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College presidents are among the highest-paid individuals in higher education, and in 2017 the Tax Cuts and Jobs Act increased their cost to their institutions via a 21% excise tax on nonprofit executive compensation above $1 million. I examine how private colleges and universities and their presidents responded using an event study design. Presidential compensation fell by 13%, with the entire adjustment running through non-taxable and other compensation, and the probability that an institution replaced its president rose by 19 percentage points. Comparing the tax liability institutions faced with the compensation their continuing presidents lost implies that presidents bore essentially the full cost of the tax. Among presidents who stayed, institutional resources shifted toward activities more visible to governing boards: academic support and student services expenditures rose by 12% and 7%, while instructional spending and net aid were unchanged.

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# Talent at the Top: Effects of Taxation on College Presidents' Compensation and Priorities

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**Abstract**

College presidents are among the highest-paid individuals in higher education, and in 2017 the Tax Cuts and Jobs Act increased their cost to their institutions via a 21% excise tax on non-profit executive compensation above $1 million. I examine how private colleges and universities and their presidents responded using an event study design. Presidential compensation fell by 13%, with the entire adjustment running through non-taxable and other compensation, and the probability that an institution replaced its president rose by 19 percentage points. Comparing the tax liability institutions faced with the compensation their continuing presidents lost implies that presidents bore essentially the full cost of the tax. Among presidents who stayed, institutional resources shifted toward activities more visible to governing boards: academic support and student services expenditures rose by 12% and 7%, while instructional spending and net aid were unchanged.

## 1 Introduction

The responses of managers and organizations to monetary incentives are a central question across different fields of economics, and one with particular relevance in education. The existing evidence highlights the impact of strong leadership on institutional performance. For instance, principal quality is linked to higher student achievement in U.S. primary and secondary schools (Bartanen, Grissom, and Rogers 2019, Coelli and Green 2012). Governance is even more critical in higher

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education, where institutions are larger and more complex, averaging 162 instructors and 396 staff members (IPEDS 2022). Colleges would rank among the top 0.5% of U.S. businesses by size if they were classified as firms, highlighting the importance of the incentives and challenges that their leaders face. Moreover, support programs such as academic advising and career support, which are generally regarded as effective in fostering student success, depend on a competent administration to be effective.

This paper explores two main questions. First, how do institutions respond to increases in the cost of governance? An ideal experiment would require an exogenous shock to the cost of executive compensation across some colleges, allowing us to observe institutional responses to these changes. Second, how does the compensation of college presidents affect their priorities? A natural experiment for this question would leverage an external shock to president salaries and examine the effects on institutional outcomes. I leverage a quasi-experimental approach to address both questions, using the implementation of the 2017 Tax Cuts and Jobs Act (TCJA) as a source of exogenous variation. The TCJA introduced a 21% excise tax levied on institutions on all compensation exceeding $1 million for employees of nonprofit organizations, effectively increasing the cost to institutions of paying their presidents. The policy change allows me to observe institutional responses to higher governance costs, and, in turn, the effects of the tax on presidents' compensation allow me to observe how expenditure priorities are affected by changes in compensation.

Using a model of Nash bargaining between a board and a multi-tasking president whose appointment must be renewed, I show that the distance between a president's pay and their outside option is the key driver of the effects of the tax. In particular, because the tax raises the cost of paying the president, it reduces pay within continuing appointments and pushes some presidents out, and both responses scale with how far above the threshold an institution was already paying. Because pay is bargained and the tax applies only to remuneration in excess of a fixed threshold, the framework also delivers two bounds on the effect of the tax on presidential compensation: presidents' pay cannot fall by more than the tax takes from the institution, and the response cannot increase faster than the statutory rate allows. Furthermore, the same shock that raises separations also makes renewal more responsive to performance for those who remain: while total compensation falls, presidents are incentivized to increase their effort when the probability of renewal falls faster than total compensation. As a result, presidents who stay reallocate effort toward the activities their boards can observe, even as their pay falls.

I then use executive compensation data from private colleges and universities' IRS 990 filings and the design of the excise tax to implement an event study design in order to test the implications of the model. I find that the TCJA led to an average reduction in compensation of 13 percentage points for those presidents at exposed institutions who remained in their positions. Reductions in compensation are concentrated in other forms of compensation rather than base salaries or bonuses. Furthermore, the tax results in a 19 percentage point increase in the probability of presidential turnover for exposed institutions. The treatment intensity prediction from the model is also validated, with compensation for remaining presidents falling by 0.17 log points per additional

dollar above the $1M threshold. Furthermore, the estimated elasticity of compensation with respect to pre-reform compensation is consistent across all compensation levels with the model-derived elasticity of 0.174. Finally, an analysis of the incidence of the tax finds that the 1.28 point estimate of tax pass-through is statistically indistinguishable from complete pass-through of the tax from institutions onto presidential compensation for staying presidents. Legible effort rises, as predicted by the model, where effort is measured by IPEDS expenditure categories, and legibility is proxied by the within-institution variation in the pre-tax period. The expenditure categories with the highest legibility, academic support, institutional support, and student services, rise as a result of exposure to the tax by 12.9, 5.7, and 7.6 log points, respectively, consistent with effort and resources being redirected toward outcomes a board can observe and reward.

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 a broad literature finding mixed outcomes of financial incentives in education (Berlinski and Ramos 2020, Biasi 2021, Cowan and Goldhaber 2018, Fryer 2013, Goodman and Turner 2013, Imberman and Lovenheim 2015, Steele, Murnane, and Willett 2010, De Philippis 2021), and to a literature that finds that leadership quality has positive effects on educational outcomes (Kelchen 2025, Bartanen, Grissom, and Rogers 2019, Branch, Hanushek, and Rivkin 2012, Coelli and Green 2012, Grissom and Bartanen 2019, Miller 2013). Evidence on the pay of education leaders specifically is thinner (Grissom et al. 2021, Hamilton et al. 2012, Mitani 2025); the closest analogue outside education is Mas (2017), who finds that salary disclosure compressed the pay of city managers and raised their exit rates, the two margins estimated here.

Also, 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 (Bai 2014, Bartlett and Sorokina 2005, Cheng 2014, Civera et al. 2024, He and Callahan III 2017, Huang and Chen 2013, Hunt, Tandberg, and Park 2019, Monks 2007, Yeung, Gigliotti, and Nguyen-Hoang 2019). 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 institutional and executive characteristics, making it impossible to interpret any observed correlation between presidential pay and institutional outcomes as causal. Addressing this weakness requires a source of variation in pay external to that bargaining, which this paper is the first to use in a higher education context.

The effort results connect to work on how agents allocate effort across tasks that differ in how easily they can be verified, which Neal (2011) identifies as central to the mixed record of performance pay in education. The framework follows De Philippis (2021) and Holmstrom and Milgrom (1991), via a different mechanism: the tax lowers the board's net value of the incumbent, raising separations and, among those who stay, the intensity of the renewal decision (Gibbons and Murphy 1992, Holmstrom 1999). The corporate literature on short horizon incentives provides an

empirical precedent of private sector executives prioritizing short-term returns when faced with high-powered incentives (Edmans, Fang, and Lewellen 2017, Edmans, Fang, and Huang 2022, Ladika and Sautner 2020, Terry 2023).

Finally, this paper also joins a literature on the effects of taxation on executive pay (Frydman and Molloy 2011, Goolsbee 2000, Rose and Wolfram 2002), and in particular the evaluations of the other executive pay provision of the Tax Cuts and Jobs Act, the removal of the performance based exception under Section 162(m) (Balsam, Evans III, and Yurko 2019, De Simone, McClure, and Stomberg 2022, Durrant, Gong, and Howard 2021, Luna, Schuchard, and Stanley 2023, Ohrn 2023). Because the tax is levied on the employer, how much of it the president bears depends on how pay is set (Bozio, Breda, and Grenet 2025, Piketty, Saez, and Stantcheva 2014, Saez, Schoefer, and Seim 2019).

# 2 Institutional context

## 2.1 What do college presidents do?

The role of a college president involves setting the institution's overall priorities, 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] Furthermore, the role is heavily shaped by the individual style and priorities of presidents. James Duderstadt, former 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, as 61 percent of presidents in the American College President Study report money issues to be their main concern, and 65 percent of presidents name budget and financial management as one of the matters occupying most of their time, ahead of fundraising at 58 percent and of managing a senior leadership team at 42 percent (Gagliardi et al. 2017). As much of an institution's spending is committed years ahead through faculty lines, federal aid formulas, and physical plant, and the day to day work of allocation sits with provosts and chief financial officers, the presidents controls the discretionary margin: which initiatives are funded, and which priorities the senior team is directed to advance. The importance of financial issues appears to be structural instead of transitory: 68 percent of presidents assessed budget and financial management,

1. What Does a College President Do? US News.

and 47 percent of presidents assessed fundraising, as the areas that will be most important to their successors.

