series are normalized by the initial period's value ($t = -15$).

[Figure 1 about here.]

Figure 1 depicts only total applications. The two lines track closely in the pre-treatment time periods, but diverge noticeably after AACSB accreditation. This suggests that there is a nonzero treatment effect. To formalize this treatment effect's estimation and establish whether similar divergences occur for other outcome variables, we econometrically estimate the average treatment effects. Specifically, we build a panel data set comprised of the 16 actual universities and the 16 synthetics, pooled over the 20 time periods (2001 to 2020). We then estimate the following difference-in-difference specification:

$$Y_{suy} = \alpha_0 Synthetic_s + \alpha_1 Post_{uy} + \alpha_2 Post_{uy} \times Synthetic_s + \psi_u + \tau_y + \epsilon_{suy}. \quad (1)$$

The variable Y_{suy} measures the outcome of an observation of type s (either the actual or synthetic version of the institution) for university u in year y. The outcome variables used capturing quantity, price, and quality will all be considered. The indicator variable $Synthetic_s$ is equal to one if and only if the observation has the type of being the synthetically-created observation. The indicator variable $Post_{uy}$ is equal to one if and only if university u in year y has been treated by receiving AACSB accreditation. The interaction term is the difference in the differences. A value of $\widehat{\alpha}_2 > 0$, for example, indicates that university, compared to its synthetic, shrinks in its value for that particular outcome variable after accreditation. A negative value for the difference-in-difference coefficient suggests that AACSB accreditation improves the outcome variable of interest. University fixed effects, ψ_u, pick up systematic differences between the cross-sectional units and year fixed effects, τ_y, account for any countrywide macroeconomic effects affecting university enrollments (e.g., recessions). Table 5 presents the results.

[Table 5 about here.]

The divergence observed in Figure 1 for university applications is statistically significant in the econometric analysis. The estimated coefficient suggests that receiving AACSB accreditation corresponds to approximately 700 additional applications each year. Using the full sample's descriptive statistics, this corresponds to just more than one-fifth of a standard deviation increase in applications ($= 0.22\sigma$) Thus, it is an economically significant effect as well.

In the bottom panel of Table 5 the results are re-estimated excluding the University of New Haven and Johns Hopkins University. We do this because the quality of the synthetic's fit is relatively worse for these two institutions.[12] The effect of accreditation on university-wide applications is similar in magnitude and highly statistically significant. This provides confidence in the claim that AACSB accreditation contributes to enhanced applications. Further, the results in the bottom panel suggest that universities are enrolling students with high SAT Math scores. The 75th percentile score grows by almost 18 points. Thus, there may be an improvement in the student body as a consequence of the accreditation.

To delve a bit more into this finding, we present an event study analysis. Time is centered at $t = 0$ as the first year after accreditation. We limit analysis to those time periods common across all universities, $t \in [-15, 2]$. Specifically, we estimate

$$Y_{st} = \gamma_0 Synthetic_s + \sum_{t=-15, t\neq -1}^{2} \theta^t + \sum_{t=-15, t\neq -1}^{2} \delta^t \times Synthetic_s + \epsilon_{st}. \tag{2}$$

A separate indicator is used for each time period, θ^t, as are indicators which differentiate the synthetics from the actual universities, $\delta^t \times Synthetic_s$. The interaction between being a synthetic and the time period identifies whether, for each period, there is a discrepancy between the actual units and the synthetic values. Time period $t = -1$ is omitted. Thus, nonzero coefficients for δ^t on the time periods with negative values, indicate non-parallel trends in the pre-treatment periods. The coefficients for the interaction term with $t \geq 0$ indicates whether there is a difference in applications in the years after accreditation (i.e., causal treatment effect). Figure 2 depicts the results.

[12] The root mean squared prediction error in the pre-treatment periods for Johns Hopkins is 11249.94, which is 32.3 standard deviations greater than the median of 459.45 (of the other 14 institutions). New Haven's root mean squared prediction error is 7.5 standard deviations above the median. Thus, the quality of fit for these two institutions (at least considering applications) is relatively poorer than the others.

[Figure 2 about here.]

The actual and synthetic universities exhibit strong parallel trends in the pre-treatment time periods. A marked decline occurs in the years following accreditation. The event study confirms the causal interpretation of the results in Table 5. The rest of the outcome variables, on the other hand, do not necessarily record marked changes. First-year enrollment, price, and SAT scores all do not present statistically significant differences after AACSB accreditation in Table 5. While not presented here, if event studies are conducted, they too fail to show a nonzero treatment effect.[13] Thus, the university-wide impact of accreditation seems limited to applications.

3.3 Business School Enrollment

A reasonable critique is that AACSB is not intended to build up the overall university's demand, but rather it is targeted towards the quality of the business-related education provided. To address this we return to the IPEDS data. There, it also reports enrollment in business-related majors. While this allows us to track the number of students in business, it does not separately present SAT scores for these students, the number of applications from students planning to major in business fields, or separately present costs incurred by students in these programs. Nevertheless, it is important to appreciate how accreditation affects student enrollment. The IPEDS data provides undergraduate enrollment separate from graduate business enrollment. Thus, we consider both the total business enrollment and its breakdown. Each are reported in even-numbered years back to 1996.

First, we estimate the same econometric model as before, Equation (1), but use the new enrollment information as dependent variables. Table 6 presents.

[Table 6 about here.]

Surprisingly, undergraduate, graduate, and (consequently) total enrollment have a positive and statistically significant difference-in-difference coefficient. This means that AACSB accreditation, contrary to expectations, is associated with a decrease in business enrollment.

To investigate this further, we graphically depict the time series. Like Figure 1 we aggregate all 16 universities, normalize the values by the first time period, and graphically depict the movement in business school enrollment over time. Like university-wide applications, we recenter the data using time $t = 0$ as the first year of accreditation. Since, IPEDS provides field specific enrollment every other year, time is measured in two-year increments. Hence, $t = -1$, for example, is enrollment two years prior. Consequently, the normalization occurs in $t = -9$. Figure 3 presents total enrollment (both undergraduate and graduate enrollment) for those time periods consistent across all 16 institutions.

