Market Value of U.S. Universities

Benjamin Bennett Jaewon Choi Chanik Jo Yoshio Nozawa*

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Abstract

We estimate the market value of "equities" of U.S. private universities by applying a structural credit risk model to the observed credit spreads of their bonds. We find that Yale University is at the top of the ranking, valued at $151 billion, followed by Harvard and Stanford. Should they be listed, their values would be comparable to McDonald's and Intel. Taking advantage of our panel data on the monthly market value of universities, we conduct a difference-in-differences analysis to assess the impact of recent policy changes on university values. The student debt relief announced in March 2020 increased the market value by 17.4%, while the research funding freeze in March 2025 decreased it by 39.4%.

JEL Classification: G12, G13

Keywords: Municipal Bonds, Nonprofits, Structural Model of Debt, Merton Model

*Benjamin Bennett is at Texas Christian University, email: ben.bennett@tcu.edu, Jaewon Choi is at the Seoul National University, email: jaewchoi@snu.ac.kr, Chanik Jo is at the Chinese University of Hong Kong, email: chanikjo@cuhk.edu.hk, and Yoshio Nozawa is at the University of Toronto, email: yoshio.nozawa@rotman.utoronto.ca.

1 Introduction

What is a university worth? Universities are formally organized as nonprofit institutions, tasked with advancing research, education, and public service. Yet in practice, modern universities—particularly in the U.S.—operate at a scale and complexity that resembles large corporations. They generate revenue through tuition, research funding, financial investments, and commercial activities including intellectual property licensing, intercollegiate athletics, and increasingly, digital and for-profit educational ventures. This raises a natural but unexplored question: can we assign a market value to universities analogous to the equity value of corporations?

In this paper, we quantify the equity value of universities from a market-based perspective. Specifically, we estimate the present value of future cash flows available after servicing debt obligations. At first glance, applying an equity valuation framework to nonprofit institutions may seem misplaced: their mission is not profit maximization, and they do not have shareholders. Our approach is instead motivated by the observation that universities share many defining features of corporations. They operate as going concerns with limited liability protection, are governed by boards of trustees analogous to corporate boards, and are led by presidents who perform roles and face career concerns similar to those of chief executive officers. Moreover, universities access capital markets—particularly through bond issuance—reinforcing their similarity to corporate entities.

Our measure of universities' equity reflects the market's assessment of the present value of net cash flows to universities, *not* the values articulated in their mission statements—such as those associated with educational and scholarly activities—unless these are realized as cash flows. This monetary valuation is of independent interest, both for policy purposes and for better understanding the societal role of universities. If universities adhere strictly to their mission statements while forgoing profit-oriented activities, their implied equity value, defined as discounted future cash flows, should be limited. By contrast, if we estimate substantial equity values, this suggests that universities generate significant cash flows beyond what would be expected under a purely mission-driven model. In this sense, our estimates provide a quantitative lens through which to assess the extent of commercialization in modern higher education.

As an illustration of university cash flows, Figure 1 below depicts the income statement of the average university in our sample. In 2023, this university reports revenues of $678 million—including, e.g., program service revenue, investment income, and grants and contributions—and expenses of $609 million, the largest components of which are employee compensation and benefits, student aid, and operating and debt service costs. The remaining $69 million represents net cash flows, or *earnings* in corporate terminology, generated in 2023. These cash flows evolve over time with the university's operating environment and, unlike in corporations, are reinvested within the institution rather than distributed to external claimants. Abstracting from this reinvestment, the value of university equity can be viewed as the present value of expected future cash flows, discounted to 2023, thus providing a forward-looking assessment of the university's operations.

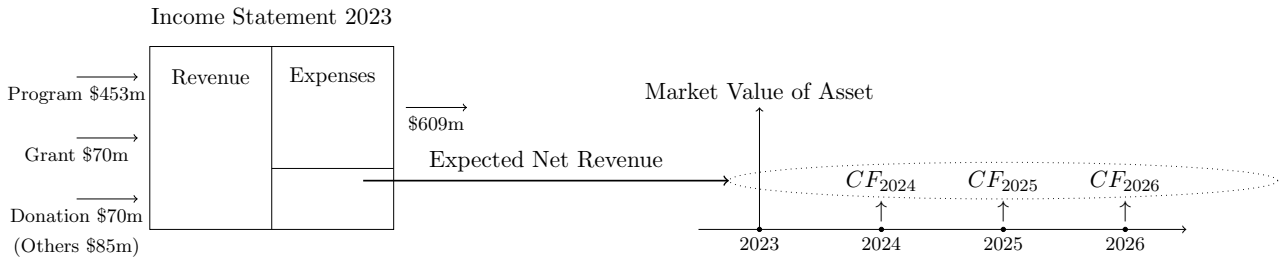


Figure 1: Income Statement of the Average University and Its Market Value

While conceptually straightforward, this valuation is challenging because it requires assumptions about unobservable growth rates and discount rates for universities' cash flows. Our approach circumvents this challenge by backing out the market value of equity from traded prices of contingent claims written on universities' future cash flows. In particular, we draw on the structural credit risk framework of Merton (1974), in which equity and debt values are jointly determined through contingent claims pricing. Although universities do not issue equity, they issue publicly traded bonds. We thus reverse the standard procedure of inferring credit spreads from observed equity prices and equity volatility (e.g., Jones et al. 1984) and instead estimate the equity value from observed credit spreads and bond volatility. This idea is analogous to reverse-engineering the Black–Scholes model: given the observed price of a put option (i.e., a defaultable bond), along with a strike price and volatility, one can infer the value of the underlying asset and, in turn, the value

of a call option (i.e., equity).

As such, our estimates reflect *market participants' views* of universities, independent of their stated missions or any presumption of profit maximization. Typical mission statements of nonprofit universities focus on education and research for the broader public, which may or may not be realized as profits. From the perspectives of bond investors, what matters is the outlook for future cash flows rather than stated objectives. Thus, by design, our estimate does not directly capture any public value generated by universities. Such externalities enter the valuation only to the extent that they are recognized and monetized in cash flows. Likewise, our approach does not impose profit-maximizing behavior as in for-profit corporations. Instead, it recovers the "as-is" expectations embedded in bond prices regarding universities' current and future operations.

We construct a monthly panel dataset of nonprofit private U.S. universities that issue bonds, covering 282 institutions from July 2011 to June 2025. We merge bond-level data with financial statement information—including total assets, liabilities, and revenues—reported to the Internal Revenue Service (IRS) by tax-exempt organizations. This dataset allows us to estimate the market value of equity for each university at a monthly frequency.

Our baseline approach to estimating the market value of equity is a structural credit risk model with stochastic volatility, following Du et al. (2019). The model maps observed credit spreads and bond-implied volatility to the implied market values of universities' assets and equity. An important advantage of this framework is its ability to price corporate bonds in a manner consistent with observed corporate equities. The model achieves this consistency by explicitly capturing asymmetries between upside and downside risk—a well-documented empirical feature across markets (e.g., Choi and Richardson 2016) that is likely to hold in municipal bond markets. As an issuer's asset value declines, its volatility increases, effectively amplifying downside tail risk. Investors demand compensation for bearing this risk, which is reflected in the model as a negative price of variance risk.

Based on our estimates, we present three main results. First, our estimates indicate that the market value of private universities is substantial. Ranking universities based on their market value over the last five years in the sample, Yale University is listed as the largest university with a market

capitalization of $151.1 billion, comparable to McDonald's Corporation and Intel Corporation, and would be ranked as the 47th largest among listed public corporations. Harvard University ($150.9 billion) and Stanford University ($134.9 billion) rank second and third, respectively. Importantly, these rankings are not a mechanical reflection of their balance sheet size. The market-to-book ratio of Yale is estimated at 4.19, higher than that of Harvard (2.80) and Stanford (3.06).

We examine the aggregate university index, defined as the sum of all universities' total market value. From 2011 to 2021, it comoved with the CRSP aggregate stock index, with a similar growth rate and a sharp, short-lived decline in March 2020. During this period, the ratio of the university index to the CRSP stock market index ranges between 2% and 4%, a ratio comparable to that of the real estate or utility sector in the S&P 500 index. However, after 2022, the university index appears to underperform, registering negative returns.

Second, we study the determinants of universities' equity market-to-book ratios. A panel regression of these ratios on university characteristics reveals that the growth rate in program service and contribution revenues, the financial investment-to-asset ratio, and the U.S. News rankings positively influence market value. Conversely, the ROA volatility is negatively associated with market value. The most significant determinant is the book leverage (debt-to-asset ratio), which accounts for 24% of the variation in the ratios. We interpret this as favorable financing conditions that simultaneously increase equity valuations and encourage more borrowing. In sum, investors appear to expect higher future cash flows and lower risk from universities that demonstrate strong revenue growth and extensive financial investments, resulting in a higher valuation.

As the third set of results, we assess the impact of recent policy changes regarding universities. The availability of monthly market prices allows us to identify their impact on the valuation of universities using a standard difference-in-differences method. This approach takes advantage of the fact that some universities are more exposed than others to policy shocks, and bond credit spreads react immediately to policy announcements. Thus, a regression of the log market value on a dummy variable indicating the period after policy announcements, and its interaction with a dummy for highly exposed universities, allows us to identify the causal impact on university value.

As a first example, we study the impact of the excise tax on endowments proposed in March

2025. Since the tax applies only to universities with endowments above a cutoff amount, we can create treatment and control groups. Our regression analysis indicates that this policy reduced the market value of the affected universities by 25.3%. The impact is more pronounced for the universities that are also subject to the funding freeze announced in the same month, and for those that received a warning letter from the U.S. Department of Education's Office for Civil Rights (OCR) regarding the anti-Semitic conduct.

The second example of our policy analysis concerns the impact of the federal student loan payment pause introduced in March 2020. This policy, backed by the Coronavirus Aid, Relief, and Economic Security (CARES) Act, reduced the debt burden of students and thus potentially increased the revenue flows to universities that depend on tuition financed by student loans. Using the top tercile of universities in terms of the percentage of undergraduate students awarded federal loans as the treated group, we find that the policy increased market value by as much as 17.4%, or $175 million per university.

As the third example, we examine the impact of the intensified visa restrictions and deportations affecting Chinese international students that gained significant attention in May 2024. This policy, amid escalating US-China tensions, may have raised concerns about disruption to enrollment and reduced tuition revenue for universities heavily dependent on tuition from Chinese international students. Using universities in the top tercile of both the share of international students and the share of Asian students as the treated group, we find that the policy decreased market value by 28.3%, with a pronounced impact on universities with high exposure to international students. These tests highlight the importance of our estimates, as they allow researchers to quantify policy impacts on the education sector in dollar terms.

At the core of our argument is the idea that bond prices issued by universities reflect investors' assessment of default risk – that is, the probability of a low cash flow scenario. To support this argument, we present several case studies of bonds that defaulted in our sample. In five out of the six cases, the borrowing universities filed for bankruptcy protection and eventually liquidated their assets, including real estate and endowment funds, to pay their creditors. Notably, bond investors anticipated such actions, and bond prices declined sharply around default events.

Furthermore, we compare the liquidity of university bonds with that of corporate bonds that have the same credit rating. We find that university bonds are slightly more actively traded than corporate bonds. For instance, the ratio of monthly trading volume to the bond amount outstanding (turnover rate) is 7.3% for AAA-rated university bonds and 5.4% for AAA corporate bonds. This observation supports our assumption that university bond prices reflect investors' expected cash flows and risk premiums.

This paper contributes to the literature on finance and universities that largely focuses on the role of endowments. This body of research highlights their central role in mediating financial strategy, governance, and educational outcomes. Studies show that payout rules, liquidity constraints, and investment choices jointly shape institutional risk-taking and long-run stability (Gilbert and Hrdlicka 2015; Dimmock et al. 2024; Brown et al. 2014). Managerial expertise and responsible investment policies influence asset allocation, fundraising, and volatility, though effects on net performance are mixed (Aragon et al. 2025; Binfarè and Harris 2025; Binfarè et al. 2022). Expansions in student credit markets raise tuition and alter pricing incentives (Lucca et al. 2018), while endowment size and prestige reinforce competitive hierarchies and student sorting across universities (Avery et al. 2012). Most closely related to our paper is Binfarè and Zimmerschied (2024), who describe the usage of debt by universities.

Nonprofit organizations play a distinctive role in the economy, providing essential services while operating under governance structures distinct from for-profit firms. Recent research reveals that despite their non-distributive nature, these entities exhibit sophisticated financial behavior. Leone and Van Horn (2005) and Eldenburg, Gunny, Hee, and Soderstrom (2011) show that nonprofit hospitals engage in both accrual-based and real activities management to meet financial and reputational goals, while Krishnan, Yetman, and Yetman (2006) find that governance quality critically shapes reporting accuracy. In capital allocation, Adelino, Lewellen, and Sundaram (2015) demonstrate that nonprofits invest rationally yet remain constrained by internal liquidity and mission considerations. Complementing this empirical evidence, economic theory provides a rationale for nonprofit forms: Glaeser and Shleifer (2001) argue they mitigate trust and contract enforcement problems; Besley and Ghatak (2005) propose a motivated-agent model highlighting mission align-

ment; and Lakdawalla and Philipson (2006) offer evidence that nonprofit entry can enhance market efficiency. Together, these studies portray nonprofits as mission-oriented yet financially responsive organizations that strategically navigate constraints similar to their for-profit counterparts.

Donor and executive behavior further illustrate the interplay between mission and financial discipline. Andreoni and Payne (2011) find that public funding can crowd out private donations by diminishing fundraising incentives, while Balsam and Harris (2014) show that excessive CEO pay erodes donor trust. On the governance side, Babenko, Bennett, and Sen (2025) document that the New York Nonprofit Revitalization Act reduced CEO pay, underscoring the role of regulation, and Lewellen (2020) finds that hospitals led by women achieve superior outcomes without sacrificing efficiency. Even within religious institutions, Hartzell, Parsons, and Yermack (2010) reveal that compensation links to organizational performance, suggesting the persistence of incentive mechanisms across contexts.

This paper also contributes to the extensive literature on the structural model of debt. Starting from Huang and Huang (2012), many studies explore the ability of the model to accurately describe observed credit spreads. Examples include Cremers, Driessen, and Maenhout (2008), Bao (2009), Chen, Collin-Dufresne, and Goldstein (2009), Bhamra, Kuehn, and Strebulaev (2010), Chen (2010), Gourio (2013), Kuehn and Schmid (2014), He and Milbradt (2014), Christoffersen, Du, and Elkamhi (2017), McQuade (2018), Chen et al. (2018), Du, Elkamhi, and Ericsson (2019), and Shi (2019). Notably, Fleckenstein and Lonfstaff (2023) and Hüther, Schmid, and Steri (2024) back out the equity values of private firms from observed credit-related securities.

While previous research has been somewhat skeptical about the ability of the structural models to price bonds, more recent research provides a more positive assessment of their pricing ability. Feldhütter and Schaefer (2018, 2023) report that the BC model for zero-coupon bonds performs well in matching the average IG bond spreads over swap rates. Bai et al. (2020) argue that by incorporating jump risk, the performance of the model improves significantly.

The rest of the paper is organized as follows: In Section 2, we describe our data. In Section 4, we present a structural model of default risk. In Section 5, we present the main results on the estimated market value of universities. Section 6 provides concluding remarks.

2 Data

2.1 Data Sources

Nonprofit organizations such as universities are required to file IRS Form 990, 'Return of Organization Exempt from Income Tax', which includes the financial statements. We download this information from the National Center for Charitable Statistics website.[1] We select a sample of universities by narrowing down to entities that file Schedule E, 'Schools'. The website provides the data from fiscal years 2008 to 2024. However, we start our sample in 2010 because the coverage in 2008 and 2009 is poor. Unlike for-profit organizations, this information is filed within five months after the end of the fiscal year, but is released with a long lag time. For example, information from the fiscal year ending in June 2023 is released after June 2024. As Form 990 is mandatory only for nonprofit organizations, our sample excludes public universities and for-profit institutions.[2]

We obtain university characteristics, such as the number of students and admission-related variables, from the Integrated Postsecondary Education Data System (IPEDS), which is a comprehensive annual census of U.S. postsecondary institutions that participate in federal student financial aid programs. Starting in 1986, data are collected directly from institutions through a series of interrelated survey components covering enrollment, completions, graduation rates, finances, human resources, student aid, and institutional characteristics.

For bond data, we use transaction information from the Municipal Securities Rulemaking Board (MSRB), obtained through WRDS. This database records the prices and volumes of municipal bond transactions reported by dealers, including bonds of nonprofit organizations such as universities. We create a monthly panel data on bond prices as follows: First, following Schwert (2017), we calculate the daily mid price of a bond by averaging the lowest bid price and the highest ask price on the same day. If we do not find bid and ask prices on the same day, we calculate the volume-weighted average interdealer price of the bond and use it as the mid price. If we do not find a transaction that satisfies either condition, we treat the bond price on that day as missing. Second, we use the last trade date for each bond to create a monthly panel data at the bond-month level.

[1] https://nccs.urban.org/

[2] Tables A3 and A4 present the summary statistics of the variables in this data set.

We use the Mergent Municipal Bond Securities Data (Mergent) to obtain the bond characteristics, such as issue dates, maturity dates, issue amounts, and call and put provisions. Using the database, we remove bonds that are insured by the third party, revenue bonds that are tied to specific projects (e.g., student dormitories), and taxable bonds.

Embedded call options distort bond prices, and thus we must account for the bias properly. Our strategy is to focus on the set of bonds that are surely called on the first call date and to treat the first call date as the effective maturity date. To this end, we remove par, discount, and small and medium-sized callable premium bonds, since they are more likely to remain uncalled after the first call date. With this filter, our sample consists of either noncallable bonds or callable bonds with a large (the top tercile by total offering amount) size issued with a premium. After this filter, only about 1% of the remaining bonds trade after the first call or mandatory put date, confirming that the retained bonds are effectively called on schedule.[3]

Throughout the paper, we use the minimum of the maturity, first call, and mandatory put dates, referring to it as the maturity date. When we compute a bond's yield, we use this minimum date and refer to it as the yield-to-worst. To compute credit spreads, we also obtain the Treasury yield data of Gürkaynak et al. (2006) from the Federal Reserve's website.

We merge the financial statement data with the monthly bond panel data based on the bonds' CUSIP. Specifically, each issuer lists some of their bond issues in Schedule K, 'Supplemental Information on Tax-Exempt Bonds', which includes the bonds' CUSIP.[4] While this list is not exhaustive, it allows us to establish the link between the issuer's employer identification number (EIN) in Form 990 and CUSIP. Then, using the CUSIP list, we search for the bonds' information in Mergent to find the unique issuer IDs. Lastly, we identify all bonds in Mergent with the same issuer IDs and

[3]We select our sample after carefully examining whether bonds with a call or put provision are fully redeemed at the first call or mandatory put date using MSRB transaction data. We find that bonds issued at a premium are much more likely to be called, as the issuer can refinance at a lower cost. Indeed, only 7% of premium callable bonds trade after the first call date, compared to 43% for par callable bonds and 24% for discount callable bonds. Among premium callable bonds, those from large issues (the top tercile by total offering amount) exercise calls most efficiently, with only 5.7% trading after the first call date. We therefore remove callable bonds that are issued at par or at a discount relative to their call price, as well as small and medium-sized premium callable bonds.

[4]In Schedule K, there are two EINs, one corresponding to the ultimate debt borrower and the other corresponding to the issuer, or the financial conduit that issues tax-exempt bonds on behalf of multiple borrowers. We only use the EIN of the ultimate borrower of the bond because the payments to the bondholders are backed solely by the cash flows of the ultimate borrower.

associate them with the EIN, which is the key identifier in IRS and IPEDS.[5] [6]

Bond prices reflect the information available to investors. Since universities' financials become available to investors with a long lag, we take a conservative approach to map yearly financial statements to the monthly bond panel. In particular, we merge the financial statements ending in year y with the bond prices from July of year $y+1$ to June of $y+2$. Since the statement data starts in 2010 and ends in 2023, our merged monthly sample starts in July 2011 and ends in June 2025.

Lastly, we convert the bond-month-level panel data into firm-month-level data by creating a synthetic five-year bond for each issuer. For this purpose, we narrow our sample to the bonds with a time to maturity between two and eight years. For each issuer and month, we identify a bond with a maturity below 5 years and another with a maturity above 5 years. If multiple issues satisfy the criteria, we select the one that has a maturity closest to 5 years. We then linearly interpolate these two bonds to obtain the yield to worst of the issuer. If we do not find a bond with a maturity below or above 5 years, we use the bond closest to 5 years.

To summarize, we merge and select the sample in the following steps.[7] We start with a list of CUSIPs that are identified as bonds issued by universities, spanning 21,727 bonds issued by 716 issuers. After merging this list with the MSRB and selecting only those with valid monthly prices, the number of CUSIPs declines to 16,731. Next, we require that the bond have a fixed coupon rate, trade at least 10 times in the sample, have a credit spread between 0 and 1,000 basis points, and have a time to maturity between 2 and 8 years. These requirements reduce the number of CUSIPs to 5,847. Finally, we require that each observation have valid financial statement information, including total assets, total liabilities, and free cash flow to the firm. After imposing

[5] Additionally, for universities that report Schedule K but with missing CUSIPs, we manually search Mergent's project names to identify their Issue IDs and retrieve all associated bonds. We then use the unique project names linked to the identified bonds to find additional bond issues sharing the same project name. Finally, we match institution names from IRS filings and IPEDS directly against Mergent project names to capture bonds for universities not yet linked through the previous steps. Table A1 in the Internet Appendix documents the number of observations in each step.

[6] We merge the university-level information from IPEDS with the panel data based on EIN. However, there are erroneous entries of EIN in IPEDS. Therefore, we manually corrected these entries to be consistent with the EIN in Form 990, and listed those EINs in the Internet Appendix A6.

[7] Table A2 in the Internet Appendix provides more details on the changes in the number of observations in each step.

all these requirements, the final sample consists of 15,154 issuer-months for 2,773 bonds issued by 282 schools.

Figure 2 plots the percentage share of the universities in our sample relative to the total universe of nonprofit private universities in the IPEDS data. We measure the size of universities in terms of total assets, revenue, and number of students. The total asset share of our sample stands at around 60% of the entire universe, while the revenue share ranges from 40% to 50%. Both are increasing in the first five years of the sample period and remain stable afterwards. In contrast, the student share is lower, increasing from 20% at the beginning of the sample to around 35% at the end. Thus, while not all private universities issue bonds, our sample provides reasonable coverage of the sector.

2.2 Case Study on Bond Defaults

Our analysis is based on the idea that a university's bond price reflects investors' expectations for future cash flows. Therefore, we must demonstrate that insufficient cash flow results in losses for bond investors, who then account for possible defaults in bond pricing. To this end, we conduct a case study on universities that experienced payment defaults by examining how the bond prices of these universities change before and after the defaults.

To identify defaults, we use FISD to find the list of defaulted bonds and narrow down to those with payment default rather than covenant default. Then, we merge the issuer with bond prices in MSRB. To measure the potential loss experienced by the investors, for each defaulted bond, we compute the average daily price over the one-year period before the default date, and the average over the one-year period on and after the default date. Then we take the average across bonds at the issuer level and report it in Table 2.

In FISD, we find seven universities that missed payments. We are able to find bond prices for six of them, spanning the period from April 2014 to May 2021.[8] One year before default, the average price ranges from 78.1 to 99.5% of par, but it falls to a range of 13.1 to 87.7% after the default. The average post-default price of the six universities is 63.7% of par, implying the loss given default

[8]The default of another university, Alderson Broaddus College, is recorded in FISD, but we do not find the bond prices in MSRB.

of around 36%. Figure 3 plots the daily bond prices of the six universities. In all six cases, the bond prices decline significantly upon the default announcement. After the announcement, the price appears to drift down over the following few years, eventually reaching near zero.

In this small set of defaulted universities, all but one (Tompkins Cortland Community College) filed for bankruptcy and ceased their operations. Just like a bankruptcy of a private sector firm, a committee of creditors is appointed, and a liquidation plan is submitted to a bankruptcy court to be approved. This often involves the payments to the creditors out of the endowment and the sales of the university's real estate.[9] Four universities filed for Chapter 11 bankruptcy—a legal mechanism traditionally designed to allow entities to reorganize and continue operating—although they were eventually liquidated.

Looking at the credit rating in Table 2, four issuers were rated by either Moody's or S&P, and their original rating at issuance ranges from BBB- (10) to B+ (14). The rating agencies recognized their increased risk before default, so that the rating one month before default ranges from BB+ (11) to CC (20).

Finally, we investigate the fundamentals of these issuers. Figure 4 plots the average revenue and EBITDA for the seven defaulted universities, centered around the default year and setting two years before default as a reference year. The plot exhibits a notable decline in EBITDA three years before the default year, while the revenue is relatively constant. After default, these universities move toward closure, resulting in a rapid decline in revenue.

2.3 Liquidity Analysis

One potential concern regarding the application of structural models to the municipal bond market is liquidity. Municipal bonds are generally viewed as less liquid than corporate bonds (e.g., Chakravarty and Sarkar, 1999; Chernenko and Sunderam, 2020), which could imply that their

[9] Mid-Continent College is closed in June 2014, two months after its default in April 2014. It sold the campus to a private sector firm in January 2017 for $1.8 million. Dowling College sold its real estate to pay debt, with an article citing "Bondholders, meanwhile, are likely to be reimbursed largely due to the beautiful campus, but for the moment, they're waiting for the last chapter to end long after the last students left." The College of New Rochelle defaulted in July 2017 and closed at the end of the summer session in 2019. It sold its campus in November 2019. As of October 2025, Ohio Valley University is in the process of selling its campus to pay its bondholders. Judson College is in the process of liquidating its assets, releasing its endowments to pay its creditors.

yields contain a significant liquidity premium that might distort the equity values inferred from our model. To test whether this is the case, we compare the liquidity of the university bonds in our sample against a benchmark of U.S. corporate bonds during the same sample period.

We measure liquidity using bond turnover, defined as the ratio of monthly trading volume to the bond's amount outstanding. We categorize bonds into five credit rating groups—AAA, AA, A, BBB, and High Yield (HY)—and compute the average monthly turnover for both university and corporate bonds.

Table 3 presents the results. In contrast to the illiquidity of the broader municipal market, the university bonds in our sample are more liquid than corporate bonds. For AAA-rated issuers, the average monthly turnover for university bonds is 7.36%, compared to 5.39% for corporate bonds. This difference of 1.98 percentage points is statistically significant. Similarly, university bonds exhibit significantly higher turnover ratios in the AA, A, and BBB categories.

Corporate bonds exhibit higher liquidity only in the High Yield category, where turnover is 10.25% compared to 7.69% for university bonds. However, high-yield university bonds account for less than 1% of our sample. Therefore, the vast majority of university bonds in our dataset are traded more frequently than comparable corporate bonds. This suggests that the credit spreads observed in our sample are not driven primarily by a liquidity premium, supporting the validity of applying a structural model to these assets.

3 Structural Mapping Between Universities and Corporations

While modern U.S. universities remain legally distinct from for-profit corporations, their financial and governance structures resemble those of corporate entities. These similarities provide the conceptual foundation for viewing universities through an equity valuation lens and motivate our framework. In this section, we outline the legal, operational, and financial similarities and differences between nonprofit private universities and for-profit corporations.

Legal structure and governance. The primary distinction between a university and a corporation lies in their legal frameworks and the fiduciary mandates governing their leadership.

For-profit corporations, typically organized as C-corporations, are governed by state corporate law and are generally understood to operate in the interest of shareholders. In comparison, U.S. higher education institutions operate under entirely different fiduciary requirements. Private nonprofit universities are organized under IRS Section 501(c)(3) and are legally bound by the non-distribution constraint, prohibiting the distribution of net earnings or surpluses to private individuals.[10] Furthermore, while corporate governance relies on corporate managers and the board of directors, university governance is legally and traditionally shared among the board of trustees, the administration, and the faculty senate, with a more decentralized decision-making environment.

Despite these differences, important similarities remain that may shape the incentives of university leadership. Both universities and corporations are limited liability entities, shielding administrators and leadership from personal financial obligations. They also operate as going concerns; even in the absence of cash distributions, universities resemble non-dividend-paying corporations. University presidents perform roles similar to corporate CEOs and face comparable career concerns. The market for university presidents is competitive and highly compensated, shaping the incentive structure similar to that of corporate leadership.