Beyond financial concerns, the role also involves cultivating continued relationships and exercising leadership. Presidents work closely with donors and alumni in order to facilitate fundraising, and engage in lobbying efforts, working with local, state, and federal governments to address issues related to federal student loan funding, research funding, state-level educational programs, and local governments. Managing the campus community also involves addressing student and wider political issues that may result in disruptive protests, as well as their resultant fall-out; 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.

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. [2]

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

2. Hiring a Search Firm? Do Your Homework First. Chronicle of Higher Education.

shift in how university leaders are compensated and managed, reflecting an increasingly corporate approach to higher education governance. [3]

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 benefits. Incentives such as signing, performance, retention, and completion bonuses are common, and the details on their implementation are rarely made public, but appear to be often determined by the president and approved by the governing board. Benefits are extensive, 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 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 2012 and 2019, along with IPEDS data on financial and academic outcomes for colleges. This period of time allows me to compare compensation before and after the implementation of the TCJA. Below, I describe the data sources and sample construction and present descriptive statistics.

The Chronicle of Higher Education provides executive compensation data for private colleges between 2012 and 2019, 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 is 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 262 institutions and 457 presidents spread between 2012 and 2019.

3. The CEO-ization of the President's Contract. Inside Higher Ed.

[4] Additionally, all compensation information is presented in 2018 constant dollars.

Table 1 describes the components of compensation and outcomes for the sample. Treated institutions, defined as institutions paying their presidents $1M or more in 2017, offer substantially higher presidential compensation, with a mean of $1,284,677 compared to $553,128 for control institutions. 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. Significantly, other aspects of compensation, such as other kinds of compensation or non-taxable (in kind) compensation, play a larger role than bonuses, accounting for between 14% and 20% of total compensation. Turnover rates are slightly lower in the treated group (8%) than in the control group (13%), possibly reflecting greater stability in leadership. Treated institutions also report significantly larger financial resources, with mean total assets of $7,384.32 million compared to $1,097.81 million in the control group, and much higher total liabilities and endowments. Revenue generation is stronger among treated institutions across tuition, public funding, private funding, and investment returns. Finally, treated institutions spend more per capita on instructional and academic support, as well as research, suggesting a greater investment in educational and research outcomes.

4. 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.

Table 1: descriptive statistics, compensation and outcomes

| | Control | | Treated | | Full sample | |
|---|---|---|---|---|---|---|
| | Mean | Median | Mean | Median | Mean | Median |
| Total compensation | 553129 | 495001 | 1284677 | 1088551 | 719293 | 560739 |
| Turnover | 0.13 | 0 | 0.08 | 0 | 0.12 | 0 |
| Base salary | 412826 | 399458 | 792341 | 769145 | 499029 | 437489 |
| Bonuses | 34157.6 | 0.05 | 140073 | 0.05 | 58215.3 | 0.05 |
| Non-taxable compensation | 47329.8 | 36776.1 | 92713.1 | 62556.3 | 57638.2 | 39319.8 |
| Other compensation | 57776.3 | 17240.6 | 257134 | 83327.5 | 103059 | 22899 |
| Total assets | 1097.81 | 574.13 | 7384.32 | 2848.58 | 2534.11 | 701.92 |
| Total liabilities | 288.96 | 168.4 | 2246.84 | 1016.88 | 736.28 | 199.83 |
| Total endowment | 605.79 | 230.99 | 3922.62 | 1363.28 | 1360.5 | 299.2 |
| Total revenue | 244.7 | 151.66 | 1883.28 | 871.51 | 619.08 | 177.04 |
| Total expenditures | 219.34 | 137.73 | 1692.18 | 806.38 | 555.85 | 160.79 |
| Net income | 25.36 | 6.76 | 191.11 | 41.54 | 63.23 | 9.04 |
| Tuition revenue | 110.49 | 76.91 | 352.18 | 265.22 | 165.39 | 92.49 |
| Public funding | 15.28 | 2.81 | 253.57 | 112.39 | 69.41 | 3.44 |
| Private funding | 27.92 | 14.8 | 245.84 | 104.81 | 77.42 | 18.16 |
| Investment return | 40.27 | 9.42 | 311.34 | 56.96 | 101.84 | 12.62 |
| Instructional expenditure per capita | 99515.9 | 79446.2 | 333983 | 171818 | 153651 | 87850.1 |
| Research | 14.09 | 1.5 | 284.38 | 135.76 | 75.49 | 2.17 |
| Academic support | 24.11 | 14.62 | 140.65 | 62.36 | 50.58 | 17.05 |
| Net aid per capita | 798.74 | 0 | 6216.47 | 0 | 2049.61 | 0 |
| Observations | 467 | | 1589 | | 2056 | |

However, this sample is not representative of the universe of non-profit or public institutions, so any intuitions about the presidents of these institutions is not likely to extend to the presidents of smaller non-profit or public institutions. Table 2 compares institutions in the sample with the universe of private non profit institutions, and the universe of public institutions, using available IPEDS data on institutional characteristics, enrollment, and finances. Treated institutions are much larger, with an average enrollment of 15,485, compared to 7,689 in the sample, 1,747 in all non-profits, and 8,964 in all public institutions. The racial composition shows that treated institutions have a higher percentage of Asian students (10.12%) but lower percentages of Black and Hispanic students compared to the broader population of non-profits and public institutions. The treated institutions also have a greater focus on graduate education, with 39.86% of their students in post-graduate programs, compared to just 6.46% in public institutions. Unlike public and other non-profit institutions, treated institutions do not have open admissions, with a highly selective average admission rate of 35.27%. Financially, treated institutions are far wealthier, with average assets of $9,094 million and endowments of $4,818.9 million, significantly surpassing

other groups. Finally, their revenue and expenses are substantially higher, with treated institutions earning an average net income of $243.4 million, compared to only $2.7 million among all non-profit institutions.

Table 2: comparison of institutions in the sample with the universe of private non-profit and public institutions

| | Treated | Sample | All nonprofits | All public |
|---|---|---|---|---|
| Enrollment | 15485 | 7689 | 1747 | 8964 |
| Percent Black | 7.94% | 9.11% | 13.28% | 13.37% |
| Percent Hispanic | 9.45% | 9.36% | 9.28% | 13.53% |
| Percent Asian | 10.12% | 6.48% | 3.90% | 4.06% |
| Percent Female | 52.91% | 56.58% | 55.80% | 57.63% |
| Percent post-grad | 39.86% | 26.05% | 28.22% | 6.46% |
| Open admissions | 0.00% | 1.49% | 18.73% | 65.61% |
| Admission rate | 35.27% | 53.24% | 78.48% | 89.45% |
| Assets | 9094.0 | 2307.7 | 191.4 | 93.0 |
| Liabilities | 2500.7 | 643.1 | 59.4 | 180.7 |
| Endowment | 4818.9 | 1178.3 | 97.6 | 96.4 |
| Revenue | 2350.6 | 587.2 | 59.8 | 207.9 |
| Expenses | 2107.1 | 500.6 | 57.1 | 197.5 |
| Net income | 243.4 | 86.6 | 2.7 | 10.4 |
| N | 53 | 261 | 1971 | 1725 |

Source: IRS 990 filings and IPEDS component, 2012-2019.

### 3.1 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 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 and 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. On average, this tax affects the top 20% of the compensation distribution.

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 Conceptual framework

## 4.1 Set-up

This section presents a simple framework aimed at illustrating the expected effects of taxing executive compensation above a fixed threshold. In addition to the effect on pay, I discuss the implications for the president's decision to remain at their job, for the allocation of her effort across tasks, and for the compensation an institution pays once the office changes hands. To focus on the effects that can be identified in my empirical application, I make some simplifying assumptions to the multi-task problem proposed by Holmström and Milgrom (1991).[5]

A board contracts with a president over compensation and effort. Costly executive search and match-specific rents give both parties a stake in the relationship, so I model compensation as the outcome of Nash bargaining rather than as a unilateral board decision. This is consistent with the qualitative evidence on presidents participating in the design of their own compensation arrangements.

**Tasks and institutional value** The president allocates effort across two tasks, $e_o$ and $e_h \geq 0$, distinguished by whether the board can verify their output within the contract period. I refer to these as legible and illegible tasks. Effort costs $c(e_o, e_h) = \frac{1}{2}(e_o^2 + e_h^2)$, and the board values the president's output at

$$V(e_o, e_h) = v_o e_o + v_h e_h \tag{1}$$

**Performance measures** Each task generates a performance measure observed with noise, $y_i = e_i + \varepsilon_i$ with $\varepsilon_i \sim \mathcal{N}(0, \sigma_i^2)$ for $i \in \{o, h\}$.

