Talent at the top: effects of taxation on college presidents' compensation and performance

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Abstract

I study how college presidents respond to monetary incentives and how their leadership affects institutional outcomes. Using an event study design based on the implementation of the Tax Cuts and Jobs Act (TCJA), which introduced a 21% tax on compensation above $1 million for nonprofit employees, including college presidents, I find that compensation rose to offset the tax, indicating a high institutional willingness to pay for talent. I then show that presidents account for a significant amount variation in institutional outcomes, and that the reform led to increases in investment, fundraising, and student outcome expenditures. I also find that observable characteristics of presidents are predictive of performance, and their compensation is consistent with a pay-for-performance model.

1 Introduction

Research on improving student success in higher education often focuses on demand-side interventions such as student financial aid and support services. While these are crucial, much less attention has been given to the role of managerial quality in determining student outcomes. Institutional efficiency and decision-making, both influenced by college leadership, can significantly shape students' academic experiences and success. However, understanding how managers, particularly college presidents, impact performance is challenging due to two main factors: limited

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quasi-experimental variation in managerial selection or compensation, and the existence of multiple productivity measures in higher education (Staiger 2016).

In this paper, I study the effects of college presidents on institutional outcomes by exploiting a source of variation in their compensation. The Tax Cuts and Jobs Act (TCJA) introduced a 21% tax on compensation exceeding $1 million for nonprofit employees, including private college presidents. This tax affected approximately 15 to 25 percent of all private college presidents, making it a unique opportunity to study how compensation influences managerial decisions and institutional performance. Although the reform applied to a broader set of nonprofit employees, I focus on college presidents because they are among the highest-paid executives in private universities and play a critical role in shaping institutional strategy.

To explore the effects of this tax on college presidents, I compiled a dataset on executive compensation from IRS 990 filings, sourced from the Chronicle of Higher Education, covering the years 2009 to 2020. This dataset tracks the compensation of college presidents and its various components. Additionally, I incorporated institutional outcomes derived from IPEDS, which provide key indicators of financial health and student success, including access to financial aid and retention rates. I also manually collected data on the demographics, education, and professional experience of the presidents in the sample.

The results show that the introduction of the TCJA tax significantly impacted college presidents. I find that presidential turnover increased by 14 percentage points after the tax was implemented, yet compensation for those who remained in their positions rose by 20 percentage points, indicating that institutions are willing to absorb the additional costs to retain top talent. Interestingly, the increase in compensation was primarily driven by raises in base salaries rather than bonuses or deferred compensation, suggesting that institutions prioritized direct increases in pay to retain leaders. Additionally, I estimate a low elasticity of compensation, meaning that presidents' pay was relatively insensitive to the increased tax burden.

Finally, I explore the link between presidential compensation and institutional outcomes. My findings suggest that individual presidents account for a significant portion of the variation in financial outcomes, with the inclusion of presidential fixed effects increasing the explanatory power of the model, consistent with similar studies. The tax reform led to noticeable increases in institutional investment, debt, fundraising, and expenditures on student outcomes. Additionally, I find that presidential quality, as measured by fixed effects, can be predicted by observable characteristics such as demographics, education, and experience. Moreover, the compensation patterns of college presidents align with a pay-for-performance model, rather than a rent-seeking one, reinforcing the idea that high-quality presidents are rewarded for their contributions to institutional success.

This paper contributes to several strands of related literature. In first place, this paper is one of the first to analyze the effects of management quality and incentives in higher education, as part of a broader literature on the effects of management in educational outcomes. This paper

is tied both to the effects of financial incentives on educational outcomes (Berlinski and Ramos 2020, Biasi 2021, Cowan and Goldhaber 2018, Goodman and Turner 2013, Mbiti et al. 2019, Steele, Murnane, and Willett 2010), the effects of top managers in education (Bartanen, Grissom, and Rogers 2019, Branch, Hanushek, and Rivkin 2012, Coelli and Green 2012, Grissom and Bartanen 2019, A. Miller 2013, Muñoz and Prem forthcoming), and the effects of interventions aimed at improving managerial quality in education (Asim et al. 2024, Beg, Fitzpatrick, and Lucas 2023, Fryer et al. 2017, Muralidharan and Singh 2020, Romero et al. 2022). This literature is also closely tied to research on the effects of top managers in government settings (Fenizia 2022, Munoz and Otero 2022, Limodio 2021).

In second place, this paper is one of the first to provide causal evidence in a broad literature that studies the correlates of the compensation of college presidents. While there is a broad range of correlates of presidential compensation (Bai 2014, Bartlett and Sorokina 2005, Civera et al. 2024, Cheng 2014, He and Callahan III 2017, Huang and Chen 2013, Hunt, Tandberg, and Park 2019, Monks 2007), these correlates are vulnerable to the critique raised for similar studies in the private sector by Edmans, Gabaix, and Jenter 2017. As compensation arrangements are endogenous, resulting from the interaction between executives, boards, compensation consultants, and the labor market, they are inevitably correlated with observable and unobservable firm, industry, and executive characteristics. This makes it impossible to interpret any observed correlation between executive pay and firm outcomes as a causal relationship. To address this weakness requires a source of variation affecting executive compensation, which this paper is the first to use in a higher education context.

Finally, this paper contributes to the multiple evaluations of the effects of the Tax Cuts and Jobs Act, and finds results in line with the existing evidence. A broad set of these evaluations focus on the effects of the TCJA on private sector executive compensation (Balsam, Evans III, and Yurko 2019, De Simone, McClure, and Stomberg 2022,Durrant, Gong, and Howard 2021,Luna, Schuchard, and Stanley 2023,Ohrn 2023), usually finding that executive compensation increased after the implementation of a similar measure that eliminated the performance-based pay exception. Additionally, other studies find that firm-level investment increased as a result of the reform (Crawford and Markarian 2024,Wagner, Zeckhauser, and Ziegler 2020,Chodorow-Reich et al. 2024), but that charitable giving was severely desincentivized (Han, Hungerman, and Ottoni-Wilhelm 2024).

2 Institutional context

2.1 What do college presidents do?

The role of a college president involves setting the overall strategy for the institution and managing the interests of a wide range of stakeholders, with fundraising, public relations, and financial

sustainability being usually of central importance. For this reason, the role has been compared by college presidents as comparable to the role of a CEO in a private company. [1]. This role, as a result, involves a large amount of communication, with a college president giving 175 speeches in a given year, all of them geared to motivate and engage all stakeholders into supporting the organizational mission. [2].Furthermore, the role is heavily shaped by the individual style and priorities of presidents. James Duderstadt, president of the University of Michigan, states that

> "Each presidency is characterized by a distinctive style that, over time, tends to affect—or infect—the rest of the institution. Contributing to this style are the way the president approaches the challenge of leadership; the nature of the president's working relationships with students, faculty, and staff; the spirit of teamwork the president inspires among other university leaders; and even the character of university events." Duderstadt (2009)

One of the most important responsibilities for presidents is ensuring the continued financial viability of their institutions. This involves continued relationships with donors and alumni, aiming to secure financial support for the institution - as a result, presidents spend significant time and effort in fundraising and related activities. Additionally, presidents often engage in lobbying efforts, working with local, state, and federal governments to ensure that proposed policies support, or at least do not harm, the institution's mission. For example, this role requires continued engagement with federal regulations, via the process of negotiated rulemaking with the Department of Education in issues that affect students, or negotiations with the National Science Foundation or other external research funders to ensure financing. Furthermore, their role requires contact with state and local governments, given the existence of local educational support programs, such as loans and grants, and the outsized impacts that institutions can have on local economies. As a result, the role involves a significant amount of travel.

On top of setting strategies and ensuring financial sustainability, college presidents also have to exercise leadership within the campus community, as they are expected to be actively involved in ensuring the welfare of the institutional community. This responsibility involves multiple aspects - managing parental concerns, addressing student issues that may result in disruptive protests, and reconciling the interests of faculty and administration. At institutions where collegiate sports are a major factor, presidents are also expected to address the issue if their teams are underperforming as well. Presidents face additional responsibilities outside of campus as well, as they often are expected to serve in institutional associations, such as the American Association of Universities, as well as possible advisory positions in government or outside paid engagements in the boards of external companies.

[1] What Does a College President Do? US News.
[2] The President's Many Roles, Inside Higher Education.

The role is year-round, with different pressures depending on the season. During the fall, presidents often deal with incoming students and their issues, while the winter break is focused on receptions and fundraising. During the spring, administrators usually focus on budgets, while, as the academic year is over, the summer is focused on political and regulatory issues. The pressures involved and the increasing amounts of responsibility are leading to shorter tenures, both due to the personal costs involved and the difficulty in maintaining the trust of many, usually antagonistic, actors involved at the same time.

2.2 How are college presidents hired and paid?

Colleges and universities are increasingly relying on executive-search firms, or "headhunters," to fill key leadership positions, including presidents, provosts, and even deans. This trend reflects a relatively recent shift, with the global search-firm industry now valued at nearly $13 billion, including a U.S. market share of $4 billion. Despite limited research on their role and cost in higher education, these firms have become crucial for managing leadership transitions. Closed searches have surged over the past two decades, driven by concerns that presidential candidates seeking new positions might lose their positions or cause potential donor unrest if their intentions to change positions were discovered. The use of these firms has recently extended as well to other positions, such as vice-presidents, provosts, and even deans. [3]

After an agreement is made, presidential hiring is increasingly marked by complex contracts that resemble those of corporate CEOs rather than the letters of appointment of traditional academic leaders. While the specifics of these agreements are often difficult to obtain—especially at private universities— Finkelstein and Wilde find, using a sample of 116 public university presidential contracts, that presidential contracts have grown more intricate, with terms and incentives mirroring those found in CEO contracts. This "CEO-ization" of the university presidency highlights a shift in how university leaders are compensated and managed, reflecting a more corporate approach to higher education governance. [4]

University presidential contracts are typically multiyear agreements, with initial terms ranging from three to five years and renewals commonly extending for five years. Compensation includes a base salary, deferred compensation, and tax-optimized agreements. Incentives such as signing, performance, retention, and completion bonuses are often determined by the president and approved by the governing board, though they are rarely made public or defined in measurable terms. Presidents also receive extensive benefits, including life and disability insurance, health coverage, and special retirement benefits, often structured to minimize tax liability via the addition of 'gross-up' payments intended to offset any remaining tax liabilities. Perks like housing and cars are common, as they are required for fulfilling their travel and hosting duties. Contracts usually provide

[3] Hiring a Search Firm? Do Your Homework First. Chronicle of Higher Education.
[4] The CEO-ization of the President's Contract. Inside Higher Ed.

provisions for outside activities, including speaking engagements and paid corporate directorships, which may require board approval. Evaluations typically involve the president setting annual goals for board review, but generally use general language. Termination clauses frequently guarantee payouts, sometimes for the full remaining contract term, or at a maximum of one year's salary.

3 Data

I use compensation data from the Chronicle of Higher Education between 2009 and 2020, along with IPEDS data on financial and academic outcomes for colleges. This period of time allows me to compare compensation trends before and after the implementation of the TCJA. Below, I describe the data sources and sample construction and present descriptive statistics.

3.1 IRS 990 filings

The Chronicle of Higher Education provides executive compensation data for private colleges between 2008 and 2020, based on the IRS 990 filings for each college listing highly compensated and key employees, as defined by the IRS, in the respective Schedule J. This data, available at the individual level, provides individual names, titles, occupational categories (presidents, athletic employees, academics, administrators, medical personnel, lawyers, and former employees), and total compensation. Additional data is available for presidents: their compensation broken down by base salary, bonuses, other compensation, non-taxable compensation, and deferred compensation, along with their start and end dates in the position. This dataset provides a detailed panel of key employees, providing insight into institutional governance and compensation. The Chronicle, however, does not provide data on the universe of private colleges and universities, reporting data only for colleges with at least 100 million in annual revenue.

The Chronicle changed its criteria for inclusion into their data in 2017, from institutions with the largest 500 endowments to institutions with annual revenues of at least $100 million, leading to significant attrition in their original data. To ensure that my results are not driven by reporting or selection issues, I balance the panel to institutions that report at least one year after 2017. This data restriction leads to a sample with 289 institutions and 21.636 observations spread between 2008 and 2020. [5] Additionally, all compensation information is presented in 2018 constant dollars.

Figure 1 presents the evolution of total compensation for presidents, administrators, and academics. The increase in compensation over this period is notable for presidents and administrators, as presidents increase their average compensation by approximately 37% over a six-year period, a similar proportion to administrators. Presidential compensation reached an average of $900.000 for

[5] This restriction leads to dropping 377 colleges out of 666, 56% of all the institutions that ever appear in the sample. However, these dropped colleges are disproportionately small, affecting a minority of students. Out of a total student population of 1.447.054 students in 2017, this restriction leads to dropping 27% of them.

institutions in the selected sample, with an increase in levels after 2017. This compensation, however, is subject to the data limitations and restrictions discussed above, and is not representative of the universe of college presidents. For context, public college presidents earn, at the median, between $220.000 and $500.000, compared with a median range for private institutions of $390.000 - $ 820.000. [6]

However, this high mean compensation hides large levels of heterogeneity in presidential compensation. Figure 1 presents a histogram of presidential remuneration, showing that this mean is driven by a small fraction of high earners. The median college president earns approximately $500.000, and a small fraction does not receive compensation, corresponding to religious institutions. In total, only approximately 10% of presidents earn 1 million or more.