The equity equivalent in a nonprofit framework. To apply structural credit risk models stemming from Merton (1974), we establish a conceptual mapping between for-profit corporate entities and nonprofit higher education institutions. The primary divergence between these entities lies in their ownership structure. As nonprofit organizations, universities do not issue equity. They operate under a strict non-distribution constraint, prohibiting the transfer of net earnings to private shareholders. Economically, however, a university's net assets play a role analogous to corporate equity. The net asset position acts as the residual claimant and primary buffer against operational shocks, absorbing losses and thereby protecting senior debt holders from default. In this framework, the present value of future cash flows accruing to net assets corresponds to the market value of equity, allowing the structural model to recover the value of net assets as it does for corporate equities.

Liability structures and the debt boundary. Another critical component of the structural

[10] Our analysis does not include public universities because, as quasi-public entities, their bond prices are not informative about their future cash flows.

mapping is the formulation of the debt threshold. Because private universities are 501(c)(3) organizations, they cannot access capital markets directly in the same manner as corporations. Instead, as qualified charitable organizations, nonprofit universities issue "municipal" tax-exempt bonds.[11] These bonds are issued via financial conduits in each state. Despite this indirect issuance structure, the repayment for the bond comes only from the issuing institution, and the bond's prospectus explicitly states that the state conduit has no legal or moral obligations to pay the debt. Because the credit risk is borne entirely by the university's underlying cash flows, these tax-exempt municipal bonds function as the issuers' default boundary in the model, much like taxable corporate bonds do for corporations.

Asset composition and operational characteristics. In our model, the unobservable asset value of the borrower and its associated volatility determine the probability of default. In a corporate setting, asset value is derived from revenue from commercial operations. Conversely, a university's asset base generates revenue through a complex system of cross-subsidization, relying heavily on cash flow streams such as program service revenues, external research grants, and philanthropic donations. Furthermore, a university's most significant financial asset—the endowment—differs drastically from corporate cash reserves. Endowments are subject to stringent legal regulations, such as the Uniform Prudent Management of Institutional Funds Act (UPMIFA), which restricts the liquidation of principal even during periods of severe institutional distress. This introduces a unique operational rigidity. In our setup, the asset volatility increases as its value declines due to operational pressures or endowment shocks. Therefore, it translates the unique asset composition and operational rigidity of a university into a quantifiable market value of equity.

4 Model

In this section, we provide details on the empirical estimation of university equity. Specifically, we apply the structural model with stochastic volatility developed by Du et al. (2019) to the

[11] Universities also issue taxable bonds despite their higher cost of capital, primarily because tax-exempt financing is subject to IRS restrictions on eligible uses, particularly for projects involving private business use or general operating expenditures. The proceeds from these bonds are not restricted to specific projects and can be used to finance general operating needs. In our analysis, we exclude these bonds and focus on tax-exempt bonds, as they are the primary source of borrowing for universities.

observed credit spreads of university-issued municipal bonds.

4.1 Outline

Let a bond issuer i's asset value X and its variance V follow the dynamics under the physical probability measure

$$\frac{dX_{i,t}}{X_{i,t}} = (\mu_{i,t}^P - q_i)dt + \sqrt{V_{i,t}}(\rho dW_{2,i,t} + \sqrt{1-\rho^2}dW_{1,i,t}), \tag{1}$$

$$dV_{i,t} = \kappa(\theta - V_{i,t})dt + \sigma\sqrt{V_{i,t}}dW_{2,i,t}, \tag{2}$$

where $\mu_{i,t}^P$ is the expected return on the asset, q_i is the asset's payout rate, ρ is the correlation between shocks to the asset and the variance, $dW_{\cdot,i,t}$ is an independent Wiener process. The dynamics under the risk-neutral measure are obtained by replacing $\mu_{i,t}^P$ by the risk-free rate r, κ by $\kappa^* = \kappa + \sigma\lambda_V$, and θ by $\theta^* = \frac{\kappa}{\kappa^*}\theta$. The key parameters include λ_V, the price of variance risk, and λ_D, the price of asset risk. While these prices are held constant, the risk premium on assets (and thus bonds) varies depending on the level of variance $V_{i,t}$.

In the model, the issuer defaults when its asset value $X_{i,t}$ first hits the default boundary defined by $X_D F_i$, where F_i is the face value of the borrower's debt. The parameter X_D depends on the borrower's strategic motive to default and the non-debt liabilities (such as pension liabilities) that influence the borrower's decision to default.

Let t^* denote the default time. Indexing time as $t_k = \{t_0(\equiv t), t_1, \ldots, t_K(\equiv T)\}$, the time-$t$ value of a coupon bond for issuer i with a semi-annual coupon c and time to maturity $\tau = T - t$ is

$$\begin{aligned} B_{i,t} = {} & \frac{c}{2}\sum_{k=1}^{K} e^{-r(t_k - t)} Q(t^* > t_k; \Lambda_{i,t}, \Theta) \\ & + (1 - LGD)\sum_{k=1}^{K} e^{-r(t_k - t)} Q(t^* > t_{k-1}; \Lambda_{i,t}, \Theta) q(t^* = t_k; \Lambda_{i,t}, \Theta) \\ & + e^{-r\tau} Q(t^* > T; \Lambda_{i,t}, \Theta) \end{aligned} \tag{3}$$

where $Q(t^* > t_k; \Lambda_{i,t}, \Theta)$ is the risk-neutral survival probability as of time t_k, $q(t^* = t_k; \Lambda_{i,t}, \Theta)$

is the conditional probability of default in time t_k, $\Lambda_{i,t} = (X_{i,t}, V_{i,t}, c_{i,t}, \tau_{i,t}, q_{i,t}, F_{i,t})$ is the issuer-specific time-varying model parameters, and $\Theta = (X_D, LGD, \rho, \kappa, \theta, \sigma, \lambda_D, \lambda_V)$ is time-invariant global model parameters. The first term in (3) represents the present value of coupon payments. We assume that coupons have zero recovery upon default, and their payments stop upon default. The second term is the present value of the principal payment upon default with a loss given default, LGD, while the third term is the principal value when there is no default. We compute the yield to maturity of the bond in (3) as well as the risk-free bond that has the same cash flow as the defaultable bond, and the difference in yield is the credit spread, $s_{i,t}$.

The model also generates a bond's instantaneous volatility

$$\sigma^B_{i,t} = \sqrt{\left(\left(\frac{X_{i,t}}{B_{i,t}}\frac{\partial B_{i,t}}{\partial X_{i,t}}\right)^2 + \left(\frac{\sigma}{B_{i,t}}\frac{\partial B_{i,t}}{\partial V_{i,t}}\right)^2 + 2\rho\sigma\frac{X_{i,t}}{B^2_{i,t}}\frac{\partial B_{i,t}}{\partial X_{i,t}}\frac{\partial B_{i,t}}{\partial V_{i,t}}\right) V_{i,t}}. \tag{4}$$

The market value of asset $X_{i,t}$ and its variance $V_{i,t}$ are not observable to econometricians. However, we observe credit spreads and bond volatility for issuer i in month t. Thus, for each i and t, we solve for the system of two equations with two unknowns,

$$s_{i,t} = s(X_{i,t}, V_{i,t}, c_{i,t}, \tau_{i,t}, q_{i,t}, F_{i,t}; \Theta), \qquad \sigma^B_{i,t} = \sigma(X_{i,t}, V_{i,t}, c_{i,t}, \tau_{i,t}, q_{i,t}, F_{i,t}; \Theta), \tag{5}$$

taking given the coupon $c_{i,t}$ and time to maturity $\tau_{i,t}$ of the borrower's representative bond.

Given the knowledge of $X_{i,t}$ and $V_{i,t}$, we compute the value of equity as

$$S_{i,t} = X_{i,t} - F_{i,t}\left(PVB_{i,t} + DWL_{i,t}\right), \tag{6}$$

where

$$PVB_{i,t} = (1 - LGD) \sum_{k=1}^{K} e^{-r(t_k - t)} Q(t^* > t_{k-1}; \Lambda_{i,t}, \Theta) q(t^* = t_k; \Lambda_{i,t}, \Theta) + e^{-r\tau} Q(t^* > T; \Lambda_{i,t}, \Theta),$$

$$DWL_{i,t} = LGD \sum_{k=1}^{K} e^{-r(t_k - t)} Q(t^* > t_{k-1}; \Lambda_{i,t}, \Theta) q(t^* = t_k; \Lambda_{i,t}, \Theta). \tag{7}$$

The first equation in (7) captures the present value of the principal payment, and the second equation captures the dead-weight loss arising from the bankruptcy cost.

Table 4 lists the model parameters Θ. Panel A reports the parameters we take from Du et al. (2019) and hold fixed across all issuers: the correlation ρ, the variance dynamics parameters θ, κ, and σ, the loss given default LGD, and the target long-run asset Sharpe ratio.

Panel B reports the three parameters that we re-estimate separately for each credit rating group—the default boundary X_D, the price of variance risk λ_V, and the price of asset risk λ_D—using the panel of ICE BofA U.S. corporate bonds. The calibration consists of two steps. First, for each rating group, we calibrate the optimal value of X_D that minimizes the distance between the model's default probability under the physical measure and Moody's historical cumulative default probability for that rating. Second, we calibrate the price of risk parameter λ_V to minimize the pricing errors on the credit spreads of corporate bonds in that rating group, and λ_D is pinned down by the restriction that the long-run asset Sharpe ratio equals 0.22.[12] When we subsequently price the bonds of a given university, we apply the parameters from the rating group that matches the university's credit rating.

We solve the system of equations (5) numerically by simulating the path of $X_{i,t}$ and $V_{i,t}$ 10,000 times. To calculate the bond volatility in (4), we compute the derivative $\partial B_{i,t}/\partial X_{i,t}$ and $\partial B_{i,t}/\partial V_{i,t}$ numerically.

Figure 5 depicts the relationship between credit spreads and the equity market-to-book ratio, $S_{i,t}/S^B_{i,t}$ in the model. It shows that the market value of equity is a decreasing function of credit

[12]The calibration results are presented in Internet Appendix I. We show that using corporate bonds, the model is able to generate sizable credit spreads that match the data with the error up to 3 basis points. At the same time, it exactly matches observed stock prices using the model counterpart in (6).

spreads. In addition, given a credit spread, an issuer with a high book leverage has a higher market-to-book ratio. This is because, all else equal, a high book leverage indicates a higher default risk. Thus, to keep the credit spreads constant, the market value of the asset must increase to offset that risk, resulting in a higher stock value. Notably, the figure shows that there is no one-to-one mapping between credit spreads and the value of equities. To accurately capture the expected cash flows, we must convert credit spreads using the model.

4.2 Model Inputs

The most important input to the model is the borrowers' credit spreads. Since the bonds in our sample are tax-exempt, we convert their yield-to-worst to a taxable basis. Specifically, given the tax-exempt yield of bond j in month t, $y^*_{j,t}$, we calculate the tax-equivalent yield,

$$y_{j,t} = \frac{y^*_{j,t}}{(1 - \zeta_{t,\text{Federal}})(1 - \zeta_{j,t,\text{State}})}, \tag{8}$$

where $\zeta_{t,\text{Federal}}$ is the marginal federal income tax rate for the highest income bracket in month t, and $\zeta_{j,t,\text{State}}$ is the corresponding state tax rate for bond j in month t. To compute credit spreads, we take the difference between the tax-equivalent yield of the university bond and the U.S. Treasury yield, which is interpolated to match the maturity of the bond. This method differs from Schwert (2017), who use the swap rate as a benchmark. Since our sample includes highly rated and liquid bonds issued by universities such as Harvard and Yale (both of which are AAA-rated), we would end up with negative credit spreads if we used the swap rate as a benchmark. Since structural models of credit spreads cannot generate negative credit spreads, this creates a technical difficulty when we back out the equity value. Thus, we use the Treasury yield to calibrate the price of risk parameters, λ, and estimate the model.

Another key input to the estimation process is a bond's volatility. Estimating it using MSRB data is a challenge since we observe prices only on days when transactions occur. To tackle this

problem, we use the daily price data and compute the scaled log return using two dates, d_1 and d_2,

$$r_{j,d_1,d_2} = \frac{p_{j,d_2} - p_{j,d_1}}{\sqrt{d_2 - d_1}}, \tag{9}$$

and estimate the volatility using the rolling 12-month window,

$$\sigma_{j,t} = \sqrt{\frac{252}{N_{j,t} - 1} \sum_{d_2 \in [t-11,t]} (r_{j,d_1,d_2} - \bar{r}_{j,d_1,d_2})^2}. \tag{10}$$

We require at least 10 return observations ($N_{j,t} \geq 10$) for each estimate. If not, the volatility in the month is treated as missing. Finally, we interpolate the bond-level volatility estimates at the 5-year maturity as we do for the credit spreads to obtain the volatility of the issuer's representative bond.

To measure the borrower's leverage, F_i, we follow Feldhütter and Schaefer (2018) and use the borrower's liability. A book value of equity is defined as the difference between the total assets and total liabilities.

To estimate the payout rate of an asset, $q_{i,t}$, we calculate the free cash flow to the firm as a proxy. Technically, this differs from the practice in the literature (see, for example, Feldhütter and Schaefer 2018), which computes the payout as the sum of dividends and interest payments. However, we cannot apply this method because universities do not pay dividends. Therefore, we compute free cash flow to the firm as a proxy for potential payments: these cash flows are available for payment to outside stakeholders if needed. Specifically, we calculate the free cash flow to the borrower in year y as

$$FCFF_{j,y} = \text{Revenue}_{j,y} - (\text{Total Expense}_{j,y} - \text{Interest Paid}_{j,y}) + \text{Depreciation}_{j,y} - \text{Capex}_{j,y}, \tag{11}$$

and the payout rate is $FCFF_{j,y}/Asset_{j,y}$.

Panel A of Table 1 presents the summary statistics of the panel data. The average bond has a credit spread of 246 bps, a coupon rate of 4.85%, bond volatility of 10% per year, the issuer's free cash flow of $107 million, total assets of $4,983 million, and total liabilities of $1,348 million.

5 Main Results

5.1 Overview

We start by presenting the summary statistics of the estimated market values of assets and equities, $X_{i,t}$ and $S_{i,t}$. Panel B of Table 1 presents the results. We find that on average, the market values of assets and equities are \$9.4 billion and \$8.2 billion, respectively, while the corresponding median values are \$1.5 billion and \$1.0 billion. The average equity market-to-book ratio is 1.50, while the median ratio is 1.02. Since the average exceeds the median, the estimated market values are highly right-skewed. The average market leverage $F/X_{i,t}$ is 34%, while the average asset variance is 0.37.

Table 5 presents the top 50 universities in terms of their equity market value averaged over the last five years of our sample period (July 2020 – June 2025). We relegate the ranking of all universities in the Internet Appendix Table A5. Yale University is ranked first with a market value of \$151 billion. Should it be listed on a stock exchange, it will be ranked around #47 in terms of market capitalization. For comparison, the market capitalization averaged over the same period for McDonald's Corp is \$189 billion, and that for Intel Inc. is \$168 billion. Harvard University and Stanford University, ranked #2 and #3 according to our metric, have the market value of \$151 and \$135 billion, respectively. Importantly, our ranking is not a mechanical reflection of the size of the university's balance sheet. The market-to-book ratio of Yale is, on average, 4.2 over this period, which exceeds that of Harvard (2.8). Therefore, Harvard exceeds Yale in terms of the book value, but Yale's market value is higher than Harvard's. As discussed in Section 4.1, each university has different leverage, and as a result, our rankings are not simply a ranking of credit spreads (reported in the third column), either.

Our ranking of private universities appears to be only weakly correlated with the standard rankings from U.S. News, reported in the last column of Table 5, which includes both public and private universities. For example, New York University is ranked #35 in the U.S. News ranking, while it is ranked #6 in terms of its equity market value, one notch above Princeton (ranked #1 in the U.S. News ranking). The weak correlation is expected. The U.S. News rankings are based

on attributes such as graduation and retention outcomes, academic reputation (peer assessment), and faculty resources. In contrast, our rankings are based on investors' expectations of cash flows generated from the operations of universities, capturing different aspects of university value.

Just like the S&P500 index, the distribution of the market value is highly right-skewed. Yale's market cap is 4.9 times as large as Cornell University (ranked #10) and 12.6 times as large as Boston College (ranked #20).

Next, we study the time trend of the aggregate portfolio of university equities. Each month, we aggregate the market value of university equities, create the "university equity index", and plot it in Figure 6, Panel A. The figure also shows the total market capitalization of the CRSP aggregate market portfolio. Since our estimates rely on a particular sector of the economy with large outliers, the university equity index is more volatile than the aggregate stock market. Nonetheless, they share several key features between 2011 and 2021: both exhibit an upward trend with a notable decline during the COVID-19 period in 2020. However, after 2022, the trend appears to diverge. While the university index stops growing with increased volatility, the aggregate stock index steadily increases. At the end of our sample period, the university index represents 0.6% of the aggregate stock market.

Since our estimates of equity value derive from the credit spreads, we compare the university index with the average university credit spreads, as plotted in Figure 6, Panel B. For comparison, we add the BBB corporate credit spreads to the plot. The average university credit spreads exhibit a downward trend from 2011 to 2021, with a notable spike in March 2020, where they reach nearly 400 basis points. After 2022, the credit spreads remain elevated between 300 and 400 basis points. BBB corporate credit spreads are generally lower, but share a similar trend of slowly decreasing from 2011 to 2021, with a similar spike in 2020. However, the two series appear to diverge after the inflation shock in 2022. While corporate credit spreads promptly recover from the shock in 2023 and 2024, the university credit spreads remain high. Notably, the university spread increased from 310 basis points in February 2025 to 362 and 436 basis points in March and April, respectively, possibly reflecting a series of new policies announced then. As of June 2025, the university credit spreads remain at a level similar to March 2020, while the corporate credit spreads are at the lowest

level since 2011. This divergence explains why our university equity index appears to perform worse than the CRSP aggregate index after 2022.

5.2 Determinants of the equity market-to-book ratio

The equity market-to-book ratios reported in the previous subsection vary widely across universities—New York University's averages 7.7 while the University of Pennsylvania's averages 1.3. We now ask what drives the variation. We regress the log market-to-book ratio on variables drawn from the determinants of corporate valuations, grouped into four economic categories: revenue and cash-flow fundamentals, operating risk, financial risk, and reputation. If market-based valuations of universities reflect the same economic forces that price public firms, these variables should load with signs and magnitudes comparable to their corporate counterparts.

We estimate the following panel regression for university i and month t:

$$\log(S_{i,t}/S^B_{i,t}) = \beta \mathbf{X}_{i,t} + \theta_t + \epsilon_{i,t}, \tag{12}$$

where $\log(S_{i,t}/S^B_{i,t})$ is the log equity market-to-book ratio, $\mathbf{X}_{i,t}$ is a vector of determinants, and θ_t denotes year-month fixed effects. Continuous variables are winsorized at the 0.5th and 99.5th percentiles and standardized to have zero mean and unit standard deviation. We take logs to dampen extreme values and exclude 33 observations with negative equity. Standard errors are double-clustered at the university and tax-year levels.

Panel A of Table 6 measures how much variation fixed effects absorb on their own. Year-month fixed effects explain 16.1% of the variation in the ratio; university fixed effects explain 62.0%. Most of the variation in university valuations is cross-sectional, not time-series.

Panel B reports a base model with a few representative variables per economic category. We find that book leverage is the largest single determinant: a one-standard-deviation increase raises $\log(S_{i,t}/S^B_{i,t})$ by 0.59 ($t = 20.72$) and accounts for 23.8% of its variation, as reported in the variance-decomposition column. Credit rating dummies corresponding to AA, A, BBB, HY (AAA is the omitted category) jointly account for 9.9%, and ROA accounts for 3.0%. Higher ROA (0.17,

$t = 8.66$), lower ROA volatility (-0.07, $t = -3.32$, measured as the standard deviation of changes in ROA over a three-year period), higher financial investments (0.15, $t = 4.59$), and better US News rank (0.10, $t = 3.86$) all raise the ratio. The positive loading on book leverage runs against the mechanical effect in a standard corporate setting, where higher leverage reduces equity value. Several channels are consistent with the pattern: universities with more borrowing capacity may be stronger institutions with larger expected future cash flows; favorable financing conditions may raise valuations and encourage borrowing simultaneously; and debt may add value through financial flexibility or tax-equivalent shields in the municipal market.

Panel C decomposes the aggregate explanatory variables into their components. On the revenue side, program service revenue (PSR) scaled by assets (0.07, $t = 2.02$) and other revenue scaled by assets (0.09, $t = 3.53$) load positively; contributions and investment income do not enter significantly. Year-over-year changes in PSR and contributions also load positively. On the financial-risk side, book leverage remains dominant (0.53, $t = 18.32$). Non-endowment investments (0.10, $t = 4.85$) and discretionary endowment (0.12, $t = 4.78$) both raise the ratio; non-discretionary endowment does not. Ivy League membership becomes significant at the 5% level in the decomposition specification (0.16, $t = 2.02$).

Next, we examine how the quality of universities is related to the market-to-book ratio. To this end, we explore ten potential explanatory variables, including student-to-faculty ratio, international-student share, enrollment-to-admission ratio, nonwhite faculty share, female faculty share, tenure faculty share, PhD-degree indicator, instruction spending per asset, research spending per asset, and faculty salaries per asset. To assess their marginal effect on the market-to-book ratio, we control for the set of significant variables from the previous analysis, including ROA, book leverage, the investment-to-asset ratio, credit rating dummies, and the U.S. news rank.

Table 7 reports the coefficient on these education-quality variables after accounting for the control variables and year-month fixed effects. Among the ten inputs examined, only the PhD-degree indicator (0.17, $t = 3.23$) and research spending per asset (0.04, $t = 2.15$) enter significantly at the 5% level. The international-student share is weakly significant (0.04, $t = 1.85$). Education-input measures appear largely unpriced by bondholders once financial fundamentals and reputation

are in the specification.

5.3 Assessments of Policy Impacts on Market Values

Utilizing our market value estimates, we examine how government policies regarding universities affect the implied equity values of universities. Book values of equities remain constant over short event windows and therefore cannot capture policy effects. In contrast, market values derived from bond prices reflect real-time investor assessments of future cash flows, risk, and institutional stability. This approach allows us to quantify policy impacts through changes in the dollar value of equity. We examine whether and to what extent two notable policies affect the equity value of universities.

5.3.1 Federal research funding freezes in March 2025

We first focus on the federal research funding freezes that began in March 2025. On March 7, the federal government announced the immediate cancellation of approximately $400 million in federal grants and contracts to Columbia University due to alleged inaction on campus anti-semitism incidents. This was followed by the Department of Education's Office for Civil Rights (OCR) warnings to 60 institutions on March 10 and an audit of Harvard's $8.7 billion in grants on March 31, escalating tensions over federal oversight and threatening cash flows for top universities. Concurrently, policy discussions in March 2025 included proposals for increased endowment taxes, such as the Woke Endowment Security Tax (WEST) Act of 2025 (S.936) introduced on March 11, which proposed a one-time 6% excise tax on endowments exceeding specified thresholds (e.g., $11.9 billion for secular private institutions).[13] These developments further intensified financial pressures on universities with large endowments.

To assess whether and to what extent this event affected top universities, we employ a difference-in-differences (DiD) research design. Specifically, we estimate the following DiD regression for

[13] As of April 2026, the bill has not advanced beyond the Senate Finance Committee.

university i and month t:

$$\log S_{i,t} = \beta Post_t \times Treat_i + \gamma' \mathbf{X}_{i,t} + \psi_i + \theta_t + \epsilon_{i,t}, \tag{13}$$

where $\log S_{i,t}$ is the natural logarithm of the equity value of university i at month t, *Post* is an indicator variable for the period after March 2025, *Treat* denotes universities affected by the policy announcements, and $\mathbf{X}_{i,t}$ is a vector of university-month-level control variables, including ROA, book leverage, the investment-to-asset ratio, credit rating dummies, the (negative of the) U.S. News rank, and an indicator for unranked universities. The dependent variable and the continuous controls are winsorized at the 0.5% and 99.5% levels. The sample period spans November 2024 to June 2025, and standard errors are clustered at the university level.

To define a group of universities affected by the policies, we construct four nested treatment definitions of increasing severity: (1) universities with endowments exceeding the WEST Act threshold;[14] (2) those also subject to federal funding freezes;[15] (3) those also receiving OCR warning letters; and (4) the intersection of all three. The remainder of the sample is considered the control group. We obtain our main results by focusing on the four-month post-treatment period (March 2025 to June 2025), but we also present estimates for three-month periods to describe dynamic effects.

Table 8 Panel A presents the estimated coefficient β, associated t-statistic, adjusted R-squared, and the number of observations of regression equation (13). Columns (1) to (4) report the estimates for the corresponding treatment group. We find that the treated universities experienced a significant decline in equity value due to the policy announcements. In particular, the equity value of the universities with endowments above the tax threshold declines 25.3% (Column (1), $t = -2.80$) more than the control group. To put this number in context, the time-series standard deviation of monthly returns on the equal-weighted portfolio is 17.0% (Table 1). Thus, this is a

[14] In our sample, these universities include Harvard, MIT, Yale, Columbia, Princeton, University of Pennsylvania, Northwestern, and Stanford.

[15] Two other private universities experienced federal funding actions during this period but cannot be included in our analysis. Johns Hopkins University had grants terminated in March 2025, but our sample does not contain bond observations for Johns Hopkins after April 2021. Duke University faced a federal funding freeze announced on July 29, 2025, which falls outside our sample window that ends in June 2025.

sizable variation with more than one standard deviation of the typical movement in returns of the average university.

The corresponding estimates in Columns (2), (3), and (4) are -31.0% ($t = -3.14$), -28.5% ($t = -2.77$), and -39.4% ($t = -5.34$), respectively, with the largest impact arising for the group exposed to all three policies (Column (4)). Since the fourth treatment group has the average equity value of \$64.1 billion as of February 2025, the estimate in Column (4) translates to an equity value loss of approximately \$25.3 billion.

Figure 7 presents the dynamic effects of the policies on the fourth category of treated universities relative to others, using February 2025 as the benchmark. Specifically, we plot the coefficient estimates on interaction terms between the calendar-month dummy in equation (13) and the treated university indicator. Before the event, the estimates remain close to zero, indicating that there is no pre-trend. In March 2025, the market reacted immediately to the policy announcements, with a drop of nearly 50% in equity value. This decline is attenuated in May and June and turns insignificant. However, the economic magnitude remains large at nearly -10%.[16] Overall, these findings indicate that our measure of university equity values reasonably captures the heightened financial risks these institutions face due to policy changes in a timely manner.[17]

To break down the response of the four most severely impacted universities in Column (4), Figure 8 plots their monthly equity value rescaled to February 2025. All four schools' equity values fell sharply in March and continued to decline through April, when the broader institution-wide freezes against Princeton, Northwestern, and Harvard were announced. Translating these percentages into dollars, the four universities collectively lost approximately \$165 billion of equity value over March–June 2025, with Harvard alone accounting for roughly \$97 billion and Princeton, Columbia, and Northwestern contributing \$38, \$21, and \$8 billion, respectively.

[16] Consistent with this regression evidence, Figure A1 shows that the aggregate equity value of the entire sample drops sharply in March 2025 and reaches its trough in April. Figure A2 shows that this aggregate decline is driven almost entirely by the treated group, while the control universities are essentially flat over the same window.

[17] Figure A4 and Table A14 in the Internet Appendix present the results using the Synthetic Difference-in-Difference method of Arkhangelsky et al. (2021), which confirms the main results.

5.3.2 Federal student loan payment pause in March 2020

Next, we examine the federal student loan payment pause, which was initiated administratively on March 13, 2020, following the national emergency declaration, and subsequently enacted into law on March 27, 2020, through the CARES Act—with the suspension made retroactive to March 13. This policy suspended payments and interest accrual on most federal student loans amid the COVID-19 pandemic, offering borrowers immediate liquidity relief. It aimed to alleviate economic distress by enabling borrowers to redirect funds toward essential consumption or other debts, which could indirectly support university enrollment and tuition revenues by improving students' financial stability.