**Assumption 1 (*Legibility*).** $\sigma_h^2 \gg \sigma_o^2$.

5. I do not model the board's choice of incentive intensity or monitoring effort.

The outputs of legible effort are observed by the board with less noise, countable, while the outputs of illegible efforts are either strongly affected by factors external to the president or are only realized in the long term, so a board cannot credibly contract for illegible efforts inside a usual contract window. Assumption 1 has two implications.

First, from the standard multi-task result, optimal incentive intensity on a task is decreasing in the noise of its performance measure, so as $\sigma_h^2 \to \infty$ the intensity on the illegible task vanishes and contracts load variable pay on legible output only. I therefore write compensation as

$$w = s_b + \beta_o y_o + s_d, \qquad \beta_o > 0, \quad \beta_h = 0, \tag{2}$$

with $s_b$ a base salary, $\beta_o$ the intensity on legible performance, and $s_d$ a discretionary residual comprising deferred compensation, retirement contributions and housing.[6]

**Assumption 2 (*Contractual rigidity*).** $s_b$ and $\beta_o$ are fixed within the contract period, so that adjustment of total compensation operates through $s_d$.

Second, the board's renewal decision responds more strongly to legible performance. While boards cannot contract credibly on illegible outcomes, they are able to observe leading indicators through ongoing governance interactions, so I write the probability of renewal as

$$\pi = G(z), \qquad z = \zeta(S_B) + \alpha_o e_o + \alpha_h e_h, \qquad \alpha_o > \alpha_h > 0, \tag{3}$$

where $S_B$ is the board's surplus from the match, $\zeta' > 0$, and $G$ is a distribution function with density $g$.

**Assumption 3 (*Regularity*).** $G$ is continuously differentiable and single-peaked, and the renewal index lies above the mode of $G$ both before and after the reform, so that $g$ is decreasing at $z^0$ and at $z^1$.

The first part of Assumption 3 says that a board comfortable with its president sits on the flat upper tail of $G$, so that pushing it toward the margin raises the *sensitivity* of renewal to performance, and not only its level. Requiring the index to remain above the mode after the reform rules out an overshoot in which the board moves past the margin and the sensitivity falls again. As shown in Appendix 8.6, this condition also delivers concavity of the president's problem, so no separate second-order condition is needed.

**Assumption 4 (*Quasi-fixity*).** $e_h = \bar{e}_h$ within the contract period.

Illegible inputs are multi-year commitments: faculty lines, aid formulas tied to external funding, and physical plant. They cannot be adjusted on the timescale over which the president responds to a change in their contract.[7]

6. I assume CARA preferences and normally distributed noise, so that the president's objective is a certainty equivalent. Risk aversion is central to the multi-task result: with a risk-neutral agent, the board would be able to load arbitrarily strong incentives on any informative signal, however noisy.

7. Assumption 4 is central to the model. If both efforts could adjust freely they would move in the same proportion

**Outside option** The president's reservation utility is:

$$\bar{U}(\theta) = u(I^{\text{ret}}) + \delta_r\, v(L) - d(\theta), \tag{4}$$

**Assumption 5 (*Outside option*).** $\bar{w} < \bar{U}(\theta) \leq w^*$ for presidents in the treated group.

The upper bound in Assumption 5 holds by revealed preference for any president observed in post.

**The tax** Section 4960 levies $\tau = 0.21$ on remuneration *in excess of* $\bar{w} = \$1\text{M}$, so the board's cost of compensation is

$$C(w) = w + \tau \max\{w - \bar{w},\, 0\}. \tag{5}$$

The marginal cost of a dollar is $\kappa \equiv 1 + \tau$, so first-order conditions take their usual form. But institutional liability is continuous at the threshold: an institution paying \$1,001,000 owes \$210, and an institution paying \$1,100,000 owes \$21.000.

**Assumption 6 (*Interior taxation*).** $w^* > \bar{w}$ for treated institutions, both before and after the reform.

**Bargaining** Compensation is assumed to be the result of a Nash bargaining process happening at the beginning of a president's term and before the introduction of the tax. Nash bargaining over $w$ yields

$$w^* \;=\; \underbrace{(1-\mu)\bar{U}}_{\text{outside option}} \;+\; \underbrace{\frac{\mu\,(V + \tau\bar{w})}{\kappa}}_{\text{share of the taxed surplus}} \tag{6}$$

and a renewal rent $R \equiv w^* - \bar{U} = \mu\big[(V + \tau\bar{w})/\kappa - \bar{U}\big]$, which is the payoff the president loses if the match ends. Rearranging (6) gives the expression the results below turn on:

$$w^{*1} = \frac{w^{*0} + \tau K}{1 + \tau}, \qquad \text{with} \quad K \equiv (1-\mu)\bar{U} + \mu\bar{w}. \tag{7}$$

The board's valuation $V$ drops out, leaving $K$, a weighted average of the president's outside option and the statutory threshold.

**Assumption 7 (*Common bargaining power*).** Bargaining power $\mu \in (0, 1)$ is common to all presidents, whether remaining, departing or incoming, and is unchanged by the reform.

Assumption 7 means that presidents differ in type $\theta$ along a single dimension, the level of their outside option $\bar{U}(\theta)$. It is what allows the compensation of a departing president and that of her successor to be compared in Result 3, since the two then differ only through $\bar{U}$.

and the legible share would be unchanged. If instead total effort were fixed, the legible task would contract by more than the illegible one, since by (3) it is the more renewal-sensitive of the two. The pattern in Result 5 requires a quasi-fixed illegible margin together with a moving renewal density.

### 4.2 Effects of the excise tax

**Result 1. Incidence:** *(a) In a continuing match, compensation falls by* $\mu\tau(V - \bar{w})/(1 + \tau)$*, increasing in the board's valuation and in the tax rate. (b) The proportional fall cannot exceed* $\log(1 + \tau) = 0.191$*.*

Part (a) follows directly from differencing (6). Part (b) follows from (7): since $K > 0$, the post-reform wage is bounded below by $w^{*0}/(1+\tau)$. The intuition is that Nash bargaining splits a surplus that the tax shrinks; the board can be made whole but no better, so the president cannot lose more than the tax takes.

**Result 2. Exit:** *Holding effort at its pre-tax allocation, the tax lowers the threshold outside option at which the match survives by* $\tau(V - \bar{w})/(1 + \tau)$*, and raises separations, as presidents leave due to their outside option now exceeding the threshold.*

Result 2 is a partial statement. The renewal index in (3) depends on effort, so the tax's full effect on separations includes the effort response characterised in Result 5. Keeping the two separate matters for interpretation: the separation rates I estimate are equilibrium objects that already embed both channels, whereas Result 2 isolates the direct effect of the tax on the retention margin.

**Result 3. Composition:** *Compensation measured at the institution falls by more than compensation measured within a continuing match, because presidents who leave are replaced by successors with lower outside options, who bargain to lower pay.*

Equilibrium pay is increasing in the outside option, $\partial w^*/\partial \bar{U} = 1 - \mu > 0$, and anyone who accepts the post has an outside option below the threshold that induced the incumbent to leave.

**Result 4. Treatment intensity:** *(a) Every margin, namely the compensation response, the shift in the retention threshold, and the change in the renewal rent, scales with the institution's distance above the threshold,* $V - \bar{w}$*, and vanishes at* $V = \bar{w}$*. (b) Holding* $K$ *fixed, the elasticity of the compensation response with respect to compensation is* $-\tau\rho/(1 + \tau\rho)$*, where* $\rho \equiv K/w^{*0}$*, and lies strictly between* 0 *and* $\tau/(1 + \tau) = 0.174$*.*

Part (a) states that the effect of the tax is zero at the threshold and grows with exposure, due to the design of the tax. Part (b) follows from (7) together with the observation that a president who accepts the post must value it at least as much as their outside option, so $K$ cannot exceed pay.

The elasticity in part (b) is a partial derivative holding $K$ fixed, and therefore describes variation in pre-reform compensation coming from the board's valuation $V$. Under Assumption 7, $K$ varies across institutions only through $\bar{U}$, so the gradient estimated across institutions recovers the elasticity in part (b).

**Result 5. Legible effort:** *Legible effort rises in levels, and the legible share of effort rises, if the sensitivity of renewal to performance increases proportionally more than the renewal rent falls.*

The president's first-order condition for legible effort is

$$e_o = \underbrace{\beta_o}_{\substack{\text{explicit} \\ \text{incentive}}} + \underbrace{\delta_r \, \alpha_o \, g(z) \, R}_{\text{renewal channel}} . \tag{8}$$

The tax cuts $R$, which weakens the renewal channel. But by Result 2 it also pushes the match toward the replacement margin, and since the board began on the flat upper tail of $G$, this raises $g$. The president's performance now matters more for whether they keep the job at the same time as the utility of remaining shrinks. Illegible effort cannot respond, by assumption. Exit and the increase in legible effort are therefore two consequences of a single shock, the fall in the board's net value of the incumbent.

