Financial Disclosure by Contractors and Government Funding Allocation: Evidence from U.S. Research Universities*

Zhenghai CHI†

January 2026

ABSTRACT

Using the implementation of Governmental Accounting Standards Board Statements No. 34 and 35 (GASB 34/35) across U.S. public institutions and colleges, I examine how mandatory financial disclosure by contractors affects federal agencies' funding allocation. I find that GASB 34/35 adoption leads to a decline in federal grants to public research universities relative to private ones. I provide evidence that monitoring and private information signaling are likely the underlying mechanisms. Specifically, after GASB 34/35, reductions in federal grants are larger for public universities with greater organizational complexity, and federal grant allocations become more responsive to prior private funding signals. Despite this reduction, research output improves, as measured by patents and publications per million dollars of research expenditure. I further document spillover effects of changes in federal funding on other university stakeholders. Overall, the findings show that financial disclosure regulation has real effects on government investment decisions in public procurement, with downstream implications in the higher education sector.

Keywords: Public Procurement; Higher Education; Governmental Accounting Standards; Not-for-profits Organization
JEL Classification Codes: D61, G38, H52, H57, M41, M48

---

* All errors are my own. This article benefited from language polishing assistance using ChatGPT. All ideas, data collection, empirical analysis, and conclusions are solely mine.
† Department of Accounting, NUS Business School, National University of Singapore. Email: zhenghai.chi@u.nus.edu.

1. Introduction

In the public sector, governments procure public goods for society, such as national defense, healthcare, and education. However, misallocation arising from information asymmetry is particularly severe in this setting, as the market mechanism works poorly under monopoly or oligopoly (Tirole, 1984) and governments cannot fully observe contractors' costs, effort, or quality (Laffont and Tirole, 1993). As a result, disclosure mandates are often viewed as a policy tool for mitigating information frictions by informing principals and facilitating monitoring of agents (e.g., Akerlof, 1970; Holmström, 1979; Laffont and Tirole, 1986; Stiglitz, 2000). Yet whether such transparency improves the allocation of government resources remains theoretically unclear and empirically unresolved. Transparency may fail to translate into real effects when government actions generate dispersed externalities, as interested parties face limited ability to coordinate for Coasian bargaining (e.g., Coase, 1960; Dranove et al., 2003; Weil et al., 2013; Bonetti et al., 2023). In the context of Governmental Accounting Standards Board Statements No. 34 and 35 (hereafter, GASB 34/35) across U.S. public colleges, I examine whether and how mandatory financial disclosure by contractors affects federal agencies' funding allocation.

Public procurement is among the largest components of government spending. In the U.S., federal, state, and local governments collectively spend more than $2 trillion per year on contracts for goods and services, representing roughly 10-12% of GDP (CLJE, 2024; OECD, 2025). However, numerous government audits and reports warn that the public sector routinely suffers from waste, fraud, and inefficiency, much of which is attributed to inadequate transparency or limited visibility into contractors' financial and operational positions. OECD estimates that up to 10-30% of public procurement value may be lost due to opacity, corruption, or poor contract management (OECD, 2025). These concerns are echoed by the U.S. Government Accountability Office (GAO):

> *"Waste occurs when individuals or organizations expend government resources carelessly, extravagantly, or without adequate purpose. ... Wasteful spending reduces the efficiency and effectiveness of a wide range of federal programs and operations. Many examples of waste have been identified that relate to government purchases ... Waste can cost the federal government billions of taxpayer dollars due to mismanagement of assets, not following policies and statutes, or inadequate oversight procedures."*
> *(GAO, 2024)*

The misallocation and inefficiency are widely viewed as arising largely from information asymmetries between principals (e.g., governments) and agents (e.g., contractors). Such information frictions weaken the principal's capacity to access reliable information and monitor agents. For this, as Laffont and Tirole (1986) suggested, *"the use of accounting data in regulatory or procurement contracts"* can mitigate these informational problems. Relatedly, the fundamental theory (e.g., Verrecchia, 1983; Dye, 1985; Verrecchia, 2001; Lambert, 2001; Healy and Palepu, 2001) indicates that disclosure can alleviate both moral hazard and adverse selection in the principal-agent relationship. Against this backdrop, it is essential to evaluate the overall desirability, economic efficiency, and aggregate outcomes of disclosure regulation (Leuz and Wysocki, 2008). A key consideration is whether low-cost financial disclosure mandates can improve allocative efficiency of substantial government funding, which remains unclear in both theory and practice.

The implementation of GASB 34/35 for Institutions of Higher Education (IHEs) provides a unique setting to examine how mandatory financial disclosure affects federal funding allocation within the public sector. The government investment in IHEs constitutes an important component of public procurement in the U.S. Through funding research universities, the federal government purchases scientific knowledge, technological innovation, and human capital that benefit the entire society. However, at the same time, universities are highly complex organizations whose research activities are difficult to monitor, making government funding decisions particularly susceptible to information asymmetries regarding costs, effort, and quality (e.g., Dong et al., 2025). Existing evidence has pointed to widespread opportunistic behavior in the use of federal funds. Both individual researchers and universities have incentives to seek higher federal reimbursements, as gaps in expenditure must otherwise be covered with their own resources (e.g., Lichtenberg, 1992; Rogerson, 1992a; Thomas and Tung, 1992; Jenny, 1996). Consistent with this incentive, federal audits and enforcement actions have documented repeated cases of overcharging at U.S. universities, resulting in expensive penalties and settlements (e.g., U.S. Department of Justice, 2020; Office of Inspector General, 2021).

GASB 34/35 mandated a transition from limited fund-based reporting (AICPA, 1973) to more comprehensive, entity-wide financial statements (GASB 34, 1999; GASB 35, 1999), substantially expanding the availability and transparency of financial information for public colleges and universities. Prior to GASB 34/35, public institutions disclosed only fragmented financial information, while private institutions had already adopted more transparent FASB reporting standards (FASB, 1995). Beginning in academic year 2001, GASB 34/35 was phased in across all public colleges and universities. These cross-sectoral differences in disclosure regimes between public and private institutions generate a regulatory shock to examine how mandatory financial disclosure by contractors affects federal funding allocation. This setting naturally gives rise to two related empirical questions. First, does mandatory financial disclosure affect the level of federal funding allocated to universities? Second, conditional on such effects, what are the associated economic consequences?

Mandatory financial disclosure by universities can affect the allocation of federal funding through two mechanisms: enhanced monitoring and private information signaling. Under the monitoring channel, expanded financial disclosure improves transparency over universities' costs, operations, and financial positions, thereby strengthening oversight by governments, regulators, media, and other stakeholders. A large literature in accounting and public economics shows that information asymmetry in public procurement allows agents to engage in opportunistic behavior, such as cost manipulation and rent extraction, leading to inefficient transfers (e.g., Williamson, 1971; Rogerson, 1992b; Laffont and Tirole, 1993; Bajari et al., 2014). By improving the information environment, mandatory disclosure can constrain such behavior and reduce information rents. As a result, governments may revise funding decisions for institutions that previously benefited from opacity-driven overpayments, leading to lower federal funding following the disclosure mandate.

Additionally, disclosure may also influence funding allocation through a private information signaling channel. When financial information becomes publicly available, dispersed interested parties can combine disclosure with their private knowledge and reveal information through observable actions (e.g., private donations or other forms of non-federal support), making efficient resource allocation (Hayek, 1945; Grossman and Stiglitz, 1980). Prior research shows that decision-makers can learn from such actions and update beliefs in investment and regulatory settings (e.g., Edmans et al., 2015; Zuo, 2016; Kang et al., 2021; Goldstein, 2023). In this context, federal agencies may infer information about universities from private responses to disclosure and place greater weight on these externally revealed signals when mapping information into subsequent funding decisions.