To identify universities with high exposure to student loans, we use the percentage of undergraduate students awarded federal student loans from the IPEDS database. To avoid look-ahead bias, we use the observations available to investors in 2019. We define the treatment group as universities in the top tercile of this variable and run the same DiD regression as in equation (13) using the sample from November 2019 to June 2020.

Table 9 presents the results. Column (1), which uses a four-month post-event window, shows a statistically significant positive effect of 17.4% ($t = 1.98$). The dynamic event-study in Figure 9 reveals that the effect is concentrated in the first month after the policy announcement, so the estimate becomes larger as we shorten the post-event window. Column (2), which restricts the post-event window to three months (March–May 2020), shows that universities in the top tercile for the percentage of students with federal loans experienced a statistically significant 21.8% rise in equity value compared to others ($t = 2.21$). Given that the average equity value for universities in the treatment group was \$666 million as of February 2020, this increase translates to a gain of approximately \$145 million in equity value for treated universities relative to non-treated ones.

To explore heterogeneity, we interact the DiD term with indicators for universities in the bottom tercile of (1) the government-grant-to-asset ratio, (2) undergraduate enrollment, and (3) average federal loan amount per borrower. These interactions test whether the effect is amplified for smaller, more tuition-dependent institutions. The results suggest that universities with a lower government grant share and smaller enrollment experienced a larger increase in the market value of equity,

consistent with these institutions being more reliant on student tuition and thus more sensitive to student loan relief. By contrast, in Column (6), the interaction with low loan size is significantly negative, indicating that the gain is not realized at universities whose students hold the smallest loans but is instead concentrated among those with medium-to-large per-borrower loan amounts. This pattern is consistent with the effect operating through loan forgiveness: universities serving students with larger debt balances benefit more when those payments are paused.

5.3.3 Visa Scrutiny and Deportations of Chinese International Students

Our third policy analysis focuses on the intensified visa restrictions and deportations affecting Chinese international students that gained significant attention in April 2024. Amid escalating US-China tensions, a widely circulated news article on April 20 reported that Chinese students and scholars holding valid visas were being subjected to prolonged airport interrogations, immediate visa cancellations, and deportations upon arrival in the United States.[18] The article cited the Chinese Embassy in Washington as stating that more than 70 students with valid documentation had been deported from the U.S. since July 2021, with more than ten cases since November 2023. Chinese Foreign Ministry spokesperson Mao Ning openly condemned the United States for canceling visas and deporting Chinese students and academics without substantive proof, accusing Washington of overstretching national security concepts and creating obstacles for cultural exchanges. Since the news broke in late April, we use May 2024 as the event month. These incidents and widespread media coverage likely captured investors' attention, raising concerns about potential impacts on university fundamentals through declining Chinese student enrollment and the consequent loss of tuition revenue for institutions heavily dependent on Chinese students.

To identify universities that heavily rely on Chinese international students, we define the treated group as institutions in the top tercile for both the share of international students and the share of Asian students. We employ this proxy because IPEDS data do not provide a detailed breakdown of Asian students or international students by nationality. As in prior analyses, we use observations of these variables available to investors in 2023 to avoid look-ahead bias. We estimate the same

[18] https://www.theguardian.com/us-news/2024/apr/20/chinese-students-in-us-tell-of-chilling-interrogations-and-deportations

difference-in-differences regression as in equation (13), using the sample period from January 2024 to August 2024.

As reported in Column (1) of Table 10, universities with high exposure to Chinese international students experienced a statistically significant 28.3% decline in equity value relative to other universities. Given that the treated group averaged $46.7 billion in equity value as of April 2024, this corresponds to an average equity loss of approximately $13.2 billion for the treated group compared to the control group. Column (2) confirms the robustness of this result using shorter post-event windows of three months.

We further explore triple-difference specifications in columns (3) through (7) to assess whether the effect is amplified for five subgroups: universities with (3) a high share of foreign Asian faculty, defined as those in the top tercile for both the share of foreign faculty and the share of Asian faculty; (4) a high share of international students (top quintile); (5) a high share of Asian students (top quintile); (6) large student enrollment (top tercile); and (7) PhD-granting status. The interaction with the share of international students is marginally significant at -28.4% ($t = -1.94$, Column (4)), suggesting that universities with the largest international student exposure bore a disproportionately large share of the impact.

Figure 10 illustrates the dynamic effects of the event on universities with high exposure to Chinese international students relative to others. The equity values of treated universities plunge in May 2024 and remain significantly lower than those of other universities from June to August, indicating a prolonged impact on equity values.

In summary, our empirical analyses document the directions and magnitudes of the effects from the Trump administration's policies in March 2025, the federal student loan payment pause in March 2020, and the visa scrutiny and deportations of Chinese international students in May 2024. These analyses demonstrate that our measure enables real-time assessment of risks and cash flows. Unlike book values of equity, our measure reflects policy impacts in a timely manner and allows us to quantify these impacts. This is important as the magnitudes of impacts provide valuable information for policymakers, enabling them to evaluate the financial consequences of government policies and make more informed decisions about regulatory changes affecting the higher education

sector.[19]

6 Conclusion

This paper proposes and implements a novel approach to estimating the market value of nonprofit universities by inferring investors' expectations from the observed prices and volatilities of their publicly traded bonds. Using a structural model of default risk with stochastic volatility, we reverse-engineer the implied equity value of universities—the residual claim on discounted future cash flows after debt service—from the perspective of debt investors. This framework allows us to quantify the market capitalization of nonprofit universities even in the absence of traded equity securities.

Our estimates reveal that the market value of private universities constitutes a nontrivial portion of the U.S. economy. The aggregate market capitalization of universities represents approximately two to four percent of the total stock market capitalization during the sample period, comparable to the real estate or utilities sectors in the S&P 500 index. At the institution level, Yale, Harvard, and Stanford emerge as the largest universities by market value, with magnitudes rivaling those of major publicly listed corporations. Importantly, these rankings are not mechanical reflections of balance sheet size: market-to-book ratios vary widely, reflecting heterogeneity in expected growth, operational flexibility, and financial management. Higher ROA, financial investments, and US News rank are associated with greater market-to-book ratios, while greater reliance on government grants and higher capital expenditures are associated with lower valuations.

Beyond providing new valuation estimates, our analysis exploits high-frequency variation in bond prices and quantifies the causal impact of policy shocks on university valuations. The federal research funding freeze of March 2025 led to a decline of approximately 39% in market value for the most affected universities, with more severe effects among Ivy League institutions and those highly dependent on federal grants. Conversely, the federal student loan payment pause in March 2020 raised market valuations by 17% among universities with high exposure to student

[19] Appendix Tables A11, A12, and A13 show that our difference-in-differences results for the three events remain robust when using the log of the market value of assets, rather than the log of the market value of equities, as the outcome variable.

loan financing. Additionally, the intensified visa restrictions on Chinese international students in May 2024 triggered an average market value reduction of approximately 28% for institutions with high shares of international and Asian enrollment. These findings demonstrate that our measure of market-based equity value quickly reacts to policy news and offers a tool to assess the impact of policy changes on universities.

Overall, our results bridge the literature on structural models of credit risk and the emerging research on the financial behavior of nonprofit institutions. By translating bond prices into implied equity valuations, we provide a framework for quantifying the financial market value of organizations that lack traded equity. While our approach intentionally abstracts from the broader social returns to education and research, it provides a transparent, empirically grounded measure of financial value from the perspective of market participants.

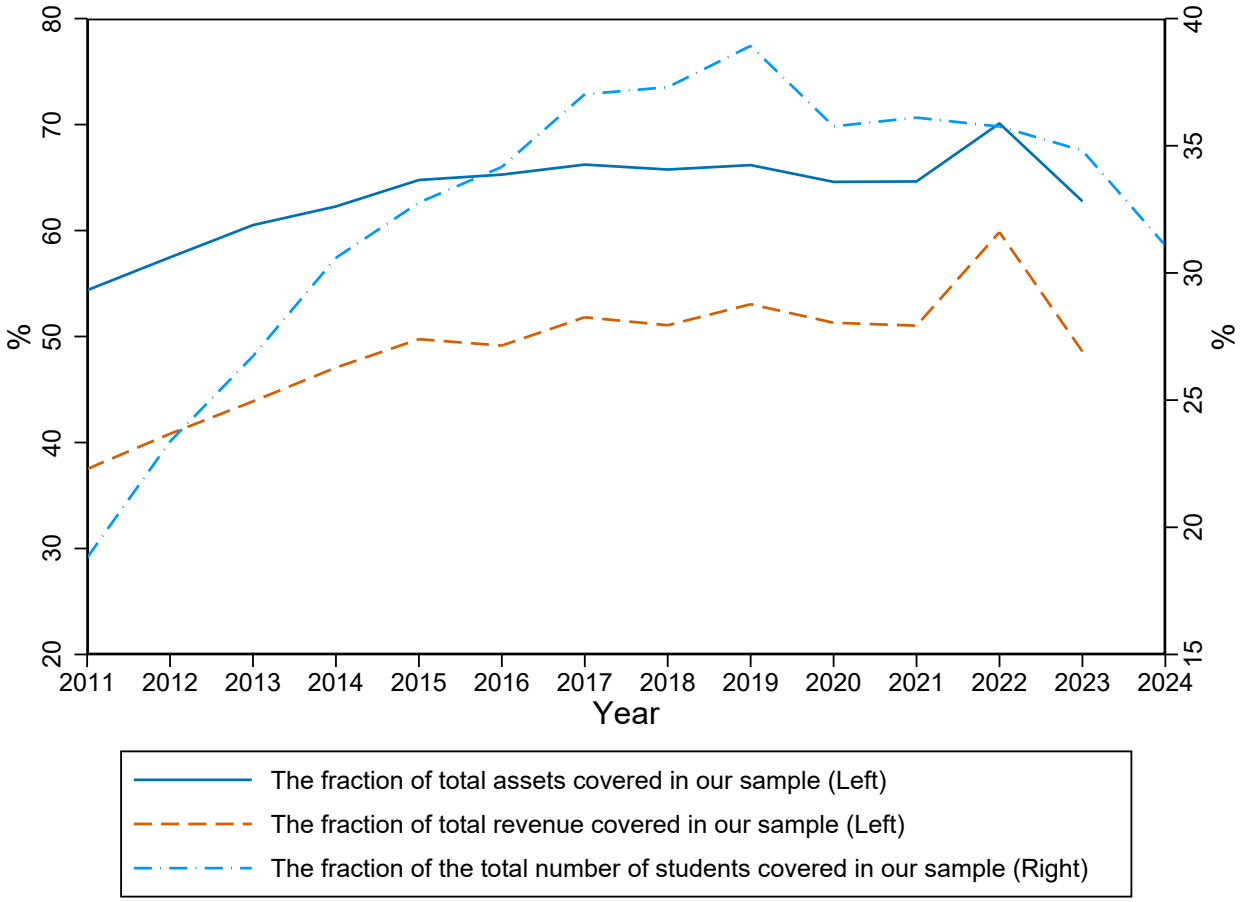


Figure 2: Data Coverage

This figure plots the fraction of total assets, total revenue, and student enrollment of private nonprofit universities in the IPEDS database that are covered in our sample. Student enrollment is measured as of the fall of each year. Total assets and total revenue are obtained from IRS Form 990 filings and correspond to the fiscal year ending date.

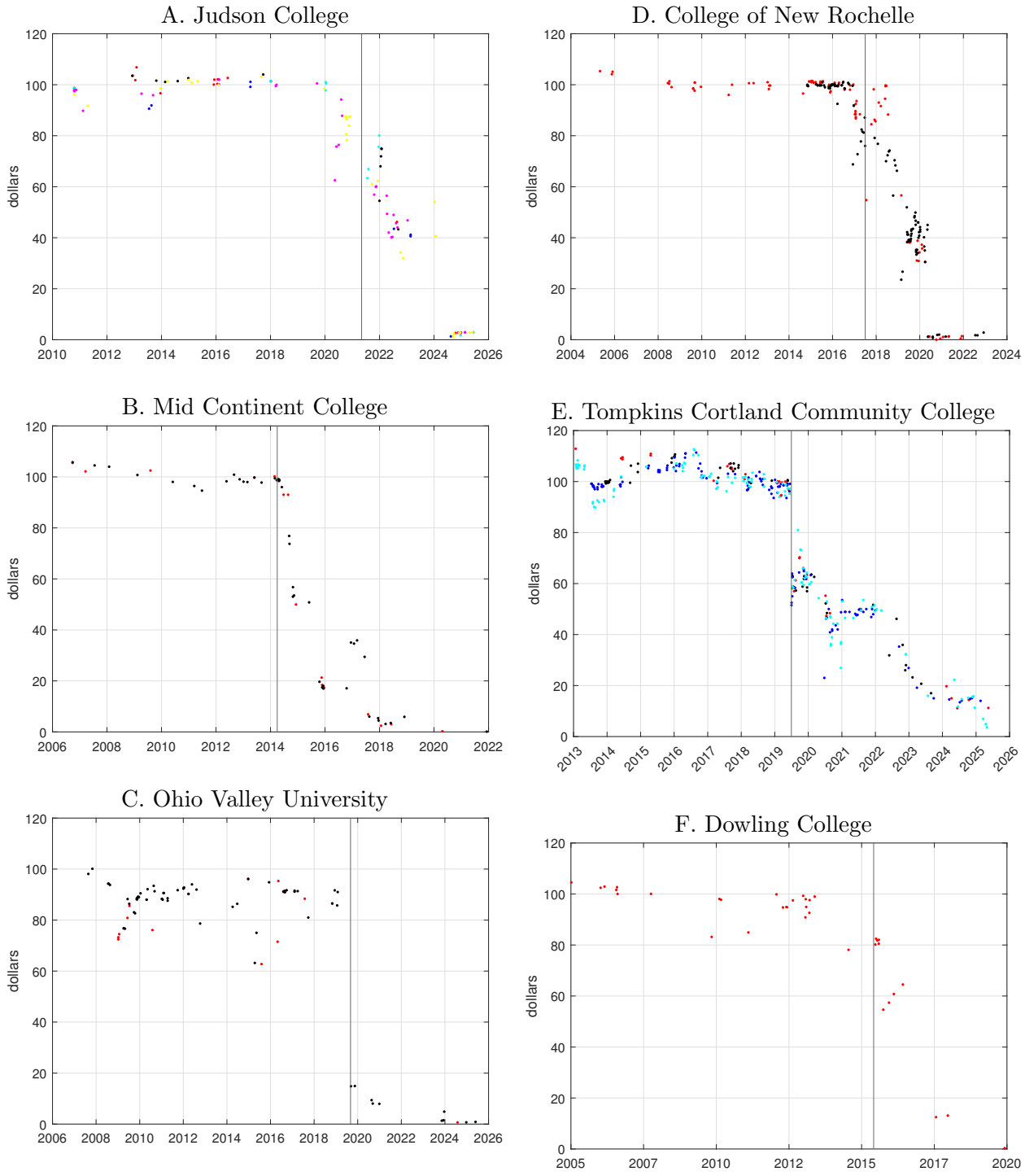


Figure 3: Bond Prices of Defaulted Universities

The figure plots the daily bond prices of defaulted universities in the sample. We select the sample of universities that experienced payment defaults during the sample period. The daily price is constructed as the average of the highest ask price and the lowest bid price on a day. If either of these prices is missing, we use the average interdealer price. The vertical line indicates the first default date. The dots with a different color correspond to a different bond issued by the same issuer.

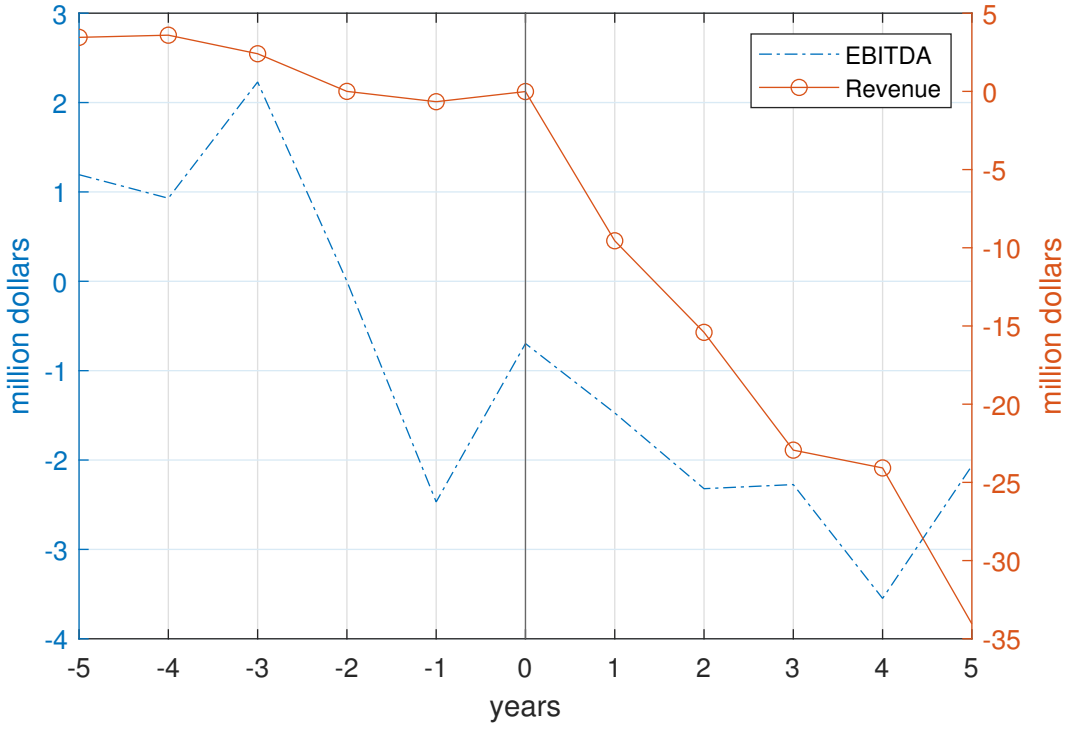


Figure 4: Financial Statements of Defaulted Universities

The figure plots the revenue and EBITDA in million dollars, averaged across seven universities that defaulted in our sample. For each university, we find the default year and use it as year 0. Then, we set year -2 as a reference point and compute the difference in revenue and EBITDA for the surrounding years. We take the average across universities and plot it as a function of the year relative to the default year.

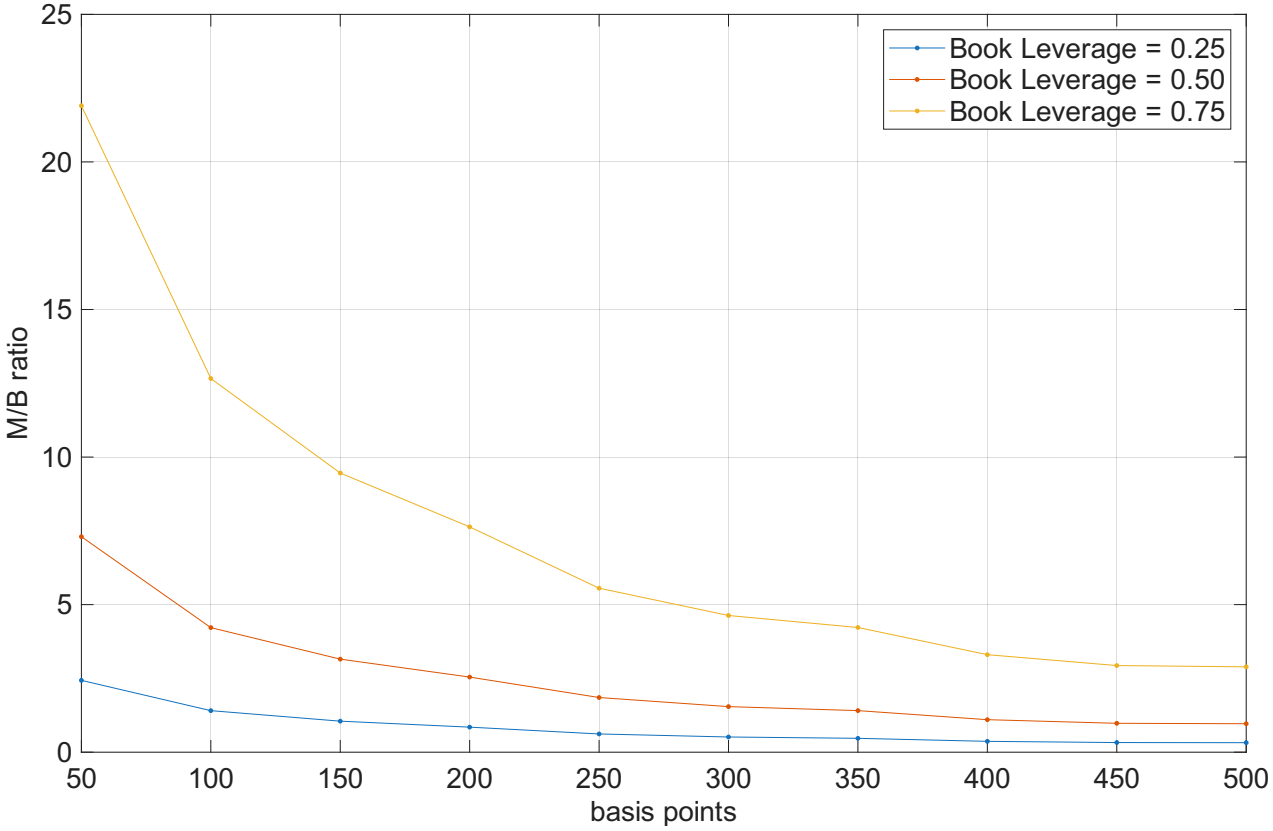


Figure 5: Relationship Between Credit Spreads, Market-to-Book Ratio, and Book Leverage

This figure plots the credit spreads (x-axis, in basis points) and the equity market-to-book ratio (y-axis) using the Du et al. (2019) model. We use the parameters for the A-rated group in Table 4 and let the input credit spreads vary, while bond volatility is fixed at the sample average of 11.12%. For each set of inputs, we solve the system of two equations with two unknowns in Eq. (5) and back out the market-to-book ratio. Book leverage is defined as the ratio of the book value of liabilities to the book value of total assets.

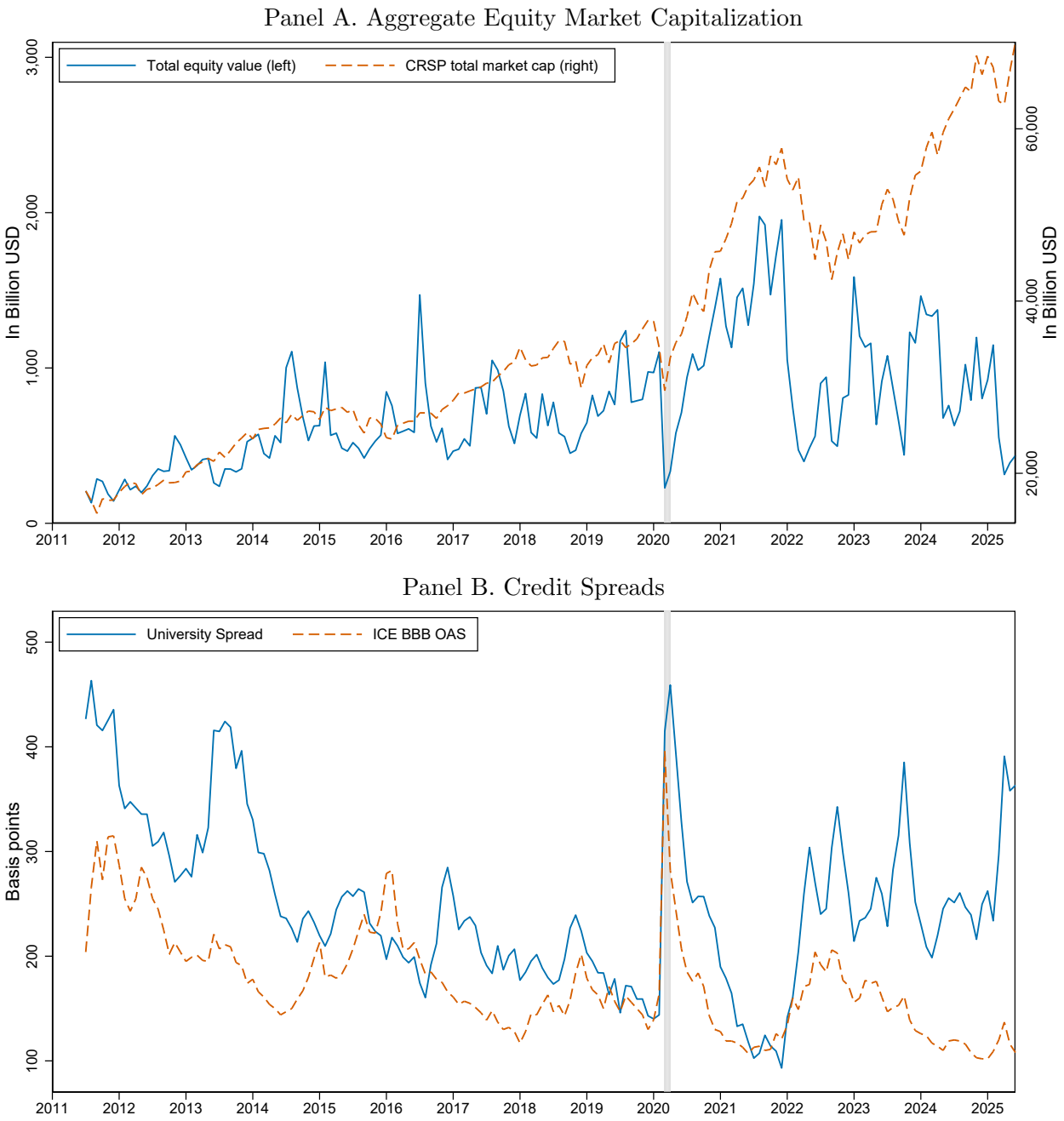


Figure 6: Comparison Between Universities and Corporations

Panel A plots the total equity value of universities and the total market capitalization (in billion dollars) of the CRSP equity universe from NYSE/NASDAQ/AMEX from July 2011 to June 2025. The total equity value of universities is calculated by summing the equity values across all universities in our sample for each month. Panel B plots the average credit spread of universities and the ICE BofA BBB US Corporate Index Option-Adjusted Spread in basis points. The shaded area denotes the NBER recession from March 2020 to April 2020.

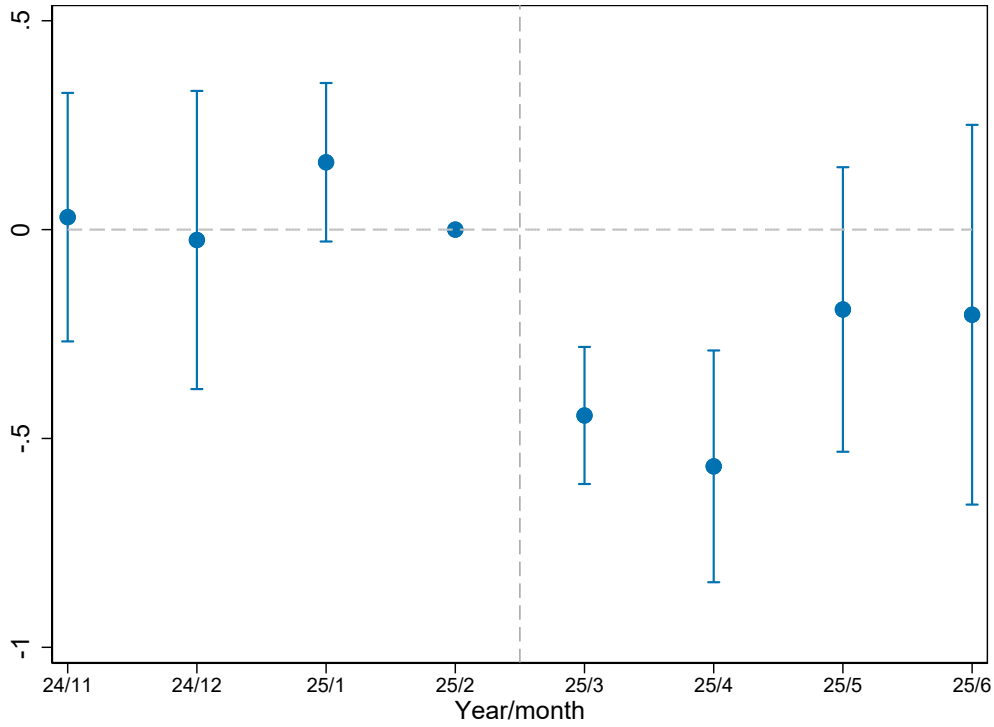


Figure 7: Effects of Policies against Top Universities in March 2025

This figure displays point estimates and 95% confidence intervals for the relative differences in log equity market value between treated universities and others from November 2024 to June 2025, with February 2025 as the benchmark period. The treated group comprises universities that satisfy all three conditions: (1) endowments exceeding the WEST Act threshold ($11.9 billion for secular private institutions, $10.5 billion for Cornell), (2) federal research funding freezes, and (3) OCR warning letters. The dependent variable is log equity market value, and the plotted coefficients represent estimated coefficients on interactions between monthly dummies and the treated university indicator. The dependent variable and the continuous controls (ROA, book leverage, and the investment-to-asset ratio) are winsorized at the 0.5% and 99.5% levels. Controls include ROA, book leverage, the investment-to-asset ratio, credit rating dummies, the (negative of the) U.S. News rank, and an indicator for unranked universities. The regression includes university and year-month fixed effects. Standard errors are clustered at the university level.