Second, the model predicts the conditions under which a proportional increase in legible effort will happen. If If $\Delta e_o = \delta_r \, \alpha_o \Big[ g(z^1)R^1 - g(z^0)R^0 \Big]$, and writing $\Gamma$ for the ratio $g(z^1)R^1/g(z^0)R^0$, and $\chi$ for the share of pre-reform legible effort attributable to the renewal channel, the proportional response is

$$\frac{\Delta e_o}{e_o^0} = \chi \, (\Gamma - 1). \tag{9}$$

By Equation 9, legible effort will rise if $\Gamma > 1$, since $\chi > 0$. When this is satisfied, the share of legible effort will also rise, since the derivative of the share of legible effort with respect to total effort is positive.

In summary, this simple framework indicates that a tax on compensation above a fixed threshold operates on three margins at once, and that the three are not independent. The same shock that induces some presidents to leave raises the sensitivity of renewal for those who stay, and therefore their incentive to deliver on the tasks their board can observe. It also implies that what an institution appears to pay its president after such a reform reflects both renegotiation and replacement, and that these must be measured separately. Finally, it delivers two bounds on the size of the compensation response, one on its level and one on its elasticity with respect to exposure, that hold for any parameter values and that a response operating through channels other than incidence, such as avoidance, need not respect.

In my empirical exercise I evaluate the relevance of these mechanisms. I first estimate the compensation response for continuing matches, and compare both to the bounds implied by Results 1 and 4. Second, I estimate the effect on separations and test whether it scales with distance above the threshold. Third, I test whether presidents who remain increase legible output and its share, and whether the magnitude is consistent with the exit response through the channel described in Result 5.

# 5 Empirical strategy

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

$$y_{ist} = \sum_{t \neq 2017} \beta_t \times T_{st} \times I(t = t) + \gamma_s + \eta_t + e_{st} \tag{10}$$

where $y_{st}$ is the outcome for institution s in year t, $T_{ist}$ is an indicator variable for whether the institution was paying its president \$1M or more in 2017, $\gamma_s$ is an institution fixed effect, and $\eta_t$ is a year fixed effect. The coefficients of interest, $\beta_t$, 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, and cluster standard errors and the institution level to address temporal correlation issues.

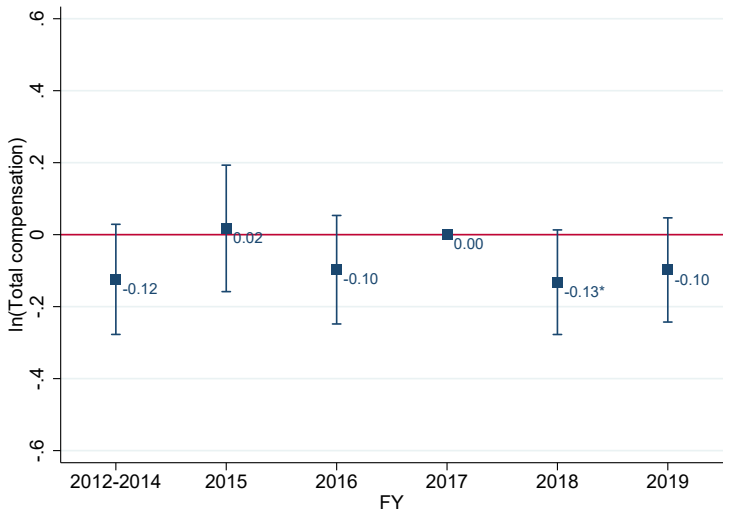
The key identifying assumption permitting a causal interpretation of the $\beta_t$ parameters is that the compensation of covered employees subject to the tax would have trended similarly to the compensation of other employees, absent the introduction of the excise tax. This assumption is likely to hold, 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.

# 6 Results

## 6.1 Presidential compensation

Figure 1 plots an event study of the introduction of the tax on log total compensation among presidents who remained in place after the introduction of the tax, relative to 2017, the year immediately preceding the tax's effective date. In the three years before treatment, estimates are small and statistically indistinguishable from zero, consistent with parallel pre-trends between treated and comparison institutions. Beginning in fiscal year 2018, compensation falls by 13 log points, and the decline persists into 2019 (-0.10, not significant but of similar magnitude). The pattern is consistent with Result 1(a): boards facing the new excise tax renegotiated presidential pay downward within continuing matches rather than absorbing the liability or letting it fall only on the separation mechanism. The magnitude is consistent with the $log(1 + \tau) = 0.191$ ceiling derived in the framework.

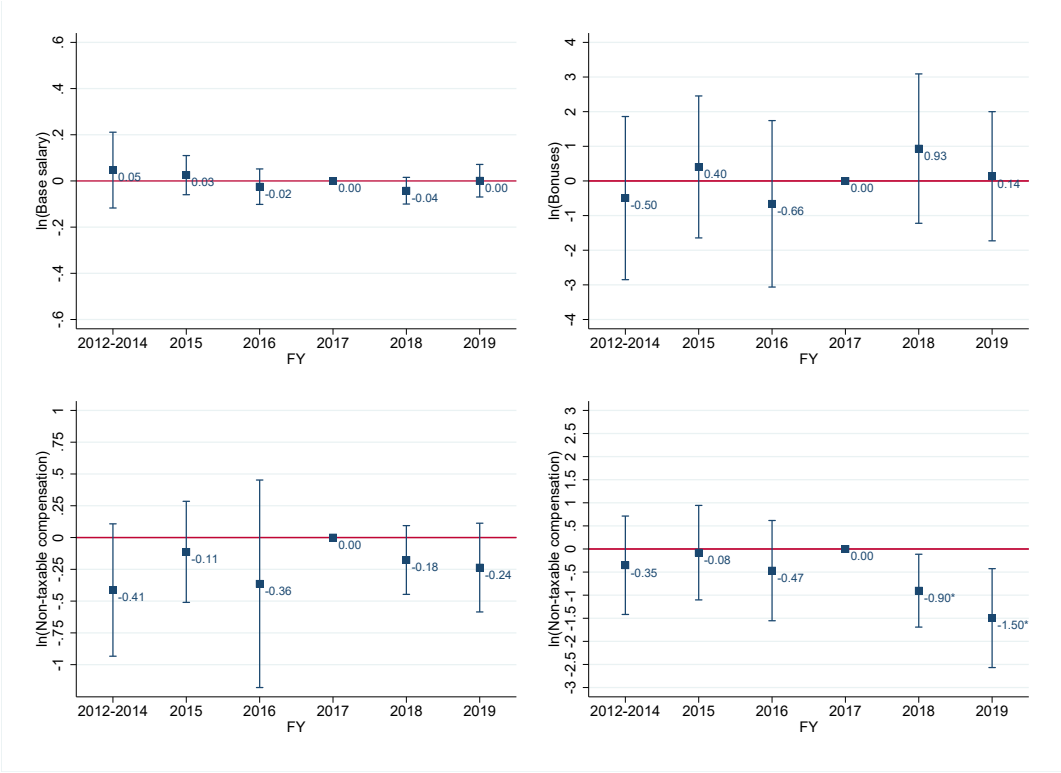
Figure 1: Effects of the TCJA on compensation




Notes: Regressions include institution and year fixed effects and institution-specific time trends. Standard errors are clustered at the institution level. Pre-treatment periods before 2014 are binned into a single coefficient.

Figure 2 plots an event study of the introduction of the tax on the components of compensation for presidents who remained in place after the introduction of the tax. Base salary is essentially flat across the entire panel, with pre-period estimates near zero (0.05, 0.03, -0.02) and similar post-period estimates (-0.04 in 2018, 0.00 in 2019), and none statistically significant. This result is consistent with Assumption 2: negotiated base pay is contractually rigid within the period, so it does not carry the incidence of the tax. Bonuses, conditional on remaining presidents receiving a bonus, move in both directions across years (-0.50, 0.40, -0.66 pre-period; 0.93, 0.14 post) with wide confidence intervals throughout. Non-taxable compensation shows a similar pattern, directionally negative but never significant. The effects of the tax on other compensation are significant: -0.90 log points in 2018 and -1.50 log points in 2019, implying respective declines of 60% and 88% with respect to their baseline. Together, these results on salary composition support Assumption 2: compensation adjustments did not run through the negotiated base salary but through the discretionary residual, and were specifically concentrated in other compensation specifically.