Notwithstanding, these mechanisms may not translate into meaningful changes in public funding in practice. First, financial disclosures may convey only fragmented or indirect information about procurement activities, and the resulting information could be complex and costly to process, limiting its usefulness for monitoring (Bloomfield, 2002; Hirshleifer and Teoh, 2003; Blankespoor et al., 2020). Second, private responses to disclosure may be noisy or driven by non-informational motives (e.g., political ideology or social preferences), weakening their value as signals for funding decisions (Bénabou and Tirole, 2006; DellaVigna et al., 2012). Finally, when disclosure targets government actions with dispersed externalities, the benefits of improved information accrue broadly to society, while the costs of coordination and oversight are borne privately by a limited set of actors. This misalignment makes Coasian bargaining difficult to achieve, and collective action and free-rider problems may prevent improved information from being translated into coordinated oversight or policy responses (Coase, 1960; Dranove et al., 2003; Weil et al., 2013; Bonetti et al., 2023). As a result, the net effects of mandatory financial disclosure on federal funding allocation are theoretically ambiguous and ultimately hinge on empirical evidence.

I begin by examining whether the implementation of GASB 34/35 affects the level of federal research grants received by public universities. Using difference-in-differences (DiD) design, I find that, relative to private universities, public institutions experience a significant decline in federal grants following the disclosure mandate. Specifically, on average, federal grants decline by 7.9-16.4% in public universities across model specifications after GASB 34/35 adoption. I next explore the mechanisms underlying this decline. The evidence is consistent with two channels. First, under the monitoring mechanism, the reduction in federal funding is more pronounced for public universities with greater ex-ante organizational complexity, such as institutions operating multiple campuses or offering a broader range of academic programs. Second, consistent with a private information signaling channel, federal funding allocations become more responsive to prior private donations and state grants following GASB 34/35, suggesting that federal agencies place greater weight on externally revealed signals when mapping information into subsequent funding decisions.

The second set of findings documents related downstream economic consequences of GASB

34/35 adoption. Despite the reduction in federal grants, public universities exhibit improved research output following the disclosure mandate. Conditional on research expenditures, GASB 34/35 adoption is associated with higher research output: public universities experience larger increases in patent applications and grants per million dollars of research expenditure, as well as in publications per million dollars of research expenditure, relative to private universities. I further examine whether changes in federal funding are associated with shifts in the composition of federal support within universities. While federal grants decline, federal resources are increasingly directed toward student-oriented programs. Relative to private universities, public institutions receive higher levels of federal student grants and loans following GASB 34/35 adoption. These patterns are consistent with a shift in the composition of federal support across different activities within universities. Finally, I also find spillover effects on faculty labor outcomes. Average faculty compensation declines across all ranks following GASB 34/35 adoption, while faculty mobility remains unchanged, suggesting that adjustments in faculty labor market occur primarily along compensation margins rather than employment.

To attribute main results to the financial disclosure mandate requires that the DiD identifying assumptions plausibly hold. I conduct a series of robustness tests to address the general concerns. First, I confirm the absence of diverging trends before GASB 34/35 adoption to gauge the plausibility of parallel trends assumption, which ensures the internal validity of the causal inference. Second, to assess the sensitivity of the results to potential violations of parallel trends post-treatment, I test on Honest DiD approach (Rambachan and Roth, 2023). Allowing for limited deviations from parallel trends in the post-treatment counterfactual, the estimated effects remain significant over a wide range of assumptions. Third, I examine whether the results are driven by problematic comparisons arising from staggered treatment timing. Using the Goodman-Bacon decomposition (Goodman-Bacon, 2021), I show that the estimated effect is primarily driven by comparisons between public and private universities, with negligible effects from comparisons across treated units. Fourth, I assess the sensitivity of the results to omitted variable bias using the Oster test (Oster, 2019). The estimates indicate that unobservable factors would need to be implausibly strong and in the opposite direction to overturn the main findings, suggesting that omitted variables are unlikely to drive the results. Finally, to further mitigate concerns related to staggered treatment timing (Baker et al., 2022), I restrict the sample to universities adopting GASB 34/35 in the first implementation phase. The results remain qualitatively identical and quantitatively similar, reinforcing the robustness of the main results.

This paper mainly contributes to three streams of literature. First, this research feeds into the scanty literature in public economics and accounting examining the impact of transparency on government procurement. Several studies document how publicization of procurement information affects bidder participation and contract execution (e.g., Coviello and Mariniello, 2014; Lewis-Faupel et al., 2016; Duguay et al., 2023; Nathan, 2024; He et al., 2024). Overall, most evidence suggests that publicizing procurement information strengthens oversight, leading to more competitive award procedures and better contract execution. At the same time, some research emphasizes potential downsides of transparency: Duguay et al. (2023) show that increased transparency can induce rigidity in procurement processes by limiting officials' ability to use private information, and He et al. (2024) document that heightened transparency can impose proprietary costs on contractors. This paper extends the existing literature in two ways. First, this study shifts the focus from the publicization of procurement information to the transparency of contractors' financial information, and examines its effects on government procurement decisions. Second, whereas the existing literature focuses on intermediate procurement outcomes (e.g., contract renegotiations, and cost overruns), this study provides evidence on the real economic consequences of government procurement by examining how transparency-induced changes in federal funding translate into innovation and scientific production.

Second, this study adds to the literature on the real effects of disclosure regulation in both economics and accounting. Prior accounting research documents that disclosure regulation has real effects on corporate actions, including investment (e.g., Biddle et al., 2009), workplace safety (e.g., Christensen et al., 2017), natural-resources extraction (e.g., Rauter, 2020), poverty alleviation (e.g., Lu et al., 2025), and toxic emissions (e.g., Jing et al., 2025). Related work in microeconomics also shows that disclosure can generate economic externalities in settings such as healthcare and environment (e.g., Dranove et al., 2003; Greenstone et al., 2023; Bonetti et al., 2025). In contrast to this line of literature, this study provides evidence that financial disclosure regulation has real effects on how federal agencies allocate funding within the higher education sector. After the disclosure mandate, affected universities exhibit systematic changes in federal funding patterns: federal research funding declines while research production efficiency improves, and federal support is directed to student-oriented programs such as student grants and loans. Dong et al. (2025) is the most closely related study to mine but focuses on the real effects of cost management standards in higher education, rather than disclosure regulation.

Third, this study directly contributes to the literature on the effects of GASB accounting practices. Prior research has documented consequences of GASB standards for public pension (e.g., Naughton et al., 2015; Anantharaman and Chuk, 2024; Fan, 2025), municipal financing and debt markets (e.g., Marks and Raman, 1988; Plummer et al., 2007; Baber and Gore, 2008; Davies et al., 2017; Baber et al., 2024; Cuny and Dube, 2025), and a broader set of local socioeconomic and administrative outcomes, including labor markets (Naughton et al., 2015; Dambra et al., 2023), infrastructure maintenance (McDonough and Yan, 2024), and housing markets (Fan, 2025). This study differs from the existing literature in two respects. First, this study provides novel evidence on the effects of GASB disclosure mandates within the higher education sector, documenting disclosure-driven consequences for universities and downstream stakeholders, such as faculty and students. Second, more importantly, whereas prior studies primarily examine how external non-government stakeholders (e.g., investors, creditors, or labor unions) use GASB-based information, this study reveals how governments themselves learn from and respond to GASB disclosures. Specifically, my findings suggest that the federal government leverages GASB-mandated financial information when allocating federal funds to universities. More broadly, this highlights that GASB information flows not only from public institutions to external users, but also within the public sector hierarchy, shaping inter-governmental decision-making.

Lastly, this study offers policy insights into public procurement, particularly in the higher education sector. Unlike transactions in capital markets, public procurement often targets public goods characterized by high uncertainty, long horizons, and broader social welfare rather than private profits, such as scientific research, public infrastructure, and education investment. These investments cannot be financed on the same terms or with the same ease as private investments mediated through capital markets. For instance, when financing firms, lenders can typically secure their claims through collateral or residual ownership of the asset, and recover part of their investment by liquidating the asset if necessary. In contrast, such mechanisms are largely absent in public procurement, as illustrated by the higher education sector: research projects may fail without generating recoverable value; and investments in students are non-collateralizable, as the individuals embodying such investments cannot be traded in a non-slave state. Against this backdrop, policymakers face the question of how to allocate limited funds effectively and efficiently within the public sector. This study highlights the role of financial disclosure as a policy instrument that operates through information provision rather than direct expenditure constraints. Rather than imposing funding caps or ex-ante restrictions, financial disclosure regulation can enhance the government's ability to allocate resources more efficiently. At a minimum, the findings provide evidence that disclosure-based regulation can help the federal government and taxpayers better manage the public cost of research procurement, while improving research productivity in the higher education sector.