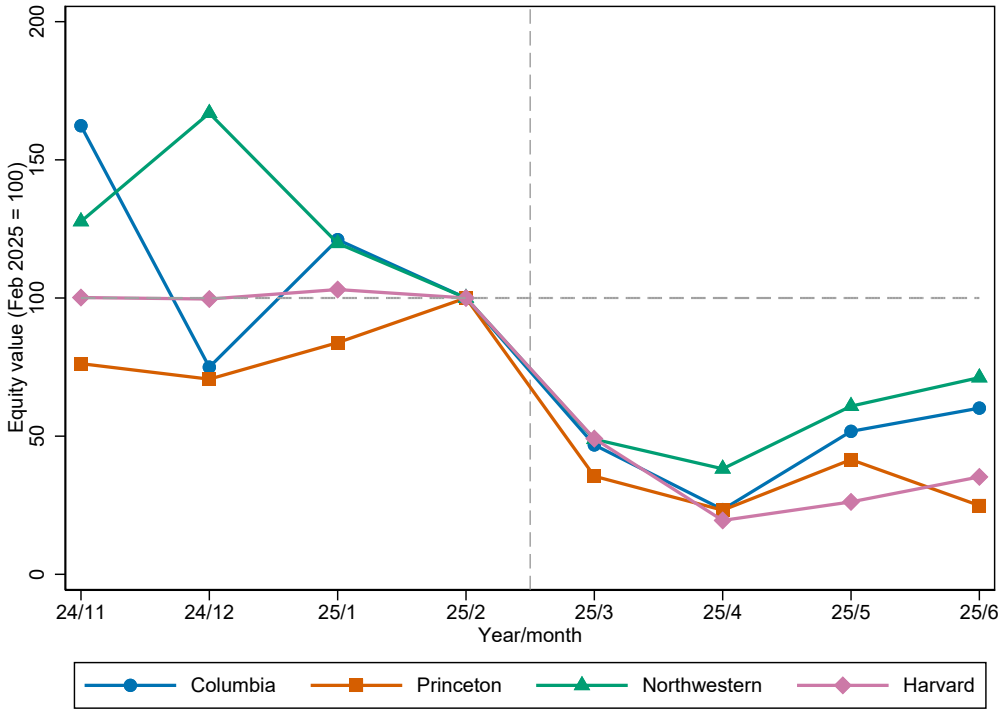


Figure 8: Case Study: Equity Value of the Four Fully-Treated Universities around March 2025

This figure plots the monthly equity market value of the four universities exposed to all three policies (the WEST Act endowment-tax threshold, the federal research funding freeze, and the OCR warning letter): Columbia, Princeton, Northwestern, and Harvard. Each series is rescaled to 100 in February 2025, the month immediately before the policy announcements.

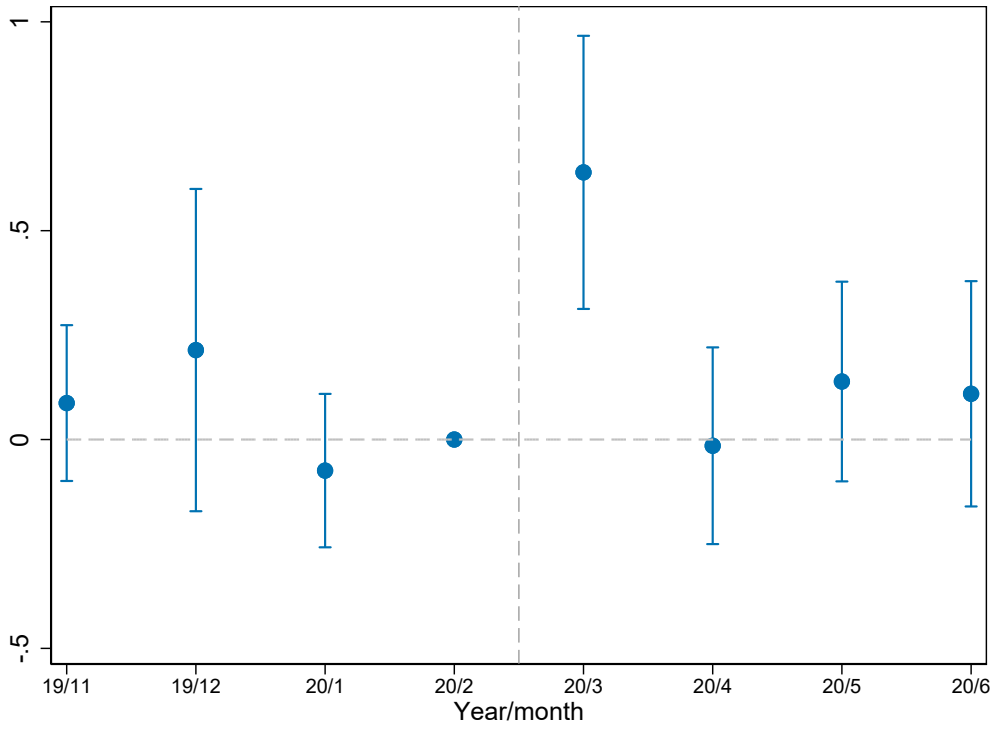


Figure 9: Effects of Federal Student Loan Payment Pause in March 2020

This figure displays point estimates and 95% confidence intervals for the relative differences in log equity market value between high student loan exposure universities and others from November 2019 to June 2020, with February 2020 as the benchmark period. The treated group consists of universities in the top tercile of the percent of undergraduate students awarded federal student loans. The dependent variable is log equity market value, and the plotted coefficients represent estimated coefficients on interactions between monthly dummies and the treated group universities indicator. The dependent variable and the continuous controls (ROA, book leverage, and the investment-to-asset ratio) are winsorized at the 0.5% and 99.5% levels. Controls include ROA, book leverage, the investment-to-asset ratio, credit rating dummies, the (negative of the) U.S. News rank, an indicator for unranked universities, and university and year-month fixed effects. Standard errors are clustered at the university level.

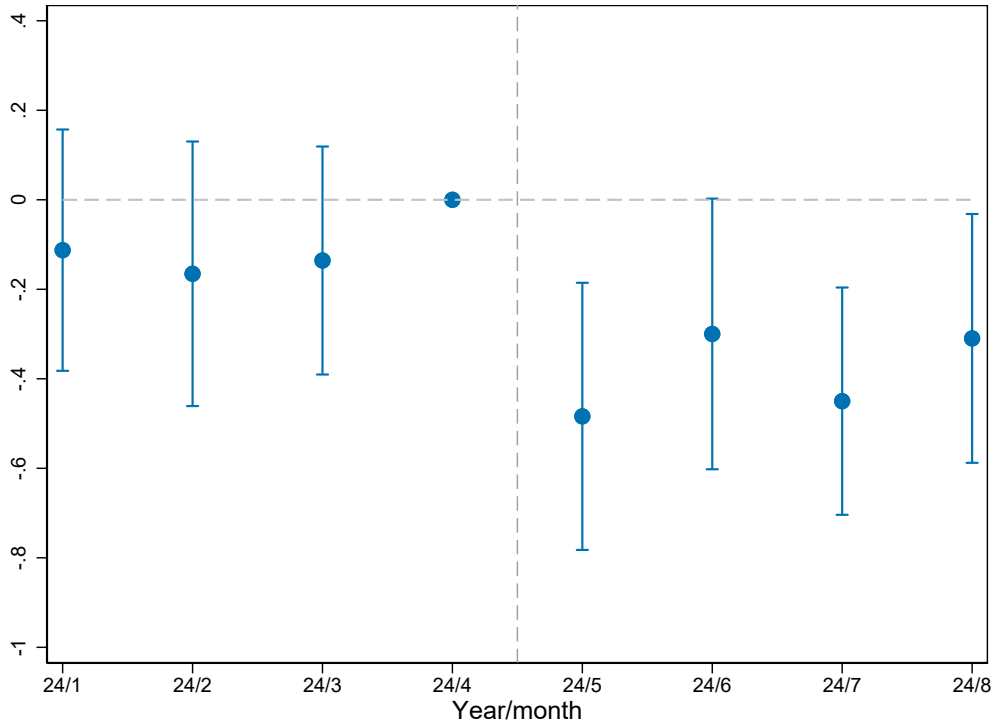


Figure 10: Effects of Visa Scrutiny and Deportations of Chinese International Students in May 2024

This figure displays point estimates and 95% confidence intervals for the relative differences in log equity value between universities with a high share of Chinese international students and others from January 2024 to August 2024, with April 2024 as the benchmark period. Universities with a high share of Chinese international students are those in the top tercile of the share of international students and in the top tercile of the share of Asian students. The dependent variable is log equity value, and the plotted coefficients represent estimated coefficients on interactions between monthly dummies and the treated group universities indicator. The dependent variable and the continuous controls (ROA, book leverage, and the investment-to-asset ratio) are winsorized at the 0.5% and 99.5% levels. Controls include ROA, book leverage, the investment-to-asset ratio, credit rating dummies, the (negative of the) U.S. News rank, an indicator for unranked universities, and university and year-month fixed effects. Standard errors are clustered at the university level.

Table 1: Summary Statistics

	N	Mean	SD	Min	p1	p10	p50	p90	p99	Max
Panel A: Input variables										
Spread	15,154	246.07	166.05	0.21	22.09	75.20	207.78	467.69	815.15	999.86
Coupon	15,154	4.85	0.46	1.11	3.00	4.00	5.00	5.00	5.54	6.50
Matched Treasury yield	15,154	2.26	1.32	0.11	0.21	0.65	1.90	4.23	4.76	5.05
Time to worst	15,154	4.93	1.40	2.00	2.09	2.90	5.00	6.96	7.86	7.99
BondVOL	15,154	0.10	0.07	0.01	0.03	0.05	0.08	0.16	0.32	1.81
FCFF	15,154	107	334	-1487	-280	-25	26	274	1,784	4,006
Asset book	15,154	4,983	9,993	65	145	448	1,566	12,727	57,547	75,288
Liability book	15,154	1,348	2,711	17	59	132	413	3,532	11,368	35,024
Panel B: Output variables										
Equity Market	15,154	8,206	29,921	-133	27	147	1,046	16,262	148,108	950,602
EquityMB	15,154	1.50	1.79	-0.58	0.09	0.33	1.02	3.07	7.89	62.11
Log(EquityMB)	15,121	0.01	0.91	-6.32	-2.31	-1.10	0.03	1.12	2.07	4.13
Asset Market	15,154	9,426	31,849	29	104	289	1,477	19,695	159,509	978,719
AssetMB	15,154	1.24	0.99	0.13	0.26	0.48	0.98	2.24	4.80	31.87
MarketLev	15,154	0.34	0.19	0.01	0.05	0.13	0.31	0.59	0.91	2.56
AssetVAR	15,154	0.37	0.35	0.00	0.02	0.07	0.29	0.77	1.36	16.78
Panel C: Month-level variables										
Aggregate Equity	168	740	387	132	144	314	629	1,275	1,954	1,975
Median Equity	168	1,158	428	387	421	652	1,118	1,683	2,972	3,027
Median EquityMB	168	1.09	0.41	0.42	0.44	0.62	1.05	1.55	2.46	2.61
Value-weighted Return	167	0.06	0.35	-0.80	-0.53	-0.33	0.03	0.51	1.63	1.88
Equal-weighted Return	167	0.17	0.25	-0.57	-0.31	-0.10	0.13	0.46	0.97	1.40
Ratio	168	0.02	0.01	0.01	0.01	0.01	0.02	0.03	0.04	0.05
Median spread	168	226.62	83.17	74.21	91.68	143.59	208.04	354.09	456.04	497.05

Spread: credit spread in basis points. *Coupon*: coupon rate in percent. *Matched to Treasury yield*: treasury yield in percent, matched to each bond's maturity. *Time to worst*: time to worst in years. *BondVOL*: annualized bond volatility. *FCFF*: free cash flow to firm in million USD. *Asset book*: book value of assets in million USD. *Liability book*: book value of liabilities in million USD. *Equity Market*: market value of equity in million USD. *EquityMB*: market value of equity divided by book value of equity. *Log(EquityMB)*: natural logarithm of EquityMB. *Asset Market*: market value of assets in million USD. *AssetMB*: market value of assets divided by book value of assets. *MarketLev*: book value of liabilities divided by market value of assets. *AssetVAR*: asset variance. *Aggregate Equity*: aggregate market capitalization of universities. *Median Equity*: cross-sectional median equity value. *Median EquityMB*: cross-sectional median equity market-to-book ratio. *Value-weighted Return*: value-weighted mean of individual university equity returns. *Equal-weighted Return*: equal-weighted mean of individual university equity returns. *Ratio*: ratio of aggregate market capitalization of universities to aggregate CRSP NYSE-NASDAQ-AMEX market capitalization (sample period ending in December 2024). *Median spread*: cross-sectional median credit spread.

Table 2: List of Universities Defaulted

Name	Default Date	Event	Bond Prices		Credit Rating		Outcome
			Before Default	After Default	Original	Before Default	
Mid Continent College	20140401	MPP	99.5	87.7			Ch. 11 bankruptcy in Sep 2014.
Dowling College	20150601	BKLE	78.1	72.5	14	20	Ch. 11 bankruptcy in 2016.
The College Of New Rochelle	20170701	MPP	89.8	82.5	10	11	Ch. 11 bankruptcy in Sep 2019.
Tompkins Cortland Community College	20190701	MIP	98.8	62.2	10	15	Continues its operation as of Oct 2025.
Ohio Valley University Inc	20190903	MIP	87.6	13.1			Ch. 7 bankruptcy in Feb. 2022
Judson College	20210506	MPP	82.2	64.0	10	12	Ch. 11 bankruptcy in 2021.
(Average)			89.3	63.7			

The table lists the payment defaults that are recorded in the merged sample of FISD and MSRB. MPP is missed principal payments, MIP is missed interest payments, and BKLE is bankruptcy. Price before default is the average of the daily prices over the one-year period before the default date, expressed as a percentage of the par value, and Price after default is the average over the one-year period on and after the default date. Original credit rating is a credit rating assigned to the issue when they are issued, averaged across bonds for each university. Rating before refers to the credit rating one month before default, also averaged across bonds. Numerical values are assigned to a rating such that AAA=1, AA+=2, ..., C=21.

Table 3: Comparison of Turnover Ratios between University and Corporate Bonds by Credit Rating

	AAA	AA	A	BBB	HY
			Panel A: University bonds		
Turnover (%)	7.363	8.078	10.294	13.026	7.686
	(28.38)	(58.01)	(66.81)	(32.65)	(6.66)
Obs.	16,070	44,106	52,659	10,732	753
			Panel B: Corporate bonds		
Turnover (%)	5.386	7.305	6.697	6.830	10.245
	(23.16)	(43.29)	(100.37)	(116.73)	(81.22)
Obs.	8,720	64,952	399,968	507,727	144,828
			Panel C: Difference between the two groups		
Difference	1.977***	0.773***	3.597***	6.196***	-2.559**
	(5.68)	(3.53)	(21.43)	(15.38)	(-2.22)

This table compares the liquidity of university bonds and corporate bonds across five credit rating categories: AAA, AA, A, BBB, and High Yield (HY). Liquidity is measured by turnover, defined as the ratio of monthly trading volume to the bond's amount outstanding, in percentage terms. Panel A reports the average turnover for university bonds, Panel B reports the average turnover for corporate bonds, and Panel C reports the difference between the two groups. Turnover values are winsorized at the 1% and 99% levels each month to mitigate the impact of outliers. t-statistics based on standard errors, clustered by bond, are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4: Parameters of the Du et al. (2019) Model

Panel A: Global parameters (fixed across rating groups)

Parameter	Value	Source
ρ (correlation between asset and variance shocks)	-0.150	Du et al. (2019) Table 1
θ (long-run mean of variance)	0.084	Du et al. (2019) Table 1
κ (speed of mean-reversion of variance)	4.000	Du et al. (2019) Table 1
σ (volatility of variance shock)	0.300	Du et al. (2019) Table 1
LGD (loss given default)	0.550	Du et al. (2019)
SR (target long-run asset Sharpe ratio)	0.220	Du et al. (2019)

Panel B: Rating-specific parameters (re-estimated by rating group)

Rating group	X_D	λ_V	λ_D
AAA	0.500	-8.900	-0.583
AA	0.580	-7.500	-0.371
A	0.705	-5.900	-0.128
BBB	0.605	-6.400	-0.204
HY	0.875	-1.400	$+0.555$

This table reports the parameters of the stochastic volatility model of Du et al. (2019), in which asset value X and variance V follow

$$\frac{dX_t}{X_t} = (\mu_X^P - q)\,dt + \sqrt{V_t}\big(\rho\,dW_{2,t} + \sqrt{1-\rho^2}\,dW_{1,t}\big), \tag{14}$$

$$dV_t = \kappa(\theta - V_t)\,dt + \sigma\sqrt{V_t}\,dW_{2,t}, \tag{15}$$

and the risk-neutral drift and mean-reversion speed are $\mu_X^Q = r$ and $\kappa^* = \kappa + \sigma\lambda_V$, with $\mu_X^P = r + (\sqrt{1-\rho^2}\lambda_D + \rho\lambda_V)V_t$. Panel A lists parameters taken from Du et al. (2019) and held fixed across rating groups. Panel B lists parameters that we re-estimate separately for each credit rating group using the ICE BofA U.S. corporate bond panel. For each rating group g, (i) the default boundary $X_D^{(g)}$ is chosen to minimize the distance between the model-implied cumulative default probabilities and Moody's historical cumulative default rates for rating g over 1920–2020; (ii) the price of variance risk $\lambda_V^{(g)}$ is chosen to minimize the squared distance between the time-series average of model-implied credit spreads and observed credit spreads in rating group g; and (iii) the price of asset risk $\lambda_D^{(g)}$ is pinned down by the constraint that the long-run asset Sharpe ratio equals 0.22,

$$SR = (\sqrt{1-\rho^2}\,\lambda_D + \rho\,\lambda_V)\sqrt{\theta} = 0.22.$$

Table 5: Top 50 Universities by Equity Value

Rank	Name	Equity	Equity M/B	Spread	US News Rank	Asset	Leverage	Revenue	Revenue /Asset	PSR /Revenue	Contrib /Revenue	Inv.Income /Revenue	Endowment /Asset
1	Yale University	151.19	4.19	0.70	5	49.95	0.23	6.50	0.13	0.36	0.22	0.06	0.74
2	Harvard University	150.92	2.80	0.62	3	66.24	0.17	7.96	0.12	0.26	0.26	0.04	0.70
3	Stanford University	134.87	3.06	0.63	3	55.33	0.17	8.22	0.15	0.39	0.34	0.03	0.60
4	Massachusetts Institute of Technology	83.18	2.95	0.65	2	35.68	0.17	5.44	0.16	0.47	0.20	0.02	0.63
5	University of Notre Dame	52.87	3.28	0.73	20	21.35	0.20	2.95	0.14	0.36	0.21	0.04	0.68
6	New York University	49.72	7.73	1.63	35	17.75	0.63	8.85	0.50	0.78	0.16	0.01	0.28
7	Princeton University	46.19	1.44	1.09	1	38.46	0.13	3.73	0.10	0.15	0.22	0.57	0.81
8	Columbia University	45.83	2.64	0.93	12	22.46	0.21	6.38	0.28	0.57	0.29	0.01	0.56
9	University of Southern California	36.76	3.97	0.68	28	13.79	0.32	5.85	0.43	0.75	0.16	0.01	0.45
10	Cornell University	30.67	2.62	0.78	12	16.05	0.25	5.72	0.36	0.80	0.10	0.02	0.51
11	University of Pennsylvania	29.77	1.25	1.91	6	32.37	0.24	9.99	0.31	0.64	0.19	0.02	0.57
12	Emory University	29.09	2.29	1.10	24	18.37	0.29	5.48	0.30	0.71	0.18	0.01	0.46
13	Duke University	25.63	1.98	1.23	7	18.39	0.25	3.94	0.21	0.31	0.42	0.03	0.57
14	Dartmouth College	23.76	3.02	0.64	18	10.53	0.18	1.66	0.16	0.34	0.27	0.05	0.68
15	Northwestern University	21.99	1.55	1.03	9	17.83	0.19	3.52	0.20	0.66	0.13	0.02	0.57
16	Johns Hopkins University	21.95	2.41	0.68	9	12.76	0.29	8.48	0.66	0.53	0.41	0.01	0.49
17	University of Rochester	15.74	4.21	2.10	47	6.92	0.42	4.68	0.68	0.85	0.10	0.02	0.37
18	Boston University	15.55	3.20	1.22	43	7.81	0.37	2.92	0.37	0.70	0.23	0.01	0.37
19	University of Chicago	14.72	1.85	2.94	12	14.07	0.41	4.34	0.31	0.41	0.49	0.02	0.58
20	Boston College	11.97	2.92	1.22	39	5.89	0.28	1.38	0.23	0.69	0.16	0.04	0.54
21	Carnegie Mellon University	11.09	2.22	0.95	24	5.97	0.20	1.82	0.31	0.53	0.36	0.03	0.46
22	Brown University	10.27	1.55	1.21	9	8.30	0.19	1.72	0.21	0.45	0.33	-0.03	0.65
23	Northeastern University	8.83	3.21	1.14	53	4.63	0.39	2.16	0.48	0.82	0.14	0.01	0.31
24	Thomas Jefferson University	6.81	10.77	2.07	142	3.50	0.80	1.08	0.31	0.92	0.04	0.00	0.19
25	Syracuse University	6.75	2.61	1.27	67	3.81	0.29	1.61	0.42	0.86	0.06	0.02	0.43
26	Georgetown University	6.72	3.51	1.98	22	4.57	0.55	1.80	0.40	0.61	0.26	0.05	0.54
27	University of Miami	6.70	2.27	2.49	67	5.98	0.46	4.93	0.83	0.81	0.17	0.01	0.21
28	Baylor University	6.09	2.38	1.06	93	3.63	0.26	1.37	0.38	0.82	0.11	0.06	0.50
29	The Rockefeller University	5.81	2.18	1.74		4.16	0.35	0.51	0.12	0.06	0.45	0.01	0.60
30	Baylor College of Medicine	5.52	3.76	1.28		2.74	0.46	2.21	0.81	0.64	0.29	0.01	0.51
31	Mount Sinai School of Medicine	5.34	4.51	1.85		3.21	0.61	3.25	1.03	0.73	0.22	0.00	0.23
32	Case Western Reserve University	5.04	1.89	1.11	53	3.73	0.26	1.36	0.37	0.48	0.43	0.01	0.48
33	Tufts University	4.88	1.40	1.09	40	4.85	0.28	1.33	0.27	0.60	0.24	0.01	0.56
34	Tulane University of Louisiana	4.38	2.08	1.86	73	3.36	0.34	1.51	0.45	0.71	0.18	0.02	0.53
35	Williams College	4.09	1.10	1.87		4.77	0.21	0.45	0.10	0.35	0.14	0.00	0.68
36	Texas Christian University	4.00	1.54	0.92	98	3.57	0.28	0.92	0.26	0.70	0.08	0.05	0.50
37	Wesleyan University	3.81	2.10	0.87		2.37	0.23	0.29	0.12	0.90	0.23	0.00	0.66
38	Pepperdine University	3.43	2.29	1.04	76	2.12	0.31	0.61	0.29	0.74	0.08	0.07	0.47
39	Swarthmore College	3.29	1.21	1.26		3.29	0.13	0.35	0.11	0.33	0.07	0.33	0.78
40	Wake Forest University	3.10	1.99	2.02	47	2.41	0.31	0.66	0.28	0.74	0.16	0.02	0.40
41	Pomona College	2.94	0.96	1.09		3.59	0.12	0.31	0.09	0.41	0.09	0.12	0.75
42	Southern Methodist University	2.82	1.01	1.87	89	3.83	0.22	1.02	0.27	0.70	0.17	0.03	0.49
43	Saint Louis University	2.68	1.39	2.53	105	2.74	0.28	1.17	0.43	0.71	0.10	0.04	0.54

Table 5 – continued from the previous page

Rank	Name	Equity	Equity M/B	Spread	US News Rank	Asset	Leverage	Revenue	Revenue /Asset	PSR /Revenue	Contrib /Revenue	Inv.Income /Revenue	Endowment /Asset
44	Drexel University	2.50	2.02	2.33	98	2.39	0.47	1.34	0.57	0.80	0.16	0.02	0.35
45	Claremont McKenna College	2.44	1.60	1.23		2.01	0.23	0.27	0.14	0.39	0.42	0.05	0.57
46	St. John's University-New York	2.42	2.40	1.66		1.64	0.37	0.79	0.48	0.86	0.07	0.01	0.50
47	Wellesley College	2.14	0.72	2.46		3.61	0.16	0.43	0.12	0.42	0.14	0.03	0.77
48	Babson College	2.12	2.56	1.26		1.10	0.23	0.36	0.33	0.70	0.15	0.02	0.62
49	Midwestern University-Glendale	2.11	1.47	1.32		1.79	0.17	0.51	0.29	0.94	0.02	0.03	0.01
50	Colgate University	2.05	1.71	0.59		1.62	0.26	0.34	0.21	0.61	0.21	0.03	0.59

This table presents the top 50 universities ranked by average equity value over the 5-year period from July 2020 to June 2025. All variables are averaged over the same period unless otherwise noted. *Equity*: market value of equity in billions of USD. *Equity M/B*: equity market-to-book ratio, defined as market value of equity divided by book value of equity. *Spread*: credit spread of the representative bond in percent. *US News Rank*: based on the 2024 ranking; blank entries indicate unranked institutions. *Asset*: book value of total assets in billions of USD. *Leverage*: book value of total liabilities divided by book value of total assets. *Revenue*: total revenue in billions of USD. *Revenue/Asset*: total revenue divided by book value of total assets. *PSR/Revenue*: program service revenue divided by total revenue. *Contrib/Revenue*: total contributions (donations and government grants) divided by total revenue. *Inv.Income/Revenue*: investment income divided by total revenue. *Endowment/Asset*: endowment divided by total assets. Financial statement variables are from IRS Form 990 filings. The sample excludes public universities that are not required to file IRS Form 990.