[13] In addition, we estimate a two-way fixed effects, staggered difference-in-difference model using all treated and donor units from 2001-20. The difference-in-difference coefficient of 1824.24 is statistically significant ($p < 0.05$) and confirms the causal effect of accreditation on applications. The results presented in Table 5 are our most reliable as the controls are observationally-equivalent to the treated observations (pre-treatment), so that treatment can be taken *as if* random.

[Figure 3 about here.]

Interestingly, while the match between the actual and synthetics is quite close initially, a sharp divergence begins in $t = -5$. This is a full decade prior to accreditation. The two lines are trending differently years before the universities choose to seek the third-party certification. The gap between the actual and synthetic enrollments after accreditation mirrors the gap prior.

This flat enrollment is robust. The left panel of Figure 4 compares business enrollment of the treated universities to their corresponding flagship, public institutions. Specifically, we identify the primary public university in the same state as each treated university. For example, for Northeastern Illinois University we collect business enrollment data for the University of Illinois. We then aggregate (and normalize) their business enrollments to act as an alternative comparison.

[Figure 4 about here.]

Clearly, again, a serious divergence begins four periods (i.e., eight years) prior to accreditation. While the treated universities have shrunk in enrollment by 5.4% from $t = -9$ (18 years prior) to the period before accreditation ($t = -1$), the synthetics have, collectively, grown by 107% and the flagship publics in the same states have grown by 50.5%.

Another natural comparison is to look at the performance of the universities who seek accreditation and of those schools who the treated universities identify as their peers. To gain full access to their data, NCES asks institutions to report the colleges and universities that they view as their peers. Thus, we use the self-identified peer institutions for our treated ones. Two universities (Kutztown and SUNY Fredonia) do not report peer institutions. For the 14 who do, the average number of self-identified peers is 15.9. We collect business enrollment for each peer institution. A small number has to be excluded. Occasionally, a treated university lists another treated university as its peer. We must also drop peers who do not report their data.[14] There are 185 unique higher educational institutions in the peer group.

For each treated university, we calculate the (unweighted) average of its peer institutions in total business enrollment each year. This creates a single peer comparison similar to the construction of the synthetic. The important difference is that the creation of the synthetics uses a formal error minimization process to determine the comparison. The peers are only the self-identified list of institutions, and it is uncertain how they were selected. We aggregate both the actual universities and their constructed peers and normalize the values by the enrollments nine periods prior to treatment (i.e., 18 years), as was done for the flagships. The right panel of Figure 4 depicts.

Just as with both the comparisons with the synthetics and flagships, the treated universities experience a decline in enrollment while their peer institutions experience an increase. Business enrollment is up 8.0%

[14] For example, a number of elite universities do not have undergraduate business programs and are listed by Johns Hopkins as its peer (e.g., Harvard). These are eliminated from the data set. There are also duplicates. For example, both Drake and Lawrence Tech consider Butler University as a peer. Therefore, Butler's business school enrollment is used in the calculation of each treated university's peer.

in the peer institutions from the initial period ($t = -9$) to the period just prior to accreditation ($t = -1$). This compares to a reduction by 9.2% in the universities seeking accreditation.[15] Again, non-parallel trends exists prior to seeking AACSB accreditation.

Hence, the results in Table 6 are not presenting a causal, negative impact of accreditation but are influenced by the non-parallel, pre-treatment time trends.

To correct for this we detrend the time series by the linear time trends for the actual and synthetic values. That is, for each type of cross-sectional unit in this panel data set (i.e., either the actuals or the synthetics) we estimate its linear time trend which best fits the observations in the pre-treatment time periods. From this, we calculate the residuals for all observations. In the time periods prior to the treatment these will take a mean value of zero and have a flat time trend. Divergences after the treatment capture the accreditation's trend shift. Specifically, for the detrending exercise, we first estimate

$$Y_{suy} = \beta_0 + \beta_1 Synthetic_s + \beta_2 Year_y + \beta_3 Synthetic_s \times Year_y + \epsilon_{suy}. \tag{3}$$

Only observations coming before university u is treated are used in the estimation. The estimated coefficient $\widehat{\beta}_0$ is the intercept term for the actual universities, while $\widehat{\beta}_0 + \widehat{\beta}_1$ is the intercept for the synthetics. Similarly, $\widehat{\beta}_2$ is the slope term for the actuals and $\widehat{\beta}_2 + \widehat{\beta}_3$ is the slope term for the synthetics. These estimated coefficients are used to create fitted values for all observations/time periods. The difference between the true value and the fitted value is the detrended residual of interest. This detrending process is done for total business enrollment, and the breakdowns into undergraduate enrollment and graduate enrollment. Table 7 presents the results.

[Table 7 about here.]

For graduate enrollment, the effect of AACSB accreditation essentially zeroes out. The improvement is highly statistically insignificant. For undergraduate enrollment and total enrollment, the coefficient is still positive and statistically significant. They are, though, substantially smaller. Thus, correcting for the non-parallel time trends, we are unable to identify a positive effect of accreditation on business school enrollment.

To illustrate the detrending's effect, we present an event study analysis. Time is centered at $t = 0$ as the first year after accreditation. We limit analysis to those time periods common across all universities, $t \in [-9, 0]$. Specifically, we estimate Equation (2) from before. A separate indicator is used for each time period and an indicator differentiates the synthetics from the actual universities. The interaction between being a synthetic and the period identifies whether, for each time period, there is a discrepancy between the actual units and the synthetic values. Again, time period $t = -1$ is omitted. Thus, nonzero coefficients for the interaction terms in time periods with negative values indicate non-parallel, pre-treatment trends.

[15] This decline is slightly larger than the 5.4% reduction previously reported as this figure excludes Kutztown and SUNY Fredonia.

The coefficient for the interaction term with $t = 0$ indicates whether there is a difference in business school enrollment two years after accreditation. Figure 5 depicts the results.

[Figure 5 about here.]

The correction essentially brings the point estimates closer to the zero-line for the pre-treatment years. It does not change the main message that AACSB accreditation does not produce identifiable increases in business school enrollments.