A caveat worth noting when interpreting these results: although the analysis documents improvements in research productivity and student-oriented support alongside declines in average faculty compensation, this study does not make any claims about changes in welfare. The reduced-form evidence presented here does not permit a structural assessment of welfare effects, nor does it allow definitive conclusions about the net welfare implications of the observed redirections.

The remainder of the paper proceeds as follows. Section 2 develops the hypothesis. Section 3 introduces the institutional setting of federal funding and the GASB 34/35 reform in IHEs, along with the research data. Section 4 presents the sample selection and empirical specifications. Sections 5 and 6 report the effects of GASB 34/35 on federal funding and discuss their economic implications. Finally, Section 7 presents concluding remarks.

2. Conceptual Framework and Hypothesis

I provide a general framework and hypothesis that links financial disclosure by contractors to government funding allocation decisions, before turning to the empirical examination in the setting of higher education sector.

There is extensive evidence of waste in the public sector, where opacity has historically enabled weak oversight and inflated transfers. Building on this prior, I conjecture that disclosure by agents (e.g., contractors) may discipline their opportunistic behavior and thus reduce inefficient transfers by principals (e.g., governments). Specifically, governments may revise funding decisions for institutions that previously benefited from opacity-driven overpayments, leading to lower funding levels following the disclosure mandate. In my framework, the disclosure mandates may have such effects through two distinct mechanisms: monitoring and private information signaling.

A long line of investigations, audits, and enforcement actions has revealed extensive waste and widespread misbehavior in government purchase. Many such cases have been pursued by the U.S. Department of Justice (DOJ) and Office of Inspector General (OIG). For example, in 2024, Raytheon admitted to "defective pricing" in defense procurement contracts, which involved failing to disclose lower cost data in order to inflate prices, and the company agreed to pay more than 950 million dollars in penalties and settlements (DOJ, 2024). As the DOJ noted, *"Government contractors have an obligation to be fully transparent about their cost and pricing data …"* (DOJ, 2024), underscoring how transparency plays a role in public procurement.

Essentially, these cases illustrate how agents exploit incomplete information to extract private benefits from principals (Laffont and Tirole, 1993; Bajari et al., 2014). Contractors possess private information regarding their actual costs, operations, and quality, which principals cannot fully observe. This information asymmetry offers agents room for opportunistic misbehavior, such as cost padding and manipulation (Williamson, 1971; Rogerson, 1992b; Chen and Gunny, 2015). These practices ultimately lead to overbilling, allowing agents to capture excess payments that arise from incomplete information (e.g., Bandiera et al., 2009; Bajari et al., 2014). Recent literature highlights how transparency reshapes public procurement by mitigating information asymmetry. Coviello and Mariniello (2014) show that publicizing government purchases through newspapers significantly reduces procurement costs and rationalizes public spending. Duguay et al. (2023) find that disclosing procurement contracts on digital platforms promotes competitive bidding. Nathan (2024) further demonstrates that the data disclosure requirements under the Truth in Negotiations Act (TINA) lead to greater competition (i.e., more bids) and improved contract performance (i.e., less frequent renegotiations and cost overruns) in the public procurement.

Financial disclosure, as a form of open data accessible to the general public, plays an important role in alleviating information asymmetry in government procurement. First, financial disclosure provides interested parties (e.g., citizens and regulators) with direct information (e.g., operations, costs, and performance) to monitor and constrain agents' opportunistic behavior (Healy and Palepu, 2001). Second, disclosure can enhance transparency even when the reporting is only indirectly informative. In such an information mosaic, dispersed interested parties can combine public disclosures with their private knowledge to infer true conditions (e.g., Grossman and Stiglitz, 1980; Cheynel and Levine, 2020), thereby informing principals and improving their decision-making. As a result, financial disclosure enhances transparency of the procurement information environment and constrains agents' ability to overcharge from information asymmetry. I substantiate the argument by analyzing two underlying mechanisms and developing corresponding stylized models.

Monitoring Mechanism: Political agency theory shows that better information about agents' actions enables interested parties (e.g., citizens, media, and regulators) to hold those involved in public affairs more accountable (Besley 2006). Otherwise, principals with incomplete information have to provide agents with a residual surplus, commonly called information rent, to ensure incentive compatibility (e.g., Laffont and Tirole, 1993; Laffont and Martimort, 2002; Bolton and Dewatripont, 2004). These constraints give rise to information rents, which represent the cost borne by the principal to prevent agents from exploiting their informational advantage and deviating from the principal's interest under asymmetric information. Specifically, to compensate agents' opportunity cost that exploits their private information in pursuit of self-interest, principals have to provide higher transfers. As a result, funding allocations deviate from the complete-information benchmark, leading to overpayment and output losses (Baron and Myerson, 1982; Krähmer and Strausz, 2011). Accordingly, greater access to procurement-related financial information through disclosure increases scrutiny on agents and curbs their opportunistic behavior for overcharge (e.g., Duguay et al., 2023; Dong et al., 2025).

Building on the seminal framework of Laffont and Tirole (1993), I provide a stylized model to formalize monitoring mechanism (see Appendix A). In this framework, asymmetric information gives rise to incentive-compatibility constraints that force the principal to deviate from the first-best allocation. As a result, production is distorted downward for high-cost agents, reducing aggregate productive efficiency. In addition, these constraints require the principal to leave information rent to low-cost agents to deter them from deceptively misreporting their cost types.

By improving the information environment, mandatory disclosure relaxes these constraints, enhances monitoring, and reduces agents' ability to extract rents.

Private Information Signaling Mechanism: Disclosure targets not only principals but also the general public. When information becomes widely accessible, dispersed individual knowledge can be aggregated through observable actions, enabling more efficient resource allocation in society (e.g., Hayek, 1945; Grossman and Stiglitz, 1980). A growing body of literature in capital markets (e.g., Edmans et al., 2015; Zuo, 2016; Goldstein, 2023) and regulatory settings (e.g., Kang et al., 2021) demonstrates such learning from dispersed individual signals, showing how managers and regulators update beliefs and improve decisions based on the private information embedded in others' actions. Specifically, when privately informed individuals respond to financial disclosure and act on their evaluations of agent, their observable actions (e.g., donations or gifts) reveal private signal to principals. Then, principals can acquire information about agents by observing the behavior of informed individuals and adjust their investment decisions accordingly. Disclosure enhances this process by improving private access to relevant information: disclosure makes external private actions more informative signals so that principals can use to refine subsequent funding decisions. That means, after the financial disclosure mandates, principals can learn about agents from these private responses and place greater weight on the resulting signals when mapping information into subsequent funding decisions.

Based on the framework of Heutel (2014), I develop a stylized model to illustrate the economic intuition behind the private information signaling mechanism (see Appendix B). The private donor first infers project quality via disclosure and chooses a contribution accordingly. The government then observes this contribution, updates its beliefs about quality, and determines its funding decision. The model yields a separating Perfect Bayesian Equilibrium in which higher contributions signal higher quality. In equilibrium, the government increases its grant in response to a larger private contribution if and only if the marginal value implied by the donor's quality signal exceeds the diminishing marginal returns to public-good provision.

So far, my discussion suggests that mandatory financial disclosure can help reduce inefficient government transfers in public procurement by monitoring contractors and informing governments. Despite these theoretical predictions, however, the effects of disclosure on public funding are not guaranteed to materialize in practice. Several frictions may attenuate or even offset the disciplinary and informational role of disclosure.