Table 6: Determinants of the Equity Market-to-Book Ratio

		Univariate				Multivariate		
Category	Variable	Coef	t-stat	Adj. R^2	N	Coef	t-stat	Var. dec.
Panel A: Baseline								
	Year-month FE only			0.161	15,121			
	University FEs			0.620	15,106			
Panel B: Base model								
Revenue	ROA	0.155***	(5.25)	0.189	15,121	0.170***	(8.66)	[2.97]
	Change in ROA	0.120***	(5.37)	0.176	14,503	0.006	(0.33)	[0.09]
Op. risk	ROA vol.	-0.094***	(-2.95)	0.176	13,793	-0.069***	(-3.32)	[1.12]
Fin. risk	Book leverage	0.308***	(8.00)	0.281	15,121	0.592***	(20.72)	[23.75]
	Investment/Assets	-0.023	(-0.49)	0.162	15,121	0.148***	(4.59)	[-0.12]
	Cash/Assets	0.067*	(1.74)	0.163	13,739	0.038*	(1.92)	[0.28]
	Credit rating (dummies)	Included		0.208	15,121	Included		[9.90]
Reputation	US News rank	0.164***	(3.39)	0.277	15,121	0.101***	(3.86)	[-0.84]
	Ivy League	0.519***	(3.65)	0.186	15,121	0.099	(1.08)	[0.50]
						Adj. $R^2 = 0.586$		$N = 12{,}812$
Panel C: Decomposition model								
Revenue	PSR/Assets					0.069**	(2.02)	[0.77]
	Contribution/Assets					0.020	(0.59)	[0.50]
	Invest. income/Assets					-0.025	(-1.13)	[0.14]
	Other rev./Assets					0.085***	(3.53)	[1.51]
	Change in PSR					0.032**	(2.27)	[0.20]
	Change in contribution					0.039**	(2.53)	[0.16]
	Change in invest. income					0.023	(1.08)	[-0.06]
	Change in other rev.					0.029	(1.53)	[0.33]
Op. risk	PSR vol.					-0.058**	(-2.25)	[0.37]
	Contribution vol.					-0.026	(-1.06)	[0.18]
	Invest. income vol.					0.009	(0.38)	[-0.04]
	Other rev. vol.					-0.024	(-1.21)	[0.30]
Fin. risk	Book leverage					0.526***	(18.32)	[21.16]
	Non-endow. invest./Assets					0.099***	(4.85)	[1.55]
	Endowment (discret.)/Assets					0.124***	(4.78)	[0.93]
	Endowment (non-discret.)/Assets					0.059	(1.61)	[-0.89]
	Cash/Assets					0.090***	(4.83)	[0.70]
	Credit rating (dummies)					Included		[10.05]
Reputation	US News rank					0.101***	(3.71)	[-0.84]
	Ivy League					0.164**	(2.02)	[0.83]
						Adj. $R^2 = 0.582$		$N = 12{,}716$

This table reports the determinants of the equity market-to-book ratio. The dependent variable is $\log(S_{i,t}/S^B_{i,t})$, the natural logarithm of the equity market-to-book ratio. Panel A reports R^2 from specifications with only fixed effects. Panel B presents a base model with one representative variable per category. Panel C decomposes the aggregate measures into their components. Univariate columns report results from separate regressions of the dependent variable on each explanatory variable with year-month fixed effects. Multivariate columns report results from a single regression including all variables in the panel. *ROA*: total revenue minus total expenses, divided by total assets. *Change in ROA*: year-over-year change in ROA. *ROA vol.*: rolling three-year standard deviation of ROA growth. *Book leverage*: total liabilities divided by total assets. *Investment/Assets*: total investment securities divided by total assets. *Cash/Assets*: cash and savings divided by total assets. *Credit rating*: grouped credit rating dummies (1 = Aaa to 5 = HY or unrated). *US News rank*: negative of US News ranking (higher = better);

unranked universities coded as zero with a separate indicator (not reported). *Ivy League*: indicator for Ivy League membership. *PSR/Assets*: program service revenue divided by total assets. *Contribution/Assets*: Contributions and grants divided by total assets. *Invest. income/Assets*: investment income divided by total assets. *Other rev./Assets*: other revenue divided by total assets, where other revenue is total revenue minus PSR minus contributions minus investment income. For a given variable, "Change in *variable*" denotes the year-over-year change and "*variable* vol." denotes the rolling three-year standard deviation of that change. *Non-endow. invest./Assets*: total investment securities minus endowment, divided by total assets. *Endowment (discret.)/Assets*: board-designated (discretionary) endowment divided by total assets. *Endowment (non-discret.)/Assets*: non-discretionary endowment divided by total assets. Variance decomposition (Var. dec.) is computed as $\beta_x \text{cov}(y, x)/\text{var}(y) \times 100$. All continuous variables are winsorized at the 0.5th and 99.5th percentiles and standardized to have zero mean and unit standard deviation. Standard errors are double-clustered by university and tax year. ***, **, and * denote significance at the 1%, 5%, and 10% levels.

Table 7: Equity Market-to-Book ratio and Education Quality

	Dep. Var = Log(Equity M/B)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Student-to-faculty	0.029									
	(1.14)									
% of international students		0.043*								
		(1.85)								
Enrollment/Admission			0.056							
			(1.52)							
Nonwhite faculty share				0.014						
				(0.69)						
Female faculty share					-0.023					
					(-1.26)					
Tenure faculty share						-0.028				
						(-1.46)				
PhD degree offer							0.172***			
							(3.23)			
Instruction/Asset								0.012		
								(0.58)		
Research/Asset									0.044**	
									(2.15)	
Faculty salary/Asset										0.035
										(1.12)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Time FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Adj. R^2	0.570	0.562	0.558	0.569	0.570	0.570	0.564	0.561	0.563	0.561
Obs.	14,269	15,120	14,373	14,269	14,269	14,269	15,121	15,101	15,101	15,121

This table presents whether education quality proxies are associated with the log of the equity market-to-book ratio. *Student-to-faculty*: The ratio of the total number of students to the total number of faculty. *% of international students*: percentage of international students in the total number of students. *Enrollment/Admission*: the ratio of the number of enrolled students to the number of admitted students. *Nonwhite faculty share*: the share of nonwhite faculty. *Female faculty share*: the share of female faculty. *Tenure faculty share*: the share of tenured faculty. *PhD degree offer*: an indicator for whether the university offers a doctoral degree. *Instruction/Asset*, *Research/Asset*, and *Faculty salary/Asset*: instruction expenses (the direct costs of teaching), research expenses, and faculty salary in dollar amounts scaled by total book assets. All explanatory variables, except the PhD degree indicator, are standardized to have a mean of zero and a standard deviation of one. Control variables include ROA, book leverage, the investment-to-asset ratio, credit rating dummies, the (negative of the) U.S. News rank, and an indicator for unranked universities. All specifications include year-month fixed effects. t-statistics based on standard errors, double-clustered by university and tax year, are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 8: Endowment Tax Proposals and Federal Research Funding Freezes in March 2025

	Dep. Var = Log(Equity market)				
	(1)	(2)	(3)	(4)	(5)
Post 4 months×Treat 1	-0.253***				
	(-2.80)				
Post 4 months×Treat 2		-0.310***			
		(-3.14)			
Post 4 months×Treat 3			-0.285***		
			(-2.77)		
Post 4 months×Treat 4				-0.394***	
				(-5.34)	
Post 3 months×Treat 4					-0.443***
					(-6.10)
# of treated universities	8	5	6	4	4
University controls	✓	✓	✓	✓	✓
University FEs	✓	✓	✓	✓	✓
Year-month FEs	✓	✓	✓	✓	✓
Adj. R^2	0.945	0.945	0.945	0.945	0.951
Obs.	885	885	885	885	795

The dependent variable is the log of equity market value. The pre-treatment period is November 2024 to February 2025. *Post* is an indicator taking one from March 2025, and the number following *Post* indicates the length of the post-treatment window: 4 months (March–June 2025), or 3 months (March–May 2025). In Panel A, the treatment groups are defined as nested sets of policy exposure: *Treat 1* includes universities with endowments exceeding the WEST Act threshold ($11.9 billion); *Treat 2* adds those subject to federal research funding freezes; *Treat 3* adds recipients of OCR warning letters; and *Treat 4* includes universities affected by all three. The dependent variable and the continuous control variables (ROA, book leverage, and the investment-to-asset ratio) are winsorized at the 0.5% and 99.5% levels. Control variables include ROA, book leverage, the investment-to-asset ratio, credit rating dummies, the (negative of the) U.S. News rank, and an indicator for unranked universities. All specifications include university and year-month fixed effects. t-statistics based on standard errors clustered by university are in parentheses. ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 9: Federal Student Loan Payment Pause in March 2020

	Dep. Var = Log(Equity market)				
	(1)	(2)	(3)	(4)	(5)
Post 4 months×High loan share	0.174**				
	(1.98)				
Post 3 months×High loan share		0.218**	0.079	-0.000	0.231**
		(2.21)	(0.86)	(-0.00)	(2.24)
Post 3 months×High loan share×Low Gov't grant			0.650**		
			(2.41)		
Post 3 months×High loan share×Low student #				0.475***	
				(2.79)	
Post 3 months×High loan share×Low loan size					-0.233**
					(-2.44)
# of treated universities	29	29	29	29	29
University controls	✓	✓	✓	✓	✓
University FEs	✓	✓	✓	✓	✓
Year-month FEs	✓	✓	✓	✓	✓
Adj. R^2	0.949	0.949	0.950	0.950	0.949
Obs.	780	678	678	678	678

The dependent variable is the log of equity market value. The pre-treatment period is November 2019 to February 2020. *Post* is an indicator taking one from March 2020, and the number following *Post* indicates the length of the post-treatment window: 4 months (March–June 2020), or 3 months (March–May 2020). *High loan share* denotes universities in the top tercile of the percent of undergraduate students awarded federal student loans, measured as of February 2020. In columns (4)–(6), the treatment indicator is interacted with university characteristics measured in the bottom tercile as of February 2020. *Low Gov't grant* denotes universities in the bottom tercile of the government-grant-to-asset ratio. *Low student #* denotes universities in the bottom tercile of total undergraduate enrollment. *Low loan size* denotes universities in the bottom tercile of average federal loan amount per borrower. The dependent variable and the continuous control variables (ROA, book leverage, and the investment-to-asset ratio) are winsorized at the 0.5% and 99.5% levels. Control variables include ROA, book leverage, the investment-to-asset ratio, credit rating dummies, the (negative of the) U.S. News rank, and an indicator for unranked universities. All specifications include university and year-month fixed effects. t-statistics based on standard errors clustered by university are in parentheses. ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 10: Visa Scrutiny and Deportations of Chinese International Students in May 2024

	Dep. Var = Log(Equity market)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Post 4 months×High Foreign Asian student	-0.283***		-0.274***	-0.081	-0.364***	-0.150	-0.109
	(-3.76)		(-3.10)	(-0.60)	(-4.39)	(-1.05)	(-0.67)
Post 3 months×High Foreign Asian student		-0.305***					
		(-3.73)					
Post 4 months×High Foreign Asian student×High Foreign Asian faculty			-0.038				
			(-0.30)				
Post 4 months×High Foreign Asian student×High Foreign student (Q5)				-0.284*			
				(-1.94)			
Post 4 months×High Foreign Asian student×High Asian student (Q5)					0.129		
					(1.09)		
Post 4 months×High Foreign Asian student×Large Student enrollment						-0.206	
						(-1.36)	
Post 4 months×High Foreign Asian student×PhD degree offer							-0.195
							(-1.13)
# of treated universities	26	26	26	26	26	26	26
University controls	✓	✓	✓	✓	✓	✓	✓
University FEs	✓	✓	✓	✓	✓	✓	✓
Year-month FEs	✓	✓	✓	✓	✓	✓	✓
Adj. R^2	0.956	0.955	0.956	0.956	0.956	0.956	0.956
Obs.	981	848	981	981	981	981	981

The dependent variable is the log of equity market value. The sample period is from January 2024 to August 2024. *Post* is an indicator taking one from May 2024, and the number following *Post* indicates the length of the post-treatment window: 4 months (May–August 2024), or 3 months (May–July 2024). *High Foreign Asian student* denotes universities in the top tercile of the share of international students and in the top tercile of the share of Asian students. In columns (4)–(8), the treatment indicator is interacted with university characteristics. *High Foreign Asian faculty* denotes universities in the top tercile of the share of foreign faculty members and in the top tercile of the share of Asian faculty members. *High Foreign student (Q5)* denotes universities in the top quintile of the share of international students. *High Asian student (Q5)* denotes universities in the top quintile of the share of Asian students. *Large enrollment* denotes universities in the top tercile of total student enrollment. *PhD degree offer* denotes universities that grant doctoral degrees. The university characteristics used to define the treatment group and variables for the triple DiD tests are based on information available to investors in April 2024. The dependent variable and the continuous control variables (ROA, book leverage, and the investment-to-asset ratio) are winsorized at the 0.5% and 99.5% levels. Control variables include ROA, book leverage, the investment-to-asset ratio, credit rating dummies, the (negative of the) U.S. News rank, and an indicator for unranked universities. The regression includes university and year-month fixed effects. t-statistics based on standard errors clustered by university are in parentheses. ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels, respectively.

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I Calibration of the Stochastic Volatility Model to Corporate Bonds

In this section, we calibrate the stochastic volatility model of Du et al. (2019) to U.S. corporate bonds separately for each credit rating group. The goal of this exercise is to recalibrate their model so that it prices corporate bonds accurately across the full credit spectrum, and then apply rating-matched parameters when we price the bonds of each university.

In our calibration, we tie our hands by mostly using the parameters of Du et al. (2019) except the default boundary parameter X_D and the price of risk parameters, λ_V and λ_D. We recalibrate these three parameters separately for each rating group $g \in \{\text{AAA, AA, A, BBB, HY}\}$. The calibration consists of two steps. First, for each rating group, we calibrate the optimal value of X_D that minimizes the distance between the model's default probability under the physical measure and Moody's historical default probability for that rating. Second, we calibrate the price of risk parameters λ_V and λ_D to minimize the pricing errors of corporate bonds in that rating group, while keeping the long-run asset Sharpe ratio constant.

For this exercise, we obtain the corporate bond data from the ICE BofA Merrill Lynch database. We restrict the sample to industrial bonds and group them by credit rating into five groups: AAA, AA, A, BBB, and high yield (HY). Within each rating group, we keep bonds with a remaining time to maturity between 2 and 8 years and an option-adjusted spread of at least 5 basis points. We use CRSP to compute equity volatility from daily returns over a 3-year rolling window, and Compustat to obtain the issuer's leverage and payout rate following the definition of Feldhütter and Schaefer (2018). The sample is monthly and starts in June 2011, matched to the start of the university bond panel.

Table A7 reports the summary statistics of the merged panel data by rating group. As expected, average credit spreads rise monotonically as the rating deteriorates, from around 33 basis points for AAA to over 500 basis points for high-yield bonds, and leverage is higher for lower-rated issuers.

First, for each rating group g, we search for the optimal value of $X_D^{(g)}$ that minimizes the distance in probability of default between the model and the data. Following Feldhütter and Schaefer (2018),

we numerically find the optimal value that solves

$$\min_{X_D} \sum_{\tau=1}^{20} \left(PD_\tau^{Model}(\bar{F}^{(g)}, \bar{V}^{(g)}, \bar{q}^{(g)}, \bar{r}^{(g)}, X_D) - PD_\tau^{Moody's,(g)} \right)^2, \tag{16}$$

where $PD_\tau^{Moody's,(g)}$ is the τ-year cumulative probability of default for rating group g published by Moody's for the period from 1920 to 2020, and $(\bar{F}^{(g)}, \bar{V}^{(g)}, \bar{q}^{(g)}, \bar{r}^{(g)})$ are the average leverage, variance, payout rate, and risk-free rate within rating group g. Table A8 reports the fitted probability of default by rating group, compared with the data.

Second, we calibrate the model to match the credit spreads in the data. For each rating group g, we search for the optimal value of $\lambda_V^{(g)}$ that solves

$$\min_{\lambda_V} \sum_t \left(\bar{s}_t^{Model}(\lambda_V, \lambda_D; X_D^{(g)*}) - \bar{s}_t^{(g)} \right)^2, \tag{17}$$

$$s.t. \quad SR = (\sqrt{1-\rho^2}\lambda_D + \rho\lambda_V)\sqrt{\theta} = 0.22,$$

where $\bar{s}_t^{Model}$ and $\bar{s}_t^{(g)}$ are the cross-sectional average of model-implied and observed credit spreads within rating group g in month t. We restrict the long-run asset Sharpe ratio to 0.22, the benchmark value used in Du et al. (2019); given $\lambda_V^{(g)}$, the constraint pins down $\lambda_D^{(g)}$. The resulting parameter estimates are reported in Panel B of Table 4. Table A9 reports the resulting fit of the model by rating group: the average model-implied credit spread closely tracks the data in every rating group, with differences of only a few basis points.

To verify the soundness of our approach, we compute the model's equity value from (6) scaled by the issuer's book equity, and compare the ratio with the data. Figure A3 shows that the model and the data line up along the 45-degree line within each rating group, implying that the model is consistent with a wide range of the market-to-book ratio across the credit spectrum.

II University Bond Sample Construction

This appendix describes the steps used to construct the university bond sample. We begin by identifying non-profit private universities using administrative data, then build a comprehensive bond list by combining information from multiple sources.

Identifying Non-Profit Private Universities

We identify the universe of non-profit private universities using the Integrated Postsecondary Education Data System (IPEDS), maintained by the U.S. Department of Education and covering all institutions that participate in federal student financial aid programs. IPEDS provides an Employer Identification Number (EIN) for each institution, which serves as our primary key for linking universities across datasets. IPEDS contains 7,144 unique EINs in total. To identify non-profit private universities, we use IPEDS' `SECTOR` variable in Table HD and restrict to `SECTOR` = 2, 5, and 8 ('Private not-for-profit, 4-year or above', 'Private not-for-profit, 2-year', and 'Private not-for-profit, less-than 2-year', respectively). We remove Wright Career College (EIN 481153519) and Victory University (EIN 626001209) as they are erroneously recorded as non-profit universities. As a result, restricting to private, non-profit institutions yields 2,178 EINs.

We further require universities to appear in IRS Form 990 Schedule E (Schools), which must be filed by organizations that operate a private school. This requirement ensures that an entity's primary mission is education rather than, for example, healthcare: hospital systems that also operate an affiliated university would otherwise satisfy the IPEDS restriction but are excluded at this stage. Of the 2,178 non-profit private university EINs in IPEDS, 1,636 match Schedule E filings.

Bond Sample Construction

Table A1 reports the number of EINs, bond issues, and CUSIPs at each step of the bond sample construction process.

Step 1: Bonds reported in IRS Schedule K. We begin with bonds reported in IRS Form 990

Schedule K (Supplemental Information on Tax-Exempt Bonds). Non-profit organizations that issue tax-exempt bonds are required to complete Schedule K, which includes nine-digit CUSIP identifiers for each bond. Restricting to the 1,636 EINs matched to Schedule E, we identify 920 EINs that filed Schedule K. Of these, we remove the following invalid CUSIP strings: "none," "000000000," "nanan," "notapplic," "multiples," "999999999," "xxxxxxxxx," "nocisipno," "variousnu," "seepartvi," "111111111," "100000000," "private," and "123456789."

We additionally drop two confirmed erroneous CUSIP-EIN pairings identified by cross-checking MSRB EMMA official statements and Mergent project names. First, CUSIP 924159AU0 was reported in Schedule K by College of St Joseph (EIN 30213180), but the official statement on EMMA confirms that this bond was issued solely for Green Mountain College. Second, CUSIP 74265LAS7 was reported by Emory University (EIN 580566256), but the bond in fact belongs to Agnes Scott College. After dropping observations with missing CUSIPs and these two erroneous CUSIP-EIN pairings, 711 EINs remain with 2,263 CUSIPs.

Step 2: Remove bonds associated with multiple universities. We identify CUSIPs in Schedule K that are reported by more than one university. Examining the corresponding official bond statements in the MSRB EMMA database, we find that these cases involve bonds whose proceeds are shared across multiple universities under pooled financing arrangements: the bond proceeds are loaned simultaneously to several institutions, and each participating university consequently reports the same CUSIP in its Schedule K filing. We remove these CUSIPs because their price dynamics reflect the combined credit fundamentals of multiple institutions rather than any single university. After this filter, 701 EINs and 2,248 CUSIPs remain.

Step 3: Merge with Mergent. We merge the remaining Schedule K CUSIPs with the Mergent Municipal bond database, which provides detailed bond characteristics. This step retains 670 EINs with 1,879 issues and 1,949 CUSIPs. The reduction reflects bonds that are not covered by Mergent, which could be due to erroneous recordings in Schedule K.

Step 4: Retrieve all bonds within the same bond issues. A single bond issue in Mergent (identified by a unique Issue ID) typically comprises many CUSIPs. Because Schedule K reports

only a subset of those CUSIPs, we treat all CUSIPs sharing an Issue ID with any Schedule K bond as belonging to the corresponding university. Specifically, we extract the distinct Issue IDs associated with the 1,949 CUSIPs from Step 3 and then retrieve every CUSIP in Mergent that belongs to those Issue IDs. This expands the bond list to 20,569 CUSIPs, while the EIN (670) and issue (1,879) counts remain unchanged.

Step 5: Bond expansion using manually collected Issue IDs. Among the 1,636 EINs in our IPEDS–Schedule E sample, some universities report Schedule K, but with entirely missing CUSIP entries. We use this subset of EINs together with available university names from the IRS and IPEDS and their state information, and manually search Mergent's `project_name_c` variable to identify the corresponding Issue IDs. To avoid false positives, we retain a manually collected Issue ID only when the issuer's state in the Mergent issue information file matches the university's state in IPEDS. We add these manually verified Issue IDs and associated CUSIPs to the bond list from Step 4. This step adds bonds for 97 additional EINs, expanding the sample to 767 EINs, 2,104 issues, and 21,831 CUSIPs.

Step 6: Bond expansion via Mergent project name matching. To identify additional bonds belonging to the 767 universities already in our sample, we exploit `project_name_c` field that names the issuing entity or project. Specifically, we extract the unique `project_name_c` values from the 2,104-issue list associated with 767 EINs, produced in Step 5. Removing, any (`project_name_c`, `state_c`) pair that maps to more than one EIN, we collect all issues with the same `project_name_c` and `state_c` associated with 767 EINs. The matched issue IDs are then expanded to all their CUSIPs. This step expands coverage to 4,291 issues and 38,152 CUSIPs.

Step 7: Bond expansion via direct university name matching. We perform a second round of project-name matching using institution names drawn directly from the Schedule E–IPEDS merged file.

We construct up to 21 name variants per EIN: six IRS organization name fields from Schedule E, ten IRS Form 990 header name fields (F9-P00-T00-HEADER), and five IPEDS institution name fields.

We then apply the following text normalization to all name variants and to the Mergent `project_name_c` field: (i) convert to lowercase and trim whitespace; (ii) remove corporate suffixes ("corporation," "incorporated," "inc"); (iii) standardize abbreviations ("univ."→"university," "saint"→"st," "&"→"and"); (iv) remove generic filler words ("of the," "the," "of," "trustees," "issue," "proj.," "refunding," "project," "program"); (v) strip four-digit year tokens (2001–2025); (vi) remove all punctuation (apostrophes, hyphens, periods, commas); and (vii) remove all remaining spaces, producing a fully compressed string (e.g., *Yale University* → *yaleuniversity*). For each of the 21 name variants we enforce the same one-to-one requirement as in Step 6: a (cleaned name, `state_c`) pair is retained only if it maps to exactly one EIN. We then merge the cleaned Mergent project names against each of the 21 cleaned institution-name dictionaries on (cleaned name, `state_c`), retrieve the corresponding CUSIPs, and add them to the Step 6 list. This step adds 95 new EINs, expanding the sample to 862 EINs, 5,175 issues, and 45,563 CUSIPs.

Step 8: Keep only tax-exempt bonds. We restrict the sample to federally tax-exempt bonds, excluding bonds designated as taxable or subject to the Alternative Minimum Tax (AMT). Our structural credit risk model is designed for bonds whose yields reflect default risk and not differences in tax treatment. This filter retains 859 EINs, 4,842 issues, and 44,045 CUSIPs.

Step 9: Remove revenue bonds tied to specific projects. We exclude bonds whose debt service depends on revenues generated by a specific project rather than the university's overall operations. Including such bonds would conflate project-specific revenue risk with university-wide credit risk. We identify bonds for exclusion by examining the `use_of_proceeds_c` variable in Mergent and verifying classifications against official statements in the MSRB EMMA database. The excluded categories are: (i) *Hospitals* and *Other Healthcare*, where debt service is derived from hospital revenues; (ii) *Student Housing* and *Other Housing*, where debt service is derived from dormitory revenues; (iii) *Civic/Convention Centers*, where payments come primarily from lease revenues; and (iv) *Water and Sewer* and *Retirement Centers*, which appear to reflect erroneous classifications in Schedule K, as the underlying bonds are not associated with the reported universities. After these exclusions, the sample contains 852 EINs, 4,703 issues, and 42,568 CUSIPs.

Step 10: Remove insured bonds. We exclude bonds that carry credit enhancement from a financial guaranty insurer. For insured bonds, the observed credit spread reflects the insurer's creditworthiness rather than that of the issuing university, making these bonds unsuitable for estimating the structural model. Approximately 92% of insured bonds in our sample were issued before the 2008 financial crisis, consistent with the near-complete withdrawal of bond insurers from the market following the crisis. Removing insured bonds yields 829 EINs, 3,876 issues, and 31,865 CUSIPs.

Step 11: Remove callable bonds.

Our structural model requires that a bond's effective maturity be known with reasonable certainty. For callable bonds, this requires that the call option be exercised predictably at the first call date. We find that discount and par callable bonds, as well as premium callable bonds from small and medium-sized issues (the bottom two terciles by total offering amount), are more likely to trade after the first call date. Therefore, we remove these bonds from the sample. This results in 716 EINs, 2,890 issues, and 21,727 CUSIPs.

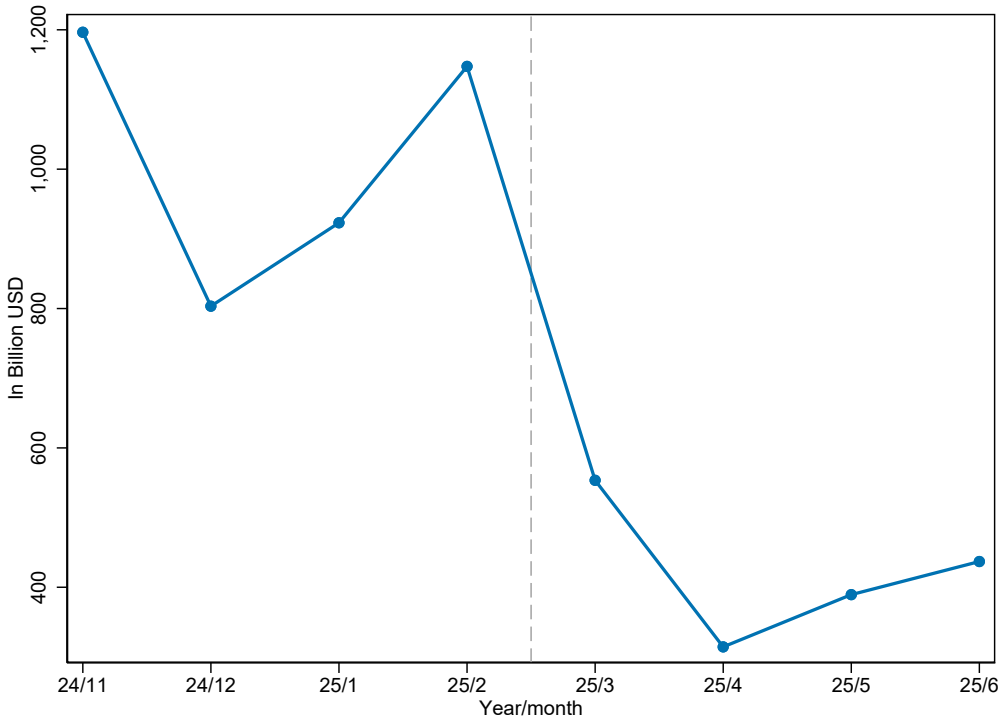


Figure A1: Aggregate Equity Market Value around March 2025

This figure plots the aggregate equity market value (in billion USD) of all universities in the sample from November 2024 to June 2025. The vertical dashed line indicates March 2025, corresponding to the announcement of the WEST Act endowment tax, federal funding freezes, and OCR warning letters.