4 Conclusion

We analyze the impact of AACSB accreditation on student demand. To accomplish this, we use the Synthetic Control Method to assess the impact of AACSB accreditation on 16 schools that recently obtained the accreditation. A modest, positive impact was found on university-wide undergraduate applications, but not on total first-year enrollment, price, or student quality. However, when looking specifically at business programs, AACSB accreditation initially appears to result in a decrease in business school enrollment. When trends prior to AACSB accreditation are examined, though, we show an existing steady decline in business school enrollment prior to accreditation. Correcting for this, we fail to find evidence that AACSB accreditation improves this negative trend.

These results suggest that AACSB accreditation does not necessarily have a meaningful impact on university admissions. Our results could suggest that attaining AACSB accreditation may not create the revenue that justifies the cost of achieving that level of accreditation. But this is still debatable. It is worth emphasizing that student demand is one, albeit important, dimension to accreditation's potential value. Our study does not include its effects on faculty productivity, teaching quality, student placement and starting salaries, and alumni donations. A full calculation of all benefits and costs is beyond the scope of this study. We hope our results will contribute to these discussions.

Another concern is that we examine schools that recently obtained AACSB accreditation. This is necessary as coverage of pre-treatment data is needed to accurately identify the comparison units. The consequence, though, is that post-accreditation data is limited. While the results of this paper do not suggest AACSB accreditation reverses the negative trend seen by those business schools in the years immediately following the certification, it is possible that there may eventually be a positive impact after a longer period of time. One can also reasonably question whether the lack of effect we document from these institutions can be extrapolated to the decision of a currently accredited university deciding to no longer retain AACSB accreditation.

Finally, while we see an increase in applications after accreditation, we do not see an impact on enrollment. We also find mixed evidence on student quality. This suggests that the extra applications may have led to higher rejection rates and, maybe, an improvement in the student body (as measured by SAT scores).[16]

[16] We do return to the IPEDS data and collect acceptance rates. Following the same identification strategy, we find a statistically insignificant effect of accreditation.

On the other hand, accreditation may be simply generating applications from students who have limited interest and ultimately enroll elsewhere. AACSB may impact other indicators of student quality that we did not have data for, such as high school GPA. There may also be intra-university shifts in the distribution of students changing the make-up of who on a campus is studying business. In addition, we only have data on listed price. The increase in applications may have allowed institutions to reduce their price discounts. We simply do not have the data to explore these alternatives, but encourage future research on these margins.

5 Appendix

[Figure 6 about here.]

[Figure 7 about here.]

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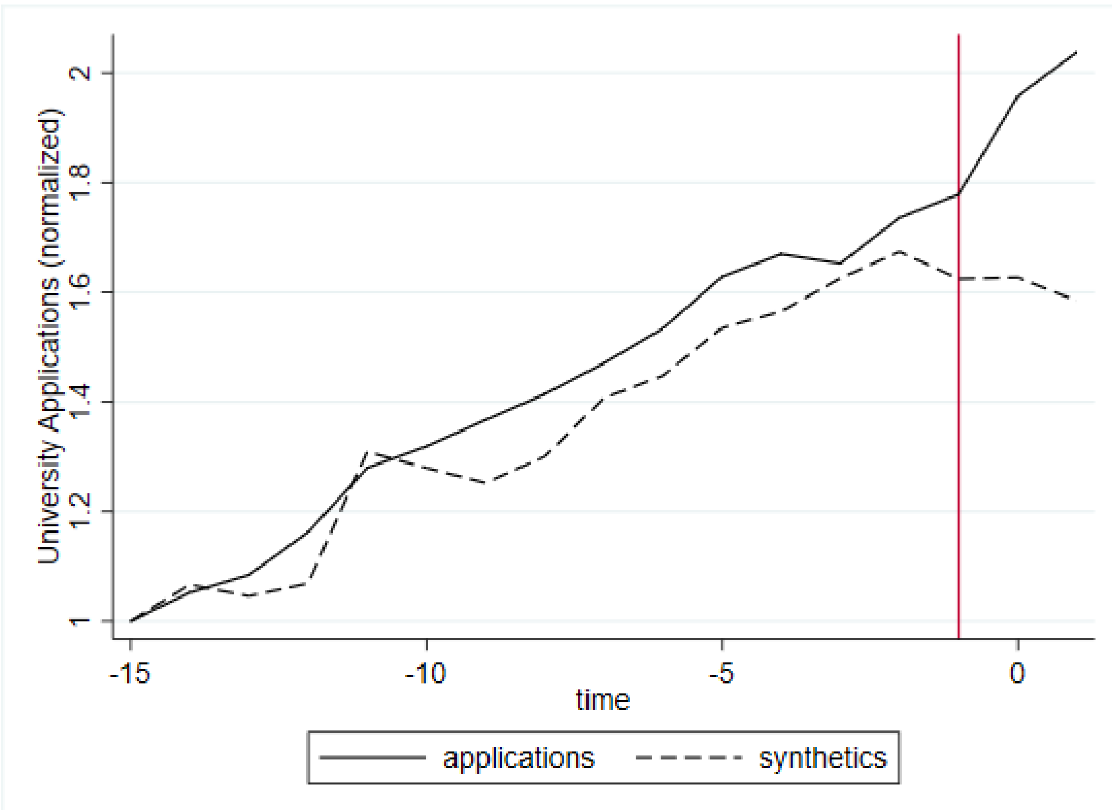
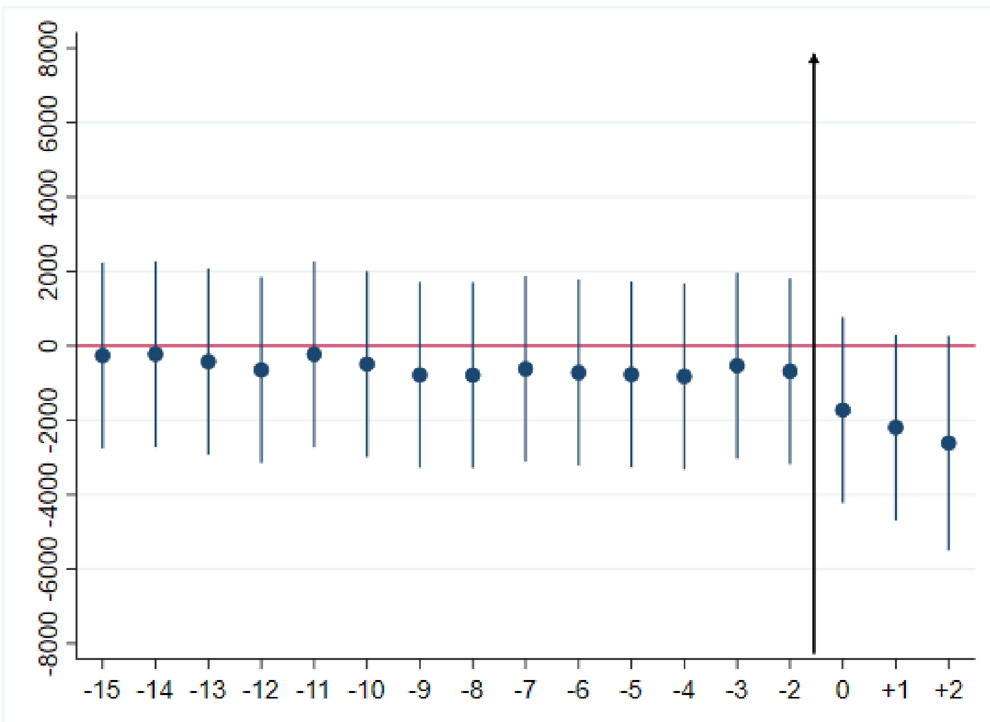
List of Figures