First, disclosure may fail to enhance monitoring when information processing capacity is limited. Financial disclosures may provide only fragmented and indirect signals about procurement activities. As a result, although disclosure expands the information set, principals and third-party monitors may lack the expertise, incentives, or resources to effectively interpret and act on complex financial reports (e.g., Bloomfield, 2002; Hirshleifer and Teoh, 2003; Blankespoor et al., 2020). **Second**, the private information signaling mechanism may break down when private contributions are weakly informative. If privately informed individuals face coordination problems or non-pecuniary motives (e.g., political ideology or social preferences), their observable actions may not reliably reflect underlying project quality (e.g., Bénabou and Tirole, 2006; DellaVigna et al., 2012). In such settings, principals may rationally discount private donations as noisy or biased signals, weakening their responsiveness to these actions. **Third**, transparency from disclosure may not work when it targets government actions with dispersed externalities. In such a case, the benefits of improved information accrue broadly, while the costs of coordination and negotiation are borne privately rather than internalized collectively, making Coasian bargaining difficult to achieve (e.g., Coase, 1960; Dranove et al., 2003; Weil et al., 2013; Bonetti et al., 2023). As a result, even when disclosure makes a difference, collective action problems and free-rider incentives may prevent interested parties from translating information into government actions.

Since the net effects of mandatory financial disclosure are not clear ex-ante, I state my hypothesis in a null form:

Null Hypothesis: Mandatory financial disclosure by contractors does not affect government funding allocation in the public sector.

3. Institutional Setting and Data Collection

I examine how financial disclosure by contractors affects federal agencies' allocation of research funding by using the implementation of GASB 34/35 across U.S. public colleges. In this section, I first provide background on public procurement and the GASB 34/35 reforms in institutions of higher education (IHEs). I then describe the data sources used in this study.

3.1 Background of Public Procurement in IHEs

In this part, I will introduce government procurement in IHEs. I focus exclusively on federal-level procurement, as state-level funding is typically directed toward in-state public institutions. In contrast, federal funds are generally open to institutions across the country, creating a competitive environment in which universities compete nationally for federal funds. Dong et al. (2025) provides more details regarding the research funding in IHEs.

3.1.1 Government Procurement in IHEs

The federal government procures public goods, such as research and technology, primarily from research universities for public needs through federally sponsored programs. Federally sponsored programs here are those "research and development, training, and other sponsored work performed by colleges and universities under grants, contracts, and other sponsored agreements with the federal government" (Office of Management and Budget, 1979).

The costs associated with such procurement, i.e., federally funded research, are classified into direct costs and facilities & administrative (F&A) costs (see OA-A Figure 1 in online appendix A). Direct costs can be directly attributed to a specific research project, such as personnel, equipment, materials and supplies, and travel. In contrast, F&A costs, also known as indirect costs, are "those that are incurred for common or joint objectives and therefore cannot be identified readily and specifically with a particular sponsored activity" (Office of Management and Budget, 1979). Facilities costs include expenses such as depreciation of research buildings, and administrative costs cover institution-wide supporting services, including budget and human resources offices.

Both direct and F&A costs are reimbursable by the federal government. Direct costs are proposed at the project level by researchers and reviewed by budget offices within IHEs prior to submission. Federal agencies then evaluate proposed budgets alongside scientific merit, requiring that costs be "reasonable, necessary, and allowable" under federal cost principles (Office of Justice Programs, 2020). Since F&A costs cannot be allocated to individual projects, they are reimbursed as a fixed percentage of direct costs, known as the F&A cost rate. This rate is periodically negotiated between IHEs and their cognizant federal agencies based on historical institutional data, including the ratio of total F&A costs attributable to federally sponsored research to total direct costs. Once established, the negotiated rate applies uniformly to federally funded research across agencies (Azoulay et al., 2025).

3.1.2 The Federal Funding Process

Federal research funds are available through many federal agencies. Here, I briefly introduce the stylized pattern for how federal agencies operate through the lens of the National Institutes of Health (NIH, 2024). The federal research funding process can be summarized in three stages: pre-award assessment, award review and budget negotiation, and post-award monitoring (see Figure 2).

First, prior to award issuance, federal agencies conduct a pre-award risk assessment focused on the recipient institution. Federal regulations require awardees to maintain effective internal controls over federal funds, and agencies rely on institutional financial reports and audit information to assess whether an institution has adequate financial management capacity. Information on internal controls at this stage determines whether an institution is eligible for standard awards or subject to additional conditions.

Second, during award review and budget negotiation, federal agencies evaluate proposed budgets at the project level, focusing on cost reasonableness, necessity, and alignment with the proposed research. Scientific merit is assessed by peer reviewers, who evaluate the quality, feasibility, and significance of the proposed research. Budgetary and administrative review, by contrast, is conducted by agency officials (e.g., grants management officers in NIH), who are responsible for reviewing, negotiating, and approving proposed costs. While institutional internal controls are not reassessed at this stage, agencies rely on established institution-level financial parameters based on prior financial reporting (e.g., the negotiated F&A rate) when reviewing project-level budgets.

Third, after an award is made, federal agencies engage in post-award monitoring. Agencies use ongoing financial reporting (e.g., institutional disclosures), drawdown data, and audit results (e.g., Single Audits) to monitor compliance with federal cost principles and to evaluate the continued effectiveness of institutional internal controls. These reports inform corrective actions, additional reporting requirements, or enforcement measures when necessary.

Overall, institutional financial reports and internal control information play an important role in both pre-award assessment and post-award monitoring. At the same time, such information could inform agency officials' decision-making during award reviews and budget negotiations.

3.1.3 Opportunistic Behavior in Research Funds

Despite rigorous ex-ante approval processes and ex-post federal audit, there is evidence of inefficient use of federal funds in IHEs. Both researchers and institutions may have incentives to overcharge the federal government (Jenny, 1996). Researchers may inflate direct costs to generate excess funds for discretionary purposes, such as food, supplies, or unrelated travel (e.g., DOJ, 2020; OIG, 2021). Institutions may also benefit, as higher direct costs increase reimbursable indirect costs, which are proportional to direct expenditures. These additional indirect funds can be used to support facilities and administrative functions that would otherwise require institutional resources (e.g., Lichtenberg, 1992; Rogerson, 1992a; Thomas and Tung, 1992). Since both researchers and institutions can benefit from weak monitoring environment, they may lack incentives to ensure efficient use of federal funds.

A substantial body of anecdotal evidence also illustrates such behavior. For example, the OIG reported that Northeastern University improperly claimed $194,890 under a federal grant initiated in 1996 (OIG, 2005). Similarly, the OIG found that the University of Massachusetts Medical School overstated its claim by $249,525 under a grant from the NIH that began in 2001 (OIG, 2006). More recently, federal enforcement actions suggest that such practices persist. In 2020, Harvard University paid more than $1.3 million to settle allegations of overcharging NIH grants (DOJ, 2020). In 2021, the University of Nevada, Las Vegas agreed to pay $1.4 million for submitting improper claims under NIH and Health Resources and Services Administration (HRSA) grants (OIG, 2021). In all of these cases, the misallocated funds were ultimately recovered, and the institutions were penalized.

3.2 Background of Financial Disclosure across U.S. Colleges

3.2.1 The History of Financial Reporting

The Higher Education Act of 1965 mandated that institutions participating in Title IV federal student aid programs (e.g., Pell grants and federal student loans) report data on institutional finance. The IPEDS finance survey, conducted by the U.S. Department of Education's National Center of Education Statistics, serves the national need for disclosure in IHEs. IPEDS has collected institutional finance data for all Title IV-eligible institutions since the academic year 1986/87. For the entire timeline, please refer to Figure 2.

From 1986[1] to 1995, both public and private institutions were required to report financial information using the same form, known as the "Common Form" (or "Old Form"), with public institutions continuing to use the Common Form through the early 2000s. During this period, all colleges and universities followed the accounting and reporting standards described in the American Institute of Certified Public Accountants' (AICPA) 1973 audit guide (AICPA, 1973). However, the Common Form relied on a traditional fund-accounting structure that was not well aligned with either the FASB or GASB 34/35. As Ingram (1984) criticized, ***"****the basic accounting entity … is the fund. … [and] consolidated reporting of these funds is prohibited****"***. As a result, key elements of modern financial reporting (e.g., total assets, total liabilities, or a clear differentiation among operation activities) were entirely absent from the Common Form. The financial information is fragmented and less informative for users. Consistent with these concerns, GASB later concluded that *"fund group reporting … was not essential for most users' understanding of the financial position and results of operations of public colleges and universities"* and that *"fund group information … does not help users to understand how short-term results affect the long term"* (GASB 35, 1999). In summary, the limitations of Common Form reduced comparability across institutions and increasingly conflicted with a growing need for transparency in the public sector.