The composition of compensation provides additional insight on how college presidents are remunerated, as well as motivates questions on the incentives they may face. Table 1 presents summary statistics by compensation component for college presidents. The first fact is that college presidents receive most of their compensation as base salaries, with bonuses being less than 10% of total mean compensation and the median bonus being zero. This is consistent with the structure of the job, as multiple tasks are required and performance monitoring by the board is imperfect, leading to contracts where salary is the main driver of total compensation, and consistent with previous research. However, deferred compensation is a significant part of total compensation, being linked to 'golden parachutes' also found in the literature. Other aspects of compensation, such as other kinds of compensation or non-taxable (in kind) compensation, also play relatively minor roles.

3.2 IPEDS

I complement the Chronicle compensation data with IPEDS data for colleges between 2008 and 2020, to test the relationship between changes in compensation and the presence of effects on institutional-level outcomes.

However, these indicators usually constitute a minority of university revenues and do not provide a full accounting of an institution's financial position, as described by Table 2, which provides an overview of the components of university revenue. Tuition and fees represent the largest source of income, with a mean of $164.8 million and a median of $91.55 million, though the standard deviation of $200.04 million reflects significant variability across institutions. Federal and state appropriations contribute minimally, with mean values of $1.84 million and $1.75 million, respectively, and median values of zero, indicating that many colleges receive no funding from these sources. Despite this, maximum values exceed $400 million for both categories. Federal grants and contracts provide

[6] Median Salaries of College Presidents, 2020-21. Chronicle of Higher Education.

an average of $64.96 million, but with a low median of $3.14 million, suggesting that only a few institutions receive large amounts. Private gifts, grants, and contracts also play a significant role and are highly variable, averaging $76.65 million with a standard deviation of $191.64 million. Investment returns are highly variable, with a mean of $141.07 million, a median of $16.64 million, and a standard deviation of $750.47 million, showing that some colleges generate substantial revenue from investments. Revenue from sales and services of auxiliary enterprises has a mean of $41.60 million. Overall, total revenues across institutions vary widely, with a mean of $684.58 million, but a median of $192.83 million, reflecting the financial diversity of private colleges.

As that presidents, by their own admission, tend to focus on financial outcomes, I first analyze the financial outcomes that presidents are more likely to be able to influence - both by setting the strategic direction of the institution, and by their fundraising and financing efforts. Specifically, I focus on:

- Long-term investments
- Plant-related debt
- Gifts to the institution (total restricted and unrestricted)
- Private grants and contracts (total restricted and unrestricted)
- Public grants and contracts (total federal, state and local)

However, these indicators do not provide a full picture of the financial stability of the institution, another key duty for presidents. To address this, I use a key financial performance indicator recommended as the best practice indicator for assessing the financial performance of universities. This indicator, the Composite Financial Index (CFI), ranges between -4 and 10, and is constructed as a weighted average of revenue and capital ratios indicating the financial health of an institution. Figure 2 describes the different actions institutions are recommended to consider, based on their CFI levels. [7]

However, additional resources are not necessarily translated into increased access to resources for students, as they can be directed into overhead or other institutional goals depending on policy priorities. To address this issue, I focus on the following measures:

[7] The indicators are:

- Primary reserve ratio, defined as the ratio between expendable net assets and total expenses.
- Net operating ratio, defined as the ratio between the difference between operating revenues and expenditures, and operating revenues.
- Return on net assets, defined as the ratio between the change in total net assets each year and total net assets.
- Viability ratio, defined as the ratio between expendable net assets and total plant-related debt.

- Average student grants, defined as the total amounts awarded to students from federal, state, local and institutional sources.
- Net grant aid to students, defined as the portion of scholarships and fellowships granted by an institution that exceeds the amount applied to institutional charges such as tuition and fees or room and board.
- Total expenditures in student service, defined as expenses for activities whose primary purpose is to contribute to students emotional and physical well - being, such as career guidance, counseling, financial aid administration; as well as admissions and registrar services.

Finally, I ask whether there are any possible direct effects of presidential administration on student success. While there are many possible measures of student success and satisfaction, and are driven by student-level factors outside the administration's control, I focus on fall-to-fall retention rates as a proxy for improved student-level outcomes, as persistence is a prerequisite for graduation and labor market outcomes.

Table 3 describes the financial outcomes that are most likely to affect students, and retention rates. The mean amount directed toward total institutional grants is $88.61 million, with a median of $52.40 million and a standard deviation of $97.11 million. Net institutional grants, which are calculated net of tuition and fees, average a modest $2.79 million, with a much smaller standard deviation of $14.77 million, highlighting that some institutions provide no net grants after tuition and fees. Expenditure on student support, including services such as counseling, career guidance, and admissions, averages $34.22 million, with a median of $20.94 million. Fall retention rates tend to be high in this sample, with an average of 86.22% and a median of 88%.

3.3 Who are the college presidents?

I manually collected comprehensive education and employment data for all the presidents in my sample. This dataset includes detailed information on their educational background, specifying the institutions and fields of study for their undergraduate and advanced degrees. Additionally, I gathered data on their professional experience, documenting their roles and institutions in their two most recent positions.

Table 4 describes presidents' levels of education. The table shows the distribution of college presidents' highest degrees and their fields of study, providing insight into the academic backgrounds of leaders in higher education. The most common degree held by college presidents is a PhD, with 1,007 individuals holding one. Among these, 17.78% had unspecified fields ("Unavailable"), while Education (16.09%) and Social Sciences (11.22%) were the next most represented fields. Philosophy

and Religious Studies (9.24%) and Psychology (5.46%) also made up significant portions. Notably, fields like Engineering (3.97%), History (3.87%), and Business (2.58%) are less common but still relevant. For those with an MA (93 presidents), the most frequent field was Business, Management, Marketing, and Related Support Services, accounting for 31.18%. Health Professions and Education followed at 10.75% and 8.60%, respectively. In contrast, JD holders (136 presidents) had no detailed breakdown by field, and for BA holders (92 presidents), the vast majority (86.96%) had unspecified fields of study.

Table 5 provides an overview of the institutions where college presidents obtained their highest degrees, broken down by the degree level (PhD, JD, and MA). The data suggests a concentration of degrees from elite universities but also highlights a wide variety of institutions contributing to leadership in higher education. For PhD holders, Harvard leads with 5.09% of all PhDs awarded, followed by the University of Pennsylvania (3.27%) and Yale (3.18%). Despite these prominent institutions, a significant portion of PhD holders (56.45%) received their degrees from other universities, and 18.64% of PhD data is listed as "Unavailable." Among JD holders, Harvard again stands out, accounting for 13.97% of all law degrees, with Yale (7.35%) and the University of Virginia (4.41%) following. While top law schools are well-represented, nearly 39% of JDs were awarded by other institutions, and 17.65% of JD data is unavailable. For MA degrees, Harvard (8.60%) and the University of Iowa (4.30%) are prominent, with Yale and Drexel University also contributing. A notable 25.81% of MA degree data is unavailable, and 40.86% of presidents received their MA from other institutions.

Table 6 presents the last role of college presidents, highlighting that the majority of college presidents come from academic leadership roles, particularly from positions such as Vice President, President, Provost, and Dean. A significant 74.85% of presidents had their last job in academia. Of these, 28.67% were Vice Presidents, 25.55% were already serving as Presidents, 18.21% were Deans, and 18.01% were Provosts. Smaller percentages held positions as Directors, Chairs, Professors, or other academic administrative roles. Outside academia, 3.61% of presidents previously worked in government roles, while 3.77% came from the non-profit sector, and 10.02% transitioned from the private sector. A smaller portion, 1.88%, had their last job in religious organizations. For 5.87% of the presidents, the data on their prior work experience is unavailable.

4 Effects of the TCJA on college presidents

4.1 Policy

Congress undertook a wide-ranging revision of the tax code in 2017 via the Tax Cuts and Jobs Act (TCJA), with provisions affecting the non-profit sector - and, by extension, private colleges and universities, since they are classified as nonprofits (501(c)(3) organizations). While some measures are aimed at individuals, such as changes in the tax deduction for charitable donations and an increase in estates exempt from estate tax, most measures are aimed at closing loopholes for nonprofit organizations, putting them on a similar footing to private sector firms. In first place, the TCJA eliminated deductions for unrelated business income obtained by nonprofits carrying out revenue-raising activities outside their core mission, disallowing offsetting revenue from unrelated businesses with losses from another unrelated business to minimize tax burdens. In second place, the TCJA imposed a 1.4% excise tax on the net investment income of colleges of universities with large endowments, affecting institutions with at least 500 students and at least $500.000 in investment assets per student. This excise tax applies to approximately 40 institutions in the country and is intended to equalize the tax treatment between foundations and universities, as foundations were already subject to a similar excise tax. Finally, the TCJA imposed a 21% excise tax on remuneration in excess of 1 million for covered employees. This threshold is constant and is not indexed to inflation.

The implementation of this excess compensation tax follows the given stages for nonprofit organizations, as defined in Section 501(a). The identification of covered employees falls to the individual organization, regardless of the remuneration paid to any of its employees. The IRS defines covered employees as any one of the 5 highest compensated employees in the organization for the year, or any employee who has ever been defined as a covered employee. The excise tax applies to all aspects of compensation, including compensation received from related organizations, but excludes Roth IRA contributions and any compensation to medical professionals for medical services. If an employee is subject to the tax, the nonprofit organization calculates the amount of tax due, pro-rating if necessary its contribution to the total due if it does not pay the total remuneration of the employee.

4.2 Policy bite

In first place, Figure 3 describes the fraction of covered employees by year for private universities. While a minority of employees of covered employees are subject to the tax, as expected given the 1 million remuneration threshold, this fraction rises after the implementation of the TCJA. This increase is especially pronounced for college presidents, with an increase from 10% to 25%.

Additionally, I implement the Cattaneo, Jansson, and Ma (2018) manipulation test separately across all post-2017 years. Figure 4 presents the relevant density plots. While this test is statistically significant for 2017, prior to the implementation of this tax, it is manipulated to the right of this threshold, indicating excess mass to the right of the $1M point - possibly related to prestige reasons related to presidential compensation. This test is not statistically significant during 2018 and 2019, but is statistically significant in 2020, indicating that institutions and presidents have started to adapt to this nex tax. In this case, the excess mass is to the left to the $1M point, suggesting that institutions and executives are optimizing their compensation agreements in order to avoid this new tax.

4.3 Identification

To identify the effects of the TCJA on presidents' outcomes, I implement an event study of the form

$$y_{ist} = \sum_{t \neq 2017} \beta_t \times T_{ist} \times I(t = t) + \gamma_s + \delta_i + \eta_t + e_{ist} \tag{1}$$

where y_{ist} is the outcome for individual i in institution s in year t, T_{ist} is an indicator variable for whether the individual was a covered employee, γ_s is an institution fixed effect, δ_i is an employee fixed effect, and η_t is a year fixed effect. The coefficient of interest, β_t, captures the average difference in outcomes for employees subject to the excise tax before and after its implementation. The reference year is 2017, the year the TCJA was passed, as its implementation began in 2018. I bin all years prior to 2014 in a single coefficient.

The key identifying assumption permitting a causal interpretation of the β_t parameters is that the compensation of covered employees subject to the tax would have trended similarly to the compensation of other employees, absent the introduction of the excise tax. This assumption is likely to hold, as the passage of the TCJA was unexpected prior to the 2016 election, making it unlikely that institutions anticipated the reform. Additionally, the event study results show no evidence of anticipatory effects for college presidents, providing additional evidence in favor of the parallel trends assumption.

Figure 5 presents point estimates and confidence intervals from estimating Equation 1 for presidential turnover and log total compensation as outcomes. Turnover trends are similar for treated and untreated groups before policy implementation, but turnover rises slightly three years after the implementation of the TCJA, by 14 percentage points compared to untreated presidents. This increase in president exit can be attributed to the increase in value of outside options for college presidents in the private sector due to the tax hike. However, there are no statistically significant effects of the TCJA on compensation. However, there appears to be a downward trend of the point estimates after the TCJA is implemented.

Figure 6 presents the above results for the disaggregated components of presidential compensation. The results are consistent with the descriptive statistics presented above and institutional pay-setting contexts. The main driver in the decrease in compensation appears to be changes in compensation filed under Other, which falls by approximately 12 percentage points two years after the introduction of the reform compared to untaxed presidents. Other components of compensation are not affected, except for a marginally significant increase in deferred compensation set aside. Overall, these effects are consistent with previously discussed trends in compensation, and the fact that the TCJA taxes all components of compensation.

4.4 Threats to identification and robustness tests

Selection into treatment issues

A first threat to identification is the fact that institutions or presidents may strategically alter their compensation in order not to be affected by the tax, especially for individuals close to the cut-off. For example, a president earning marginally more than a million dollars would be worse off than a president just under this threshold, and manipulate their compensation structure in order to avoid being subject to the tax. This manipulation would change the composition of the treatment and control groups, changing the interpretation of the estimates and possibly affecting their respective trends. However, there are no presidents who earned more than a million dollars in 2017 or before, and who subsequently earned less than this amount during the following years at the same institution - avoiding biases due to changes in the composition of the treatment and control group.