Figure 1: University-wide Applications



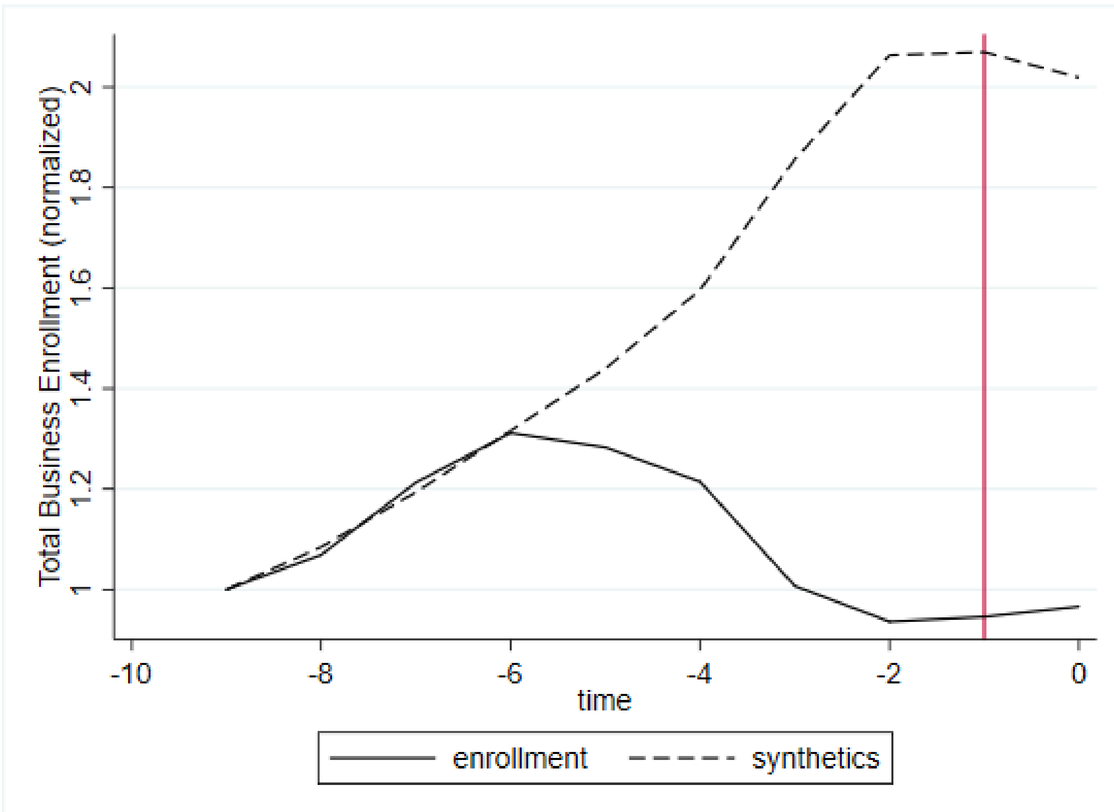
The total (undergraduate) applications received by the university is depicted. Applications are aggregated for all 16 treated universities. The solid line is the sum of the actual universities and the dashed line is the sum of the synthetics for each treated university. The values are normalized by the total enrollments observed 15 periods prior to accreditation. University undergraduate applications is reported every year.

Figure 2: University-wide Applications Event Study



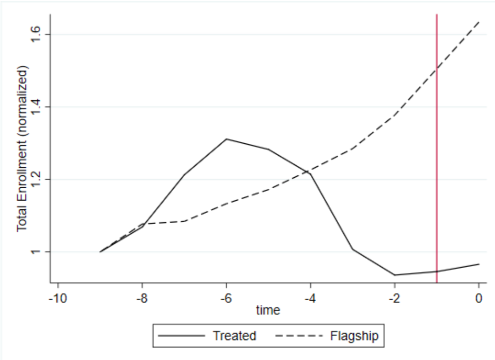
University applications is the dependent variable. The coefficient estimates, along with their 95% confidence intervals, for the interactions between the time period and being a synthetically-created observation are depicted. Time period $t = -1$ is omitted.