Starting in academic year 1996, private not-for-profit institutions were first required to follow the financial reporting models issued by the FASB[2] (U.S. Department of Education, NCES 2000). Later, public institutions were also affected by changes to the Governmental Accounting Standards Board (GASB), which was phased in between 2001 and 2003. Most public institutions were using GASB reporting standards in 2001, but some continued to use the Common Form through 2002; all institutions were required to report using GASB standards by 2003.[3]

Beginning in 2007, IPEDS introduced the "Aligned Form" to further improve comparability across institutions reporting under FASB and GASB standards. The Aligned Form harmonized item definitions and reporting categories across sectors, but did not alter the underlying accounting frameworks themselves; institutions continued to follow either FASB or GASB standards, with

[1] Throughout this paper and my data, years typically refer to the fall semester of an academic year. For example, 1986 refers to the 1986/87 academic or fiscal year.
[2] The new FASB model is contained in Statement of Financial Accounting Standards (SFAS) Nos. 116 (FASB, 1993a), 117 (FASB, 1993b), and 124 (FASB, 1995).
[3] IPEDS Finance Data FASB and GASB - What's the Difference? A Guide for Data Users, IPEDS, available at: [Link]

the aligned templates simply standardizing how those standards were translated into the IPEDS survey.

3.2.2 GASB 34/35 Adoption across U.S. Public Colleges

Private institutions experienced a substantial modernization of their financial reporting beginning in 1996, when they were required to adopt the FASB not-for-profit reporting model. Relative to the AICPA's 1973 audit guide and the IPEDS Common Form, the FASB offered a materially richer depiction of institutional financial position, greatly enhancing transparency and facilitating more effective external monitoring (e.g., Benston et al., 2007). In contrast, the similar transparency reforms for public institutions did not occur until the implementation of GASB Statements 34 and 35.

As stated in GASB No. 34's Introduction, its objective was to enhance transparency and accountability in the public sector:

> *"1. The objective of this Statement is to enhance the understandability and usefulness of the general purpose external financial reports of state and local governments to the citizenry, legislative and oversight bodies, and investors and creditors. GASB Concepts Statement No. 1, Objectives of Financial Reporting, recognizes these groups as the primary intended users of governmental financial reports and establishes financial reporting objectives to meet their information needs. Those objectives are the foundation for the standards in this Statement.*
>
> *2. Accountability is the paramount objective of governmental financial reporting-the objective from which all other financial reporting objectives flow. Governments' duty to be accountable includes providing financial information that is useful for economic, social, and political decisions. Financial reports that contribute to these decisions include information useful for (a) comparing actual financial results with the legally adopted budget, (b) assessing financial condition and results of operations, (c) assisting in determining compliance with finance related laws, rules, and regulations, and (d) assisting in evaluating efficiency and effectiveness."*
>
> *(GASB 34, 1999, ¶1)*

To achieve this purpose, GASB 34 introduced several fundamental changes. First, it adopted entity-wide accrual financial statements rather than the fund-based reporting standard, providing a comprehensive view of an institution's financial position and resource flows. Second, it mandated the inclusion of Management's Discussion and Analysis (MD&A), requiring management to offer narrative explanations of financial performance, major events, and year-to-year changes. Moreover, GASB 34 required clearer explanations in several concrete areas, including major revenue sources, expense classifications, and significant accounting policies. Collectively, these reforms showed a substantial shift toward greater transparency, comparability, and decision-usefulness in the financial reporting of the government sector.

GASB 35 extended this framework to public colleges and universities, formalizing their integration into the governmental model and eliminating the prior AICPA College Guide approach. GASB 35 requires public higher education institutions to prepare financial statements that meet stakeholder information needs. As stated in the Summary:

> *"This Statement establishes accounting and financial reporting standards for public colleges and universities within the financial reporting guidelines of GASB Statement No. 34, Basic Financial Statements—and Management's Discussion and Analysis—for State and Local Governments. ... Under this guidance, in its separately issued reports, a public institution is required to include management's discussion and analysis (MD&A); basic financial statements, as appropriate for the category of special-purpose government reporting selected; notes to the financial statements; and required supplementary information other than MD&A."*
> *(GASB 35, 1999, Summary)*

The Introduction section further clarifies the purpose of the Statement:

> *"The objective of this Statement is to enhance the understandability and usefulness of the general purpose external financial reports issued by public colleges and universities. The standards are designed to provide financial information that responds to the needs of the three groups of primary users of general purpose external financial reports: (a) those to whom government is primarily accountable (the citizenry), (b) those who directly represent the citizens (legislative and oversight bodies), and (c) those who lend or who participate in the lending process (investors and creditors)."*
> *(GASB 35, 1999, ¶1)*

This reflects a substantial expansion in the scope of financial disclosure relative to the limited information provided under the Common Form. Moreover, although GASB 35 largely adopted the framework established by GASB 34, it also introduced requirements that are tailored specifically to the higher education sector. In practice, these provisions generate more granular disclosures than those required for general-purpose governments. For example, public institutions must separately identify major components of research expenses, including salaries, laboratory operations, depreciation of research facilities and equipment, among others.

Taken together, the implementation of GASB 34/35 markedly increased the granularity, scope, and transparency of accounting information available to the public. Consistent with this, recent research documents that GASB standards materially affect the information environment and generate real economic effects (e.g., Dambra et al., 2023; Baber et al., 2024). At the same time, a long line of literature shows that such increased segment-level disclosure significantly alters information and monitoring environments (e.g., Berger et al., 2003; Hirst et al., 2007; Berger et al., 2024; Jing et al., 2025). Accordingly, the adoption of GASB 34/35 is a quasi-experimental regulatory shock that substantially improves the financial transparency of public institutions.

3.3 Data Collection

In this paper, I collect data from several public data source, including the Integrated Postsecondary Education Data System (IPEDS), College Scorecard, the U.S. Department of Education's Office of Federal Student Aid, the United States Patent and Trademark Office (USPTO), and Elsevier's ScienceDirect/Scopus databases.

IPEDS provides a comprehensive set of institution-level statistics, including information on institutional characteristics, enrollment, staffing, finances, etc. These data are used to measure institutional structure (e.g., campus configuration, control, and size), financial resources (e.g., federal, state, and private funding), and research activity (e.g., research expenditures). IPEDS also reports detailed information on student financial aid received by students at each institution, such as federal student grants.

The U.S. Department of Education's Office of Federal Student Aid provides data about federal financial assistance programs, including student aid data (Title IV loans, grants, and campus-based programs). I obtain the student loan borrowing data here.

Patent data are obtained from the USPTO, primarily using the "*U.S. Colleges and Universities—Utility Patent Grants*" series compiled by the Patent Technology Monitoring Team. This dataset provides annual counts of patent applications and grants assigned directly to U.S. universities. To measure the full scope of institutions' innovation activities, I extend these records by identifying patents filed under affiliated entities (e.g., university foundations, research institutes, and technology transfer offices) through manual matching under the assistance of AI tools. Finally, this yields a consolidated patent record for each university that includes assignments under both the university's official name and its affiliated organizations.

Last, to measure academic research output, I use Elsevier's ScienceDirect/Scopus database, which provides publication counts for each institution by year, covering journal articles, conference papers, book chapters, case reports, and other indexed outputs.

4 Sample Selection and Research Design

4.1 Sample Selection

I restrict the analysis sample to not-for-profit U.S. research universities, defined as Research I (i.e., R1, or previously called "Doctoral/Research Universities-Extensive") and Research II (i.e., R2, or previously called "Doctoral/Research Universities-Intensive") institutions under the 2000/01 Carnegie Classification, which was one year prior to the implementation of GASB 34/35. I further exclude U.S. service schools and institutions located in U.S. overseas territories and insular areas to ensure comparability across institutions.

I limit the sample period to academic years 1999 through 2008 for two reasons. First, data coverage in the IPEDS prior to 1999 contains substantial missing observations, which would reduce data reliability. Second, I end the sample period in 2008 to avoid potential confounding factors of the global financial crisis. Prior evidence indicates that U.S. federal government contract spending declined following the financial crisis (e.g., Jordan 2012). The final sample used in the analysis is summarized in Table 1.