Figure 2: Effects of the TCJA on compensation by components

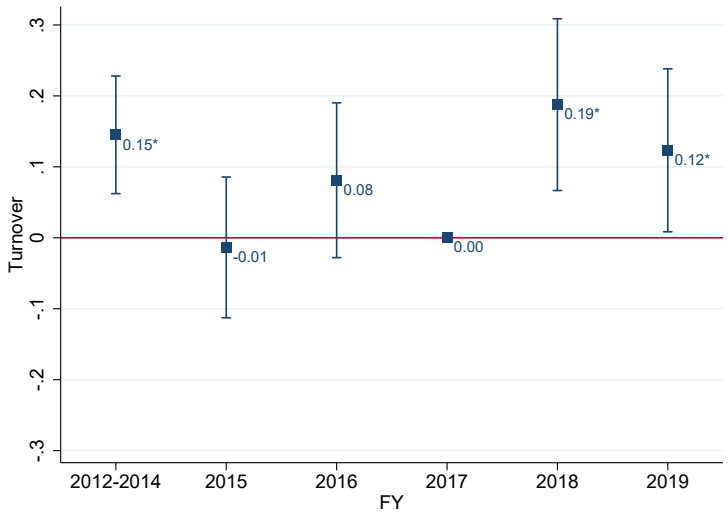



Notes: Regressions include institution and year fixed effects and institution-specific time trends. Standard errors are clustered at the institution level. Pre-treatment periods before 2014 are binned into a single coefficient.

## 6.2 Presidential exit

Figure 3 plots an event study of the introduction of the tax on presidential turnover (an indicator for a new president arriving) using the full sample, since turnover is zero by construction among presidents who stayed throughout. While there is a statistically significant coefficient for 2012-2014 due to binning, in the two years immediately preceding treatment, estimates are small and statistically insignificant (-0.01 in 2015, 0.08 in 2016), showing no differential pretrends in exit rates in the run-up to the reform. Following treatment, turnover rises significantly relative to 2017: presidents at treated institutions were 19 percentage points more likely to be replaced in 2018 and 12 percentage points more likely in 2019. This is consistent with Result 2: the tax lowered the effective retention threshold and increased exit, although it is not possible to identify the relative contributions of the presidential participation constraint and the board renewal margins.

Figure 3: Effects of the TCJA on turnover




Notes: Regressions include institution and year fixed effects and institution-specific time trends. Standard errors are clustered at the institution level. Pre-treatment periods before 2014 are binned into a single coefficient.

### 6.3 Compensation of entrants

Among presidents affected by the tax who departed after the tax took effect, average final compensation was $1,176,256. Excluding partial first years, their successors' average initial compensation was $574,725. A signed t-test of the incoming presidents' compensation being less than the departing presidents' compensation results is not statistically significant (p=0.996), while a t-test for a difference of means is statistically significant (p=0.0071). This successor discount is consistent with Result 3: incoming presidents typically bring weaker outside options than the incumbents they replace, so institutions can renegotiate to a substantially lower starting package at each transition.

### 6.4 Treatment intensity

Result 4 predicts that the compensation response to the tax should scale with a president's distance above the $1M threshold. For each compensation outcome $y_k$, I estimate two specifications separately:

$$y_{k,it} = \beta_k \left(\text{Treated}_i \times \text{Post}_t\right) + \alpha_i + \lambda_t + \varepsilon_{k,it} \tag{11}$$

$$y_{k,it} = \gamma_k \left(\log(\text{dist}_i) \times \text{Post}_t\right) + \alpha_i + \lambda_t + \varepsilon_{k,it} \tag{12}$$

where $y_{k,it}$ is log compensation component $k$ for institution $i$ in year $t$; $\text{Treated}_i = \mathbf{1}\{w_i^0 > \bar{w}\}$ indicates a 2017 presidential salary above the statutory \$1M threshold; $\text{dist}_i = w_i^0 - \bar{w}$ is the president's compensation in excess of the threshold; $\text{Post}_t$ indicates fiscal years 2018 and later; and $\alpha_i$, $\lambda_t$ are institution and year fixed effects. Standard errors are clustered at the institution level, and estimation is restricted to presidents who remained in place after the introduction of the tax.

Table 3 presents the results. Each cell reports $\beta_k$ or $\gamma_k$ from its own regression. The Threshold coefficient on total compensation is small and statistically indistinguishable from zero, the null jump the model predicts: because tax liability is continuous in its base, there is no reason to expect a discontinuity at \$1M.

The Exposure coefficient is negative and significant: the coefficient of -0.17 log points is equivalent to stating that, for each additional \$1.000 of tax liability, remaining presidents faced compensation declines of \$150.7, implying that presidents further above the threshold in 2017 saw significantly larger post-treatment declines, confirming Result 4(a). Base salary shows a marginally significant exposure effect, despite showing no effects in the pooled event-study estimates. By component, the effect is concentrated in other compensation, where both coefficients are large and significant ($-0.952$ and $-1.357$). This implies that other compensation is the component absorbing the adjustment, consistent with earlier results.

Table 3: heterogeneous effects of the tax by distance to the threshold

| | (1) Threshold Treated × Post | (2) Exposure log(dist) × Post |
|---|---|---|
| Total compensation | -0.046 | -0.171*** |
| | (0.040) | (0.062) |
| | [1234] | [1234] |
| Base salary | -0.039 | -0.091* |
| | (0.046) | (0.049) |
| | [1234] | [1234] |
| Bonuses | 0.801 | -0.987 |
| | (0.795) | (1.365) |
| | [1234] | [1234] |
| Nontaxable benefits | 0.056 | 0.234 |
| | (0.123) | (0.224) |
| | [1234] | [1234] |
| Other compensation | -0.952*** | -1.357** |
| | (0.343) | (0.599) |
| | [1234] | [1234] |
| Institution FE | Yes | Yes |
| Year FE | Yes | Yes |

Notes: each cell contains the individual coefficient of a regression of the components of compensation on the presidents' exposure to the tax and to the distance to the threshold, plus institution and year fixed effects, for the sample of presidents who remained matched with their institutions after 2017. Standard errors are clustered at the institution level. * p<0.1, ** p<0.05, *** p<0.01

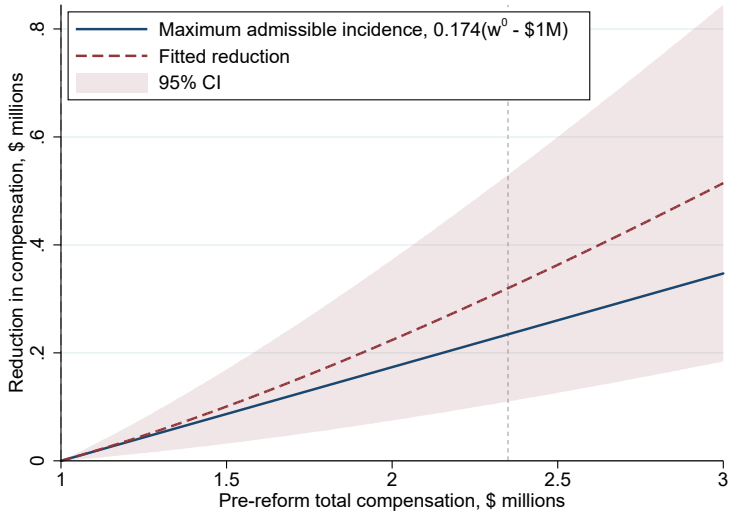
### 6.5 Elasticity with respect to initial compensation and incidence

Figure 4 tests the framework's central quantitative prediction, that the compensation response to the tax cannot exceed $\tau/(1+\tau) = 0.174$ log points per log dollar of pre-reform compensation. I use the estimates from Table 3 on log total compensation regressed on log pre-reform compensation, with an estimated gradient of $\hat{\gamma} = -0.171$ (SE = 0.061). A test against the theoretical ceiling of $-0.174$ fails to reject equality ($p = 0.97$): the estimated response is statistically equal to the theoretical maximum. In the model's own terms, a gradient this close to the ceiling implies $\rho = K/w^0$ is close to 1: the outside options of presidents earning well above the \$1M threshold are nearly as attractive as their realized pay, so boards retain very little bargaining leverage at the top

of this market, and the tax extracts close to the maximum share of compensation the framework allows.

I then contrast the linear prediction of the drop in presidential compensation with the predicted drop in compensation from the theoretical model. Figure 4 plots the linear prediction of the drop in compensation by 2017 compensation levels using the estimated coefficient of $\hat{\gamma} = -0.171$, along with its respective 95% confidence interval, alongside the theoretical ceiling on the drop in compensation. I find that the confidence intervals for the realized drop in compensation are consistent with the predictions of Result 1 across the distribution of 2017 compensation. [8]

Figure 4: Elasticity with respect to initial compensation




Estimated reduction in compensation among continuing matches, by pre-reform total compensation, with 95% confidence interval. The solid line is the maximum reduction consistent with bargaining incidence, $\tau/(1+\tau)$ per dollar of compensation above the threshold. Estimates come from a regression of log compensation on log pre-reform compensation interacted with the post-2018 indicator, with institution and year fixed effects, converted to dollars by the delta method. Vertical dashed lines mark the $1M threshold and the 90th percentile of pre-reform compensation among treated institutions.