Anticipation effects

This identification strategy could be biased if institutions anticipated the tax increase, giving them time to adjust by preemptively altering presidential compensation patterns or dismissing particularly high-paid presidents. However, it is likely that this tax was unexpected for several reasons. First, the most discussed provision of the TCJA regarding academia was the introduction of the endowment tax, while the excess compensation tax received minimal attention, and the elimination of deductions for unrelated business income was scarcely mentioned. A source even referred to the excess compensation tax as "another cost of doing business" that would be incorporated into the already substantial expenses of hiring top employees, alongside search fees, salaries, and benefits packages [8]. Second, the TCJA did not immediately go into full effect; although colleges began complying with the new law, the IRS issued additional guidance in 2018 that clarified the definition of covered employees and the payments subject to the tax [9]. Lastly, the pretrends in the event

[8] Tax Law's Effects on Colleges Unfolding. Inside Higher Ed.
[9] Interim Guidance Under Section 4960

study design do not show a clear trend, further suggesting that the legislation and its effects were not anticipated.

Joint test of pre-treatment coefficients

Testing the parallel trends assumption by individual inspection of the pre-treatment coefficients is likely to involve issues with low statistical power to detect any violation (Roth 2022). In first place, I implement the Freyaldenhoven et al. (2021) recommendation and implement a joint test for all pre-treatment coefficients to be jointly equal to zero. Table 7 presents the results of this approach. I find that pre-treatment coefficients are not jointly statistically significant for presidential turnover, total compensation, base salaries, bonuses, and non-taxable compensation, suggesting that the parallel trends assumption holds in this setting. However, this test is statistically significant for deferred compensation, both paid and set aside.

Unit-specific time trends

In second place, I estimate a model including unit-specific time trends of the form

$$y_{ist} = \sum_{t \neq 2017} \beta_t \times T_{ist} \times I(t = t) + \gamma_s + \delta_i + \gamma_s \cdot t + \delta_i \cdot t + \eta_t + e_{ist} \tag{2}$$

where y_{ist} is the outcome for individual i in institution s in year t, T_{ist} is an indicator variable for whether the individual was a covered employee, γ_s is an institution fixed effect, δ_i is an employee fixed effect, and η_t is a year fixed effect. The coefficient of interest, β_t, captures the average difference in outcomes for employees subject to the excise tax before and after its implementation. The reference year is 2017, the year the TCJA was passed, as its implementation began in 2018.

The interpretation of this study design involves trade-offs. By definition, this design has the advantage of not being confounded by outcomes trending differently across universities, addressing directly any parallel trend violations. However, this approach involves multiple caveats. In first place, the interpretation of the coefficients is no longer the same as in the main event-study design, as the counterfactual becomes the outcome compared to the reference period, net of underlying linear trends in the counterfactual between that period and now - i.e., a comparison within individuals, instead of across the treatment and control group. (Miller 2023) In second place, introducing unit-specific time trends will bias the estimation of dynamic treatment effects. If treatment effects have a real trend after the introduction of a policy, the estimated unit-specific time trends will also include the real trend in the treatment impacts, and biasing the main estimates. In third place, as it, by definition, forces unit-specific pre-trends to be zero, it does not provide a falsification test for the parallel trends assumption. I use this model as additional context instead of using it as the main specification, due to challenges in interpretation, as covered employees in a previous point of

time may not be the best counterfactual when estimating the effect of a tax, and that the context suggests that treatment effects are likely to be dynamic due to the delays of institutions to adjusting as the IRS issued additional guidance.

Figure 7 provides the result of this approach for turnover and log total compensation. I find that the probability of turnover falls by 16 percentage points, as compared to the individual reference period, and that log total compensation rises by 20 percentage points. This interpretation is consistent with the relevant counterfactual for this specification - a president who was employed before the introduction of the tax, and did not leave the institution, is likely to have had renegotiated their compensation to absorb this tax (as suggested by the relevant press commentary), and, as a result, is more likely to stay in their position.

Figure 8 provides the result of this approach for the components of total compensation. This result provides additional evidence for the within-individual interpretation of the effects of the tax hike - while the other components of compensation are not affected, base salaries rise by 20 percentage points, by almost the exact amount of the tax. This pattern is consistent with the one observed in the descriptive statistics, where base salaries account for a majority of presidential compensation.

Rambachan and Roth (2023) sensitivity analysis

Finally, I implement the Rambachan and Roth (2023) approach based on bounding the true treatment effect, using the intuition that pre-trends are informative about violations of parallel trends. Their central insight is that the violations of parallel trends in the post-treatment period cannot be substantially larger than those in the pre-treatment period, by some constant M larger than the maximum violation of parallel trends in the pre-treatment period. The value of $M = 1$, for instance, imposes that the post-treatment violation of parallel trends is no larger than the largest pre-treatment violation of parallel trends. This approach can be used for sensitivity analyses, by reporting different confidence intervals for the treatment effect for different values of M, and reporting the breakdown value of M - the largest value for which the treatment effect is still statistically significant.

I present the results of this analysis in Figures 9 and 10 for a standard 5% significance levels. I find that the critical M values are close to 0.4 for presidential turnover and 0.5 for total compensation, indicating that for the result to remain statistically significant the maximum violation of parallel trends in the post-treatment period can be, at most, 40% and 50% of the maximum pre-treatment violation of parallel trends. For the statistically significant results on the effects of the TCJA (other compensation and deferred compensation paid), I find that the critical M value is close to 0.5.

Additionally, due to statistical power constraints related to sample size, I replicate the analysis for a 10% significance level, and present the results in Appendix Figures A-1 and A-2. I find similar results, the critical M values are close to 0.5 for presidential turnover and 0.55 for total compensation, indicating that for the result to remain statistically significant the maximum violation of parallel trends in the post-treatment period can be, at most, 50% and 55% of the maximum pre-treatment violation of parallel trends. For the statistically significant results on the effects of the TCJA (other compensation and deferred compensation set aside), I find that the critical M value is close to 0.5. For the statistically significant results on the effects of the TCJA (other compensation and deferred compensation paid), I find that the critical M value is close to 0.5.

Difference-in-difference approach

I also estimate a standard difference in difference model of the form:

$$y_{st} = \alpha(D_{st} \times Post_{st}) + \delta_i + \gamma_s + \eta_t + e_{st} \tag{3}$$

where y_{st} is an outcome for institution s in year t, D_{st} is a indicator for whether the president was subject to the TCJA excise tax, $Post_{st}$ is an indicator for years after policy implementation, δ_i is a president fixed effect, γ_s is an institution fixed effect, and η_t is a year fixed effect. This approach is complementary to the event study approach described above, but involves trade-offs, as it provides additional power for identifying treatment effects for the full post-treatment period, at the cost of averaging any existing dynamic treatment effects.

Appendix Figure A-1 describes the result of this model. The first specification finds that total compensation increases by 18 percentage points, with no statistically significant effects on turnover. Additionally, bonuses increase by 1.48 percentage points, while deferred compensation paid increases by 1.32 percentage points. Furthermore, this specification with unit-specific time trends finds that compensation increases by 24.6 percentage points, but is unable to find statistically significant effects on any component of compensation.

4.5 Tax elasticity of compensation

In the public finance literature, this intervention can be framed as the introduction of a kink in the presidents' tax schedule, introducing a raise in a marginal tax rate from zero to 21% for incomes above $1M. As previously discussed, institutions and presidents have incentives to avoid being subject to this tax, if possible, by setting their compensation lower than the relevant threshold - and they have started to achieve this, as the regression discontinuity manipulation test for 2020 showed. This manipulation result is indicative of bunching at this kink point, and provides an opportunity to estimate the tax elasticity of income for college presidents. By measuring the excess

mass of individuals or firms at the kink, it is possible to infer the elasticity of taxable income without requiring exogenous variation. In this setting, estimating the earnings elasticity will be useful for quantifying presidents' behavioral response to this tax and measuring to what extent do these executives are able to adjust their income, given their flexibility in setting bonuses or deferred compensation.

However, the implementation of this exercise includes a major caveat related to the low available sample size. As these estimates rely on nonparametric identification of a high-dimensional counterfactual earnings distribution, estimates using the current data are likely to be statistically insignificant. However, the point estimates of the tax elasticity of compensation and the location of the marginal buncher are likely to be of interest for future policy design.

Figure 11 describes the results of this exercise. I find that the estimated elasticity of compensation is 0.006. While not statistically significant, due to the previously mentioned sample size limitations, the point estimate is consistent with previous elasticities estimated in different settings. Furthermore, this elasticity estimate provides additional confirmation to the fact that college presidents find it relatively difficult to shift their compensation as a response to taxation in the very short run. Furthermore, the size of the excess mass, 4% of the sample, indicates that relatively few presidents had compensation in the range where shifting to the other side of the threshold would have left them better off.

5 Effects on college outcomes

5.1 How much do college presidents matter?

In first place, I ask to what extent variation in institutional outcomes can be explained by individual presidents. Specifically, I compare the R^2 estimated from a regression of the institutional outcomes described above on different sets of explanatory fixed effects, including president fixed effects, and report the results in Tables 8 and 9. The outcomes are in columns, and the rows report the respective R^2 from a given set of fixed effects. The first row includes only college fixed effects, the second row adds year fixed effects, the third row adds president fixed effects, the fourth row drops college fixed effects, and the fifth row adds individual president by college fixed effects.

The effects of individual presidents in explaining variation in outcomes is substantial, with the inclusion of presidential fixed effects increasing R^2 by 2 to 4 percentage points for financial outcomes (difference between second and third rows), and by 2 to 4 percentage points for academic outcomes. Formally, an F-test strongly rejects the null hypothesis that presidents' effects are zero (p-value=0.00). These increases are consistent with the magnitudes described in the previous literature, such as Bertrand and Schoar (2003) for private sector CEOs, Fenizia (2022) for public sector managers and Munoz and Otero (2022) for hospital managers.

5.2 Effects of the TCJA con college outcomes

Based on the effects of the TCJA on presidential compensation and turnover, and the fact that presidents explain a significant fraction of variation in academic and financial outcomes, I test whether the introduction of the TCJA affected these institutional outcomes. To address this, I estimate a model of the form

$$y_{st} = \sum_{t \neq 2017} \beta_t \times T_{st} \times I(t = t) + \gamma_s + \delta_i + \eta_t + e_{ist} \tag{4}$$

where T_{st} is an indicator variable for whether the institution's president was a covered employee, γ_s is an institution fixed effect, δ_i is an employee fixed effect, and η_t is a year fixed effect. The coefficient of interest, β_t, captures the average difference in outcomes for employees subject to the excise tax before and after its implementation. The reference year is 2017, the year the TCJA was passed, as its implementation began in 2018. As before, I bin all years prior to 2014 in a single coefficient.

Figure 12 presents the event study specification for financial outcomes. I find that private grants and contracts increase by 10 million three years after the introduction of the TCJA. Results for all other financial outcomes are not statistically significant, but present an upward trend after the introduction of the tax. The null effects on gifts, compared to other fundraising sources, is consistent with another provision of the TCJA, as the TCJA eliminated tax advantages for gifts and charitable giving by nearly doubling the standard income tax deduction for U.S. taxpayers. As a result, charitable giving decreased by about $20 billion annually. (Han et al., 2024)

Figure 13 presents the event study specification for resources invested directly in students. Average student grants increase by $950 one year after the introduction of the tax, while expenditures in student support increase by 9 million in the first year and remain at this level for the next two years. However, there are no statistically significant results on net institutional grants and the fall retention rate.

I carry out similar robustness test for this specification. Table 10 presents the p-values of a joint test of pre-treatment coefficients being jointly equal to zero for all institutional outcomes. The test is not statistically significant for any of the outcomes, providing additional evidence in favor of the parallel trends assumption and the validity of the results.

Figures 14 and 15 present the results for the event study design with unit-specific time trends, using as counterfactual the individual in the reference period. In first place, long-term investment rises by 1700 million, or 32% of a standard deviation. Plant-related debt also rises, by approximately

100 million. As a result, the Composite Financial Index falls by 0.3. While gifts are not affected and private grants and contracts are not affected, public grants and contracts rise by 35 million. However, students are not affected - while fall retention rates rise marginally in the first year, by 0.7 percentage points, all other student-related expenditures are not affected.

Additionally, Figures 16 and 17 present the results of the Rambachan and Roth (2023) sensitivity analyses. I find that the critical M values are close to 0.7 for long term investment, and greater to 1 for plant-related debt and private grants and contracts. and, indicating that for the result to remain statistically significant the maximum violation of parallel trends in the post-treatment period can be, at most, 70% to 100% of the maximum pre-treatment violation of parallel trends. For average student grants, the critical M value is 0.7, and close to 1 for expenditure in student support.

I replicate the analysis for a 10% significance level, and present the results in Figures A-3 and A-4 in the Appendix. I find similar results, as the critical M values are close to 0.8 for long term investment, and greater to 1 for plant-related debt and private grants and contracts. and, indicating that for the result to remain statistically significant the maximum violation of parallel trends in the post-treatment period can be, at most, 80% to 100% of the maximum pre-treatment violation of parallel trends. For average student grants, the critical M value is 0.5, and 0.95 for expenditures in student support.

Table A-2 presents estimates for the full difference in difference specification for financial outcomes. I find that the TCJA induced positive changes with respect to untreated institutions, as long term investments rose by 1184 million and plant-related debt increased by 232 million. Gifts increased by 40 million, while public and private grants and contracts rose by 74 and 15 million, respectively. With respect to student outcomes, the average student grant increased by $1458, while net institutional grants and expenditures in student support increased by $1.37 and 18 million, respectively. The specification using unit-specific trends, in contrast, finds that plant-related debt increased by 38 million with respect to the reference period, and public grants and contracts increased by 20 million. There are no significant effects related to student finance, but the fall retention rate increased by 0.7 percentage points compared to the reference period.