4.2 Research Design

4.2.1 Identification Strategy

As discussed above, private research universities have adopted FASB since the academic year 1996. Relative to the AICPA's 1973 audit guide for the IPEDS Common Form, FASB provides a substantially richer depiction of an institution's financial position, thereby enhancing transparency and facilitating external monitoring (e.g., Benston et al. 2007). In contrast, public research universities did not experience comparable transparency reforms until the implementation of GASB 34/35 in 2001.

Leveraging the implementation of GASB 34/35 as an exogenous regulatory shock that mandated more transparent financial disclosure for public institutions (see Figure 3), I employ a staggered difference-in-differences (diff-in-diffs, DiD, or DD) design to investigate the real effects of financial disclosure mandate on the allocation of federal funds. Specifically, the identification strategy compares public institutions required to adopt GASB 34/35 with a set of private institutions that were not subject to the disclosure regulation.

4.2.2 Empirical Specifications

The baseline specification for testing the effects of GASB 34/35 on the allocation of federal funds is as follows:

$$Outcome_{i,t} = \beta_0 + \beta_1 GASB_{i,t} + \gamma \boldsymbol{X}_{i,t} + \alpha_i + \varphi_t + \varepsilon_{i,t} \qquad (1)$$

where $Outcome_{i,t}$ is the variable of our interest in academic year t for institution i. $GASB_{i,t}$ is an indicator variable that equals 1 if institution i adopted GASB 34/35 in academic year t, otherwise 0. $\boldsymbol{X}_{i,t}$ is a vector of control variables, including institutional size, i.e., $Size$; and the natural logarithm of the number of school faculty, i.e., $Ln(\#\,faculty)$. α_i and φ_t are fixed effects for university and academic year. Heteroscedasticity-consistent standard errors are two-way clustered by the academic year and state level. The definition of each variable is provided in Appendix C.

β_1 is the diff-in-diffs estimator that captures the net effect of GASB 34/35 adoption on the variable of our interest, such as the amount of federal funding received by an institution. As discussed in the Hypotheses section, the net effects are theoretically unclear ex-ante, and therefore no directional prediction is imposed here.

Two considerations are worth noting. First, although the implementation of GASB 34/35 was phased in across three waves, I employ a staggered diff-in-diffs design rather than a stacked approach (e.g., Cengiz et al. 2019; Baker et al. 2022). This is motivated by the fact that 143 of the 154 public research universities adopted GASB 34/35 in the first phase, while only a small number of institutions adopted in phases two and three (see Table 1). Recent work shows that stacked DiD estimators can be problematic when treatment timing is highly unbalanced, as implicit weighting may introduce compositional bias and distort estimation (Wing et al. 2024). Other recent event-study estimators are likely subject to similar concerns in such settings (de Chaisemartin and d'Haultfoeuille 2020; Sun and Abraham 2021; Callaway and Sant'Anna 2021; Borusyak et al. 2024). Nevertheless, I conduct a series of robustness tests to address potential concerns about the internal validity of my research design later (Baker et al. 2022; Rambachan and Roth 2023). Second, heteroskedasticity-consistent standard errors are two-way clustered by the academic-year and state levels to account for serial correlation over time and policy correlation within states (Abadie et al.

2023).

4.3 Descriptive Statistics

Table 2 presents descriptive statistics for variables used in the analysis. The sample comprises 2,160 institution-year observations and exhibits significant cross-sectional variation in institutional characteristics, funding, and academic outputs.

Federal funds constitute a major component of institutional resources. The median amount of federal grants is approximately $59 million, with the interquartile range spanning from about $25 million at the 25th percentile to $148 million at the 75th percentile, which exhibits reasonable variations. Similar variation is observed for private gifts and state grants, though their magnitudes are relatively smaller. Given the wide dispersion in funding variables, the main analyses rely on their natural logarithms. Accordingly, the regression specifications primarily capture percentage changes rather than level effects, facilitating economic interpretation of the estimated coefficients. Importantly, I do not employ log-one-plus transformations, as such adjustments may introduce bias in log-linear models when the dependent variable is right-skewed (e.g., Cohen et al., 2022; Chen and Roth, 2024). Instead, we follow standard practice by using log-transformed variables.

5 GASB 34/35 and Allocation of Federal Funding

I begin by examining whether and how the implementation of GASB 34/35 affects the level of federal research funding received by public universities. Next, I examine the mechanisms underlying these changes.

5.1 Main Results: The Real Effects of GASB 34/35 Adoption on Federal Grants

I analyze the real effects of GASB 34/35 adoption on the allocation of federal grants by estimating equation (1). The first two columns in Table 3 report the baseline results. In column 1, the coefficient on $GASB$ is -0.079 (p-value <0.01), indicating that, following the implementation of GASB 34/35, federal grants to public universities decline by 7.9% relative to private universities. Based on the sample mean, this effect corresponds to a reduction of approximately $9.45 million in federal grants along the intensive margin. Given that the effects of financial disclosure may materialize with a delay, I next examine whether earlier disclosure affects the subsequent allocation of federal grants. Specifically, I re-estimate equation (1) using lead values of federal grants as the dependent variable. The results in column (2) are consistent with the prior finding, as the coefficient on $GASB$ remains negative and statistically significant (p-value < 0.01).

Since the allocation of federal grants may also be influenced by contemporaneous state-level policy shocks, I further control for state-year fixed effects to absorb unobserved variation at the state-year level. Columns (3) and (4) in Table 3 report the results from these specifications. The estimated coefficient on $GASB$ remains significantly negative (p-value < 0.01), with a larger magnitude, showing that the main findings are robust to state-level heterogeneity. Overall, these results suggest that, on average, the GASB 34/35 implementation leads to a decrease in the level of federal funds received by public universities.

5.2 Robustness Tests

In this section, I conduct a series of robustness tests to address potential concerns regarding the main results.

Parallel Trends Assumption. The internal validity of my analysis requires that public (treated) and private (control) universities would have experienced similar trends in federal funds but for the GASB 34/35 regulatory treatment. A common way to gauge the plausibility of the parallel trends assumption is to check for the absence of diverging trends before treatment. Figure 4 plots the dynamic event-study of the two-way fixed effects (TWFE) model as equation (1), along with 95% confidence level. The figures confirm the absence of diverging pre-trends in federal grants, which supports a causal interpretation of the main results.

Honest DiD. While the absence of diverging pre-trends provides supportive evidence for the parallel trends assumption, it cannot fully rule out the possibility of violations, as we cannot observe the counterfactual of the parallel trends post-treatment. To assess the robustness of the results to such potential violations, I use the Honest DiD approach (Rambachan and Roth, 2023). Figure 5 reports robust confidence intervals that allow for limited deviations from parallel trends in the post-treatment period, subject to either relative magnitude restrictions or smoothness restrictions. Under both sets of restrictions, the estimated effects of GASB 34/35 adoption on federal grants remain significantly negative over a wide range of values of the sensitivity parameter. These findings suggest that the main results remain robust even under unobservable counterfactual scenarios in which the parallel trends assumption is slightly violated in the post-treatment period.

Bacon Decomposition and Treatment Heterogeneity. Recent studies show that, in settings with staggered treatment timing, TWFE DiD estimators may combine multiple 2×2 comparisons with potentially negative weights, which can distort the estimated causal effects in the presence of treatment effect heterogeneity (Baker et al., 2022).

To assess whether such concerns are relevant in my study, I first decompose the TWFE estimator using the Goodman-Bacon decomposition (Goodman-Bacon, 2021) decomposition. Panel A of Figure 6 reports the Bacon decomposition results. The figure shows that the estimated treatment effect is primarily driven by comparisons between public and private universities. Only a small fraction of the overall estimate is attributable to comparisons across public universities with different adoption timings. Although a limited number of 2×2 comparisons yield positive estimates, their weights and economic magnitude are negligible, and do not overturn the overall negative effect. Taken together, these results suggest that the TWFE estimate is not driven by problematic comparisons and that the direction of the estimated effect is not distorted.

Panel B further examines treatment effect heterogeneity using quantile DiD regression. The results reveal heterogeneity across institutions: the decline in federal grants following GASB 34/35 adoption is more pronounced among universities that received larger federal grant allocations prior to GASB 34/35. This pattern is consistent with the possibility that universities with larger federal grant allocations faced greater scope for opportunistic or inefficient use of federal funds prior to GASB 34/35 adoption.