Beyond the proportional decline in compensation documented in Result 1, I quantify how much of the tax's total liability was shifted onto presidents through the compensation channel. Restricting to keeper institutions and summing over fiscal years 2018 and 2019, aggregate §4960 tax liability

8. Because both curves are constructed to pass through zero at the threshold, they are closest near $w^0 = \$1M$ and separate as pre-reform compensation rises, even though the underlying coefficients are statistically identical. The ceiling is linear in dollars above the threshold, a constant marginal rate, while the fitted curve reflects a constant proportional (log-linear) effect that compounds into a growing dollar amount as $w^0$ increases; the two need not coincide in dollar terms away from the threshold even when their governing coefficients match exactly. The widening confidence interval reflects the same point from the sample-size side: there are few presidents earning $2.5–3M, so the estimate is least precise exactly where the two dollar curves diverge most. The vertical line in Figure 4 marks the 90th percentile of 2017 compensation among treated presidents ($2.3M), showing that most of the exposure mass sits well inside the region where the comparison is precise.

across these institutions is \$13.25M. Using the gradient estimated in Result 4(b) ($\hat{\gamma} = -0.171$), we compute each keeper president's implied dollar compensation loss in each post-treatment year, $w_i^0(1 - \exp(\hat{\gamma}))$, and sum across presidents and years to obtain an aggregate compensation loss of \$17M. The implied pass-through rate is 1.28 (SE = 0.59). [9] However, a test against a null of complete pass-through (a rate of 1) fails to reject ($p = 0.63$). As a conclusion, the estimated tax pass-through is statistically indistinguishable from full pass-through of the tax onto presidential compensation.

### 6.6 Effects on institutional budgets

After corroborating the model's predictions on compensation, I turn to its predictions on effort. Result 5 predicts that presidents facing a compensation cut reallocate attention toward activities where that effort is legible, that is, toward those outcomes where a marginal change in effort can be more easily detectable, instead of being canceled by noise. However, as effort itself is unobservable, I focus on financial outcomes as proxies for effort, due to college presidents' self report of their priorities and concerns. However, in order to test the model's predictions, it is necessary to define empirically which financial outcomes count as legible and illegible. I use the within-institution standard deviation of each revenue and expenditure line as a proxy for noise: items with a higher year-to-year variation within an institution are more likely to be driven by idiosyncratic factors outside the president's control, such as market conditions, lumpiness in funding, etc. Table 4 presents the within-institution standard deviation of each revenue and expenditure line for the pre-tax period, 2011 to 2016, when no systematic reallocation should yet be occurring.

Expenditures are considerably less noisy than revenues, and the gap is largest for the revenue lines a president might influence directly. The core expenditure categories, instructional (SD = 0.088), academic support (0.137), institutional support (0.126), and student services (0.111), along with total expenditure itself (0.081), all cluster in a narrow band. Public service (0.922), research (1.245), and net aid per capita (1.610) are the exception on the expenditure side and an order of magnitude noisier, possibly reflecting lumpy grant-funded activity and enrollment-driven aid formulas rather than year-to-year discretionary choices. On the revenue side, tuition revenue is nearly as stable as instructional expenditure (0.087), but tuition is set by enrollment and pricing decisions well in advance, not a lever a president moves within a fiscal year. The revenue lines closest to a president's own effort, fundraising, reflected in public and private gifts and grants (0.325 and 0.359), and endowment oversight, reflected in investment returns (0.602), are roughly four to seven times noisier than total expenditure. If presidents concentrate effort where it is most legible, these are precisely the outcomes where a reallocation signal would be hardest to detect, which is the empirical justification for looking at expenditure categories rather than revenue categories for the test that follows.

9. Standard errors are bootstrapped rather than delta-method, given the nonlinear transformation and the aggregation across presidents and years.

Table 4: within-institution standard deviation of budget items, 2011-2016

| Outcome | Within-institution SD | Obs. |
|---|---|---|
| ln(Total expenditures) | 0.081 | 881 |
| ln(Instructional expenditure) | 0.088 | 881 |
| ln(Academic support expenditure) | 0.137 | 881 |
| ln(Institutional support expenditure) | 0.126 | 881 |
| ln(Student services expenditure) | 0.111 | 881 |
| ln(Public services expenditure) | 0.922 | 881 |
| ln(Research expenditure) | 1.245 | 881 |
| ln(Net aid per capita) | 1.610 | 869 |
| ln(Total revenue) | 0.217 | 879 |
| ln(Tuition revenue) | 0.087 | 881 |
| ln(Public gifts and grants) | 0.325 | 881 |
| ln(Private gifts and grants) | 0.359 | 880 |
| ln(Investment returns) | 0.602 | 710 |

After establishing the legibility of different financial outcomes, I test the model's prediction that presidents reallocate effort toward the least noisy activities. As in the treatment-intensity table, we estimate two specifications separately for each budget line item $z_k$, academic support, research, instruction, institutional support, student services, public service, and net aid per capita:

$$z_{k,it} = \delta_k \left(\text{Treated}_i \times \text{Post}_t\right) + \alpha_i + \lambda_t + \varepsilon_{k,it} \tag{13}$$

$$z_{k,it} = \eta_k \left(\log(\text{dist}_i) \times \text{Post}_t\right) + \alpha_i + \lambda_t + \varepsilon_{k,it} \tag{14}$$

where $y_{k,it}$ is expenditure component $k$ for institution $i$ in year $t$; $\text{Treated}_i = \mathbf{1}\{w_i^0 > \bar{w}\}$ indicates a 2017 presidential salary above the statutory \$1M threshold; $\text{dist}_i = w_i^0 - \bar{w}$ is the president's compensation in excess of the threshold; $\text{Post}_t$ indicates fiscal years 2018 and later; and $\alpha_i$, $\lambda_t$ are institution and year fixed effects. Standard errors are clustered at the institution level, and estimation is restricted to presidents who remained in place after the introduction of the tax.

Table 5 presents the results. Each cell reports $\beta_k$ or $\gamma_k$ from its own regression. The effects line up with the noise ranking established in Table 4. Among the four low-noise expenditure categories identified there (within-institution SD at or below 0.14 in the pre-period: instruction, academic support, institutional support, and student services), three show significant increases at the threshold: academic support rises 12.9 log points ($\hat{\delta} = 0.129$, $p < 0.05$), institutional support 5.7 log points ($\hat{\delta} = 0.057$, $p < 0.05$), and student services 7.6 log points ($\hat{\delta} = 0.076$, $p < 0.05$). Instruction, the fourth low-noise category, shows no significant movement ($\hat{\delta} = 0.035$, SE $= 0.026$). [10] None of the three high-noise categories, public service, research, and net aid per capita (within-

10. This null is consistent with the model, since instruction is constrained by multi-year commitments, faculty lines, aid formulas, physical plant, and is unable to adjust within a contract's time window, which is the president's objective.

institution SD at or above 0.92), show a significant effect on either margin. The exposure coefficients are directionally consistent but do not reach significance for any category.

Table 5: effects of the tax on budget line items

| | Step at threshold | Slope in exposure | $N$ |
|---|---|---|---|
| ln(Academic support) | 0.129** | 0.053 | 1234 |
| | (0.058) | (0.071) | |
| ln(Research) | -0.202 | -0.347 | 1234 |
| | (0.198) | (0.222) | |
| ln(Instruction) | 0.035 | 0.039 | 1234 |
| | (0.026) | (0.030) | |
| ln(Institutional support) | 0.057** | 0.069 | 1234 |
| | (0.028) | (0.046) | |
| ln(Student services) | 0.076** | 0.140 | 1234 |
| | (0.031) | (0.094) | |
| ln(Public service) | -0.194 | -0.726 | 1234 |
| | (0.312) | (0.813) | |
| ln(Net aid per capita) | -0.097 | -0.528 | 1219 |
| | (0.435) | (0.530) | |

Notes: each cell contains the individual coefficient of a regression of the budget line item on the presidents' exposure to the tax and on the distance to the threshold, plus institution and year fixed effects, for the sample of presidents who remained matched with their institutions after 2017. Standard errors are clustered at the institution level. * p<0.1, ** p<0.05, *** p<0.01

### 6.7 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.

### 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 [11]. 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 [12]. Lastly, the pretrends in the event 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. Appendix Table A-1 presents the results of this approach. I find that pre-treatment coefficients are not jointly statistically significant at the 5% level for presidential turnover, total compensation, base salaries, bonuses, and non-taxable compensation, suggesting that the parallel trends assumption holds in this setting. Appendix Table A-2 presents the results of this approach for budget line items. I find that pre-treatment coefficients are not jointly statistically significant at the 5% level, suggesting that the parallel trends assumption also holds for budget outcomes.