Figure 3: Business School Enrollment

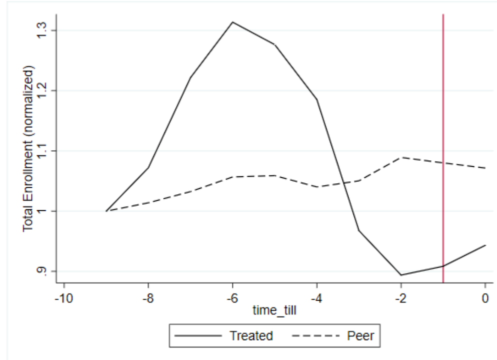


The total enrollment in majors offered by the university's business school is depicted. Enrollment in both undergraduate programs and graduate programs is aggregated for all 16 treated universities. The solid line is the sum of the actual universities and the dashed line is the sum of the synthetics for each treated university. The values are normalized by the total enrollments observed 9 periods prior to accreditation. Business school enrollment is reported every two years (in even numbered years).

Figure 4: Comparing Business Enrollment



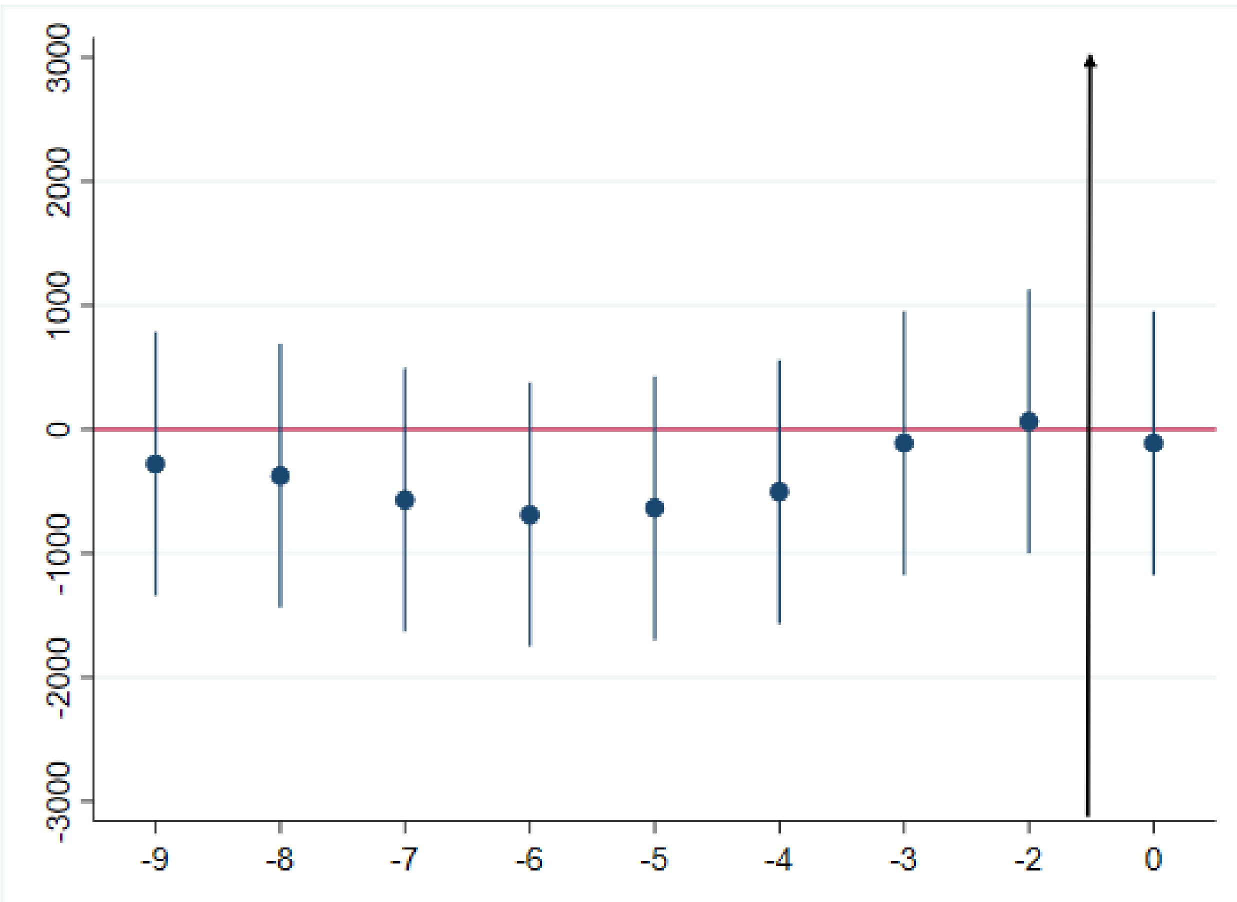
(a) Comparing to Flagships



(b) Comparing to Peers

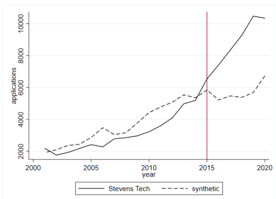
Enrollment in majors offered by the treated university's business school is depicted in the solid line. Business enrollment in the corresponding flagship, public universities is depicted with the dashed line in the left panel. Business enrollment in the self-identified peer institutions is depicted with the dashed line in the right panel. Total enrollment in both undergraduate and graduate programs are presented. The values are normalized by the enrollment values observed nine periods prior to accreditation. Business school enrollment is reported every two years (in even numbered years). Two treated universities (Fredonia and Kutztown) do not report peer institutions to NCES. Hence, they are excluded from the treated list in the right panel.

Figure 5: Business School Enrollment Event Study

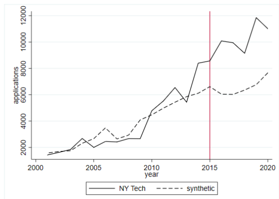


Enrollment in programs offered by the university's business school,both undergraduate and graduate, is depicted. Business school enrollment is reported every two years (in even numbered years). The left panel depicts total enrollment. The right panel depicts the detrended values.