Oster Test. I use the Oster test (2019) to assess the sensitivity of the main results to omitted variable bias. The intuition underlying the Oster test is that the bias arising from omitted observable controls is informative about the potential bias from unobservable factors. The test estimates δ, the ratio of selection on unobservables relative to selection on observables that would be required to explain away the estimated effects. As reported in Table OA-A Table 1, the estimated values of $\hat{\delta}$ are negative across all specifications. Following Satyanath et al. (2017), negative $\hat{\delta}$ implies that accounting for unobservable factors would further strengthen, rather than attenuate, the estimated treatment effects. Overall, the results indicate that unobservable factors are unlikely to offset the estimated treatment effects; if anything, accounting for such factors would strengthen the estimated causal estimates.

Sample without Staggered Treatment Timing. To further alleviate concerns related to the TWFE model under staggered treatment timing (Baker et al., 2022), I restrict the sample to public research universities that adopted GASB 34/35 in Phase 1 and exclude those in Phase 2 and Phase 3. This restriction ensures a common treatment timing across treated institutions and avoids comparisons between early- and late-treated units. As reported in Table OA-A Table 2, the estimated coefficient on GASB remains negative and statistically significant across all specifications, with magnitudes comparable to the baseline results.

5.3 Mechanisms

As discussed above, mandatory financial disclosure reduces the allocation of federal funds to public institutions of IHEs. To interpret this effect as an economic consequence of increased information transparency, a key question is the mechanism through which disclosure generates real effects on the allocation of federal funding. I test two possible channels: monitoring and private information signaling.

5.3.1 Mechanism: Monitoring

Disclosure mandates can provide interested parties with additional information, thereby enhancing monitoring and constraining opportunistic behavior. If disclosure mandates indeed operate through an improved monitoring channel, their effects should be more pronounced in universities with more complex organizational structures ex-ante. Prior literature supports this, showing a close relationship between organizational complexity and opportunistic behavior. For example, Bushman et al. (2004) show that firms with greater organizational complexity face heightened challenges in mitigating moral hazard and information asymmetry. Related evidence indicates that complex firms' structures facilitate opportunistic activities, such as aggressive tax planning and self-serving behaviors (Bennedsen and Zeume, 2018).

I primarily use two measures to proxy for organizational complexity in this study. The first set captures structural complexity through the existence and number of campuses, reflecting the geographic and administrative dispersion of a university. The second captures complexity based on the breadth of academic programs offered, reflecting differences in internal coordination.

Table 4 reports evidence consistent with the prediction for monitoring channel. Across all specifications, the two-way interaction terms between GASB adoption and proxies for organizational complexity are negative and statistically significant. In column (1), the coefficient on $GASB \times Multi\_campus$ is significantly negative, indicating that the decline in federal grants after GASB adoption is larger for universities operating multiple campuses. Column (2) shows a similar pattern when structural complexity is measured by the number of campuses. The estimated coefficient on the interaction term implies that each additional campus is associated with an incremental 1.8% larger decline in federal grants after GASB adoption. Column (3) further demonstrates that universities with greater academic complexity experience a significantly larger reduction in federal grants after GASB 34/35 implementation.

Taken together, these results suggest that the effects of mandatory financial disclosure are stronger in institutions with more complex organizational structures, where information asymmetry is likely to be more severe ex-ante. This pattern is consistent with a monitoring mechanism through which transparent disclosure improves oversight and constrains opportunistic behavior.

5.3.2 Mechanism: Private Information Signaling

Disclosure targets not only federal agencies but also the general public. If disclosure enhances the informational content of privately informed individuals' actions, federal agencies should place greater weight on observable private contributions when making subsequent funding decisions. In the context of GASB 34/35, federal grant allocations should become more responsive to private donations, as these donations increasingly reflect informed assessments of universities. I test this implication by examining whether the association between private gifts and subsequent federal funding strengthens after GASB 34/35, consistent with federal learning from the signals embedded in private information.

To test the private information signaling mechanism, I focus on two primary sources of external funding signals: private donations and state grants. Private donations are broadly available across U.S. universities and reflect dispersed, privately informed assessments of institutions by donors. In contrast, state grants are primarily directed toward public universities within a given state and embody funding decisions made by state governments, which may also possess institution-specific information.

Table 5 reports evidence consistent with the private information signaling mechanism. Overall, after GASB 34/35, federal grants to public universities significantly decline and are more responsive to the prior external signals. Column (1) shows that the interaction term $GASB * Ln(\$\,Private\ gift)_t$ is significantly positive, indicating that subsequent federal grant allocations become more responsive to previous private donations following GASB 34/35 adoption. Column (2) presents similar evidence using state grants as an alternative source of external funding signals. The positive and significant coefficient on the interaction term $GASB * Ln(\$\,State\ grant)_t$ indicates that federal agencies also place greater weight on state funding decisions following GASB 34/35.

Extending this analysis, I further examine the dynamic regulatory learning process underlying the private information signaling mechanism (Figure 7). Dynamic event-study evidence shows that the responsiveness of federal funding to private donations emerges gradually and becomes statistically significant in the later post-GASB 34/35 periods. By contrast, federal funding allocations are responsive to state grants even prior to GASB 34/35, reflecting the long-standing informational role of state funding decisions; similarly, this responsiveness also significantly strengthens in the post-GASB 34/35 periods.

Together, these results suggest that enhanced disclosure improves the informational environment by making privately informed actions more informative signals, which federal agencies incorporate into subsequent grant allocation decisions. This learning process among federal agencies evolves gradually over time.

6 Economic Implications of GASB 34/35

A natural follow-up question in the context of GASB 34/35 concerns its downstream economic implications. This section examines how public universities operate following reductions in federal funding after GASB 34/35, and how federal funding allocations shift across university activities. I focus on changes in research output conditional on funding and the redirection of federal resources across different stakeholder groups within universities.

6.1 GASB 34/35 and the Efficiency of University Output

While GASB 34/35 adoption is associated with a reduction in the level of federal funding received by public universities, an important question is whether universities adjust by using available resources more efficiently. Prior literature highlights a trade-off in the economic consequences of transparency: increased disclosure can improve efficiency by mitigating information asymmetry and promoting competition (e.g., Coviello and Mariniello, 2014; Nathan, 2024), but it may also introduce rigidity that constrains informed discretion and adversely affects execution efficiency (Duguay et al., 2023). Despite this controversy, early literature supports that transparency and auditing can enhance efficiency in the use of school resources through effective monitoring (e.g., Saito and Mcintosh, 2010).

To examine the efficiency of university research output, I measure research productivity as research outputs scaled by prior-period research expenditures. Specifically, the dependent variables include the number of patent applications and patent grants in academic years $t+1$ per million dollars of research expenditure in year t ($\# patent_{t+1}/RE_{million,t}$), as well as the natural logarithm of publications in year $t+1$ per million dollars of research expenditure in year t ($Ln(\# publication_{t+1}/RE_{million,t})$). Research activities are inherently forward-looking because research expenditures incurred in a given period typically translate into outputs only in subsequent periods. Accordingly, I relate research expenditures in year t to patents and publications realized in years $t+1$, allowing for the delayed nature of the research production process.

Table 6 reports the effects of GASB 34/35 on university research output. In column (1), the estimated coefficient implies that, after GASB 34/35 adoption, public universities generate approximately 0.062 additional patent applications per million dollars of research expenditure in the subsequent year. Column (2) shows a similar pattern for patent grants, with GASB adoption associated with an increase of about 0.076 additional patent grants per million dollars of research spending. Column (3) indicates that publication efficiency improves after GASB 34/35, with the estimated coefficient implying an approximately 12.3% increase in publications per million dollars of research spending. To further account for the delayed nature of the research process, I examine output efficiency using research outputs measured two years after research expenditures are incurred; the results remain qualitatively identical, and my conclusion still holds (OA-A Table 3).

Overall, these results indicate that GASB 34/35 adoption is associated with a more efficient conversion of research expenditures into observable academic outputs. Importantly, these gains in output efficiency occur despite an overall reduction in federal funding levels, suggesting that increased financial transparency is linked to efficient use of resources.