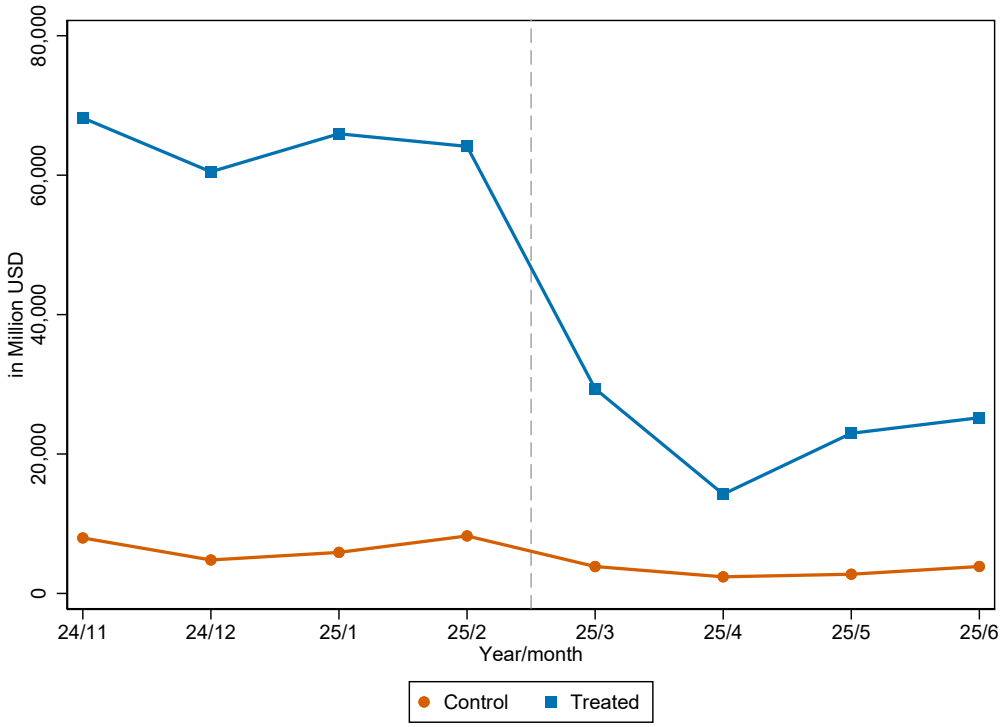
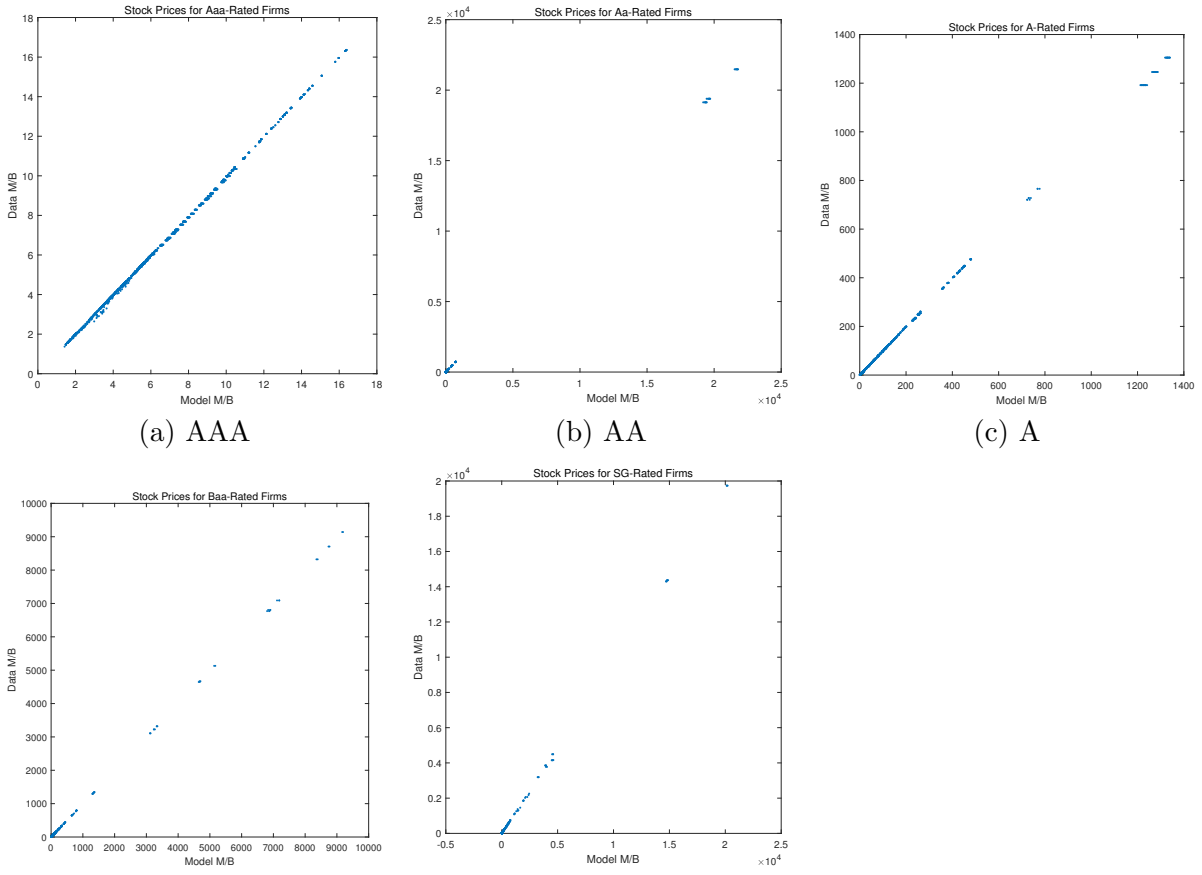


Figure A2: Equity Market Value: Treated versus Control Universities

This figure plots the average equity market value (in million USD) separately for treated and control universities from November 2024 to June 2025. The treated group comprises universities subject to the WEST Act endowment tax, federal funding freezes, and OCR warning letters. The vertical dashed line indicates March 2025, corresponding to the policy announcements.

Figure A3: Equity Market-to-Book Ratio of Corporate Bond Issuers by Rating Group



(a) AAA (b) AA (c) A

(d) BBB (e) HY

This figure plots the equity market-to-book ratios of U.S. corporate bond issuers in the data (vertical axis) against the values implied by the stochastic volatility model of Du et al. (2019) (horizontal axis), separately for each credit rating group.

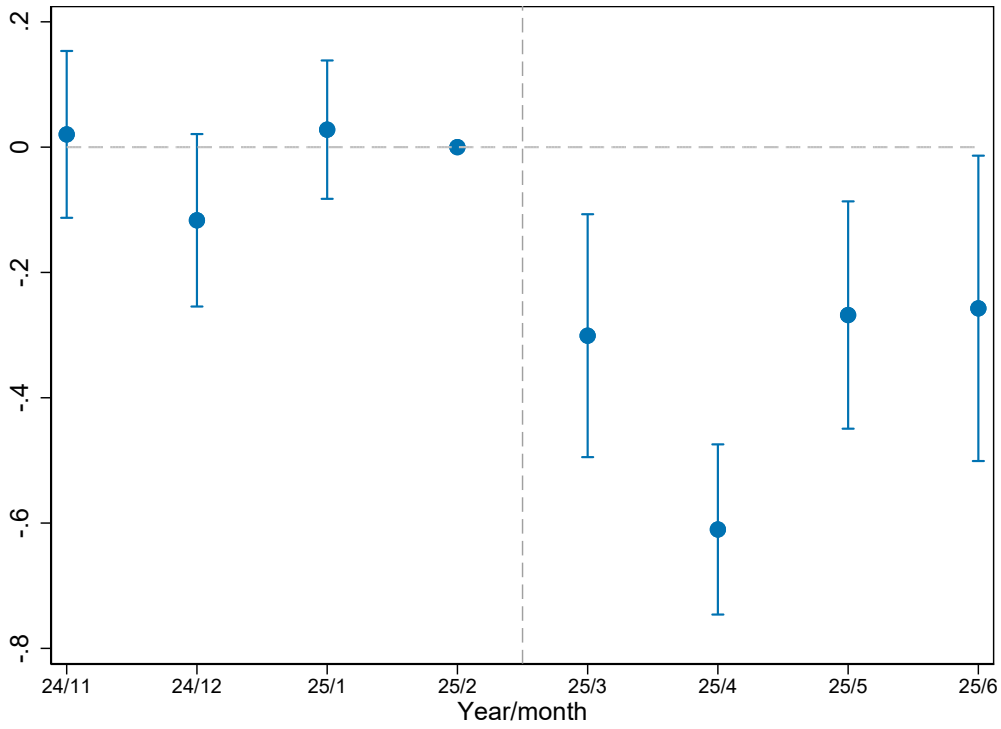


Figure A4: Effects of Policies against Top Universities in March 2025, using Synthetic Difference-in-Differences

This figure displays point estimates and 95% confidence intervals from the synthetic difference-in-differences (SDID) estimator of Arkhangelsky et al. (2021), which combines synthetic control-type unit weights to match pre-treatment trends with time weights to balance pre- and post-exposure periods. The dependent variable is the log of equity market value. The plotted series shows the normalized gap between treated and synthetic control outcomes from November 2024 to June 2025; the gap at February 2025 (one month before the event) is normalized to zero, so all other points are expressed relative to that baseline. The treated group includes universities satisfying all three conditions used in column (4) of Table 8: (1) endowments exceeding the WEST Act threshold ($11.9 billion), (2) federal research funding freezes, and (3) OCR warning letters. Because SDID requires non-missing outcomes over the entire 12-month pre-treatment period, treated universities that do not satisfy this balanced-panel requirement are dropped from the estimation. Covariates—ROA, book leverage, the investment-to-asset ratio, credit rating dummies, the (negative of) U.S. News rank, and an indicator for unranked universities—are projected out following the procedure in Arkhangelsky et al. (2021). Confidence intervals are computed period by period using leave-one-control-out jackknife standard errors.

Table A1: Sample Selection Summary

Step	EINs	Issues	CUSIPs
(1) The list of bonds (CUSIPs) for non-profit private universities available in Schedule K	711		2,263
(2) Remove bonds associated with multiple universities	701		2,248
(3) Merge with Mergent data	670	1,879	1,949
(4) Expand the bond list using distinct Issue IDs in Mergent from the above bond list	670	1,879	20,569
(5) Expand bond list using manually identified Issue IDs with missing CUSIPs in Schedule K	767	2,104	21,831
(6) Expand bond list by matching Mergent project names from existing bonds to additional Mergent issues	767	4,291	38,152
(7) Expand bond list by directly matching institution names (IRS/IPEDS) to Mergent project names	862	5,175	45,563
(8) Keep only tax-exempt bonds	859	4,842	44,045
(9) Remove revenue bonds where payment is tied to a specific project	852	4,703	42,568
(10) Remove insured bonds	829	3,876	31,865
(11) Remove par, discount, and small/medium-sized-premium callable bonds	716	2,890	21,727

This table reports the number of unique Employer Identification Numbers (EINs), bond issues, and CUSIPs at each step of the university bond sample construction. In Step (11), small/medium-sized bonds are defined as the bottom and middle tercile of the total offering amount at the issue level. See Appendix II for a detailed description of each step and the rationale for each filter.

Table A2: Steps to Cleaning Data

Step	EINs	Issues	CUSIPs	Trades	Trading days	Trading months	Months
				Bond level			Entity level
University bond list	716	2,890	21,727				
MSRB merged with university bond list	672	2,437	16,731	1,771,194	693,536	266,669	54,204
Remove trades without fundamental price	655	2,222	14,219	1,454,414	438,848	210,509	47,705
Remove observations without coupon_f	560	1,886	13,880	1,394,386	419,994	204,937	44,619
Remove `coupon_code_c` = "ADJ", "VAR", "FAR"	560	1,882	13,874	1,394,156	419,914	204,888	44,601
Remove bonds with the observations < 10	387	1,168	6,008	1,266,033	379,505	176,322	37,112
Remove bonds with credit spread $=< 0$ or > 10	384	1,155	5,955	1,121,856	332,426	154,000	34,721
Remove bonds with maturity outside the bandwidth	383	1,132	5,847	701,681	220,160	105,060	29,032
Remove missing values of key variables	282	774	2,774	407,002	122,768	42,855	15,158
Remove June 2011	282	773	2,773	406,751	122,721	42,846	15,154

This table presents the number of observations for each data cleaning step. EINs denotes the number of distinct EINs (Employer Identification Number). Issues denotes the number of distinct issues. CUSIPs denotes the number of distinct CUSIPs. Bond-level columns report the number of trades, trading days, and trading months at the bond level. Entity-level months denote the number of distinct months for each EIN.

Table A3: Summary Statistics for IRS Form 990 variables

	N	Mean	SD	Min	p1	p10	p50	p90	p99	Max
Panel A: Key income and balance sheet variables										
Revenue	1,905	995.5	1,579.4	28.4	50.5	122.0	348.1	3,145.5	7,293.6	11,078.6
Expenses	1,905	893.5	1,387.6	24.9	52.3	117.6	315.8	2,913.5	6,121.5	10,094.8
Profit	1,905	102.0	301.3	-1,383.3	-135.5	-8.2	25.2	233.7	1,612.3	3,796.9
Assets	1,905	3,834.3	8,570.4	65.3	102.0	347.6	1,181.3	9,619.0	49,933.6	75,287.5
Liabilities	1,905	1,033.3	2,303.2	17.2	30.7	101.0	317.4	2,934.4	10,409.4	35,024.4
Panel B: Total revenue breakdown										
Contributions	1,905	209.3	430.9	1.9	2.8	8.4	35.4	662.9	1,969.2	3,487.4
Program service	1,905	627.6	944.3	20.8	30.0	86.7	269.6	1,765.6	4,528.4	8,229.6
Investment income	1,905	35.9	164.1	-258.1	0.0	1.2	6.5	75.0	419.5	3,835.9
Income From Invest Bond Proceeds	1,670	0.1	0.5	-4.8	0.0	0.0	0.0	0.2	2.2	12.6
Royalties Revenue	1,724	6.9	39.8	0.0	0.0	0.0	0.1	14.3	105.5	1,261.0
Net Rental Income Or Loss	1,801	3.2	15.5	-38.3	-1.4	-0.1	0.2	4.7	77.2	211.5
Net Gain Or Loss From Sales of Assets	1,901	105.4	346.3	-952.3	-18.8	0.1	15.6	212.7	1,812.0	5,042.3
Net Income From Fundraising Events	1,782	-0.1	0.4	-4.2	-1.4	-0.5	0.0	0.0	0.7	2.9
Net Income From Gaming	1,481	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
Net Income From inventory sales	1,559	1.0	4.3	-0.8	-0.1	0.0	0.0	1.4	16.1	47.3
Other miscellaneous revenue	1,839	9.5	48.3	-51.0	-1.8	0.0	1.2	16.3	157.1	750.0
Panel C: Total contributions breakdown										
Federated campaigns	702	0.1	0.3	0.0	0.0	0.0	0.0	0.1	1.2	4.4
Membership dues	623	0.4	1.9	0.0	0.0	0.0	0.0	0.3	13.0	17.5
Fundraising events	1,569	1.0	3.1	0.0	0.0	0.0	0.2	2.5	10.2	95.1
Related organizations	850	6.3	24.3	0.0	0.0	0.0	0.0	10.6	112.1	393.1
Government grants	1,895	100.0	233.2	0.0	0.0	0.9	6.2	376.4	1,149.6	1,772.0
All other contributions	1,905	106.9	218.0	0.8	1.6	4.8	25.9	331.6	1,029.4	2,494.9
Noncash contributions	1,889	14.8	50.6	0.0	0.0	0.2	2.8	36.6	177.8	1,608.0
Panel D: Total assets breakdown										
Cash	1,749	26.3	102.5	-58.4	0.0	0.0	1.6	54.3	450.8	1,534.8
Savings	1,871	134.1	300.5	0.0	0.0	1.8	40.5	323.9	1,526.5	3,205.3
Pledges and grants receivable	1,901	113.3	261.4	0.0	0.2	2.5	23.3	282.2	1,357.5	2,745.5
Net accounts receivable	1,902	58.2	133.3	0.0	0.2	0.9	7.0	199.5	618.1	1,308.1
Loans and other receivables	1,579	0.5	1.6	0.0	0.0	0.0	0.0	1.2	8.8	17.9
Loans and other receivables from other disqualified persons	1,364	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.5	8.2
Notes and loans receivable	1,789	27.8	84.7	0.0	0.0	0.0	4.9	60.8	441.1	1,119.8
Inventories for sale or use	1,755	2.6	6.9	0.0	0.0	0.0	0.5	6.0	39.8	67.4
Prepaid expenses and deferred charges	1,890	18.1	58.0	0.0	0.0	0.7	4.2	37.2	256.0	1,182.0
Land, buildings, and equipment	1,905	855.1	1,280.8	23.8	49.7	129.0	364.2	2,222.8	6,742.3	9,037.6
Investments—publicly traded securities	1,885	797.1	2,737.1	0.0	0.0	40.0	235.0	1,439.6	8,238.9	35,816.9

Table A3 – continued from the previous page

	N	Mean	SD	Min	p1	p10	p50	p90	p99	Max
Investments—other securities	1,880	1,713.7	4,659.6	0.0	0.0	8.2	283.7	3,816.2	25,915.7	39,503.7
Investments—program-related	1,505	12.8	65.7	-1.9	0.0	0.0	0.0	27.7	148.0	1,485.3
Intangible assets	1,316	1.2	9.8	0.0	0.0	0.0	0.0	0.0	42.0	165.8
Other assets	1,865	118.0	679.4	0.0	0.0	0.0	11.6	209.5	1,864.8	16,255.4
Panel E: Total liabilities breakdown										
Accounts payable and accrued expenses	1,905	120.6	256.8	1.0	2.7	8.3	32.8	364.1	1,382.4	3,705.2
Grants payable	1,285	2.9	12.2	0.0	0.0	0.0	0.0	5.2	71.9	123.6
Deferred revenue	1,888	57.8	145.0	0.0	0.0	1.5	13.3	141.2	805.8	1,766.0
Tax-exempt bond liabilities	1,891	391.0	539.0	0.0	13.6	66.7	192.3	896.8	2,897.2	3,705.2
Escrow or custodial account liability	1,328	6.6	47.9	0.0	0.0	0.0	0.0	3.9	83.6	623.0
Loans and other payables	1,240	0.2	2.1	0.0	0.0	0.0	0.0	0.0	0.4	40.0
Secured mortgages and notes	1,702	95.5	405.1	0.0	0.0	0.0	1.2	114.7	2,742.6	3,798.7
Unsecured notes and loans	1,436	142.0	433.5	0.0	0.0	0.0	0.0	405.2	2,320.5	3,984.2
Other liabilities	1,901	288.4	1,382.9	0.0	0.1	3.7	33.3	598.9	3,859.5	28,724.4

The sample is at the tax year-EIN level. The values are in million USD.

Table A4: Summary Statistics for IRS Form 990 variables as a percentage of revenue, contributions, assets, and liabilities

	N	Mean	SD	Min	p1	p10	p50	p90	p99	Max
Panel A: Total revenue breakdown – value of each item as a percentage of total revenue (%)										
Contributions	1,905	14.79	12.41	0.58	1.29	4.44	11.51	28.15	54.46	257.16
Program service	1,905	73.20	19.21	4.64	16.02	44.52	78.15	91.60	97.00	242.77
Investment income	1,905	3.28	6.39	-15.00	0.01	0.50	1.77	6.13	34.07	92.39
Income From Invest Bond Proceeds	1,670	0.02	0.15	-4.16	0.00	0.00	0.00	0.05	0.40	3.00
Royalties Revenue	1,724	0.38	2.29	0.00	0.00	0.00	0.01	0.72	5.54	83.54
Net Rental Income Or Loss	1,801	0.20	0.44	-1.16	-0.32	-0.02	0.06	0.55	2.26	3.89
Net Gain Or Loss From Sales of Assets	1,901	7.26	17.19	-586.44	-3.18	0.02	3.88	20.29	47.11	61.44
Net Income From Fundraising Events	1,782	-0.02	0.06	-0.51	-0.21	-0.07	0.00	0.01	0.16	0.51
Net Income From Gaming	1,481	0.00	0.01	-0.01	0.00	0.00	0.00	0.00	0.03	0.08
Net Income From inventory sales	1,559	0.14	0.49	-0.68	-0.04	0.00	0.00	0.28	2.40	6.39
Other miscellaneous revenue	1,839	0.97	2.47	-25.50	-0.37	0.00	0.43	2.32	8.89	34.45
Panel B: Total contributions breakdown – value of each item as a percentage of total contributions (%)										
Federated campaigns	702	0.07	0.32	0.00	0.00	0.00	0.00	0.13	1.82	4.89
Membership dues	623	0.37	2.18	0.00	0.00	0.00	0.00	0.23	12.18	25.17
Fundraising events	1,569	1.44	2.80	0.00	0.00	0.00	0.35	4.15	13.66	27.60
Related organizations	850	2.48	7.28	0.00	0.00	0.00	0.00	6.64	34.25	85.08
Government grants	1,895	30.72	23.44	0.00	0.01	4.46	24.65	65.60	84.87	98.28
All other contributions	1,905	67.84	23.75	3.00	13.64	33.01	72.72	95.49	100.00	100.00
Noncash contributions	1,889	9.38	10.05	0.00	0.06	1.04	6.18	21.58	47.75	84.44
Panel C: Total assets breakdown – value of each item as a percentage of total assets (%)										
Cash	1,749	1.30	3.05	-1.45	0.00	0.00	0.13	3.67	13.10	43.55
Savings	1,871	4.78	4.85	0.00	0.00	0.14	3.38	11.41	22.18	43.04
Pledges and grants receivable	1,901	2.74	2.56	0.00	0.02	0.50	2.11	5.61	11.98	39.55
Net accounts receivable	1,902	1.43	2.12	0.00	0.02	0.12	0.71	3.44	8.89	29.33
Loans and other receivables	1,579	0.01	0.05	0.00	0.00	0.00	0.00	0.04	0.17	0.77
Loans and other receivables from other disqualified persons	1,364	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.01	1.64
Notes and loans receivable	1,789	0.76	1.10	0.00	0.00	0.00	0.45	1.88	3.84	25.48
Inventories for sale or use	1,755	0.08	0.13	0.00	0.00	0.00	0.03	0.19	0.65	0.89
Prepaid expenses and deferred charges	1,890	0.52	0.80	0.00	0.00	0.08	0.35	1.01	2.69	15.35
Land, buildings, and equipment	1,905	35.45	14.54	1.68	10.44	15.80	34.50	54.84	71.52	83.70
Investments—publicly traded securities	1,885	22.40	13.45	0.00	0.00	5.94	20.85	40.77	60.45	81.14
Investments—other securities	1,880	28.08	20.43	0.00	0.00	1.68	25.66	57.40	77.46	82.60
Investments—program-related	1,505	0.68	2.45	-0.17	0.00	0.00	0.00	1.72	9.59	40.62
Intangible assets	1,316	0.05	0.36	0.00	0.00	0.00	0.00	0.00	2.13	5.10
Other assets	1,865	2.99	5.45	0.00	0.00	0.00	1.07	7.73	26.04	55.78
Panel D: Total liabilities breakdown– value of each item as a percentage of total liabilities (%)										

Table A4 – continued from the previous page

	N	Mean	SD	Min	p1	p10	p50	p90	p99	Max
Accounts payable and accrued expenses	1,905	11.7	6.5	1.3	2.4	5.2	10.5	19.6	32.9	60.7
Grants payable	1,285	0.5	1.4	0.0	0.0	0.0	0.0	1.7	7.2	13.4
Deferred revenue	1,888	5.3	5.3	0.0	0.0	0.7	4.3	10.8	29.9	54.6
Tax-exempt bond liabilities	1,891	59.2	19.4	0.0	7.7	31.1	63.3	81.0	89.5	92.6
Escrow or custodial account liability	1,328	0.6	2.1	0.0	0.0	0.0	0.0	1.1	12.6	19.4
Loans and other payables	1,240	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.5	10.9
Secured mortgages and notes	1,702	5.3	11.3	0.0	0.0	0.0	0.5	16.8	53.0	89.4
Unsecured notes and loans	1,436	5.8	11.7	0.0	0.0	0.0	0.0	24.7	47.9	75.3
Other liabilities	1,901	14.9	12.8	0.0	0.0	2.3	11.7	31.5	64.4	90.5

Table A5: Top 50 Universities by Equity Value

Rank	Name	Equity	Equity M/B	Spread	US News Rank	Asset	Leverage	Revenue	Revenue /Asset	PSR /Revenue	Contrib /Revenue	Inv.Income /Revenue	Endowment /Asset
1	Yale University	151.19	4.19	0.70	5	49.95	0.23	6.50	0.13	0.36	0.22	0.06	0.74
2	Harvard University	150.92	2.80	0.62	3	66.24	0.17	7.96	0.12	0.26	0.26	0.04	0.70
3	Stanford University	134.87	3.06	0.63	3	55.33	0.17	8.22	0.15	0.39	0.34	0.03	0.60
4	Massachusetts Institute of Technology	83.18	2.95	0.65	2	35.68	0.17	5.44	0.16	0.47	0.20	0.02	0.63
5	University of Notre Dame	52.87	3.28	0.73	20	21.35	0.20	2.95	0.14	0.36	0.21	0.04	0.68
6	New York University	49.72	7.73	1.63	35	17.75	0.63	8.85	0.50	0.78	0.16	0.01	0.28
7	Princeton University	46.19	1.44	1.09	1	38.46	0.13	3.73	0.10	0.15	0.22	0.57	0.81
8	Columbia University	45.83	2.64	0.93	12	22.46	0.21	6.38	0.28	0.57	0.29	0.01	0.56
9	University of Southern California	36.76	3.97	0.68	28	13.79	0.32	5.85	0.43	0.75	0.16	0.01	0.45
10	Cornell University	30.67	2.62	0.78	12	16.05	0.25	5.72	0.36	0.80	0.10	0.02	0.51
11	University of Pennsylvania	29.77	1.25	1.91	6	32.37	0.24	9.99	0.31	0.64	0.19	0.02	0.57
12	Emory University	29.09	2.29	1.10	24	18.37	0.29	5.48	0.30	0.71	0.18	0.01	0.46
13	Duke University	25.63	1.98	1.23	7	18.39	0.25	3.94	0.21	0.31	0.42	0.03	0.57
14	Dartmouth College	23.76	3.02	0.64	18	10.53	0.18	1.66	0.16	0.34	0.27	0.05	0.68
15	Northwestern University	21.99	1.55	1.03	9	17.83	0.19	3.52	0.20	0.66	0.13	0.02	0.57
16	Johns Hopkins University	21.95	2.41	0.68	9	12.76	0.29	8.48	0.66	0.53	0.41	0.01	0.49
17	University of Rochester	15.74	4.21	2.10	47	6.92	0.42	4.68	0.68	0.85	0.10	0.02	0.37
18	Boston University	15.55	3.20	1.22	43	7.81	0.37	2.92	0.37	0.70	0.23	0.01	0.37
19	University of Chicago	14.72	1.85	2.94	12	14.07	0.41	4.34	0.31	0.41	0.49	0.02	0.58
20	Boston College	11.97	2.92	1.22	39	5.89	0.28	1.38	0.23	0.69	0.16	0.04	0.54
21	Carnegie Mellon University	11.09	2.22	0.95	24	5.97	0.20	1.82	0.31	0.53	0.36	0.03	0.46
22	Brown University	10.27	1.55	1.21	9	8.30	0.19	1.72	0.21	0.45	0.33	-0.03	0.65
23	Northeastern University	8.83	3.21	1.14	53	4.63	0.39	2.16	0.48	0.82	0.14	0.01	0.31
24	Thomas Jefferson University	6.81	10.77	2.07	142	3.50	0.80	1.08	0.31	0.92	0.04	0.00	0.19
25	Syracuse University	6.75	2.61	1.27	67	3.81	0.29	1.61	0.42	0.86	0.06	0.02	0.43
26	Georgetown University	6.72	3.51	1.98	22	4.57	0.55	1.80	0.40	0.61	0.26	0.05	0.54
27	University of Miami	6.70	2.27	2.49	67	5.98	0.46	4.93	0.83	0.81	0.17	0.01	0.21
28	Baylor University	6.09	2.38	1.06	93	3.63	0.26	1.37	0.38	0.82	0.11	0.06	0.50
29	The Rockefeller University	5.81	2.18	1.74		4.16	0.35	0.51	0.12	0.06	0.45	0.01	0.60
30	Baylor College of Medicine	5.52	3.76	1.28		2.74	0.46	2.21	0.81	0.64	0.29	0.01	0.51
31	Mount Sinai School of Medicine	5.34	4.51	1.85		3.21	0.61	3.25	1.03	0.73	0.22	0.00	0.23
32	Case Western Reserve University	5.04	1.89	1.11	53	3.73	0.26	1.36	0.37	0.48	0.43	0.01	0.48
33	Tufts University	4.88	1.40	1.09	40	4.85	0.28	1.33	0.27	0.60	0.24	0.01	0.56
34	Tulane University of Louisiana	4.38	2.08	1.86	73	3.36	0.34	1.51	0.45	0.71	0.18	0.02	0.53
35	Williams College	4.09	1.10	1.87		4.77	0.21	0.45	0.10	0.35	0.14	0.00	0.68
36	Texas Christian University	4.00	1.54	0.92	98	3.57	0.28	0.92	0.26	0.70	0.08	0.05	0.50
37	Wesleyan University	3.81	2.10	0.87		2.37	0.23	0.29	0.12	0.90	0.23	0.00	0.66
38	Pepperdine University	3.43	2.29	1.04	76	2.12	0.31	0.61	0.29	0.74	0.08	0.07	0.47
39	Swarthmore College	3.29	1.21	1.26		3.29	0.13	0.35	0.11	0.33	0.07	0.33	0.78
40	Wake Forest University	3.10	1.99	2.02	47	2.41	0.31	0.66	0.28	0.74	0.16	0.02	0.40
41	Pomona College	2.94	0.96	1.09		3.59	0.12	0.31	0.09	0.41	0.09	0.12	0.75
42	Southern Methodist University	2.82	1.01	1.87	89	3.83	0.22	1.02	0.27	0.70	0.17	0.03	0.49
43	Saint Louis University	2.68	1.39	2.53	105	2.74	0.28	1.17	0.43	0.71	0.10	0.04	0.54