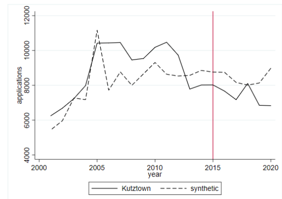
Figure 6: Accreditation & University Applications



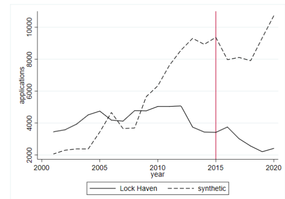
(a) Stevens Tech



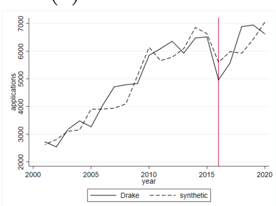
(b) NY Tech



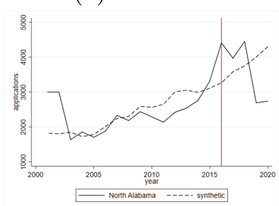
(c) Kutztown



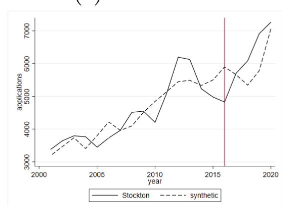
(d) New Haven



(e) Drake



(f) North Alabama



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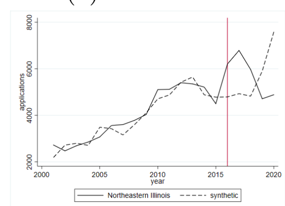
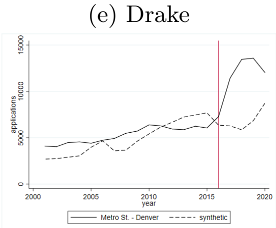
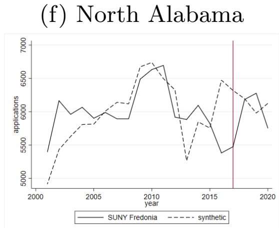


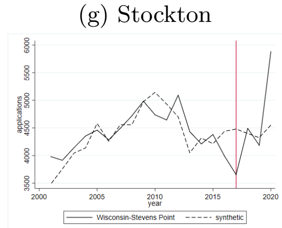
(h) NE Illinois



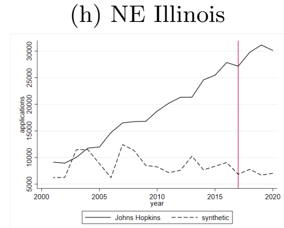
(i) Metro St



(j) SUNY Fredonia

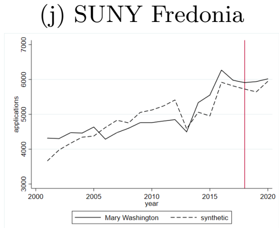


(k) Wisc-Stevens Point

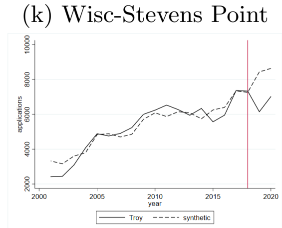


(l) Johns Hopkins

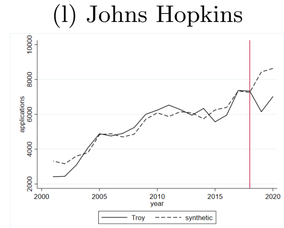
(m) Western Conn St



(n) Mary Washington

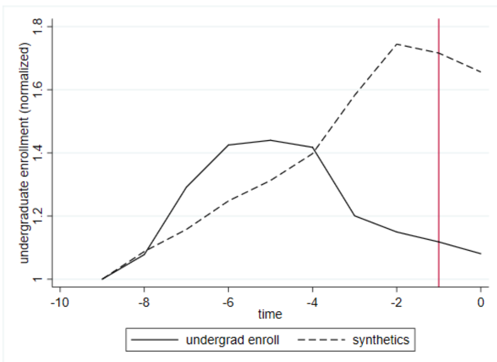


(o) Troy

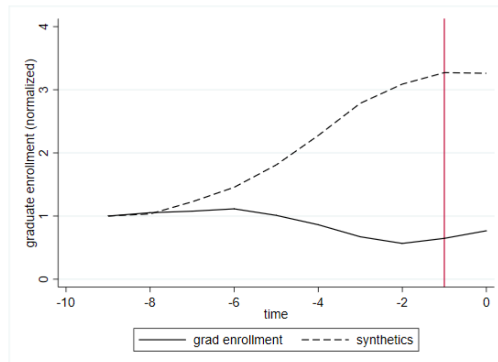


(p) Lawrence Tech

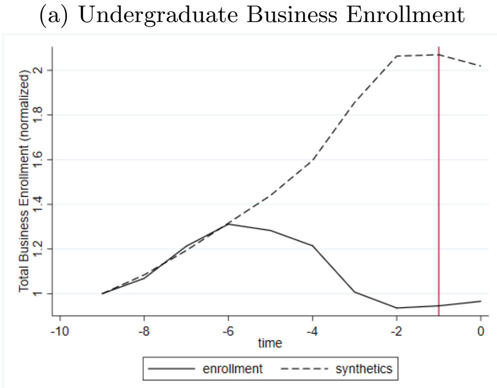
Figure 7: Business School Enrollment (breakdown)



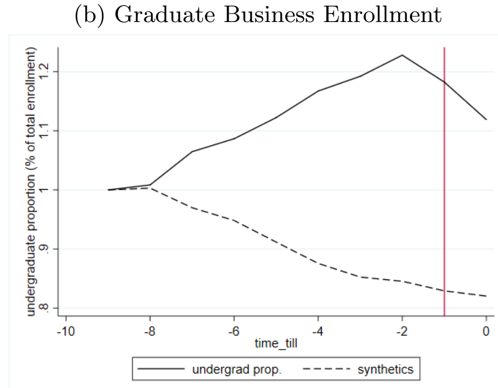
(a) Undergraduate Business Enrollment



(b) Graduate Business Enrollment



(c) Total Business Enrollment



(d) Undergrad Prop.

Enrollment in majors offered by the university's business school is depicted. The solid line is the sum of the actual universities and the dashed line is the sum of the synthetics for each treated university. The values are normalized by the enrollment values observed 9 periods prior to accreditation. Business school enrollment is reported every two years (in even numbered years). The top left panel, (a), depicts undergraduate enrollment. The top right panel, (b), depicts graduate student enrollment. The bottom left panel, (c), presents total enrollment in both undergraduate programs and graduate programs. The bottom right panel, (d), considers the proportion of total enrollment that is undergraduate enrollment. The values of this last panel is not normalized.