6 Covariates of presidential productivity

6.1 Is it possible to predict presidential quality?

As seen above, college presidents are influenced by monetary incentives, and institutions are often willing to invest significantly to retain top talent. Their leadership can have a tangible impact on

institutional outcomes, making the selection of a strong president not only valuable to the university but also beneficial for students in the long run. Given this, predicting presidential quality based on observable characteristics becomes an important consideration for institutions seeking to maximize their return on leadership investment.

While a college president's unobserved quality can manifest across different dimensions, reflecting the various responsibilities they hold, I focus on the financial aspect, which is usually emphasized by presidents. However, expenditures can be manipulated to enhance visibility or favorability with the board or other stakeholders, and revenues such as gifts or contracts are subject to substantial variability. To address this tradeoff, I use the Composite Financial Index (CFI) to begin the measurement of presidential quality, as it is the most comprehensive measure of institutional financial health and less susceptible to manipulation compared to other metrics.

In first place, I estimate a model of the form

$$CFI_{st} = \alpha_s + \gamma_t + \varphi_{M(h,t)} + \delta_c + e_{st} \tag{5}$$

where α_s is a institution fixed effect, γ_t is an institution fixed effect, and $\varphi_{M(h,t)}$ are president fixed effects, which capture managerial talent (specific to a given person) and are assumed to be constant and portable across institutions. However, these fixed effects are not identified in the base two way fixed effect model. These fixed effects are only interpretable and compared within a given connected set, defined as the largest possible set of institutions in which every institution has had at least one president transfer to at least one other institutions in the set. (Cite AKM) For example, if a president moves from institution A to B, all presidents at these two institutions belong to the same connected set. For this reason, I control for δ_c, the set of connected set indicators.

After estimating these president fixed effects, I estimate how presidential characteristics are correlated with the probability of a given president being in the top tercile of presidential fixed effects, suggesting high abilities for institutional financial management. I estimate

$$FEi = \alpha \cdot Demographics_i + \beta \cdot Education_i + \delta_c + e_i \tag{6}$$

Figure 18 presents the results of this model. Asian and Hispanic presidents have a positive and statistically significant difference in mean fixed effects compared to White presidents, ranging between 0.5 and 0.7 CFI points, while Black presidents have a negative and significant difference of 0.4. Furthermore, female presidents have a negative and significant difference of 0.2 CFI points. In terms of education, presidents with a BA or a MA have a positive and statistically significant difference in mean fixed effects compared to presidents holding a PhD, ranging between 0.1 and 0.2 CFI points, while presidents with a JD have a negative and significant difference of 0.1 CFI points.

To address the correlation between field of study and president fixed effects, I estimate

$$FEi = \alpha \cdot Demographics_i + \beta \cdot Field_i + \delta_c + e_i \tag{7}$$

Figure 19 presents the results of this model. Fields like Biology, Computer Science, Engineering, and and Public Administration show a positive correlation with presidential fixed effects while fields like Arts, English, Health and Law have negative and statistically significant correlations. Significantly, Business, Education and Social Sciences graduates have coefficients close to zero. Notably, and in constrast to Acemoglu (2023) and Muñoz and Otero (2024), there is no correlatoin between business training and president quality.

$$FEi = \alpha \cdot Demographics_i + \beta \cdot Experience_i + \delta_c + e_i \tag{8}$$

Figure 20 presents the results of this model. Significantly, most point estimates are very close to zero, implying that few positions statistically outperform the base category for the previous position: individuals who were presidents in their last job, implying that returns to previous experience in the position may be small. Furthermore, previous experience in the private sectors is negatively correlated with presidential fixed effects. Finally, the main job that is positively correlated with presidential fixed effects is that of provost, but the correlation is small. Previous religious experience, however, is related to sorting across institutions, as they are especially likely to head a religious institution facing different financial pressures from secular private institutions.

6.2 Are college presidents paid for performance?

In this context, we cannot directly test whether college presidents are paid based on performance, as there is no exogenous shock to contracts, incentives, or monitoring mechanisms. However, we can indirectly assess whether the data aligns with a model in which more talented presidents receive higher pay. Drawing from Gabaix and Landier (2008), firm sizes follow a power law, meaning that small differences in talent can lead to large increases in compensation, similar to "superstar" effects. In this model, the most talented managers are matched with the largest firms, making their skills highly valuable and resulting in substantial compensation. A testable prediction of this model is that compensation will be proportional to the size of the institution and the median firm size. Conversely, if presidents were primarily rent-seekers, the correlation between their compensation and institution size would be weak.

I replicate their analysis on my dataset, estimating an equation of the form

$$ln(w_{it+1}) = \alpha + \beta S_{nt} + \delta S_{it} + e_{it} \tag{9}$$

where $ln(w_{it+1}))$ is the logarithm of presidential compensation, S_{nt} is the size of the median institution, S_{it} is the size of the president's institution, and e_{it} is an error term. Similarly to Gabaix and Landier, I allow the effects of talent to vary across industries and firms, adding industry and firm fixed effects to the respective specifications. Additionally, this form allows to test whether returns to talent are linear, as in their model the parameters $\beta + \delta$ estimate the returns to talent.

However, in higher education, the definition of industries is not as straightforward, as nominally all institutions belong to the same sector. However, the sector presents a wide heterogeneity in institutional characteristics and outcomes that can be used to proxy an intra-industry classification. In first place, I proxy as industry the institutions' Carnegie classification, using as reference the median institution size within each Carnegie category, as in Huang et al. (2012). However, this measure can be too broad, as there is significant heterogeneity within individual categories. As a second industry measure, I use the self-reported peer classification reported by institutions in IPEDS. As institutions report a set of colleges of universities they consider as their peers, I use as reference the median size of the self-reported peer set.

A second challenge is the measurement of institutional size. While the original model uses the total market value of the firm as a measure of firm size, a similar measure is not available for colleges and universities. I propose two alternative approaches to measuring size – a financial approach based on total assets, and a more traditional approach based on enrollment numbers.

Table 11 presents the results of equation 3 using as size measures total assets and total net assets. For all specifications, institution size and median institution size appear to be strong predictors of presidential compensation. Notably, the test $\beta + \delta = 1$ is strongly rejected, rejecting the possibility of linear returns to presidential talent in this context. Inspection of the coefficients reveals that $\beta + \delta < 1$, suggesting that returns to presidential talent are subject to diminishing marginal returns. Results in Table 12 confirm this view, using enrollments as size measures.

7 Conclusion

In this paper, I examine how college presidents respond to monetary incentives and the impact of their leadership on institutional outcomes, using the implementation of the Tax Cuts and Jobs Act (TCJA), which introduced a 21% tax on compensation exceeding $1 million for nonprofit employees, including college presidents. I find that this reform had ambiguous effects on presidential turnover, but compensation rose almost exactly in line with the tax amount, indicating a strong institutional willingness to pay to retain key leadership despite the new tax.

I find that college presidents account for a significant share of variation in institutional outcomes, explaining between 2% and 4% of the R-squared, which is comparable to estimates for CEOs in the private sector and managers in the public sector. I also find that the TCJA led to changes

in institutional financial decisions, with increases in investment, debt, fundraising through private and public grants, and expenditures on student outcomes, depending on the specification.

Finally, I find that certain observable characteristics of presidents can predict their performance, and that their compensation aligns with a pay-for-performance model rather than a rent-seeking one. This implies that institutions are rewarding presidential talent in line with their impact on outcomes. However, the tax reform has effects on both the extensive and intensive margins by influencing both turnover and compensation, and further research could explore these margins in more depth to disentangle their specific contributions.

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Figure 1: distribution of presidents' compensation (back)

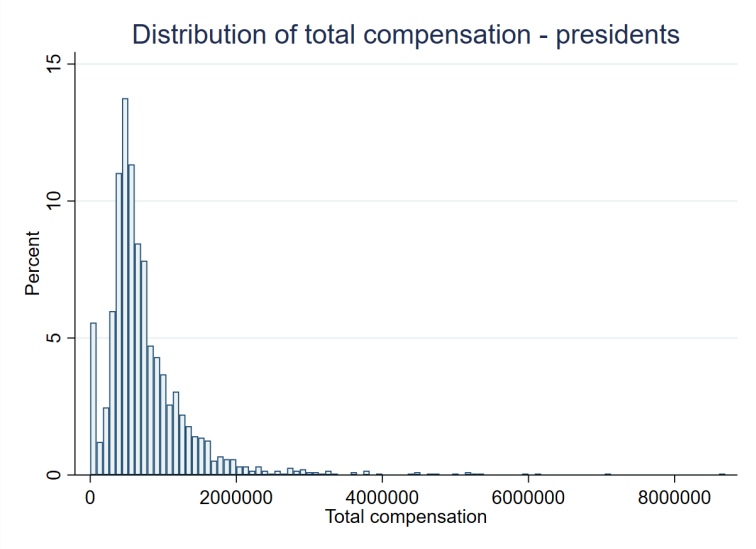


Figure 2: distribution of presidents' compensation (back)

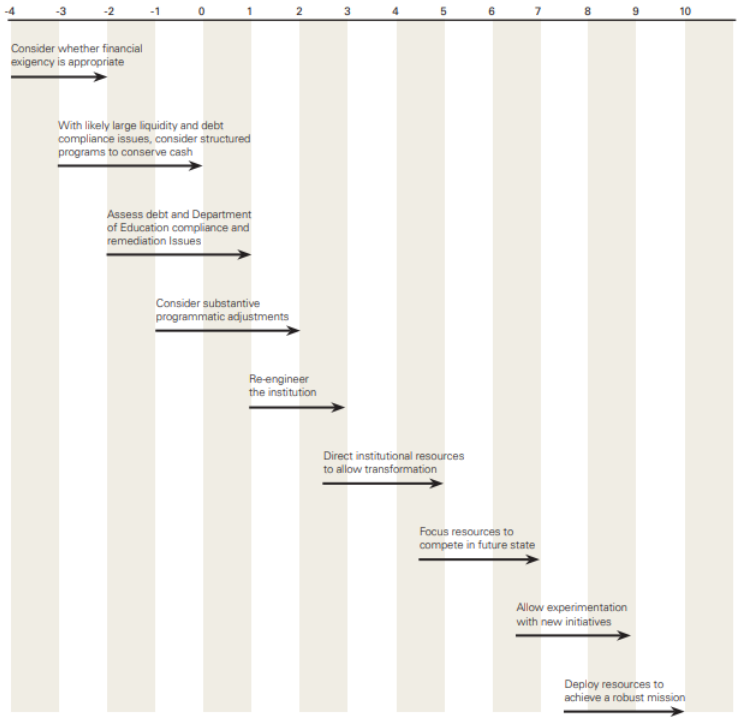


Figure 3: fraction of academic executives affected by the TCJA (back)

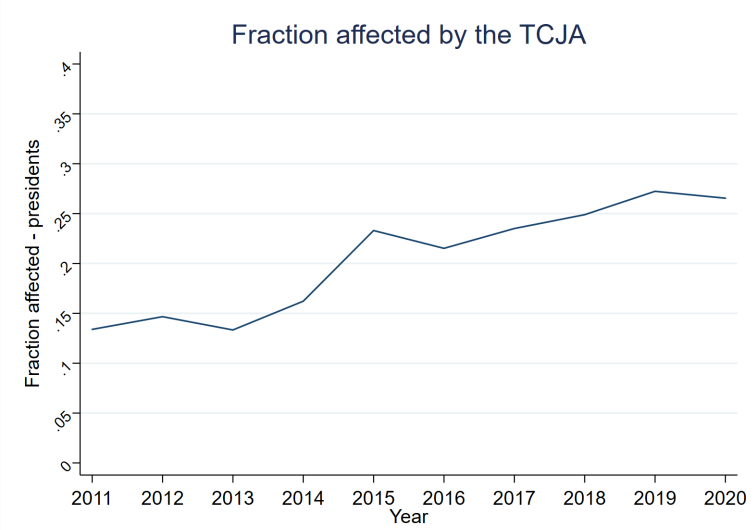
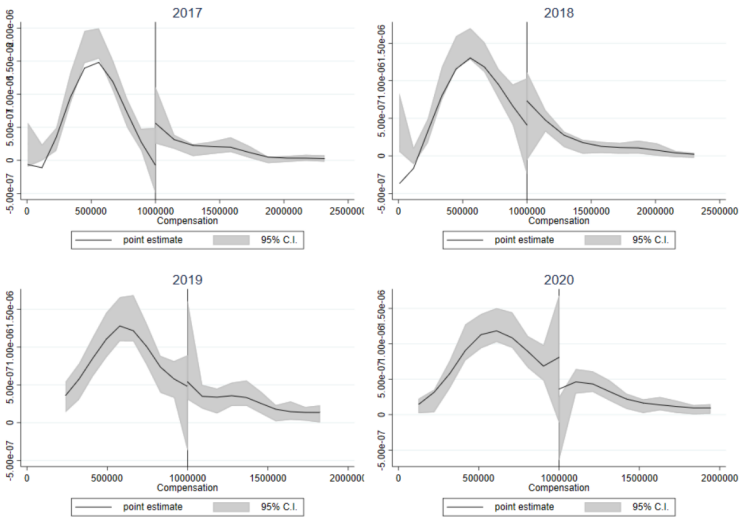
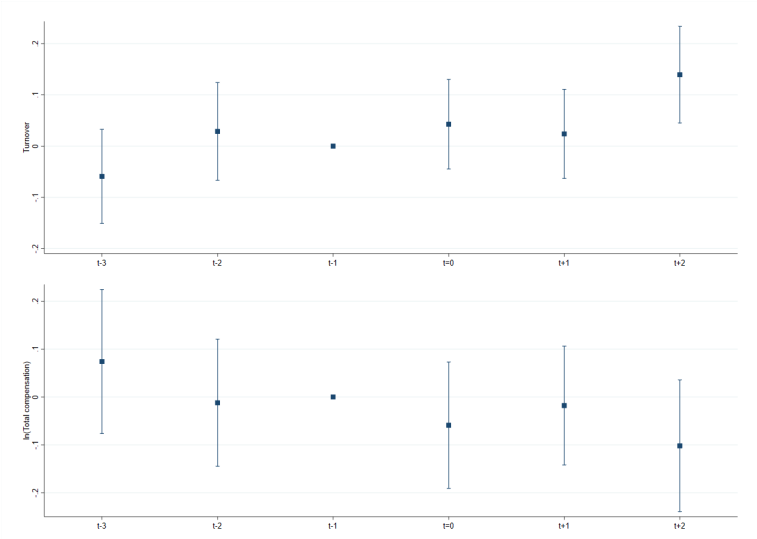