### 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.

I report the breakdown value of $M$ - the largest value for which the treatment effect is still

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statistically significant - in Appendix Table A-3, for a 10% significance level. I find that the critical $M$ values are close to 0.15 for total compensation and 0.5 for other 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, 15% and 50% of the maximum pre-treatment violation of parallel trends. However, this test is not applicable when the estimated effect is null, as is the case for all other components of presidential compensation.

# 7 Conclusion

In this paper, I study the effect of the Tax Cuts and Jobs Act's Section 4960 excise tax on college and university presidential compensation. I develop a model in which a president and their governing board bargain over pay under a multi-task incentive structure, to explain how a compensation-based tax might affect not only the level of pay but also the allocation of presidential effort.

I find compensation decreases of 13% for treated presidents who remained in their position after the reform, as well as exit increases of 19%. I also find a dose-response effect on compensation of 17 log points per log dollar of pre-reform pay. The estimated elasticity of compensation with respect to pre-reform compensation is consistent across all compensation levels with the model-derived elasticity of 0.174. Finally, the 1.28 point estimate of tax pass-through is statistically indistinguishable from complete pass-through of the tax onto presidential compensation for staying presidents.

Turning to effort, I find that legible effort rises. Among the four expenditure categories identified as precisely measured in the pre-tax period, academic support, institutional support, and student services rise significantly (12.9, 5.7, and 7.6 log points, respectively). None of the noisily measured categories, public service, research, or net aid per capita, show a significant effect, consistent with effort being redirected toward outcomes a board can observe and reward rather than toward unreliably measured outcomes.

As a back-of-the-envelope calculation of the welfare consequences of this reallocation, the mean treated institution spent \$157M on academic support and \$82M on student services, and enrolled 15,000 students. My estimates imply that average annual expenditure in these two lines rose by \$20M and \$5.75M, respectively, as a response to a mean tax liability of \$153.000. Using Webber and Ehrenberg's (2010) estimate that an additional \$100 in academic support spending per student raises the probability of graduation by 0.11 percentage points for high-SAT students, and that an additional \$100 in student services spending has an equivalent effect, I estimate that this reallocation implies a 1.9 percentage point increase in the graduation rate, at an implied cost of \$365,000 per additional graduate.

These results point to a broader area for future research: the incentives facing institutional management in education. My estimates imply that compensation incentives targeted narrowly at a single individual, the president, are able to shift institutional spending meaningfully, as a result of institutional governance structures and the bargaining process between the president and the

board. These findings open avenues for further research on how boards are constituted and their institutional monitoring processes, as well as decision-making within university leadership teams, including the responses of vice presidents and other high-ranking officials to similar incentives.

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# 8 Appendix A - derivations for the conceptual framework

This appendix collects the derivations underlying Results 1 to 5. Notation and assumptions follow Section 4. Throughout, superscript 0 denotes the pre-reform value ($\tau = 0$, $\kappa = 1$) and superscript 1 the post-reform value.

## 8.1 The bargaining solution

The board's surplus from the match is $V + \tau\bar{w} - \kappa w$ and the president's is $w - \bar{U}$, so the Nash problem is

$$\max_{w} \; \left[V + \tau\bar{w} - \kappa w\right]^{1-\mu} \left[w - \bar{U}\right]^{\mu}. \tag{15}$$

Taking logs and differentiating,

$$-\frac{\kappa(1-\mu)}{V + \tau\bar{w} - \kappa w} + \frac{\mu}{w - \bar{U}} = 0 \implies \mu\big(V + \tau\bar{w}\big) + \kappa(1-\mu)\bar{U} = \kappa w, \tag{16}$$

which gives (6). The objective is strictly concave in $w$ on the interval $\big(\bar{U}, (V + \tau\bar{w})/\kappa\big)$, which is non-empty precisely when $\bar{U} < (V + \tau\bar{w})/\kappa$, so (6) is the unique interior maximum. The renewal rent follows as

$$R = w^* - \bar{U} = (1-\mu)\bar{U} + \frac{\mu(V + \tau\bar{w})}{\kappa} - \bar{U} = \mu\left[\frac{V + \tau\bar{w}}{\kappa} - \bar{U}\right]. \tag{17}$$

Setting $\tau = 0$ gives $w^{*0} = (1-\mu)\bar{U} + \mu V$ and $R^0 = \mu(V - \bar{U})$.

To obtain (7), multiply $w^{*1}$ by $\kappa = 1 + \tau$ and regroup:

$$\begin{aligned}(1+\tau)w^{*1} &= (1+\tau)(1-\mu)\bar{U} + \mu V + \mu\tau\bar{w} \\ &= \underbrace{\left[(1-\mu)\bar{U} + \mu V\right]}_{w^{*0}} + \tau\,\underbrace{\left[(1-\mu)\bar{U} + \mu\bar{w}\right]}_{K}.\end{aligned} \tag{18}$$

Two features are used repeatedly below. First, $V$ appears in (18) only through $w^{*0}$, so conditional on observed pre-reform compensation the response depends on no further unobservable except $K$. Second, $K$ is a convex combination of $\bar{U}$ and $\bar{w}$ with weights $1-\mu$ and $\mu$, and therefore satisfies $\min\{\bar{U}, \bar{w}\} \le K \le \max\{\bar{U}, \bar{w}\}$.

## 8.2 Proof of Result 1

*Part (a).* Differencing (6) between $\kappa = 1$ and $\kappa = 1 + \tau$,

$$\Delta w^* = \mu\left[\frac{V + \tau\bar{w}}{1+\tau} - V\right] = \mu\,\frac{V + \tau\bar{w} - (1+\tau)V}{1+\tau} = -\,\frac{\mu\tau(V - \bar{w})}{1+\tau} < 0, \tag{19}$$

which is increasing in magnitude in $V$ and in $\tau$, since $\mathrm{d}[\tau/(1+\tau)]/\mathrm{d}\tau = (1+\tau)^{-2} > 0$, and also in $\mu$, which is common across presidents by Assumption 7.

*Part (b).* From (18),

$$\Delta \log w^* = \log\left(1 + \frac{\tau K}{w^{*0}}\right) - \log(1+\tau). \tag{20}$$

Since $\bar{U} \geq 0$ and $\bar{w} > 0$ we have $K > 0$, hence the first term is strictly positive and

$$\Delta \log w^* > -\log(1+\tau) = -0.191, \tag{21}$$

with the bound approached as $K/w^{*0} \to 0$. Equivalently, $w^{*1} \geq w^{*0}/(1+\tau)$: the board's total cost cannot fall below its pre-reform level, so the president cannot bear more than the full tax liability. □

### 8.3 Proof of Result 2

Throughout this proof effort is held at its pre-reform allocation, so that the renewal index moves only through the board's surplus. The effort response is characterised separately in Appendix 8.6.

*Participation margin.* A non-empty bargaining set requires $R \geq 0$, which by (17) holds if and only if

$$\bar{U} \leq T(\tau) \equiv \frac{V + \tau\bar{w}}{1+\tau}. \tag{22}$$

Note that this is the condition for gains from trade to exist, not a participation constraint in the usual sense: given a non-empty bargaining set, Nash bargaining delivers $w^* > \bar{U}$ automatically. Pre-reform $T(0) = V$, so the threshold falls by

$$T(0) - T(\tau) = V - \frac{V + \tau\bar{w}}{1+\tau} = \frac{\tau(V - \bar{w})}{1+\tau} > 0, \tag{23}$$

and differentiating, $T'(\tau) = -(V-\bar{w})/(1+\tau)^2 < 0$. With $\bar{U} \sim F$,

$$\frac{\mathrm{d}\Pr[\text{exit}]}{\mathrm{d}\tau} = -f\big(T(\tau)\big)\,T'(\tau) = f\big(T(\tau)\big)\,\frac{V-\bar{w}}{(1+\tau)^2} > 0. \tag{24}$$

Integrating over the interval, the mass of types induced to separate is $F\big(T(0)\big) - F\big(T(\tau)\big)$, which to first order is $f\big(T(0)\big)\,\tau(V-\bar{w})/(1+\tau)$ and is therefore increasing in exposure.

*Renewal margin.* Evaluating the board's payoff at $w^*$, its per-period surplus is its Nash share,

$$S_B = V + \tau\bar{w} - \kappa w^* = (1-\mu)\Big[\big(V + \tau\bar{w}\big) - \kappa\bar{U}\Big]. \tag{25}$$

Hence

$$\Delta S_B = (1-\mu)\,\tau\,(\bar{w} - \bar{U}) < 0 \tag{26}$$

under Assumption 5. By (3) and $\zeta' > 0$ the renewal index falls, so $\pi = G(z)$ falls and non-renewals rise. □

*Remark.* The participation channel (23) scales with $V - \bar{w}$; the renewal channel (26) scales with $\bar{U} - \bar{w}$. Only the former is a function of exposure. Note also that (26) reverses sign if $\bar{U} < \bar{w}$:

because compensation up to $\bar{w}$ is exempt, a tax of this form can leave the board better off in a match with a president whose outside option lies below the threshold. Assumption 5 rules this case out.