List of Tables

Table 1: Universities Achieving AACSB Accreditation: 2015-18

university	year	university	year
Kutztown University of Pennsylvania	2015	SUNY at Fredonia	2017
New York Institute of Technology	2015	Johns Hopkins University	2017
University of New Haven	2015	University of Wisconsin - Stevens Point	2017
Stevens Institute of Technology	2015		
Drake University	2016	Western Connecticut State University	2018
Stockton University	2016	Lawrence Technological University	2018
University of North Alabama	2016	Troy University	2018
Metropolitan State University of Denver	2016	University of Mary Washington	2018
Northeastern Illinois University	2016		

Table 2: Descriptive Statistics: Donor Pool

	coverage	# obs.	μ	σ	min.	max.
Applications	2001-20	3700	2756.885	3113.372	221	61649
Applications: gender distribution	2001-20	3700	0.6039	0.1213	0.131	1
First-year enrollment	2001-20	3,700	537.36	552.09	22	15,720
Enrollment: gender distribution	2001-20	3700	0.5890	0.1279	0.0147	1
SAT Reading: 25th percentile	2001-20	3700	451.18	46.74	51.7	660
SAT Reading: 75th percentile	2001-20	3700	560.36	51.37	400	800
SAT Math: 25th percentile	2001-20	3700	451.97	46.80	280	670
SAT Math: 75th percentile	2001-20	3700	451.87	46.85	280	670
Price: in-state	2001-20	3700	31,778.84	12,192.33	2458	71,624
Price: out-of-state	2001-20	3700	33,157.77	10,999.06	4876	71,624
Undergraduate student body size	2001-20	3700	3014.38	4395.56	189	111,599
Undergraduates: gender distribution	2001-20	3700	0.6093	0.1087	0.1492	0.9871
Undergraduates: White	2010-20	2035	0.5803	0.2468	0	0.9070
Undergraduates: Hispanic	2010-20	2035	0.0845	0.10950	0	0.7929
Undergraduates: Foreign	2010-20	2035	0.0297	0.0309	0	0.2418
No. students receiving Pell grants	2008-20	2405	1236.40	2205.79	60	43,057
Endowment	2003-19	3145	37,900,238	55,584,903	65,226	1.43×10^9
Faculty size	2012-20	1665	152.37	131.07	17	1756
Retention rate	2003-20	3330	72.34	8.78	18	100
Student-faculty ratio	2008-20	2405	14.16	3.43	5	45

Descriptive statistics include filled in missing values from the linear interpolation process. The 185 donor pool institutions of higher education considered.

Table 3: Schools Making Up the Synthetics

Kutztown		*New York Tech*		*New Haven*		*Stevens Tech*	
university	weight	university	weight	university	weight	university	weight
Oakwood	0.020	Woodbury	0.235	Kentucky St.	0.080	Redlands	0.109
Woodbury	0.048	Bridgeport	0.167	Ferris St.	0.239	Point Loma	0.248
Bridgeport	0.189	Gallaudet	0.128	Millersville	0.639	Kettering	0.055
Kettering	0.197	Indianapolis	0.142	Liberty	0.042	Norwich	0.541
Colby-Sawyer	0.101	Xavier (LA)	0.058			Liberty	0.047
So. New Hamp.	0.012	New England	0.067				
Tiffin	0.097	Lindenwood	0.061				
Arcadia	0.241	Ashland	0.047				
Liberty	0.095	Liberty	0.063				
		Virgin Islands	0.032				

Drake		*Stockton*		*North Alabama*		*Metro St. - Denver*	
university	weight	university	weight	university	weight	university	weight
Ferris St.	0.027	Biola	0.137	Goldey-Beacom	0.177	Chicago St.	0.068
York	0.091	Cedarville	0.548	Albany St.	0.081	New Jersey City	0.004
Norwich	0.283	Millersville	0.284	LSU-Alexandria	0.022	SUNY Morrisville	0.020
Liberty	0.035	Liberty	0.031	So. New Hamp.	0.019	Northeastern St.	0.399
Roanoke	0.564			NW Oklahoma St.	0.048	California (PA)	0.139
				Millersville	0.087	Lock Haven	0.139
				Dakota St.	0.010	Tarleton St.	0.134
				Northern St.	0.083	Liberty	0.087
				Lee	0.275	Cal St.-Channel Isl.	0.010
				Tarleton St.	0.091		
				Liberty	0.005		
				Fairmont St.	0.102		

Northeastern Illinois		*SUNY Fredonia*		*Johns Hopkins*		*Wisconsin-Stevens Point*	
university	weight	university	weight	university	weight	university	weight
Ferris St.	0.016	Ferris St.	0.002	Alabama St.	1.000	Harding	0.030
New Jersey City	0.520	SUNY Morrisville	0.020			Gallaudet	0.007
Northeastern St.	0.308	Cedarville	0.078			Albany St.	0.004
Our Lady of the Lake	0.108	Millersville	0.780			Ferris St.	0.025
Liberty	0.048	Slippery Rock	0.120			Madonna	0.023
						So. New Hamp.	0.006
						Northeastern St.	0.282
						California (PA)	0.132
						Millersville	0.333
						Slippery Rock	0.130
						Northern St.	0.025
						Liberty	0.003

Western Conn St.		*Lawrence Tech*		*Troy*		*Mary Washington*	
university	weight	university	weight	university	weight	university	weight
Thomas More	0.219	Mobile	0.055	Florida A&M	0.219	Lewis	0.113
Ferris St.	0.044	Baker	0.088	Saint Leo	0.177	Saint Ambrose	0.173
Bethel	0.201	Dillard	0.022	Ferris St.	0.029	Cedarville	0.097
Plymouth St.	0.187	Madonna	0.295	Central St.	0.189	Millersville	0.559
Central St.	0.034	Methodist	0.173	Mansfield	0.343	Fisk	0.058
Geneva	0.006	Cedarville	0.079	Liberty	0.043		
Millersville	0.135	Ok. Christian	0.139				
York	0.037	Geneva	0.115				
Tarleton St.	0.135	Saint Martin's	0.034				
Cal St.-Channel Isl.	0.005						

Due to substantial missing information, the creation of the synthetic Metro St. - Denver does not include in-state or out-of-state price. Similarly, Northeastern Illinois, Wisconsin - Stevens Point, Troy, and Western Connecticut St. do not include the four SAT measurements. Georgia Gwinnett is dropped completely as it is missing substantial amounts of information on applications, enrollment, and SAT scores.