Figure 4: manipulation test around the tax cutoff (back)



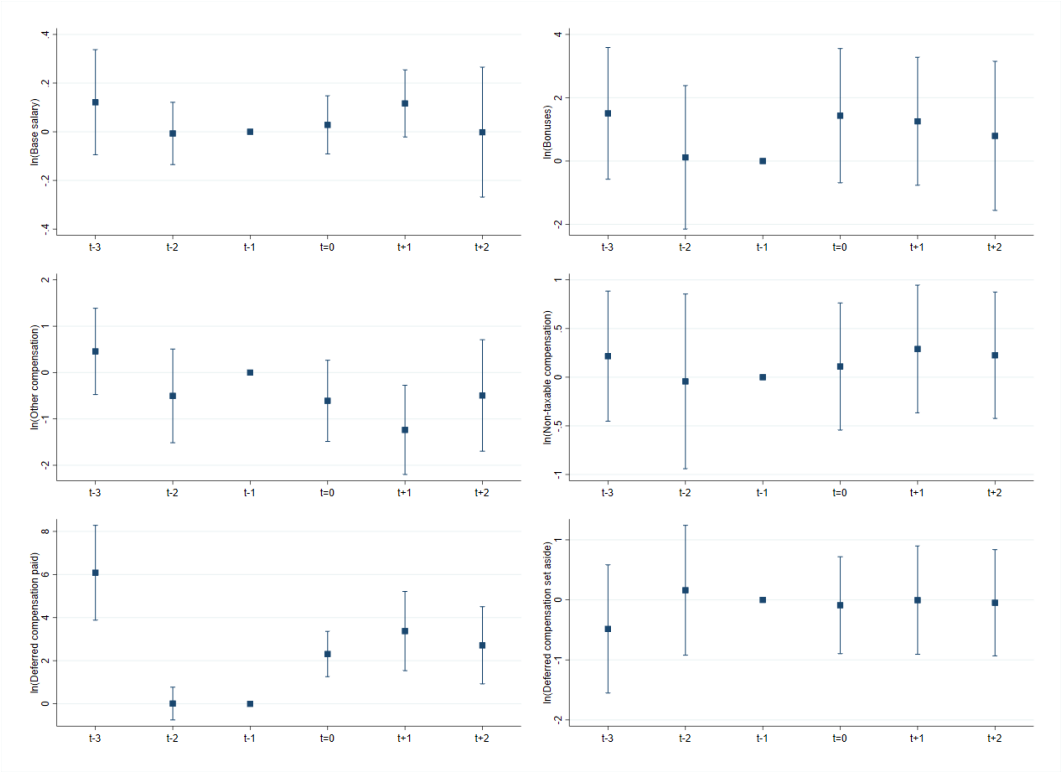
Notes: Cattaneo et al. (2016) regression discontinuity manipulation test by year across the 1 million tax threshold.

Figure 5: effects of the TCJA on compensation and turnover (back)



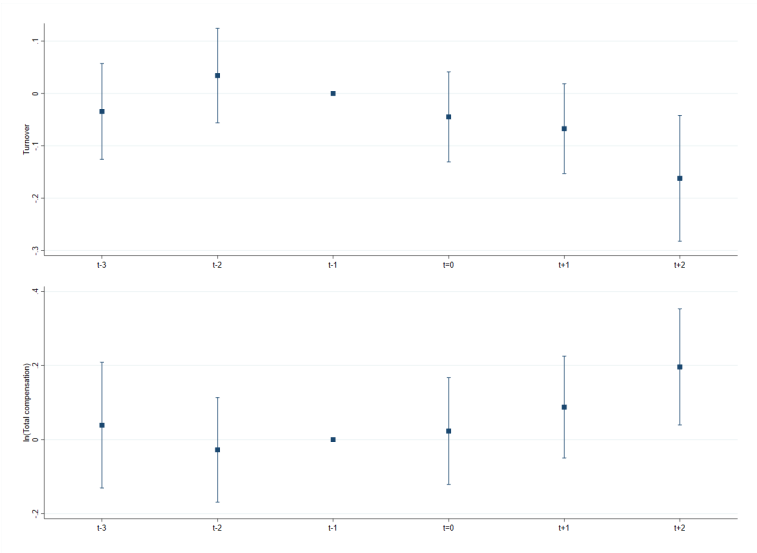
Notes: regressions include president, institution and year fixed effects, and robust standard errors. Pre-treatment periods before 2014 are binned into a single coefficient.

Figure 6: effects of the TCJA on the components of presidential compensation (back)



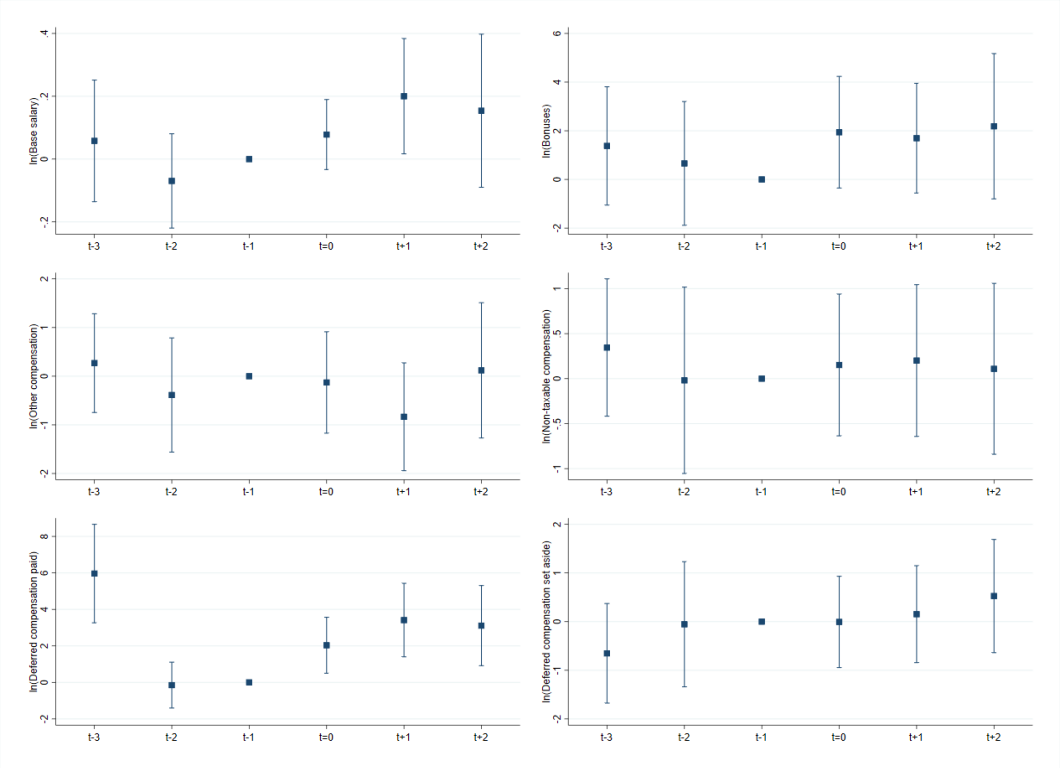
Notes: regressions include president, institution and year fixed effects, and robust standard errors. Pre-treatment periods before 2014 are binned into a single coefficient.

Figure 7: effects of the TCJA on compensation and turnover, unit-specific trends (back)



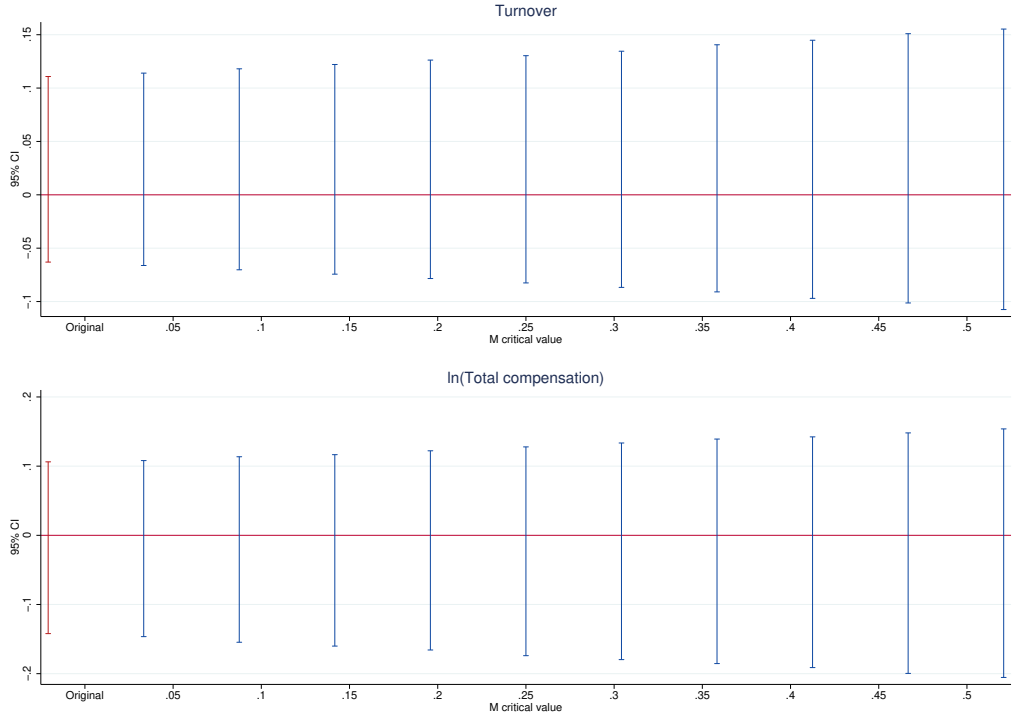
Notes: regressions include president, institution and year fixed effects, president-specific and institution-specific trends, and robust standard errors. Pre-treatment periods before 2014 are binned into a single coefficient.

Figure 8: effects of the TCJA on the components of presidential compensation, unit-specific trends (back)



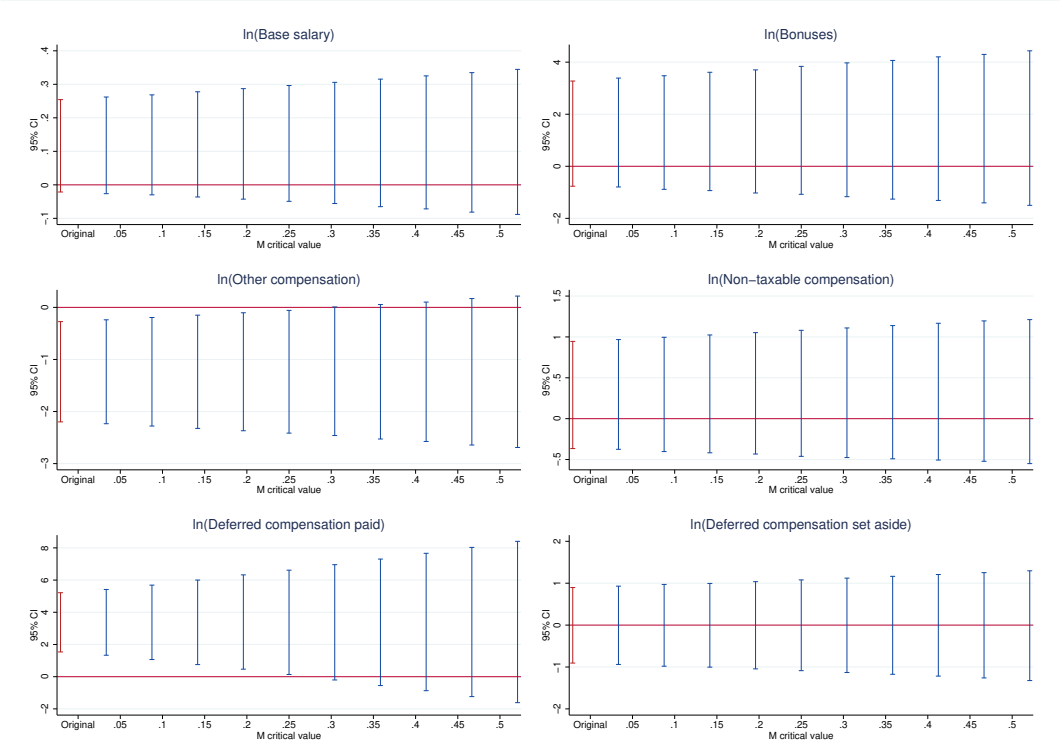
Notes: regressions include president, institution and year fixed effects, president-specific and institution-specific trends, and robust standard errors. Pre-treatment periods before 2014 are binned into a single coefficient.