### 8.4 Proof of Result 3

From (6), $\partial w^*/\partial \bar{U} = 1 - \mu > 0$. By (22) an incumbent separates when $\bar{U}$ exceeds $T(\tau)$, while any successor who accepts the post satisfies $\bar{U} \leq T(\tau)$. A successor therefore has strictly lower $\bar{U}$ than the incumbent replaced, and by Assumption 7 bargains with the same weight, so her pay is lower by $(1-\mu)\big(\bar{U}_{\text{inc}} - \bar{U}_{\text{suc}}\big)$. Institution-level compensation is the pay of whoever occupies the office, so writing $\lambda$ for the fraction of institutions experiencing a separation,

$$\Delta w^*_{\text{inst}} = \Delta w^* - \lambda(1-\mu)\,\mathbb{E}\big[\bar{U}_{\text{inc}} - \bar{U}_{\text{suc}}\big] < \Delta w^* < 0 \tag{27}$$

whenever $\lambda > 0$. □

### 8.5 Proof of Result 4

*Part (a).* By (19) the wage response is $-\mu\tau X/(1+\tau)$ with $X \equiv V - \bar{w}$; by (23) the threshold shift is $\tau X/(1+\tau)$; and by (17) the rent change inherits the same factor. All three are linear in $X$ and vanish at $X = 0$.

*Part (b).* Write $L = \log w^{*0}$, so $w^{*0} = e^L$. Differentiating (20) with respect to $L$, holding $K$ and hence $\bar{U}$, $\mu$ and $\bar{w}$ fixed,

$$\frac{\mathrm{d}\,\Delta \log w^*}{\mathrm{d}L} = \frac{-\tau K e^{-L}}{1+\tau K e^{-L}} = -\frac{\tau K}{w^{*0}+\tau K} = -\frac{\tau\rho}{1+\tau\rho}, \qquad \rho \equiv \frac{K}{w^{*0}}. \tag{28}$$

Since $K$ is held fixed, (28) describes variation in $w^{*0}$ arising from the board's valuation $V$ alone. The gradient depends on $K$ and $w^{*0}$ only through their ratio. Consider a common rescaling $(\bar{U}, \bar{w}, w^{*0}) \mapsto (\vartheta\bar{U}, \vartheta\bar{w}, \vartheta w^{*0})$ for $\vartheta > 0$, as when the framework is restated in lifetime present values. Then $K \mapsto \vartheta K$ by (18), so $\rho$ and hence (28) are unchanged.

By Assumption 5, participation gives $\bar{U} \leq w^{*0}$, and by Assumption 6, $\bar{w} < w^{*0}$. Since $K$ is a convex combination of two quantities each no greater than $w^{*0}$, we have $K < w^{*0}$ and hence $\rho < 1$. As $\tau\rho/(1+\tau\rho)$ is increasing in $\rho$,

$$\left|\frac{\mathrm{d}\,\Delta \log w^*}{\mathrm{d}L}\right| < \frac{\tau}{1+\tau} = 0.174. \quad \square \tag{29}$$

*Remark on curvature.* The gradient magnitude is decreasing in $w^{*0}$: steepest just above the threshold, flattening thereafter. A linear specification fitted over a right-skewed distribution of exposure therefore recovers an average within that range, so functional form pulls estimates toward the framework rather than away from it.

*Remark on the required magnitude.* Inverting (28), an estimated elasticity of magnitude $\gamma$ implies $\rho = \gamma/\big[\tau(1-\gamma)\big]$. An elasticity of 0.174 requires $\rho = 1$, and any larger elasticity requires $\rho > 1$, that is, an outside option exceeding current compensation, which is inconsistent with Assumption 5 and hence with the president being observed in post.

### 8.6 Proof of Result 5

Under Assumption 4 the president chooses $e_o$ taking $e_h = \bar{e}_h$ as given. Her certainty equivalent is

$$CE(e_o) = s_b + s_d + \beta_o e_o - \tfrac{r}{2}\beta_o^2\sigma_o^2 - \tfrac{1}{2}\big(e_o^2 + \bar{e}_h^2\big) + \delta_r\, G\big(z(e_o)\big)\, R, \tag{30}$$

with $z(e_o) = \zeta(S_B) + \alpha_o e_o + \alpha_h \bar{e}_h$. Note that $\mathbb{E}[w] = s_b + s_d + \beta_o e_o$, so the incentive payment enters once. Under Assumption 2 the risk premium $\frac{r}{2}\beta_o^2\sigma_o^2$ is a constant and is absorbed into $\bar{U}$. Differentiating gives (8), and differentiating again,

$$\frac{\partial^2 CE}{\partial e_o^2} = -1 + \delta_r\, \alpha_o^2\, g'\big(z(e_o)\big)\, R. \tag{31}$$

By Assumption 3 the renewal index lies above the mode of $G$, where $g$ is decreasing, so $g'(z) < 0$ and (31) is strictly below $-1$. The objective is therefore strictly concave and the solution to (8) is the unique global maximum, with no separate second-order condition required.

Differencing (8),

$$\Delta e_o = \delta_r\, \alpha_o \Big[g(z^1)R^1 - g(z^0)R^0\Big], \qquad \Delta e_h = 0, \tag{32}$$

so $\Delta e_o > 0$ if and only if $g(z^1)R^1 > g(z^0)R^0$. Writing

$$\Gamma \equiv \frac{g(z^1)R^1}{g(z^0)R^0}, \qquad \chi \equiv \frac{\delta_r\, \alpha_o\, g(z^0)R^0}{e_o^0} \in (0,1), \tag{33}$$

where $\chi$ is the renewal channel's share of pre-reform legible effort and $\chi < 1$ follows from (8) and $\beta_o > 0$, the proportional response is (9). By (26) the index $z$ falls; by Assumption 3 both $z^0$ and $z^1$ lie above the mode of $G$, so $g$ is decreasing over the interval between them and $g(z^1) > g(z^0)$. By (17), $R$ is decreasing in $\kappa$, so $R^1 < R^0$. The two forces oppose, and $\Gamma > 1$ is the stated condition. Since $e_h$ is fixed and $e_o$ rises, the legible share satisfies

$$\frac{\partial}{\partial e_o}\left(\frac{e_o}{e_o + \bar{e}_h}\right) = \frac{\bar{e}_h}{(e_o + \bar{e}_h)^2} > 0, \tag{34}$$

so it rises whenever $\Delta e_o > 0$. □

## Appendix B - Tables and figures

Table A-1: pre-trends test, joint test that all pre-treatment coefficients equal 0

| Outcome | p-value, joint test of leads = 0 |
|---|---|
| ln(Total compensation) | 0.086 |
| ln(Base salary) | 0.670 |
| ln(Bonuses) | 0.776 |
| ln(Non-taxable compensation) | 0.362 |
| ln(Other compensation) | 0.773 |

Notes: each cell contains the p-value of a joint test of all leads of an event study of the outcome on the introduction of the tax, including institution and year fixed effects, for the sample of presidents who remained matched with their institutions after 2017. Standard errors are clustered at the institution level. * p<0.1, ** p<0.05, *** p<0.01

Table A-2: pre-trends test, joint test that all pre-treatment coefficients equal 0

| Outcome | p-value, joint test of leads = 0 |
|---|---|
| ln(Academic support) | 0.463 |
| ln(Research) | 0.483 |
| ln(Instruction) | 0.367 |
| ln(Institutional support) | 0.071 |
| ln(Student services) | 0.615 |
| ln(Public service) | 0.113 |
| ln(Net aid per capita) | 0.698 |

Notes: each cell contains the p-value of a joint test of all leads of an event study of the outcome on the introduction of the tax including institution and year fixed effects. Standard errors are clustered at the institution level. * p<0.1, ** p<0.05, *** p<0.01

Table A-3: Rambachan and Roth (2023) sensitivity analysis for parallel trend violations

| Outcome | Breakdown $\bar{M}$ |
|---|---|
| ln(Total compensation) | 0.15 |
| ln(Base salary) | N/A |
| ln(Bonuses) | N/A |
| ln(Non-taxable compensation) | N/A |
| ln(Other compensation) | 0.50 |

Notes: each cell contains the critical value of the Rambachan and Roth (2023) sensitivity analysis for parallel trend violations, for an event study of the outcome on the introduction of the tax including institution and year fixed effects. When the estimates are not statistically significant, the critical value is not applicable.