Table 4: Comparing Subsamples

	actual	synthetic	donor pool
Applications	5207.24	4720.39	2472.39
Applications: gender distribution	0.5218	0.5604	0.5993
First-year enrollment	1156.91	961.41	530.55
Enrollment: gender distribution	0.5067	0.5373	0.5806
SAT: Read 25th percentile	568.61	445.90	444.52
SAT: Read 75th percentile	516.72	554.25	554.44
SAT: Math 25th percentile	526.62	452.18	446.75
SAT: Math 75th percentile	593.63	557.71	558.75
Price: in-state	25194.42	24677.70	28368.23
Price: out-of-state	29896.54	28273.19	29763.53
Undergraduate student body size	7220.09	5448.86	3024.41
Undergraduate: gender distribution	0.5147	0.5577	0.6039
Undergraduate: white	0.5726	0.6058	0.6149
Undergraduate: hispanic	0.1205	0.0709	0.0874
Undergraduate: foreign	0.0508	0.0250	0.02945
No. students receiving Pell grants	2374.38	2404.69	1222.40
Endowment	205,967,761	38,008,753	32,311,418
Faculty size	492.47	273.46	155.21
Retention rate	83.70	73.51	71.87
Student-faculty ratio	16.34	16.79	14.65

The first column averages the values over the 2001 to 2015 time periods for the 16 treated universities. The second column averages the values over the same time period for the 16 synthetics. The final column considers the full donor pool (unweighted) average over the 2001 to 2015 time period.

Table 5: Average Treatment Effect

	quantity		*price*		*quality*			
	Applications	Enrollment	In-State	Out-of-State	Math: 25th	Math: 75th	Read: 25th	Read: 75th
Full Set								
Post x Synthetic	-693.03 *	86.44	1113.57	211.96	13.10	-6.25	5.29	6.03
	(411.83)	(56.59)	(1522.47)	(1252.97)	(11.82)	(12.18)	(11.40)	(10.45)
Synthetic	-645.21 ***	-195.49 ***	-440.12	-72.89 ***	-1782.30 ***	-28.47 ***	-116.72 ***	40.38 ***
	(186.95)	(25.69)	(688.36)	(5.52)	(566.51)	(5.69)	(5.32)	(4.88)
Year Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
University Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.655	0.647	0.732	0.544	0.760	0.371	0.654	0.520
N	640	640	560	560	480	480	480	480
Excluding New Haven and Johns Hopkins								
Post x Synthetic	-580.89 ***	77.47	137.59	-545.29	7.03	-17.76 **	-9.08	4.43
	(225.84)	(63.94)	(903.79)	(796.92)	(9.07)	(8.98)	(7.12)	(8.27)
Synthetic	-140.00	-192.97 ***	1082.45 ***	-433.21	-57.60	-5.82	-104.29 ***	62.54 ***
	(101.69)	(28.79)	(404.49)	(356.66)	(4.21)	(4.18)	(3.31)	(3.84)
Year Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
University Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.740	0.649	0.908	0.905	0.693	0.556	0.829	0.742
N	560	560	480	480	400	400	400	400

Data includes the filled-in, missing values from the linear interpolation process. Each specification includes 20 year fixed effects (2001-20) and university fixed effects. Standard errors are presented in parentheses; *** 1%, ** 5%, * 10% level of significance. The top panel includes all 16 treated and 16 synthetic units. The bottom panel excludes Johns Hopkins University and University of New Haven due to poor fits between the synthetic and actual observations prior to treatment.

Table 6: Average Treatment Effect: Business School Enrollment

	Undergraduate Enrollment	Graduate Enrollment	Total Enrollment	Undergraduate (as % of total)
Post x Synthetic	409.92 ***	226.45 **	644.53 ***	-0.032
	(144.69)	(90.81)	(183.26)	(0.044)
Synthetic	-363.37 ***	-253.82 ***	-654.55 ***	0.122 ***
	(63.80)	(40.04)	(80.81)	(0.019)
Year Fixed Effects?	Yes	Yes	Yes	Yes
University Fixed Effects?	Yes	Yes	Yes	Yes
R^2	0.586	0.464	0.557	0.528
DV μ	914.56	347.29	1243.81	0.750

Panel data set includes the 16 treated universities and the corresponding 16 synthetics (i.e., 32 cross-sectional units) over the 1998 to 2020 academic years (even years only); N = 384. Data includes the filled-in, missing values from the linear interpolation process. Each specification includes 12 year fixed effects and 16 university fixed effects. Standard errors are presented in parentheses; *** 1%, ** 5%, * 10% level of significance.

Table 7: Detrended Business School Enrollment Results

	Undergraduate Enrollment	Graduate Enrollment	Total Enrollment
Post x Synthetic	383.63 ***	-9.312	379.76 **
	(144.69)	(89.46)	(182.48)
Synthetic	-1.02	-6.90	-7.30
	(63.80)	(39.45)	(80.47)
Year Fixed Effects?	Yes	Yes	Yes
University Fixed Effects?	Yes	Yes	Yes
R^2	0.536	0.435	0.516
DV μ	-40.14	11.24	-28.12

Panel data set includes the 16 treated universities and the corresponding 16 synthetics (i.e., 32 cross-sectional units) over the 1998 to 2020 academic years (even years only); $N = 360$. Each dependent variable is detrended. Each specification includes 12 year fixed effects and 16 university fixed effects. Standard errors are presented in parentheses; *** 1%, ** 5%, * 10% level of significance.