Figure 9: Rambachan and Roth (2023) sensitivity analysis for parallel trend violations (back)



Notes: Rambachan and Roth (2023) sensitivity analysis, presenting how the treatment effect across all post-treatment periods varies by critical values of M, the maximum pre-treatment parallel trends violations.

Figure 10: Rambachan and Roth (2023) sensitivity analysis for parallel trend violations, components of presidential compensation (back)



Notes: Rambachan and Roth (2023) sensitivity analysis, presenting how the treatment effect across all post-treatment periods varies by critical values of M, the maximum pre-treatment parallel trends violations.

Figure 11: bunching estimator of the tax elasticity of compensation (back)

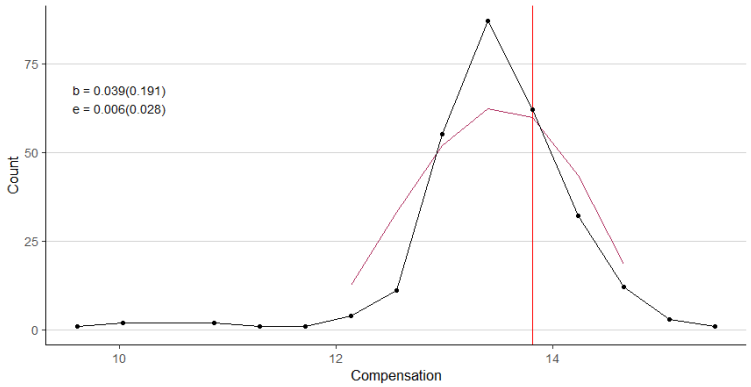
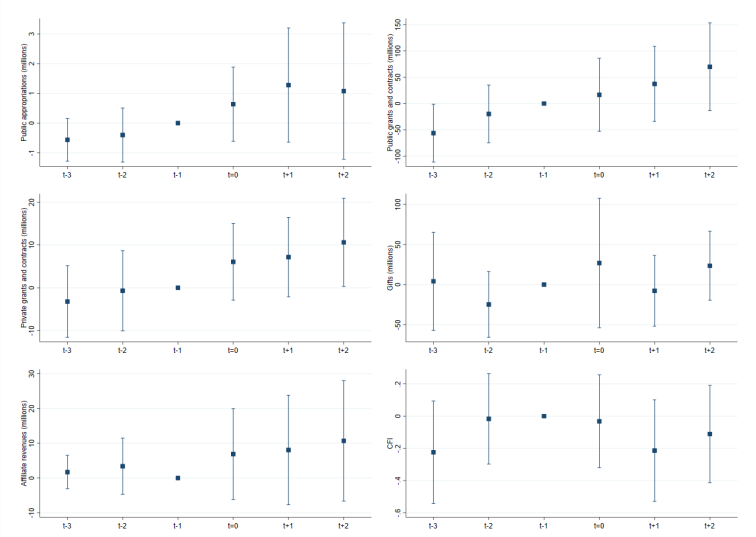
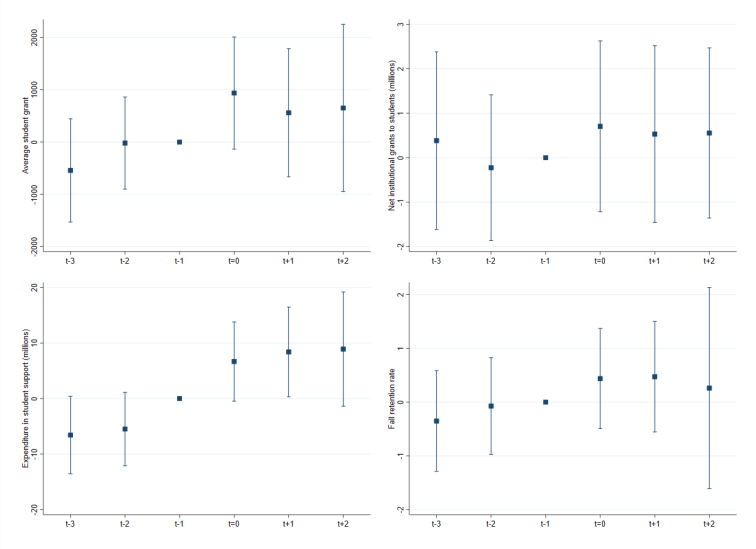


Figure 12: effects of the TCJA on institutional financial outcomes (back)



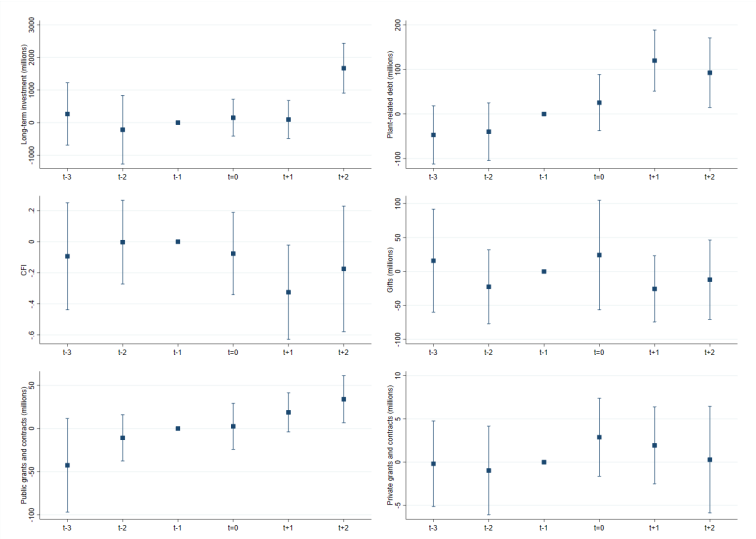
Notes: regressions include president, institution and year fixed effects, and robust standard errors. Pre-treatment periods before 2014 are binned into a single coefficient.

Figure 13: effects of the TCJA on student financial outcomes (return)



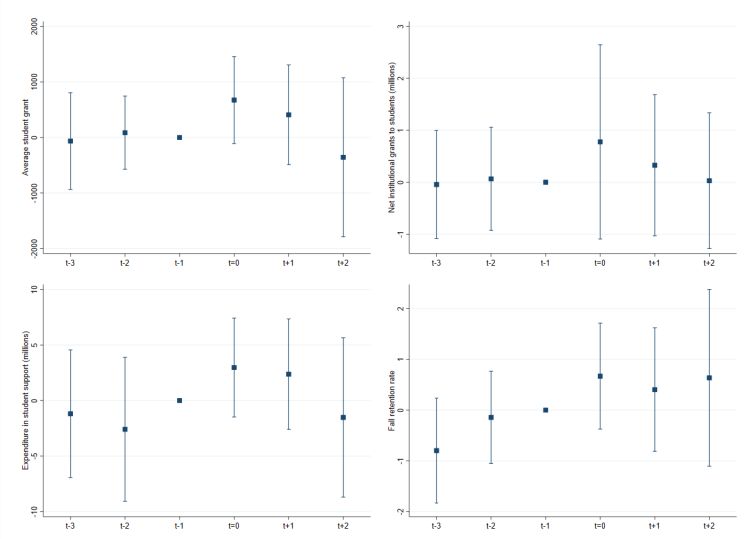
Notes: regressions include president, institution and year fixed effects, and robust standard errors. Pre-treatment periods before 2014 are binned into a single coefficient.

Figure 14: effects of the TCJA on institutional financial outcomes, unit-specific trends (return)



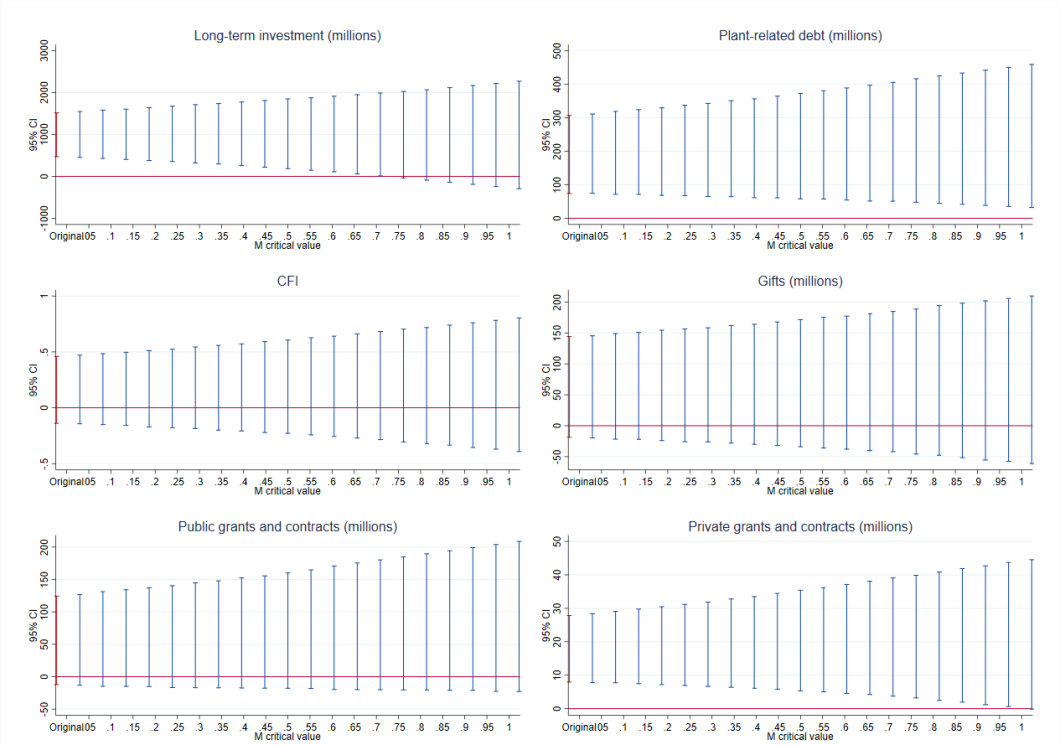
Notes: regressions include president, institution and year fixed effects, president-specific and institution-specific trends, and robust standard errors. Pre-treatment periods before 2014 are binned into a single coefficient.

Figure 15: effects of the TCJA on student financial outcomes, unit-specific trends (return)



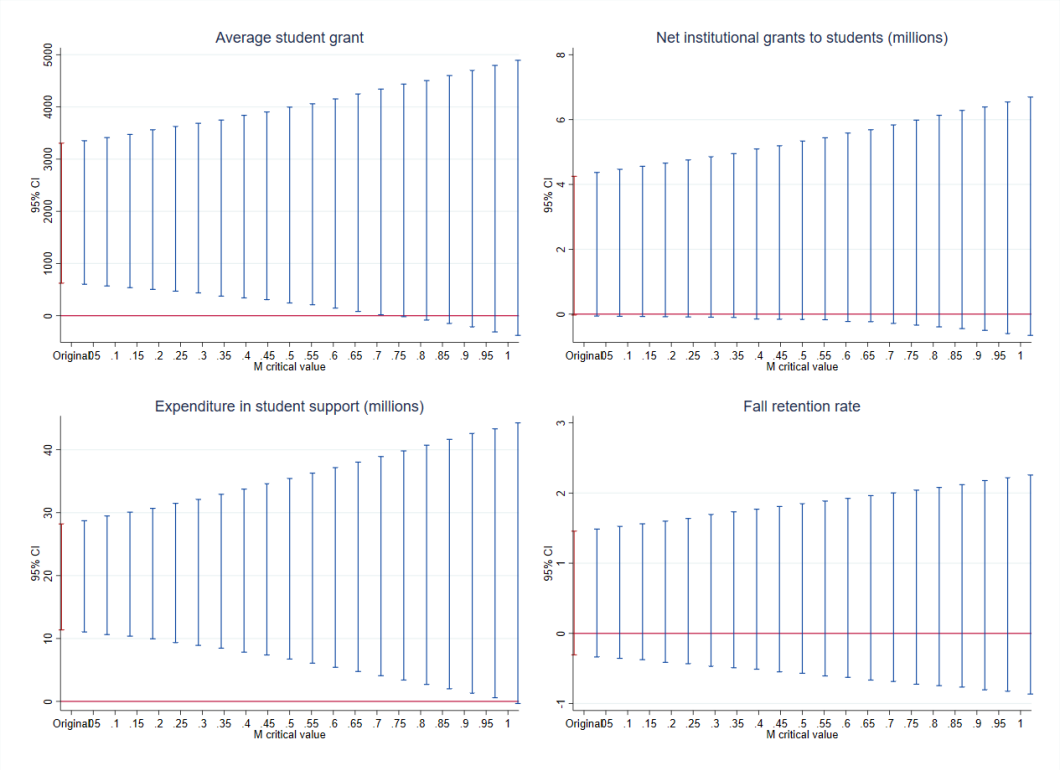
Notes: regressions include president, institution and year fixed effects, president-specific and institution-specific trends, and robust standard errors. Pre-treatment periods before 2014 are binned into a single coefficient.