Table A5 – continued from the previous page

Rank	Name	Equity	Equity M/B	Spread	US News Rank	Asset	Leverage	Revenue	Revenue /Asset	PSR /Revenue	Contrib /Revenue	Inv.Income /Revenue	Endowment /Asset
44	Drexel University	2.50	2.02	2.33	98	2.39	0.47	1.34	0.57	0.80	0.16	0.02	0.35
45	Claremont McKenna College	2.44	1.60	1.23		2.01	0.23	0.27	0.14	0.39	0.42	0.05	0.57
46	St. John's University-New York	2.42	2.40	1.66		1.64	0.37	0.79	0.48	0.86	0.07	0.01	0.50
47	Wellesley College	2.14	0.72	2.46		3.61	0.16	0.43	0.12	0.42	0.14	0.03	0.77
48	Babson College	2.12	2.56	1.26		1.10	0.23	0.36	0.33	0.70	0.15	0.02	0.62
49	Midwestern University-Glendale	2.11	1.47	1.32		1.79	0.17	0.51	0.29	0.94	0.02	0.03	0.01
50	Colgate University	2.05	1.71	0.59		1.62	0.26	0.34	0.21	0.61	0.21	0.03	0.59
51	Rensselaer Polytechnic Institute	1.93	2.38	3.00	60	1.75	0.53	0.66	0.38	0.84	0.06	0.02	0.54
52	Nova Southeastern University	1.91	1.92	2.66		1.82	0.44	0.84	0.46	0.89	0.08	0.02	0.11
53	DePaul University	1.86	1.52	2.29	151	1.81	0.28	0.87	0.48	0.85	0.08	0.03	0.45
54	Chapman University	1.81	1.29	1.49	133	1.91	0.27	0.65	0.35	0.85	0.09	0.01	0.29
55	Medical College of Wisconsin	1.79	0.86	3.56		2.99	0.29	1.53	0.51	0.77	0.14	0.02	0.53
56	Villanova University	1.79	1.11	1.16	67	2.07	0.19	0.74	0.36	0.76	0.11	0.01	0.47
57	Fordham University	1.74	1.21	3.04	89	2.27	0.34	0.98	0.43	0.87	0.10	0.01	0.39
58	Oberlin College	1.69	1.21	1.19		1.74	0.23	0.34	0.20	0.68	0.08	0.01	0.64
59	Santa Clara University	1.63	0.85	2.57	60	2.68	0.23	0.60	0.23	0.77	0.14	0.03	0.46
60	The New School	1.62	2.82	2.73	124	1.53	0.61	0.56	0.38	0.90	0.07	0.00	0.28
61	University of Dayton	1.62	1.20	1.98	133	1.96	0.27	0.83	0.43	0.88	0.06	0.03	0.37
62	Colby College	1.58	1.04	0.65		1.84	0.17	0.29	0.16	0.51	0.26	0.05	0.48
63	Marquette University	1.56	1.16	1.89	86	1.89	0.28	0.71	0.38	0.76	0.15	0.00	0.46
64	Middlebury College	1.54	1.03	1.95		1.93	0.22	0.44	0.23	0.59	0.15	0.16	0.75
65	Rochester Institute of Technology	1.51	0.85	2.53	98	2.48	0.26	0.97	0.39	0.73	0.19	0.02	0.48
66	University of Richmond	1.41	0.52	1.87		3.05	0.11	0.48	0.16	0.45	0.07	0.31	0.82
67	College of the Holy Cross	1.40	1.08	0.87		1.57	0.19	0.37	0.24	0.52	0.12	0.01	0.64
68	Lafayette College	1.36	1.27	1.66		1.52	0.25	0.24	0.16	0.73	0.11	-0.01	0.64
69	Colorado College	1.36	1.13	1.29		1.42	0.15	0.27	0.19	0.56	0.09	0.13	0.64
70	Quinnipiac University	1.35	1.26	2.15	170	1.68	0.32	0.52	0.31	0.93	0.03	0.03	0.38
71	Brandeis University	1.33	0.95	1.21	60	1.75	0.20	0.46	0.26	0.88	0.10	0.01	0.70
72	Pratt Institute-Main	1.29	3.04	1.42		0.72	0.38	0.29	0.40	0.90	0.05	0.02	0.31
73	Duquesne University	1.26	2.00	1.78	151	0.98	0.32	0.48	0.49	0.82	0.09	0.02	0.45
74	The Juilliard School	1.25	1.02	1.43		1.52	0.17	0.19	0.13	0.37	0.28	0.01	0.84
75	Loma Linda University	1.22	1.59	3.26		1.79	0.57	0.35	0.19	0.69	0.12	0.05	0.27
76	Grinnell College	1.20	0.47	1.71		2.93	0.09	0.29	0.10	0.37	0.05	0.04	0.83
77	Embry-Riddle Aeronautical University-Worldwide	1.14	1.43	2.56		1.27	0.34	0.65	0.51	0.89	0.09	0.02	0.19
78	Berklee College of Music	1.13	2.75	2.12		0.83	0.48	0.36	0.44	0.89	0.08	0.00	0.47
79	Washington and Lee University	1.05	0.47	0.88		2.51	0.12	0.26	0.10	0.60	0.20	0.00	0.54
80	Hofstra University	1.01	1.05	2.55		1.40	0.28	0.61	0.44	0.86	0.07	0.03	0.54
81	Worcester Polytechnic Institute	1.00	1.37	2.44	82	1.22	0.39	0.41	0.34	0.92	0.07	0.02	0.47
82	Denison University	0.99	0.76	0.94		1.58	0.16	0.28	0.18	0.58	0.11	0.02	0.69
83	Savannah College of Art and Design	0.96	1.00	2.04		1.22	0.22	0.58	0.48	0.97	0.01	0.02	0.15
84	Loyola Marymount University	0.95	0.81	2.62	93	1.60	0.24	0.62	0.39	0.85	0.08	0.01	0.37
85	Sacred Heart University	0.94	1.50	2.87		1.17	0.45	0.45	0.39	0.92	0.06	0.02	0.21
86	Fairfield University	0.94	1.35	2.43	124	1.06	0.33	0.39	0.37	0.84	0.09	0.02	0.39

Table A5 – continued from the previous page

Rank	Name	Equity	Equity M/B	Spread	US News Rank	Asset	Leverage	Revenue	Revenue /Asset	PSR /Revenue	Contrib /Revenue	Inv.Income /Revenue	Endowment /Asset
87	School of the Art Institute of Chicago	0.92	0.59	0.84		1.83	0.15	0.41	0.23	0.51	0.16	0.03	0.70
88	Vassar College	0.89	0.66	2.90		1.78	0.21	0.29	0.16	0.64	0.17	0.04	0.67
89	Bentley University	0.89	1.68	1.56		0.75	0.29	0.33	0.44	0.92	0.05	0.01	0.45
90	University of Denver	0.87	0.54	2.13	124	2.04	0.18	0.77	0.38	0.90	0.07	0.00	0.46
91	University of the Pacific	0.86	0.93	1.52	142	1.22	0.22	0.47	0.39	0.79	0.09	0.02	0.44
92	Creighton University	0.86	0.78	3.23	124	1.61	0.25	0.65	0.40	0.75	0.14	0.05	0.42
93	Hampton University	0.86	1.48	1.18		0.79	0.26	0.21	0.26	0.64	0.28	0.02	0.38
94	University of St Thomas	0.81	0.66	1.85	163	1.64	0.25	0.51	0.31	0.73	0.18	0.02	0.42
95	Carleton College	0.81	0.59	1.35		1.59	0.11	0.28	0.17	0.51	0.20	0.07	0.66
96	Reed College	0.74	0.92	1.18		1.00	0.18	0.15	0.15	0.70	0.15	0.01	0.69
97	Emerson College	0.74	1.54	3.68		1.10	0.55	0.30	0.27	0.90	0.04	0.02	0.20
98	Xavier University	0.70	1.46	1.88		0.72	0.33	0.32	0.45	0.86	0.09	0.02	0.33
99	University of San Francisco	0.70	0.75	3.10	115	1.38	0.31	0.56	0.41	0.84	0.10	0.01	0.35
100	Samford University	0.66	1.81	4.48	185	0.84	0.51	0.28	0.34	0.79	0.14	0.02	0.47
101	Suffolk University	0.65	1.93	3.66		0.79	0.58	0.34	0.44	0.86	0.06	0.02	0.33
102	Trinity University	0.64	0.42	0.91		1.67	0.08	0.21	0.13	0.64	0.12	0.10	0.54
103	Haverford College	0.61	0.94	1.64		0.83	0.21	0.16	0.19	0.66	0.14	0.04	0.70
104	Occidental College	0.59	0.93	0.76		0.78	0.17	0.18	0.23	0.77	0.16	0.05	0.59
105	Dickinson College	0.59	0.95	1.30		0.81	0.20	0.20	0.25	0.71	0.09	0.01	0.69
106	Butler University	0.58	1.14	2.27		0.76	0.33	0.32	0.42	0.84	0.09	0.00	0.35
107	Marist College	0.58	0.98	2.40		0.88	0.30	0.31	0.36	0.89	0.04	0.01	0.40
108	Rhode Island School of Design	0.57	1.15	1.93		0.73	0.31	0.22	0.30	0.77	0.10	0.01	0.61
109	Teachers College at Columbia University	0.56	1.11	1.90		0.70	0.26	0.28	0.40	0.69	0.19	0.02	0.66
110	High Point University	0.54	0.64	1.70		1.05	0.18	0.39	0.37	0.84	0.14	0.01	0.13
111	Barnard College	0.54	0.90	3.54		0.91	0.33	0.29	0.31	0.69	0.19	0.02	0.46
112	Rollins College	0.53	0.87	2.69		0.85	0.29	0.21	0.24	0.73	0.15	0.02	0.54
113	Union College	0.52	0.75	2.29		0.92	0.22	0.21	0.23	0.71	0.14	0.02	0.56
114	University of San Diego	0.52	0.39	2.95	98	1.70	0.20	0.54	0.32	0.83	0.10	0.01	0.38
115	Gettysburg College	0.51	1.00	1.51		0.63	0.19	0.22	0.35	0.81	0.11	0.03	0.61
116	Providence College	0.50	0.81	2.31		0.87	0.27	0.34	0.39	0.85	0.09	0.01	0.33
117	Mercer University	0.50	0.79	3.40		1.00	0.37	0.44	0.44	0.79	0.16	0.02	0.47
118	Stevens Institute of Technology	0.48	0.95	3.12	76	0.91	0.42	0.44	0.49	0.92	0.05	0.02	0.31
119	St Olaf College	0.47	0.60	1.53		0.95	0.15	0.24	0.26	0.76	0.13	0.06	0.65
120	Johnson & Wales University-Providence	0.45	0.60	2.67		0.95	0.21	0.44	0.46	0.97	0.01	0.01	0.26
121	Bard College	0.44	0.72	5.34		0.96	0.37	0.40	0.41	0.45	0.51	0.04	0.43
122	Kenyon College	0.44	0.63	3.42		1.01	0.29	0.20	0.20	0.67	0.18	0.03	0.49
123	Spelman College	0.43	0.77	1.12		0.64	0.13	0.16	0.25	0.54	0.29	0.01	0.61
124	Bryant University	0.43	1.23	2.25		0.51	0.31	0.24	0.47	0.90	0.04	0.01	0.36
125	Stetson University	0.40	0.94	2.22		0.62	0.28	0.27	0.43	0.82	0.06	0.03	0.53
126	Franklin W Olin College of Engineering	0.40	1.38	1.98		0.47	0.38	0.04	0.08	0.63	0.12	0.15	0.80
127	Skidmore College	0.39	0.49	1.97		0.99	0.18	0.26	0.26	0.79	0.13	0.01	0.45

Table A5 – continued from the previous page

Rank	Name	Equity	Equity M/B	Spread	US News Rank	Asset	Leverage	Revenue	Revenue /Asset	PSR /Revenue	Contrib /Revenue	Inv.Income /Revenue	Endowment /Asset
128	Abilene Christian University	0.38	0.48	4.56		1.12	0.26	0.31	0.28	0.59	0.18	0.03	0.60
129	University of La Verne	0.37	1.29	2.76	170	0.46	0.35	0.22	0.48	0.89	0.07	0.02	0.28
130	Samuel Merritt University	0.37	1.23	2.93		0.57	0.48	0.11	0.20	0.80	0.07	0.06	0.14
131	Emmanuel College	0.36	2.41	4.78		0.46	0.66	0.12	0.26	0.78	0.09	0.03	0.36
132	Saint Joseph's University - Philadelphia	0.36	0.49	5.05		1.12	0.33	0.45	0.40	0.67	0.24	0.03	0.37
133	The Catholic University of America	0.35	0.54	3.10	178	0.94	0.29	0.36	0.38	0.76	0.15	0.02	0.34
134	Lesley University	0.35	1.30	2.64		0.43	0.36	0.12	0.28	0.71	0.12	0.01	0.46
135	Adelphi University	0.35	1.04	2.65		0.54	0.37	0.32	0.59	0.91	0.05	0.02	0.37
136	University of Scranton	0.33	0.76	3.89		0.64	0.30	0.25	0.40	0.88	0.07	0.02	0.40
137	Loyola University-Baltimore	0.33	0.60	2.69		0.73	0.24	0.31	0.42	0.85	0.09	0.02	0.38
138	Seton Hall University	0.33	0.75	3.59	151	0.70	0.37	0.45	0.64	0.86	0.10	0.01	0.38
139	The University of Tampa	0.32	0.48	4.49		0.96	0.28	0.39	0.41	0.92	0.07	0.01	0.06
140	Simmons College	0.32	1.31	3.38	151	0.55	0.54	0.23	0.44	0.87	0.07	0.02	0.40
141	Ithaca College	0.32	0.46	1.72		0.88	0.21	0.33	0.38	0.84	0.06	0.03	0.45
142	Trinity College	0.31	0.33	4.32		1.15	0.18	0.25	0.21	0.65	0.12	0.03	0.69
143	Lipscomb University	0.29	1.47	4.19		0.48	0.58	0.21	0.45	0.88	0.09	0.01	0.20
144	Pace University	0.29	0.95	4.22		0.69	0.57	0.60	0.86	0.93	0.04	0.01	0.28
145	University of New England	0.29	0.59	3.80		0.69	0.29	0.28	0.40	0.85	0.10	0.02	0.14
146	Belmont University	0.28	0.22	3.11		1.49	0.14	0.45	0.30	0.85	0.08	0.05	0.25
147	Centre College	0.28	0.58	3.99		0.67	0.30	0.13	0.19	0.69	0.15	0.13	0.60
148	Rose-Hulman Institute of Technology	0.28	0.72	1.59		0.50	0.22	0.16	0.32	0.80	0.13	0.04	0.54
149	Campbell University Inc	0.27	0.56	2.45		0.65	0.26	0.25	0.38	0.85	0.08	0.02	0.30
150	University of Portland	0.26	0.49	2.50		0.65	0.17	0.23	0.36	0.93	0.07	0.00	0.36
151	St Lawrence University	0.26	0.53	2.08		0.63	0.24	0.21	0.33	0.84	0.13	0.02	0.57
152	Seattle University	0.25	0.37	4.41	163	0.90	0.24	0.37	0.41	0.83	0.13	0.01	0.32
153	Gwynedd Mercy College	0.25	2.57	3.23		0.14	0.31	0.10	0.76	0.59	0.21	0.01	0.26
154	Loyola University New Orleans	0.24	0.75	4.11		0.60	0.45	0.20	0.33	0.87	0.08	0.02	0.39
155	Gustavus Adolphus College	0.24	0.63	4.44		0.50	0.20	0.18	0.37	0.72	0.19	0.01	0.46
156	Whitworth University	0.23	0.85	3.18		0.39	0.30	0.22	0.55	0.60	0.11	0.03	0.52
157	Florida Institute of Technology	0.23	1.05	3.41		0.37	0.42	0.20	0.55	0.84	0.12	0.01	0.25
158	Southwestern University	0.23	0.45	1.24		0.58	0.13	0.14	0.24	0.57	0.14	0.09	0.64
159	Allegheny College	0.22	0.71	1.85		0.40	0.20	0.14	0.34	0.76	0.15	0.02	0.58
160	Furman	0.22	0.20	3.74		1.27	0.13	0.24	0.19	0.71	0.16	0.06	0.62
161	Muhlenberg College	0.22	0.46	1.67		0.57	0.16	0.17	0.30	0.73	0.11	0.06	0.58
162	Valparaiso University	0.22	0.51	3.46		0.62	0.27	0.19	0.31	0.82	0.13	0.01	0.50
163	Pacific University	0.22	1.25	1.99		0.32	0.43	0.18	0.56	0.91	0.06	0.03	0.18
164	Saint Edward's University	0.22	0.89	4.81		0.39	0.35	0.20	0.50	0.90	0.05	0.01	0.31
165	Randolph-Macon College	0.21	0.72	1.15		0.37	0.17	0.10	0.27	0.75	0.14	0.03	0.50
166	Hampden-Sydney College	0.20	0.51	3.34		0.49	0.18	0.14	0.29	0.39	0.59	0.01	0.49
167	Agnes Scott College	0.20	0.74	1.91		0.36	0.23	0.08	0.23	0.65	0.24	0.06	0.60
168	Sewanee-The University of the South	0.20	0.29	1.02		0.80	0.13	0.12	0.15	1.20	0.18	0.21	0.56
169	Regent University	0.18	2.14	5.14		0.20	0.54	0.16	0.82	0.93	0.03	0.01	0.34
170	Gallaudet University	0.18	0.46	2.17	124	0.51	0.23	0.23	0.46	0.19	0.75	0.02	0.40

Table A5 – continued from the previous page

Rank	Name	Equity	Equity M/B	Spread	US News Rank	Asset	Leverage	Revenue	Revenue /Asset	PSR /Revenue	Contrib /Revenue	Inv.Income /Revenue	Endowment /Asset
171	Macalester College	0.18	0.17	2.16		1.15	0.09	0.19	0.16	0.77	0.10	0.07	0.71
172	Rhodes College	0.18	0.34	1.04		0.64	0.18	0.12	0.19	1.01	0.11	0.03	0.62
173	New York Law School	0.17	1.04	4.55		0.34	0.49	0.08	0.24	0.72	0.10	0.06	0.14
174	Wheaton College (Massachusetts)	0.17	0.55	2.47		0.41	0.23	0.15	0.36	0.76	0.14	0.02	0.57
175	Bradley University	0.17	0.32	4.44		0.71	0.28	0.23	0.32	0.90	0.09	0.07	0.50
176	University of New Haven	0.17	0.72	3.62		0.42	0.45	0.32	0.76	0.92	0.06	0.01	0.18
177	National University	0.16	0.12	3.60		1.52	0.10	0.38	0.25	0.66	0.03	0.02	0.02
178	Washington & Jefferson College	0.16	0.62	1.26		0.33	0.22	0.09	0.27	0.90	0.09	0.02	0.40
179	Art Center College of Design	0.16	0.81	4.35		0.38	0.43	0.14	0.38	0.95	0.03	0.01	0.34
180	Transylvania University	0.15	0.77	1.80		0.26	0.25	0.07	0.25	0.69	0.11	0.03	0.48
181	La Salle University	0.15	1.34	5.15		0.28	0.60	0.16	0.57	0.87	0.05	0.02	0.28
182	Illinois Wesleyan University	0.15	0.51	5.14		0.41	0.28	0.09	0.22	0.58	0.15	0.03	0.58
183	Goucher College	0.15	0.50	4.13		0.43	0.30	0.09	0.22	0.76	0.18	0.02	0.54
184	University of the Incarnate Word	0.14	0.42	6.00		0.54	0.38	0.28	0.51	0.88	0.07	0.02	0.31
185	Connecticut College	0.14	0.28	4.86		0.66	0.21	0.17	0.27	0.80	0.17	0.01	0.63
186	Manhattan College	0.14	0.45	3.55		0.43	0.28	0.22	0.51	0.84	0.12	0.01	0.31
187	Touro University Nevada	0.14	3.88	1.40		0.11	0.69	0.07	0.62	0.88	0.10	0.01	0.05
188	California Lutheran University	0.12	0.43	2.82		0.38	0.24	0.19	0.49	0.85	0.09	0.01	0.35
189	Washington College	0.12	0.29	2.89		0.49	0.16	0.10	0.21	0.57	0.17	0.00	0.59
190	John Carroll University	0.12	0.30	5.30		0.59	0.34	0.17	0.29	0.82	0.12	0.02	0.45
191	Robert Morris University	0.11	0.81	3.13		0.28	0.49	0.18	0.66	0.90	0.09	0.01	0.13
192	Kalamazoo College	0.11	0.32	1.92		0.41	0.15	0.12	0.30	0.73	0.13	0.01	0.69
193	Webster University	0.11	0.41	5.06		0.39	0.33	0.15	0.40	0.88	0.05	0.03	0.31
194	Illinois Institute of Technology	0.11	0.24	5.64	98	0.74	0.37	0.39	0.53	0.73	0.19	0.01	0.41
195	Wartburg College	0.11	0.80	4.62		0.23	0.40	0.11	0.46	0.75	0.11	0.02	0.38
196	Le Moyne College	0.11	0.36	3.39		0.40	0.27	0.15	0.37	0.78	0.13	0.03	0.59
197	Ursinus College	0.11	0.43	3.94		0.32	0.24	0.11	0.33	0.84	0.08	0.04	0.43
198	St Catherine University	0.11	0.42	3.46		0.34	0.28	0.14	0.42	0.78	0.15	0.03	0.38
199	Iona College	0.10	0.33	4.32		0.42	0.26	0.16	0.39	0.88	0.11	0.00	0.47
200	Thomas College	0.10	1.78	1.03		0.08	0.23	0.03	0.44	0.81	0.15	0.02	0.18
201	Seattle Pacific University	0.10	0.40	4.35		0.37	0.30	0.16	0.42	0.88	0.08	0.04	0.43
202	Wentworth Institute of Technology	0.10	0.38	4.74		0.45	0.40	0.19	0.43	0.90	0.07	0.01	0.33
203	Biola University	0.09	0.29	3.43		0.46	0.30	0.23	0.51	0.83	0.13	0.02	0.30
204	Regis University	0.09	0.65	4.76		0.24	0.39	0.17	0.72	0.87	0.11	0.01	0.34
205	King's College	0.09	0.50	4.82		0.26	0.29	0.10	0.40	0.88	0.09	0.02	0.44
206	Azusa Pacific University	0.09	0.47	6.53		0.39	0.53	0.28	0.72	0.86	0.13	0.00	0.26
207	Moravian College	0.08	0.42	4.14		0.29	0.31	0.11	0.40	0.90	0.06	0.05	0.40
208	Champlain College	0.08	0.56	6.13		0.23	0.37	0.12	0.54	0.87	0.07	0.02	0.12
209	Ohio Wesleyan University	0.08	0.20	4.57		0.49	0.17	0.12	0.24	0.73	0.20	0.02	0.57
210	Saint Michael's College	0.08	0.60	5.63		0.21	0.35	0.11	0.54	0.90	0.05	0.02	0.43
211	Saint Leo University	0.08	0.51	3.44		0.25	0.39	0.17	0.68	0.96	0.03	0.01	0.27
212	Taylor University	0.08	0.36	2.36		0.26	0.16	0.10	0.39	0.82	0.14	0.03	0.37
213	Oklahoma City University	0.08	0.31	5.70		0.37	0.33	0.11	0.30	0.81	0.12	0.02	0.43
214	Saint Joseph's College of Maine	0.08	1.53	1.81		0.07	0.29	0.06	0.83	0.85	0.11	0.00	0.26

Table A5 – continued from the previous page

Rank	Name	Equity	Equity M/B	Spread	US News Rank	Asset	Leverage	Revenue	Revenue /Asset	PSR /Revenue	Contrib /Revenue	Inv.Income /Revenue	Endowment /Asset
215	The University of Findlay	0.07	0.39	3.54		0.24	0.26	0.16	0.66	0.77	0.12	0.01	0.22
216	Cabrini College	0.07	1.12	4.07		0.12	0.47	0.07	0.56	0.84	0.10	0.01	0.32
217	Knox College	0.07	0.32	3.00		0.26	0.20	0.09	0.32	0.74	0.15	0.07	0.62
218	Des Moines University-Osteopathic Medical Center	0.06	0.25	6.34		0.45	0.49	0.08	0.19	0.85	0.04	0.04	0.18
219	University of Hartford	0.06	0.29	6.75		0.45	0.48	0.28	0.63	0.87	0.07	0.02	0.46
220	Lindsey Wilson College	0.05	0.77	3.67		0.10	0.27	0.07	0.69	0.86	0.10	0.01	0.32
221	Gardner-Webb University	0.05	0.36	5.13		0.15	0.18	0.10	0.63	0.89	0.11	0.02	0.46
222	Mount Saint Mary College	0.04	0.34	5.26		0.18	0.28	0.08	0.44	0.78	0.03	0.01	0.05
223	Southwestern Law School	0.04	0.43	3.52		0.13	0.22	0.06	0.46	0.92	0.06	0.01	0.18
224	Sarah Lawrence College	0.04	0.25	5.68		0.26	0.37	0.12	0.47	0.87	0.11	0.01	0.46
225	Albion College	0.04	0.18	5.77		0.30	0.26	0.12	0.41	0.76	0.09	0.04	0.59
226	Wayland Baptist University	0.03	0.23	2.37		0.20	0.23	0.06	0.30	0.66	0.20	0.04	0.60
227	Lubbock Christian University	0.03	0.35	3.28		0.12	0.19	0.05	0.43	0.63	0.28	0.01	0.27
228	Seton Hill University	0.03	0.24	6.27		0.19	0.30	0.10	0.52	0.86	0.12	0.01	0.27
229	William Jessup University	0.02	0.61	7.90		0.14	0.76	0.06	0.42	0.78	0.21	0.01	0.04
230	Daemen University	0.02	0.38	8.08		0.08	0.45	0.07	0.94	0.92	0.04	0.01	0.20
231	Earlham College	0.02	0.07	5.61		0.33	0.30	0.07	0.20	0.80	0.20	0.00	1.14
232	University of Redlands	0.02	0.04	5.55		0.52	0.28	0.18	0.35	0.90	0.06	0.05	0.49
233	Calvin College	0.01	0.03	9.48		0.58	0.23	0.19	0.33	0.71	0.25	0.03	0.44
234	Rider University	0.01	0.05	8.71		0.28	0.44	0.23	0.83	0.89	0.09	0.01	0.24
235	Springfield College	0.00	0.01	8.45		0.29	0.40	0.16	0.55	0.86	0.10	0.03	0.34

This table presents the top 50 universities ranked by average equity value over the 5-year period from July 2020 to June 2025. All variables are averaged over the same period unless otherwise noted. *Equity*: market value of equity in billions of USD. *Equity M/B*: equity market-to-book ratio, defined as market value of equity divided by book value of equity. *Spread*: credit spread of the representative bond in percent. *US News Rank*: based on the 2024 ranking; blank entries indicate unranked institutions. *Asset*: book value of total assets in billions of USD. *Leverage*: book value of total liabilities divided by book value of total assets. *Revenue*: total revenue in billions of USD. *Revenue/Asset*: total revenue divided by book value of total assets. *PSR/Revenue*: program service revenue divided by total revenue. *Contrib/Revenue*: total contributions (donations and government grants) divided by total revenue. *Inv.Income/Revenue*: investment income divided by total revenue. *Endowment/Asset*: endowment divided by total assets. Financial statement variables are from IRS Form 990 filings. The sample excludes public universities that are not required to file IRS Form 990.