Figure 16: Rambachan and Roth (2023) sensitivity analysis for parallel trend violations, institutional financial outcomes (back)



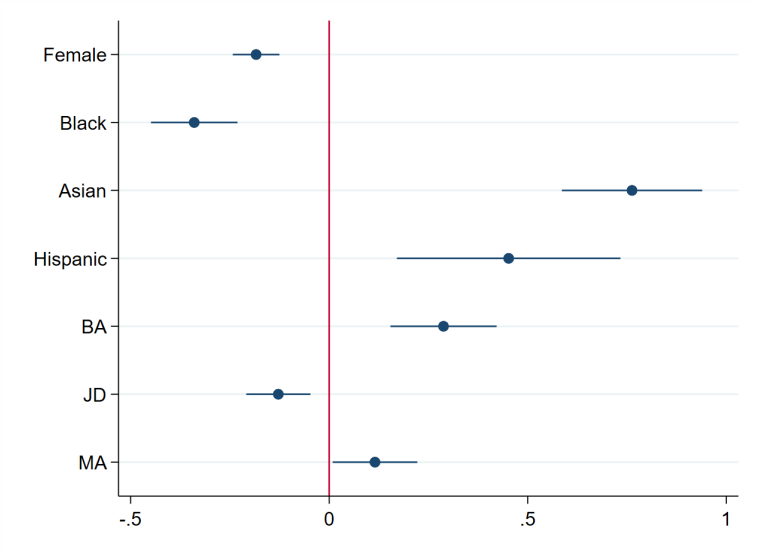
Notes: Rambachan and Roth (2023) sensitivity analysis, presenting how the treatment effect across all post-treatment periods varies by critical values of M, the maximum pre-treatment parallel trends violations.

Figure 17: Rambachan and Roth (2023) sensitivity analysis for parallel trend violations, student outcomes (back)



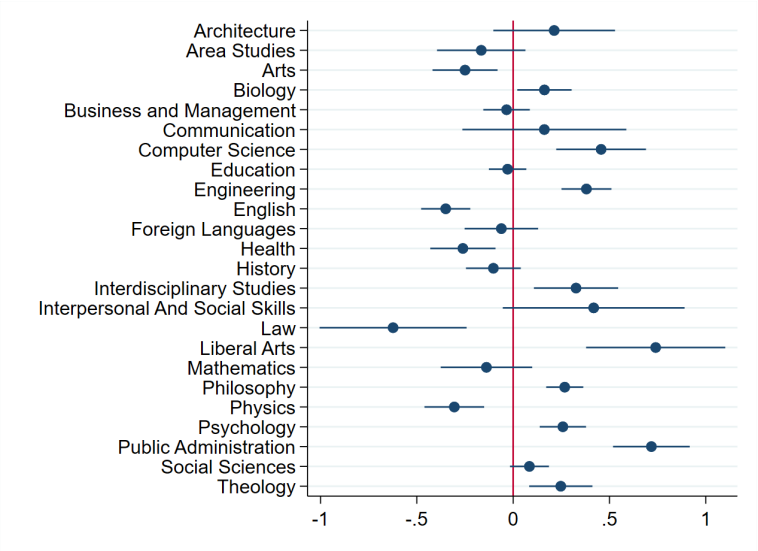
Notes: Rambachan and Roth (2023) sensitivity analysis, presenting how the treatment effect across all post-treatment periods varies by critical values of M, the maximum pre-treatment parallel trends violations.

Figure 18: correlation of demographics and education with president FE (back)



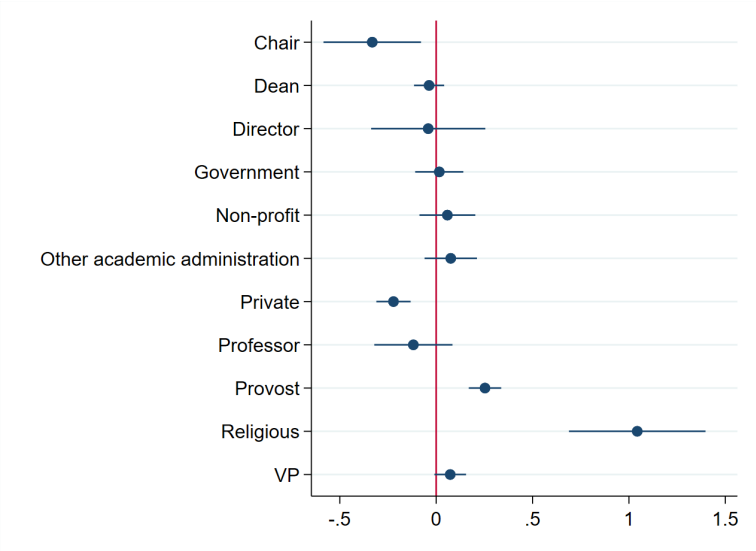
Notes: correlation of demographic and educational characteristics with president fixed effects for the CFI, controlling for connected set indicators.

Figure 19: correlation of field of study with president FE (return)



Notes: correlation of the field of study of presidents' highest degree with president fixed effects for the CFI, controlling for connected set indicators.

Figure 20: correlation of last position with president FE (back)



Notes: correlation of the field of study of presidents' highest degree with president fixed effects for the CFI, controlling for connected set indicators.

Table 1: Components of presidents' wages

	Mean	Median	SD	Max.
Total compensation	682317	534355	563828	8694337
Base salary	477927	422333	260668	2401746
Bonuses	52527.3	0.05	170422	4120316
Other compensation	96143.4	22291.2	321295	6000587
Deferred compensation paid out	20746	0.05	142989	3837324
Non-taxable compensation	55640.5	38377.4	60015.9	680628
Deferred compensation set aside	78172.3	28695.4	144145	3078200
Observations	2936			

Source: IRS 990 filings, 2009-2020.

(return)

Table 2: University revenues by components

	Mean	Median	SD	Max.
Tuition and fees	156.888	87.8922	194.799	2238.68
Federal appropriations	1.73175	0	16.3543	342.939
State appropriations	1.67135	0	18.164	409.81
Local appropriations	0.00112	0	0.01884	0.40672
Federal grants and contracts	61.6877	2.91944	202.123	3445.67
State grants and contracts	2.66086	0.33538	6.67612	64.702
Local grants and contracts	0.98634	0	9.39439	208.875
Private gifts, grants, and contracts	72.9342	16.7505	185.305	2679.58
Contributions from affiliated entities	2.65754	0	33.1313	681.207
Investment return	138.829	15.582	745.81	15722.6
Sales and services of educational activities	24.8911	0.03225	123.681	1765.6
Sales and services of auxiliary enterprises	39.1643	23.5917	52.3099	445.906
Hospital revenue	80.3934	0	500.661	8005.75
Independent operations revenue	21.4328	0	164.22	2744.95
Other revenue	30.2259	2.86993	159.173	4192.62
Total revenues and investment return	654.715	182.071	1532.11	19004.6
Observations	2936			

Source: IPEDS Finance component, 2009-2020.

(return)

Table 3: Descriptive statistics, presidential compensation and institutional outcomes

	Control		Treated	
	Mean	SD	Mean	SD
Total compensation	496994	200355	1523617	846141
Turnover	0.12552	0.33138	0.02453	0.15483
Long-term investment (millions)	946.388	3840.18	4958.69	8704.85
Plant-related debt (millions)	187.121	369.55	1008.43	1096.12
CFI	6.3155	1.93511	6.01017	2.24834
Gifts (millions)	28.823	80.6677	176.473	247.656
Public grants and contracts (millions)	24.4119	94.2232	251.11	394.966
Private grants and contracts (millions)	5.82399	24.4031	71.3231	119.288
Average student grant	21693.3	10002.1	27821	11702.1
Total institutional grants to students (millions)	63.6516	60.0097	201.927	142.326
Net institutional grants to students (millions)	1.49463	10.2682	8.68871	26.2338
Expenditure in student support (millions)	25.1701	23.8487	75.3276	68.4195
Fall retention rate	85.2619	8.77297	90.6947	8.05184

Source: IRS 990 filings and IPEDS Finance component, 2009-2020.

(return)

Table 4: field of study by highest degree

PhD		MA		JD		BA	
Unavailable	17.78%	Business	31.18%	Law	100%	Unavailable	86.96%
Education	16.09%	Health	10.75%			Social Sciences	4.35%
Social Sciences	11.22%	Education	8.60%			Business	3.26%
Philosophy	9.24%	Unavailable	8.60%			Visual Arts	1.09%
Psychology	5.46%	Visual Arts	6.45%			English	1.09%
English	5.26%	Public Administration	6.45%			Liberal Arts	1.09%
Engineering	3.97%	Theology	5.38%			Law	1.09%
History	3.87%	Social Sciences	5.38%			Health	1.09%
Theology	3.48%	Psychology	4.30%				
Visual Arts	2.88%	Architecture	2.15%				
Physics	2.68%	Engineering	2.15%				
Biology	2.68%	Liberal Arts	2.15%				
Business	2.58%	Biology	1.08%				
Health	2.48%	Communication	1.08%				
Foreign Languages	2.09%	Philosophy	1.08%				
Mathematics	1.79%	History	1.08%				
Interdisciplinary Studies	1.29%	Foreign Languages	1.08%				
Public Administration	1.19%	English	1.08%				
Communication	1.09%						
Area Studies	0.89%						
Computer Science	0.70%						
Liberal Arts	0.30%						
Law	0.20%						
Fitness Studies	0.20%						
Architecture	0.20%						
Social Skills	0.20%						
Law Enforcement	0.10%						
Human Sciences	0.10%						
N	1007		93		136		92

(back)

Table 5: institution, highest degree received

PhD	Harvard University	56	5.09%
	University of Pennsylvania	36	3.27%
	Yale University	35	3.18%
	Princeton University	30	2.73%
	University of Chicago	28	2.55%
	Stanford University	20	1.82%
	Fordham University	18	1.64%
	Columbia University	18	1.64%
	University of Wisconsin-Madison	17	1.55%
	Northwestern University	16	1.45%
	All others	621	56.45%
	Unavailable	205	18.64%
JD	Harvard University	19	13.97%
	Yale University	10	7.35%
	University of Virginia	6	4.41%
	Columbia University	5	3.68%
	University of Chicago	4	2.94%
	University of Florida	3	2.21%
	Pepperdine University	3	2.21%
	Hamline University	3	2.21%
	University of Pennsylvania	3	2.21%
	Duke University	3	2.21%
	All others	53	38.97%
	Unavailable	24	17.65%
MA	Harvard University	8	8.60%
	University of Iowa	4	4.30%
	Yale University	4	4.30%
	Drexel University	3	3.23%
	University of Evansville	2	2.15%
	University of Illinois Springfield	2	2.15%
	Howard University	2	2.15%
	New York University	2	2.15%
	Columbia University	2	2.15%
	Boston College	2	2.15%
	All others	38	40.86%
	Unavailable	24	25.81%

(return)

Table 6: most recent position before becoming presidents

Academia		994		74.85%
	President	254	25.55%	
	VP	285	28.67%	
	Provost	179	18.01%	
	Dean	181	18.21%	
	Director	12	1.21%	
	Chair	18	1.81%	
	Professor	16	1.61%	
	Other academic administration	49	4.93%	
Government		48		3.61%
Non-profit		50		3.77%
Private		133		10.02%
Religious		25		1.88%
Unavailable		78		5.87%
		1328		

(return)

Table 7: pre-trends test, joint test that all pre-treatment coefficients equal 0

	p-value, joint test of leads = 0
Turnover	0.1642
ln(Total compensation)	0.4568
ln(Base salary)	0.4631
ln(Bonuses)	0.2865
ln(Other compensation)	0.2118
ln(Deferred compensation paid)	0.0002
ln(Non-taxable compensation)	0.6471
ln(Deferred compensation set aside)	0.4972

Notes: p-value for the F test that all pre-treatment coefficients are jointly equal to zero.

(return)

Table 8: R^2 of a regression of financial outcomes on institution, president and year FE

	Long term investments	Plant-related debt	CFI	Gifts	Public grants and contracts	Private grants and contracts
College FE	0.929	0.886	0.735	0.734	0.844	0.919
College + year FE	0.935	0.902	0.849	0.745	0.850	0.924
College + year + president FE	0.954	0.941	0.875	0.745	0.848	0.949
President + year FE	0.874	0.907	0.847	0.674	0.827	0.927
President*college + year FE	0.954	0.941	0.875	0.745	0.848	0.949

Notes: R^2 from a regression of the respective outcomes on the set of fixed effects reported in the table.

(return)

Table 9: R^2 of a regression of student outcomes on institution, president and year FE

	Average student grant	Net institutional grants	Expenditure in student support	Fall retention rate
College FE	0.685	0.902	0.854	0.882
College + year FE	0.918	0.904	0.896	0.889
College + year + president FE	0.942	0.949	0.911	0.904
President + year FE	0.935	0.798	0.874	0.892
President*college + year FE	0.942	0.949	0.911	0.904

Notes: R^2 from a regression of the respective outcomes on the set of fixed effects reported in the table.

(return)

Table 10: pre-trends test, joint test that all pre-treatment coefficients equal 0

	p-value, joint test of leads = 0
Long-term investment (millions)	0.8230
Plant-related debt (millions)	0.1805
CFI	0.3368
Gifts	0.4142
Public grants and contracts	0.1086
Private grants and contracts	0.7316
Average student grant	0.4810
Net institutional grants to students	0.7930
Expenditure in student support	0.1165
Fall retention	0.7076

Notes: p-value for the F test that all pre-treatment coefficients are jointly equal to zero.

(return)

Table 11: Sorting, compensation by institution size measured by assets

	(1) ln(w)	(2) ln(w)	(3) ln(w)	(4) ln(w)	(5) ln(w)	(6) ln(w)
$\ln(\text{Assets})_{t-1}$	0.176***	0.202***	0.717***	0.182***	0.172***	0.618***
	(11.08)	(11.90)	(25.06)	(7.82)	(7.17)	(14.28)
$\ln(\text{Median peer assets - Carnegie classification})_{t-1}$	0.140***	0.233***	0.0408*			
	(9.35)	(7.54)	(2.08)			
$\ln(\text{Median peer assets - self-reported peers})_{t-1}$				0.120***	0.0930***	0.137***
				(5.53)	(3.58)	(3.96)
Carnegie group FE	No	Yes	No	No	Yes	No
Institution FE	No	No	Yes	No	No	Yes
Observations	2129	2129	2129	1701	1701	1701

Notes: *** p < 0.01, ** p < 0.05,* p < 0.10. Robust standard errros in parentheses. Estimates from a regression of the form $ln(w_{it+1}) = \alpha + \beta S_{nt} + \delta S_{it} + e_{it}$, testing if the highest paid presidents systematically sort into the largest institutions.

(back)

Table 12: Sorting, compensation by institution size measured by enrollment

	(1) ln(w)	(2) ln(w)	(3) ln(w)	(4) ln(w)	(5) ln(w)	(6) ln(w)
ln(Total enrollment)$_{t-1}$	0.272***	0.294***	0.582***	0.315***	0.232***	0.456***
	(10.64)	(11.91)	(10.70)	(9.52)	(7.43)	(6.57)
ln(Median peer enrollment - Carnegie classification)$_{t-1}$	0.375***	0.329***	0.129*			
	(12.61)	(3.96)	(2.28)			
ln(Median peer enrollment - self-reported peers)$_{t-1}$				0.222***	0.138**	0.229***
				(5.71)	(2.83)	(3.80)
Carnegie group FE	No	Yes	No	No	Yes	No
Institution FE	No	No	Yes	No	No	Yes
Observations	2108	2108	2108	1690	1690	1690

Notes: *** p $<$ 0.01, ** p $<$ 0.05,* p $<$ 0.10. Robust standard errros in parentheses. Estimates from a regression of the form $ln(w_{it+1}) = \alpha + \beta S_{nt} + \delta S_{it} + e_{it}$, testing if the highest paid presidents systematically sort into the largest institutions.

(back)

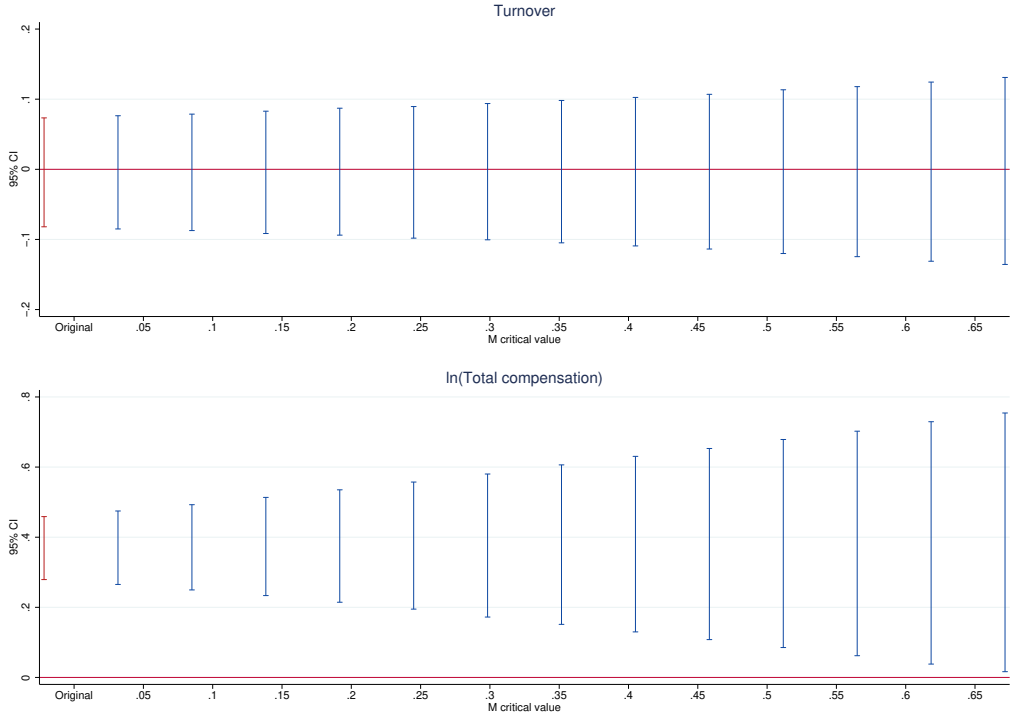
Appendix

Table A-1: Difference-in-difference specification, presidential compensation

	(1) Turnover	(2) ln(Total compensation)	(3) ln(Base salary)	(4) ln(Bonuses)	(5) ln(Other compensation)	(6) ln(Deferred compensation paid)	(7) ln(Non-taxable compensation)	(8) ln(Deferred compensation set aside)
	Base specification							
$Treated \times Post$	0.0308	0.188***	0.0638	1.486**	0.0375	1.327***	0.176	-0.324
	(0.0297)	(0.0349)	(0.0665)	(0.512)	(0.258)	(0.382)	(0.134)	(0.223)
	Unit-specific time trends							
$Treated \times Post$	-0.0257	0.246***	0.0712	0.956	0.574	0.282	-0.0560	0.184
	(-0.90)	(4.19)	(1.45)	(1.13)	(1.61)	(0.51)	(-0.26)	(0.57)
Mean of dep. variable	0.0847	13.22	12.65	1.758	8.120	-1.585	10.20	9.702

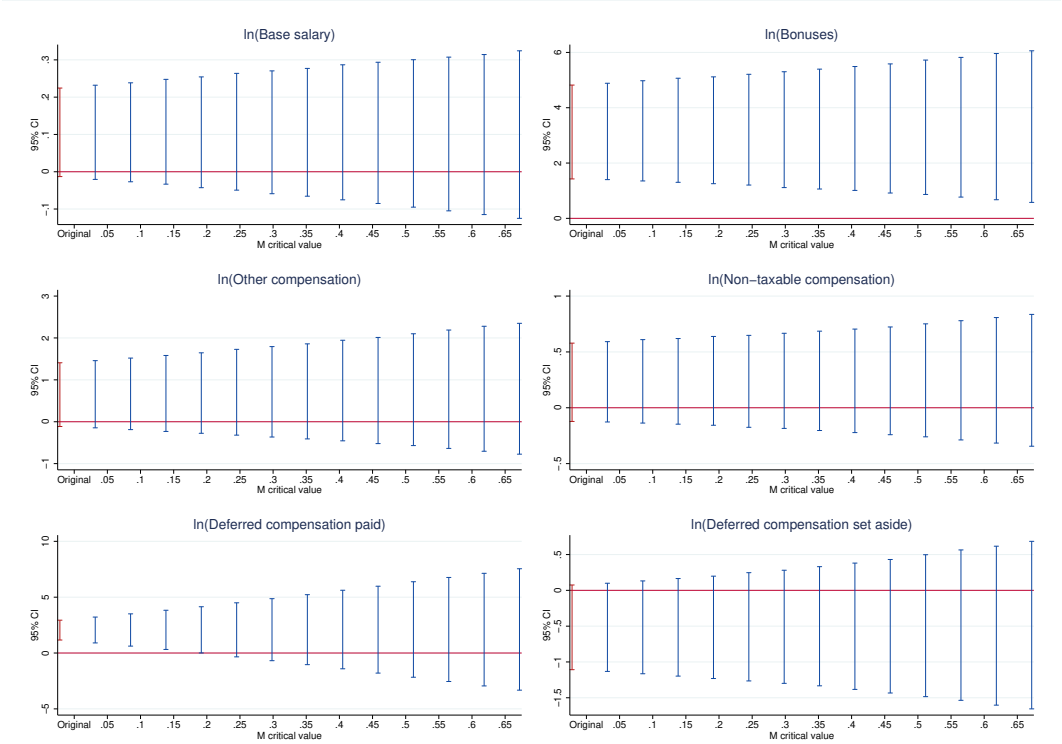
(back)

Figure A-1: Rambachan and Roth (2023) sensitivity analysis for parallel trend violations, 10% significance level



Notes: Rambachan and Roth (2023) sensitivity analysis, presenting how the treatment effect across all post-treatment periods varies by critical values of M, the maximum pre-treatment parallel trends violations. (return)

Figure A-2: Rambachan and Roth (2023) sensitivity analysis for parallel trend violations, components of presidential compensation, 10% significance level



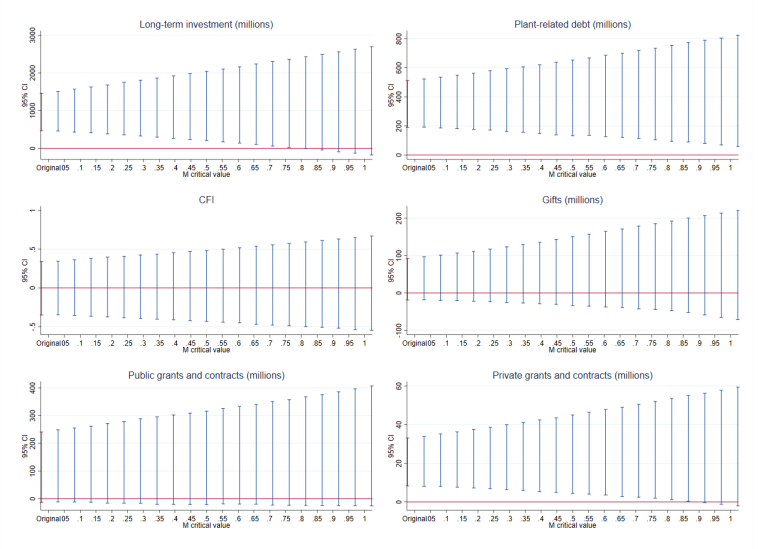
Notes: Rambachan and Roth (2023) sensitivity analysis, presenting how the treatment effect across all post-treatment periods varies by critical values of M, the maximum pre-treatment parallel trends violations. (return)

Table A-2: Difference-in-difference specification, institutional outcomes

	(1) Long-term investment (millions)	(2) Plant-related debt (millions)	(3) CFI	(4) Gifts (millions)	(5) Public grants and contracts (millions)	(6) Private grants and contracts (millions)	(7) Average student grant	(8) Net institutional grants to students (millions)	(9) Expenditure in student support (millions)	(10) Fall retention rate
	Base specification									
Treated × *Post*	1184.6***	232.5***	0.0895	41.73**	74.78***	15.54***	1458.1***	1.379***	18.06***	0.483
	(174.9)	(28.71)	(0.0728)	(13.76)	(15.76)	(2.087)	(325.4)	(0.351)	(2.073)	(0.295)
	Unit-specific time trends									
Treated × *Post*	-206.1	38.16*	-0.0768	-0.522	19.96*	1.839	280.0	0.410	2.096	0.734*
	(220.5)	(15.67)	(0.0954)	(17.43)	(9.715)	(1.355)	(287.5)	(0.287)	(1.376)	(0.331)
Mean of dep. variable	1706.5	343.2	6.246	56.55	65.92	17.81	22783.7	2.856	34.47	86.26

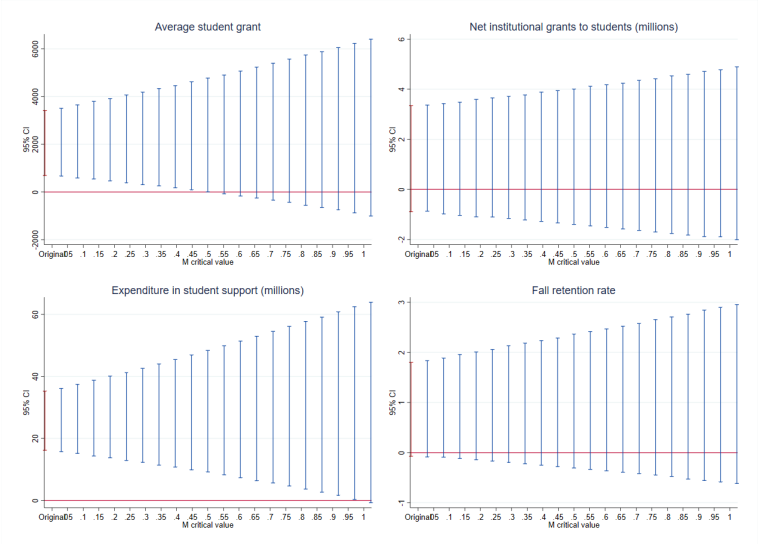
(back)

Figure A-3: Rambachan and Roth (2023) sensitivity analysis for parallel trend violations, 10% significance level



Notes: Rambachan and Roth (2023) sensitivity analysis, presenting how the treatment effect across all post-treatment periods varies by critical values of M, the maximum pre-treatment parallel trends violations.

Figure A-4: Rambachan and Roth (2023) sensitivity analysis for parallel trend violations, components of presidential compensation, 10% significance level



Notes: Rambachan and Roth (2023) sensitivity analysis, presenting how the treatment effect across all post-treatment periods varies by critical values of M, the maximum pre-treatment parallel trends violations.

(return)