Table A6: Mapping of EINs between IPEDS and IRS Form 990

Name in IPEDS	Name 1 in IRS	Name 2 in IRS	UNITID	EIN in IPEDS	EIN in IPEDS	EIN in IRS
Academy of Interactive Entertainment	ACADEMY OF INTERACTIVE ENTERTAINMENT - LA	Academy of Interactive Entertainment - LA	487658	272999527		272990527
Agnes Scott College	AGNES SCOTT COLLEGE	Agnes Scott College	138600	110566116		580566116
Albert Einstein College of Medicine	ALBERT EINSTEIN COLLEGE OF MEDICINE INC		385415	830621846		472209056
Alliant International University	Alliant International University	ALLIANT INTERNATIONAL UNIVERSITY	110468	941699659		542110067
Baker College of Auburn Hills	BAKER COLLEGE OF AUBURN HILLS	Baker of Auburn Hills	404073	383477279		383474279
Beth Hatalmud Rabbinical College	BETH HATALMUD RABBINICAL INSTITUTE		189264	111811853		510185906
Beulah Heights University	Beulah Heights University Inc	BEULAH HEIGHTS UNIVERSITY INC	139153	586050244		586055244
Birmingham-Southern College	Birmingham-Southern College	BIRMINGHAM-SOUTHERN COLLEGE	100937	630708730		630288811
Brandman University	UNIVERSITY OF MASSACHUSETTS GLOBAL	UNIVERSITY OF MASSACHUSSETS GLOBAL	262086	260152980		260152908
Bryant & Stratton College-Online	BRYANT & STRATTON COLLEGE INC		480091	160364420		844813183
Butler University	BUTLER UNIVERSITY	Butler University	150163	350867974		350867977
Caribbean University-Bayamon	CARIBBEAN UNIVERSITY INC	CARRIBEAN UNIVERSITY INC	241377	360277004		237409172
Carlos Albizu University-Miami	CARLOS ALBIZU UNIVERSITY		132842	592060342		660234412
Clinton College	CLINTON COLLEGE		217891	570387830		570387838
College for Creative Studies	COLLEGE FOR CREATIVE STUDIES		169442	382539067		381550064
College of the Ozarks	College of the Ozarks	COLLEGE OF THE OZARKS	178697	76291152		440556862
Columbia University in the City of New York	THE TRUSTEES OF COLUMBIA UNIVERSITY		190150	603800000		135598093

Table A6 – continued from the previous page

Name in IPEDS	Name 1 in IRS	Name 2 in IRS	UNITID	EIN in IPEDS	EIN in IPEDS	EIN in IRS
Concordia University	CONCORDIA UNIVERSITY		208488	933905163		930391563
Cox College	COX COLLEGE		176770	144057718		475148345
Des Moines University-Osteopathic Medical Center	DES MOINES UNIVERSITY - OSTEOPATHIC MEDICAL CENTER	DES MOINES UNIVERSITY OSTEOPATHIC MEDICAL CENTER	154156	420073034		420730347
Drake University	Drake University	DRAKE UNIVERSITY	153269	41103730		420680460
Evangel University	EVANGEL UNIVERSITY OF THE ASSEMBLIES OF GOD	EVANGEL UNIVERSITY	177339	10402130		440589787
Gemological Institute of America	GEMOLOGICAL INSTITUTE OF AMERICA INC	Gemological Institute of America Inc	114947	951652909		953797687
Gemological Institute of America-New York	GEMOLOGICAL INSTITUTE OF AMERICA INC	Gemological Institute of America Inc	191311	951652909		953797687
Indiana Wesleyan University	INDIANA WESLEYAN UNIVERSITY	Indiana Wesleyan University	151801	151801		350885591
Institute for the Psychological Sciences	THE INSTITUTE FOR THE PSYCHOLOGICAL SCIENCES INC	The Institute for the Psychological Sciences Inc	445869	54191109		541911091
Iona College	Iona University	Iona College	191931	131740459		133508093
Johnson University Florida	JOHNSON UNIVERSITY FLORIDA INC		132879	510173775		475271468
Keiser University-Ft Lauderdale	EVERGLADES COLLEGE INC		135081	591829662		650216638
Keuka College	KEUKA COLLEGE		192192	160743063		166054295
Lee University	LEE UNIVERSITY		220613	780000768		620502739
Loma Linda University	Loma Linda University	LOMA LINDA UNIVERSITY	117636	931221825		951816009
Manchester University	MANCHESTER UNIVERSITY INC	MANCHESTER COLLEGE	151777	380868127		350868127

Table A6 – continued from the previous page

Name in IPEDS	Name 1 in IRS	Name 2 in IRS	UNITID	EIN in IPEDS	EIN in IPEDS	EIN in IRS
Manna University	GRACE COLLEGE OF DIVINITY	MANNA UNIVERSITY	461528	561057695		562195966
Meharry Medical College	MEHARRY MEDICAL COLLEGE		220792	222207921	220792	620488046
Memorial Hospital School of Radiation Therapy Technology	MEMORIAL SLOAN-KETTERING CANCER CENTER	Memorial Sloan-Kettering Cancer Center	192970	131624080		912154267
Merrimack College	Merrimack College	MERRIMACK COLLEGE	166850	42013731		42103731
Midwestern University	Midwestern University	MIDWESTERN UNIVERSITY	143853	363372698		363377698
Morehouse School of Medicine	MOREHOUSE SCHOOL OF MEDICINE	Morehouse School of Medicine	140562	581438877		581438873
Muskingum University	MUSKINGUM UNIVERSITY	Muskingum University	204264	31437951		314379515
New Saint Andrews College	NEW SAINT ANDREWS COLLEGE INC		440396	820536794		383906568
North Central University	NORTH CENTRAL UNIVERSITY		174437	794750000		410706151
Oakland City University	OAKLAND CITY UNIVERSITY		152099	12345678		350869063
Pacific Lutheran Theological Seminary	PACIFIC LUTHERAN THEOLOGICAL SEMINARY FOUNDATION		120740	941384685		10725195
Pillar College	Pillar College Inc	PILLAR COLLEGE INC	440794	237075340		453912932
Pittsburgh Technical College	PITTSBURGH TECHNICAL INSTITUTE INC	PITTSBURGH TECHNICAL COLLEGE INC	215415	251633275		810903939
Roberts Wesleyan College	ROBERTS WESLEYAN UNIVERSITY	ROBERTS WESLEYAN COLLEGE	194958	116074341		160743126
Rust College	Rust College Inc	RUST COLLEGE INC	176318	604303805		640303805
Saint Anselm College	Saint Anselm College	SAINT ANSELM COLLEGE	183239	73969388		20222182

Table A6 – continued from the previous page

Name in IPEDS	Name 1 in IRS	Name 2 in IRS	UNITID	EIN in IPEDS	EIN in IPEDS	EIN in IRS
Saint Johns University	SAINT JOHN'S UNIVERSITY		174792	453656132	410693973	453656162
Saint Joseph's University	Saint Joseph's University	SAINT JOSEPH'S UNIVERSITY	215770	215770		231352674
Salus University	Salus University	SALUS UNIVERSITY	214564	232048202		231413680
San Francisco Art Institute	SAN FRANCISCO ART INSTITUTE		122454	94119621		941196211
Santa Clara University	PRESIDENT-BOARD OF TRUSTEES SANTA CLARA COLLEGE	President-Board of Trustees	122931	941156697		941156617
Shaw University	The Shaw University	THE SHAW UNIVERSITY	199643	56053023		560530235
Shenandoah University	SHENANDOAH UNIVERSITY		233541	681		540525605
Shorter University	Shorter University Inc	Shorter University	140988	580593431		582624570
Sojourner-Douglass College	SOJOURNER DOUGLASS COLLEGE INC	SOJOURNER DOUGLASS COLLEGE	163921	920954654		520954654
Southwestern College	THE SOUTHWESTERN COLLEGE		155900	480542715		480543715
St. Gregory's University	ST GREGORY'S UNIVERSITY		207689	731685198		730685198
St. John's College	ST JOHN'S COLLEGE		245652	850162247		520591421
Stevens Institute of Technology	THE TRUSTEES OF THE STEVENS INSTITUTE OF	Stevens Institute of Technology	186867	22148735		221487354
Sweet Briar College	Sweet Briar Institute	SWEET BRIAR INSTITUTE	233718	541534105		540534105
Teachers College at Columbia University	TEACHERS COLLEGE COLUMBIA UNIVERSITY	Teachers College Columbia University	196468	603800000		131624202
Truett McConnell University	Truett McConnell University Inc	TRUETT MCCONNELL UNIVERSITY INC	141237	154900079		580531392
Union Graduate College	UNION GRADUATE COLLEGE		446932	20025800		200258004

Table A6 – continued from the previous page

Name in IPEDS	Name 1 in IRS	Name 2 in IRS	UNITID	EIN in IPEDS	EIN in IPEDS	EIN in IRS
Universidad Politecnica de Puerto Rico	UNIVERSIDAD POLITECNICA DE PUERTO RICO INC		243577	660362606		660362666
University of Mary	UNIVERSITY OF MARY	University of Mary	200217	430273403		450273403
University of Mary Hardin-Baylor	University of Mary Hardin-Baylor	UNIVERSITY OF MARY HARDIN-BAYLOR	226471	741191640		741161940
University of Rochester	UNIVERSITY OF ROCHESTER		195030	263800000		160743209
University of the West	UNIVERSITY OF THE WEST		449870	80436843		931022351
White Earth Tribal and Community College	WHITE EARTH TRIBAL AND COMMUNITY COLLEGE	White Earth Tribal and Community College	434751	411737979		411978247
William Carey University	WILLIAM CAREY UNIVERSITY		176479	640329400		640329300
Williamson Christian College	Williamson Christian College	WILLIAMSON CHRISTIAN COLLEGE	443340	443340		621669683
Yeshivah Gedolah Rabbinical College	YESHIVA GEDOLAH RABBINICAL COLLEGE		363712	650809933		650809938

Table A7: Summary Statistics of Corporate Bonds by Rating Group

	AAA		AA		A		BBB		HY	
Variable	Mean	Std	Mean	Std	Mean	Std	Mean	Std	Mean	Std
Credit Spread (bps)	33.270	17.668	44.191	24.860	65.595	37.455	129.182	86.771	513.720	717.530
Leverage	0.095	0.070	0.143	0.077	0.180	0.094	0.278	0.134	0.481	0.209
Asset Volatility	0.196	0.053	0.193	0.070	0.208	0.070	0.222	0.078	0.261	0.119
Payout	0.022	0.011	0.030	0.020	0.029	0.025	0.033	0.029	0.036	0.032
Maturity (years)	4.563	1.629	4.528	1.665	4.722	1.693	4.844	1.707	5.388	1.591
Coupon (%)	3.001	1.436	3.000	1.627	3.513	1.580	4.170	1.527	6.439	1.637
Amount Out. ($M)	1,183	867	1,264	818	826	554	703	560	601	426
Bond-months	2,565		9,678		46,776		95,355		92,500	
Bonds	70		335		1,519		3,052		3,348	
Months	140		140		140		140		140	

This table reports the summary statistics of the monthly panel data of U.S. corporate bonds in the ICE BofA Merrill Lynch database, separately for each credit rating group (AAA, AA, A, BBB, HY). The sample includes industrial bonds with a remaining time to maturity between 2 and 8 years and an option-adjusted spread of at least 5 basis points, starting in June 2011. Credit spread is the option-adjusted spread expressed in basis points. Leverage is the ratio of the book value of debt to the sum of the book value of debt and the market value of equity. Asset volatility is computed following Feldhütter and Schaefer (2018) using a 3-year rolling window of equity volatility. Payout is the sum of common and preferred dividends and interest payments scaled by the quasi-market value of the asset. Maturity is the remaining time to maturity in years. Coupon is the coupon rate per year in percent. Amount outstanding is in million dollars.

Table A8: Cumulative Probability of Default (Percent) of the Stochastic Volatility Model by Rating Group

	AAA		AA		A		BBB		HY	
Horizon	Model	Moody's	Model	Moody's	Model	Moody's	Model	Moody's	Model	Moody's
1Y	0.000	0.000	0.000	0.060	0.000	0.079	0.000	0.234	0.250	3.776
5Y	0.000	0.136	0.010	0.643	0.050	1.064	0.420	2.310	12.450	17.141
10Y	0.260	0.679	0.870	1.877	1.560	2.829	3.670	5.310	26.770	27.191
15Y	1.120	1.061	3.080	3.248	4.560	4.682	8.450	8.297	35.880	34.114
20Y	2.900	1.308	5.770	4.152	7.940	6.211	13.110	10.741	42.230	39.250
X_D^*	0.500		0.580		0.705		0.605		0.875	

This table reports the cumulative probability of default in percent by credit rating group and horizon. Model is the model-implied probability using the within-group average of leverage $\bar{F}^{(g)}$, asset variance $\bar{V}^{(g)}$, payout rate $\bar{q}^{(g)}$, and risk-free rate $\bar{r}^{(g)}$, with X_D^* chosen to minimize the sum of squared differences in cumulative default probabilities between the model and Moody's. Moody's is the cumulative probability of default for the corresponding rating group averaged from 1920 to 2020. Average inputs by rating group: AAA ($\bar{F} = 0.141$, $\bar{V} = 0.047$, $\bar{q} = 0.024$, $\bar{r} = 0.014$); AA ($\bar{F} = 0.166$, $\bar{V} = 0.040$, $\bar{q} = 0.029$, $\bar{r} = 0.015$); A ($\bar{F} = 0.164$, $\bar{V} = 0.055$, $\bar{q} = 0.030$, $\bar{r} = 0.015$); BBB ($\bar{F} = 0.255$, $\bar{V} = 0.061$, $\bar{q} = 0.033$, $\bar{r} = 0.016$); HY ($\bar{F} = 0.454$, $\bar{V} = 0.089$, $\bar{q} = 0.035$, $\bar{r} = 0.020$).

Table A9: Average Credit Spreads (Basis Points) of the Stochastic Volatility Model by Rating Group

Rating group	Model	Data	Difference	N
AAA	32.5	33.1	−0.6	2,565
	(10.9)	(15.7)	(-0.2)	
AA	41.1	44.3	−3.2	9,678
	(8.7)	(16.3)	(-1.0)	
A	63.9	65.8	−1.9	46,776
	(12.9)	(14.4)	(-0.5)	
BBB	132.6	133.2	−0.6	95,355
	(17.6)	(13.4)	(-0.1)	
HY	507.4	505.8	1.5	92,500
	(21.0)	(10.6)	(0.0)	

Each month, we take the equal-weighted average of the credit spreads based on the stochastic volatility model of Du et al. (2019) and the data, separately for each credit rating group, and then average them over time. For each rating group, the price of variance risk λ_V is chosen to minimize the squared distance between the time-series average of model and data spreads, and λ_D is pinned down by the constraint that the long-run asset Sharpe ratio equals 0.22. Values in parentheses are t-statistics computed with Newey-West standard errors with 12 lags. N is the number of bond-month observations.

Table A10: Determinants of the Credit Spead (in Basis Points)

		Univariate				Multivariate		
Category	Variable	Coef	t-stat	Adj. R^2	N	Coef	t-stat	Var. dec.
Panel A: Baseline								
	Year-month FE only			0.195	15,154			
	University FEs			0.621	15,139			
Panel B: Base model								
Revenue	ROA	-20.887***	(-3.80)	0.210	15,154	-12.634***	(-3.15)	[1.00]
	Change in ROA	-8.312	(-1.56)	0.179	14,536	3.463	(0.68)	[-0.09]
Op. risk	ROA vol.	22.655***	(4.66)	0.192	13,826	15.154***	(2.94)	[1.49]
Fin. risk	Book leverage	47.923***	(6.64)	0.279	15,154	2.834	(0.50)	[0.47]
	Investment/Assets	-57.221***	(-9.73)	0.315	15,154	-21.677***	(-2.98)	[4.34]
	Cash/Assets	7.364	(1.18)	0.181	13,770	-5.133	(-1.22)	[-0.18]
	Credit rating (dummies)			0.447	15,154	Included		[18.06]
Reputation	US News rank	-42.340***	(-6.38)	0.298	15,154	-9.130	(-1.59)	[-0.20]
	Ivy League	-123.530***	(-8.66)	0.236	15,154	-6.534	(-0.50)	[0.23]
						Adj. $R^2 = 0.466$		$N = 12{,}843$
Panel C: Decomposition model								
Revenue	PSR/Assets					-3.405	(-0.54)	[-0.48]
	Contribution/Assets					-0.680	(-0.11)	[0.01]
	Invest. income/Assets					4.051	(0.89)	[-0.17]
	Other rev./Assets					-5.270	(-1.03)	[0.52]
	Change in PSR					-5.057*	(-1.79)	[0.14]
	Change in contribution					-1.352	(-0.36)	[0.00]
	Change in invest. income					-1.361	(-0.34)	[-0.02]
	Change in other rev.					-1.107	(-0.22)	[0.03]
Op. risk	PSR vol.					0.119	(0.03)	[0.02]
	Contribution vol.					6.037	(1.27)	[0.50]
	Invest. income vol.					-4.346	(-1.31)	[0.17]
	Other rev. vol.					6.030	(1.49)	[0.25]
Fin. risk	Book leverage					9.968*	(1.94)	[1.63]
	Non-endow. invest./Assets					-12.879***	(-2.64)	[0.85]
	Endowment (discret.)/Assets					-24.047***	(-3.85)	[2.61]
	Endowment (non-discret.)/Assets					-9.607	(-1.16)	[1.07]
	Cash/Assets					-9.008**	(-2.25)	[-0.28]
	Credit rating (dummies)					Included		[17.78]
Reputation	US News rank					-12.112*	(-1.76)	[-0.24]
	Ivy League					-12.264	(-0.96)	[0.43]
						Adj. $R^2 = 0.467$		$N = 12{,}747$

This table reports the determinants of the credit spread. The dependent variable is the credit spread in bps. Panel A reports R^2 from specifications with only fixed effects. Panel B presents a base model with one representative variable per category. Panel C decomposes the aggregate measures into their components. Univariate columns report results from separate regressions of the dependent variable on each explanatory variable with year-month fixed effects. Multivariate columns report results from a single regression including all variables in the panel. *ROA*: total revenue minus total expenses, divided by total assets. *Change in ROA*: year-over-year change in ROA. *ROA vol.*: rolling three-year standard deviation of ROA growth. *Book leverage*: total liabilities divided by total assets. *Investment/Assets*: total investment securities divided by total assets. *Cash/Assets*: cash and savings divided by total assets. *Credit rating*: grouped credit rating dummies (1 = Aaa to 5 = HY or unrated). *US News rank*: negative of US News ranking (higher = better); unranked universities coded as zero with a separate indicator (not reported). *Ivy League*:

indicator for Ivy League membership. *PSR/Assets*: program service revenue divided by total assets. *Contribution/Assets*: Contributions and grants divided by total assets. *Invest. income/Assets*: investment income divided by total assets. *Other rev./Assets*: other revenue divided by total assets, where other revenue is total revenue minus PSR minus contributions minus investment income. For a given variable, "Change in *variable*" denotes the year-over-year change and "*variable* vol." denotes the rolling three-year standard deviation of that change. *Non-endow. invest./Assets*: total investment securities minus endowment, divided by total assets. *Endowment (discret.)/Assets*: board-designated (discretionary) endowment divided by total assets. *Endowment (non-discret.)/Assets*: non-discretionary endowment divided by total assets. Variance decomposition (Var. dec.) is computed as $\beta_x \text{cov}(y, x)/\text{var}(y) \times 100$. All continuous variables are winsorized at the 0.5th and 99.5th percentiles and standardized to have zero mean and unit standard deviation. Standard errors are double-clustered by university and tax year. ***, **, and * denote significance at the 1%, 5%, and 10% levels.

Table A11: Endowment Tax Proposals and Federal Research Funding Freezes in March 2025

	Dep. Var = Log(Asset value)				
	(1)	(2)	(3)	(4)	(5)
Post 4 months×Treat 1	-0.413***				
	(-5.20)				
Post 4 months×Treat 2		-0.428***			
		(-4.28)			
Post 4 months×Treat 3			-0.446***		
			(-5.36)		
Post 4 months×Treat 4				-0.519***	
				(-7.62)	
Post 3 months×Treat 4					-0.547***
					(-8.24)
# of treated universities	8	5	6	4	4
University controls	✓	✓	✓	✓	✓
University FEs	✓	✓	✓	✓	✓
Year-month FEs	✓	✓	✓	✓	✓
Adj. R^2	0.975	0.975	0.975	0.975	0.977
Obs.	885	885	885	885	795

The dependent variable is the log of asset value. The pre-treatment period is November 2024 to February 2025. *Post* is an indicator taking one from March 2025, and the number following *Post* indicates the length of the post-treatment window: 4 months (March–June 2025), or 3 months (March–May 2025). In Panel A, the treatment groups are defined as nested sets of policy exposure: *Treat 1* includes universities with endowments exceeding the WEST Act threshold ($11.9 billion); *Treat 2* adds those subject to federal research funding freezes; *Treat 3* adds recipients of OCR warning letters; and *Treat 4* includes universities affected by all three. The dependent variable and the continuous control variables (ROA, book leverage, and the investment-to-asset ratio) are winsorized at the 0.5% and 99.5% levels. Control variables include ROA, book leverage, the investment-to-asset ratio, credit rating dummies, the (negative of the) U.S. News rank, and an indicator for unranked universities. All specifications include university and year-month fixed effects. t-statistics based on standard errors clustered by university are in parentheses. ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A12: Federal Student Loan Payment Pause in March 2020

	Dep. Var = Log(Asset value)				
	(1)	(2)	(3)	(4)	(5)
Post 4 months×High loan share	0.220***				
	(3.99)				
Post 3 months×High loan share		0.255***	0.185***	0.112*	0.273***
		(4.08)	(2.73)	(1.70)	(4.37)
Post 3 months×High loan share×Low Gov't grant			0.313**		
			(2.49)		
Post 3 months×High loan share×Low student #				0.300***	
				(3.04)	
Post 3 months×High loan share×Low loan size					-0.340***
					(-6.09)
# of treated universities	29	29	29	29	29
University controls	✓	✓	✓	✓	✓
University FEs	✓	✓	✓	✓	✓
Year-month FEs	✓	✓	✓	✓	✓
Adj. R^2	0.968	0.968	0.969	0.969	0.969
Obs.	784	681	681	681	681

The dependent variable is the log of asset value. The pre-treatment period is November 2019 to February 2020. *Post* is an indicator taking one from March 2020, and the number following *Post* indicates the length of the post-treatment window: 4 months (March–June 2020), or 3 months (March–May 2020). *High loan share* denotes universities in the top tercile of the percent of undergraduate students awarded federal student loans, measured as of February 2020. In columns (4)–(6), the treatment indicator is interacted with university characteristics measured in the bottom tercile as of February 2020. *Low Gov't grant* denotes universities in the bottom tercile of the government-grant-to-asset ratio. *Low student #* denotes universities in the bottom tercile of total undergraduate enrollment. *Low loan size* denotes universities in the bottom tercile of average federal loan amount per borrower. The dependent variable and the continuous control variables (ROA, book leverage, and the investment-to-asset ratio) are winsorized at the 0.5% and 99.5% levels. Control variables include ROA, book leverage, the investment-to-asset ratio, credit rating dummies, the (negative of the) U.S. News rank, and an indicator for unranked universities. All specifications include university and year-month fixed effects. t-statistics based on standard errors clustered by university are in parentheses. ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A13: Visa Scrutiny and Deportations of Chinese International Students in May 2024

	Dep. Var = Log(Asset value)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Post 4 months×High Foreign Asian student	-0.301***		-0.282***	-0.118	-0.359***	-0.166	-0.146
	(-4.56)		(-3.66)	(-1.01)	(-4.76)	(-1.36)	(-0.97)
Post 3 months×High Foreign Asian student		-0.310***					
		(-4.31)					
Post 4 months×High Foreign Asian student×High Foreign Asian faculty			-0.077				
			(-0.63)				
Post 4 months×High Foreign Asian student×High Foreign student (Q5)				-0.257*			
				(-1.96)			
Post 4 months×High Foreign Asian student×High Asian student (Q5)					0.093		
					(0.85)		
Post 4 months×High Foreign Asian student×Large Student enrollment						-0.207	
						(-1.54)	
Post 4 months×High Foreign Asian student×PhD degree offer							-0.173
							(-1.07)
# of treated universities	26	26	26	26	26	26	26
University controls	✓	✓	✓	✓	✓	✓	✓
University FEs	✓	✓	✓	✓	✓	✓	✓
Year-month FEs	✓	✓	✓	✓	✓	✓	✓
Adj. R^2	0.970	0.969	0.970	0.970	0.970	0.970	0.970
Obs.	987	853	987	987	987	987	987

The dependent variable is the log of asset value. The sample period is from January 2024 to August 2024. *Post* is an indicator taking one from May 2024, and the number following *Post* indicates the length of the post-treatment window: 4 months (May–August 2024), or 3 months (May–July 2024). *High Foreign Asian student* denotes universities in the top tercile of the share of international students and in the top tercile of the share of Asian students. In columns (4)–(8), the treatment indicator is interacted with university characteristics. *High Foreign Asian faculty* denotes universities in the top tercile of the share of foreign faculty members and in the top tercile of the share of Asian faculty members. *High Foreign student (Q5)* denotes universities in the top quintile of the share of international students. *High Asian student (Q5)* denotes universities in the top quintile of the share of Asian students. *Large enrollment* denotes universities in the top tercile of total student enrollment. *PhD degree offer* denotes universities that grant doctoral degrees. The university characteristics used to define the treatment group and variables for the triple DiD tests are based on information available to investors in April 2024. The dependent variable and the continuous control variables (ROA, book leverage, and the investment-to-asset ratio) are winsorized at the 0.5% and 99.5% levels. Control variables include ROA, book leverage, the investment-to-asset ratio, credit rating dummies, the (negative of the) U.S. News rank, and an indicator for unranked universities. The regression includes university and year-month fixed effects. t-statistics based on standard errors clustered by university are in parentheses. ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A14: Endowment Tax Proposals and Federal Research Funding Freezes in March 2025, using Synthetic Difference-in-Differences

	Dep. Var = Log(Equity market)	
	(1)	(2)
Post 4 months×Treat 4	-0.281**	
	(-2.42)	
Post 3 months×Treat 4		-0.306***
		(-2.72)
# of treated universities	3	3
University controls	✓	✓
University FEs	✓	✓
Year-month FEs	✓	✓
Obs.	864	810

This table reports average treatment effect on the treated (ATT) estimates from the synthetic difference-in-differences (SDID) estimator of Arkhangelsky et al. (2021), which combines synthetic control-type unit weights to match pre-treatment trends with time weights to balance pre- and post-exposure periods. The dependent variable is the log of equity market value. The pre-treatment matching window spans 12 months (March 2024 to February 2025). The treated group (*Treat 4*) includes universities satisfying all three conditions used in column (4) of Table 8: endowments exceeding the WEST Act threshold ($11.9 billion), federal research funding freezes, and OCR warning letters. Column (1) reports the ATT over the post-treatment horizon of March–June 2025 (*Post 4 months*); column (2) repeats the specification over the shorter March–May 2025 horizon (*Post 3 months*). Because SDID requires non-missing outcomes over the entire 12-month pre-treatment period, treated universities that do not satisfy this balanced-panel requirement are dropped from the estimation, so the number of treated units reported is smaller than the counts in Table 8 (without Northwestern University). Covariates—ROA, book leverage, the investment-to-asset ratio, credit rating dummies, the (negative of) U.S. News rank, and an indicator for unranked universities—are projected out following the procedure in Arkhangelsky et al. (2021). t-statistics in parentheses are computed as the ATT divided by its leave-one-control-out jackknife standard error. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.