6.2 Spillover Effects of GASB 34/35

This section examines how GASB 34/35 reshapes the internal allocation of federal funds within universities, affecting both student-oriented funding and faculty labor outcomes.

6.2.1 Redirecting Federal Funds toward Student Aid

Government purchases in IHEs extend beyond procurement for research and technology, as well as investments in human capital (Avery and Turner, 2012). In addition to funding scientific research, governments provide student grants and loans to facilitate access to higher education and support human capital accumulation for society (Friedman, 1962). Against this backdrop, this subsection examines whether, after GASB 34/35 adoption, federal funding is redirected within public universities toward student-oriented financial support, such as federal student grants and loans.

Table 7 reports evidence consistent with a reallocation of federal funds toward student-oriented support after GASB 34/35 adoption. In column (1), the significantly positive coefficient on $GASB$ implies an approximately 8.9% increase in federal student grant funding after GASB 34/35 adoption. Column (2) shows a similar pattern for federal student loans, with the coefficient suggesting an economically sizable 31.1% increase. Based on the sample means, these estimates correspond to increases of about $1.1 million in federal student grants and $8.6 million in federal student loans, respectively. Notably, the combined increase in student-oriented funding (about $9.7 million) is comparable in magnitude to the previously documented reduction of around $9.45 million in federal research grants (section 5.1), suggesting a reallocation of federal funds within public universities rather than an overall contraction in federal support.

Taken together, these results suggest that reductions in federal research funding associated with GASB 34/35 are accompanied by a shift in federal funding toward investments in human capital. Rather than withdrawing support uniformly, the government appears to reallocate resources within universities toward student-focused financial aid.

6.2.2 Faculty Compensation and Mobility

Beyond redirecting federal funds from research to human capital investment, GASB 34/35 may also have spillover effects on internal labor outcomes within IHEs. After reducing federal research funding to public universities, GASB 34/35 may influence individual research activity and academic output, with downstream implications for faculty compensation and employment mobility, particularly among research-active faculty. Accordingly, this section examines the effects of GASB 34/35 on tenure-track and tenured faculty on nine- or ten-month contracts, focusing on Assistant Professors, Associate Professors, and Full Professors whose compensation and employment outcomes are relatively more sensitive to research activity and funding conditions.

Faculty Compensation. Panel A of Table 8 reports the effects of GASB 34/35 adoption on faculty compensation. Across all academic ranks, the estimated coefficients on $GASB$ are significantly negative, which means declines in faculty compensation for public universities after GASB 34/35. Specifically, GASB 34/35 adoption is associated with a decline of approximately 2.0% in average salaries for Assistant Professors, 3.1% for Associate Professors, and 2.8% for Full Professors. Given the sample means, these estimates correspond to economically meaningful reductions in annual compensation.

Faculty Mobility. Panel B examines whether GASB 34/35 adoption affects faculty mobility. In contrast to the compensation results, the estimated coefficients on $GASB$ are statistically insignificant across all ranks, indicating no changes in faculty mobility.

Overall, these findings suggest that universities adjust to funding changes primarily through compensation rather than employment reallocation. This pattern is consistent with prior discussion that faculty compensation adjusts more readily than employment in response to financial pressures; tenure protections, long-term contracts, and hiring frictions limit short-run mobility in academic labor markets (Ehrenberg, 2004).

7 Conclusion

This study investigates how mandatory financial disclosure affects government procurement and public resource allocation. I examine this question through the lens of the higher education sector. Specifically, I exploit the implementation of GASB 34/35 as a transparency reform for U.S. public universities and compare them with private universities that were not subject to the mandate. I find that mandatory financial disclosure is associated with a decline in federal research funding to affected universities. This funding decline does not translate into weaker research performance; instead, research production efficiency improves, as measured by patents and publications relative to research funding. Cross-sectional evidence is consistent with disclosure operating through enhanced monitoring, with stronger effects among institutions with greater organizational complexity. Additional tests suggest that governments also learn from private information embedded in other funding signals when allocating federal resources. Furthermore, I find that federal support is redirected to student-oriented programs such as federal student grants and loans, while average faculty compensation declines and faculty mobility remains unchanged. Overall, the results imply that financial disclosure regulation can reshape federal agencies' allocation decisions and generate real economic consequences within the higher education sector.

Reference

Abadie, A., Athey, S., Imbens, G.W. and Wooldridge, J.M., 2023. When should you adjust standard errors for clustering?. *The Quarterly Journal of Economics*, *138*(1), pp.1-35.

Akerlof, G.A., 1970. The Market for" Lemons": Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics*, *84*(3), pp.488-500.

American Institute of Certified Public Accountants (AICPA) 1973, *Audits of Colleges and Universities*, American Institute of Certified Public Accountants, New York, NY.

Anantharaman, D. and Chuk, E., 2024. The impact of governmental accounting standards on public-sector pension funding. *Review of Accounting Studies*, *29*(2), pp.1948-1996.

Avery, C. and Turner, S., 2012. Student loans: Do college students borrow too much—or not enough?. *Journal of Economic Perspectives*, *26*(1), pp.165-192.

Azoulay, P., Gross, D.P. and Sampat, B.N., 2025. *Indirect Cost Recovery in US Innovation Policy: History, Evidence, and Avenues for Reform* (No. w33627). National Bureau of Economic Research.

Baber, W., Beck, A. and Koester, A., 2024. Accounting standardization and separation in the municipal debt market: Evidence from GASB 34. *The Accounting Review*, *99*(4), pp.29-56.

Baber, W.R. and Gore, A.K., 2008. Consequences of GAAP disclosure regulation: Evidence from municipal debt issues. *The Accounting Review*, *83*(3), pp.565-592.

Bajari, P., Houghton, S. and Tadelis, S., 2014. Bidding for incomplete contracts: An empirical analysis of adaptation costs. *American Economic Review*, *104*(4), pp.1288-1319.

Baker, A.C., Larcker, D.F. and Wang, C.C., 2022. How much should we trust staggered difference-in-differences estimates?. *Journal of Financial Economics*, *144*(2), pp.370-395.

Bandiera, O., Prat, A. and Valletti, T., 2009. Active and passive waste in government spending: evidence from a policy experiment. *American Economic Review*, *99*(4), pp.1278-1308.

Baron, D.P. and Myerson, R.B., 1982. Regulating a monopolist with unknown costs. *Econometrica*, *50*(4).

Bénabou, R. and Tirole, J., 2006. Incentives and prosocial behavior. *American Economic Review*, *96*(5), pp.1652-1678.

Bennedsen, M. and Zeume, S., 2018. Corporate tax havens and transparency. *The Review of Financial Studies*, *31*(4), pp.1221-1264.

Benston, G.J., Carmichael, D.R., Demski, J.S., Dharan, B.G., Jamal, K., Laux, R., Rajgopal, S. and Vrana, G., 2007. The FASB's conceptual framework for financial reporting: A critical analysis. *Accounting Horizons*, *21*(2), pp.229-238.

Berger, P.G. and Hann, R., 2003. The impact of SFAS No. 131 on information and monitoring. *Journal of Accounting Research*, *41*(2), pp.163-223.

Berger, P.G., Choi, J.H. and Tomar, S., 2024. Breaking it down: Economic consequences of disaggregated cost disclosures. *Management Science*, *70*(3), pp.1374-1393.

Besley, T., 2006. *Principled agents?: The political economy of good government.* Oxford University Press.

Biddle, G.C., Hilary, G. and Verdi, R.S., 2009. How does financial reporting quality relate to investment efficiency?. *Journal of accounting and economics*, *48*(2-3), pp.112-131.

Blankespoor, E., deHaan, E. and Marinovic, I., 2020. Disclosure processing costs, investors' information choice, and equity market outcomes: A review. *Journal of Accounting and Economics*, *70*(2-3), p.101344.

Bloomfield, R.J., 2002. The 'incomplete revelation hypothesis' and financial reporting.

Bolton, P. and Dewatripont, M., 2004. *Contract theory*. MIT press.

Bonetti, P., Leuz, C. and Michelon, G., 2023. Internalizing externalities through public pressure: transparency regulation for fracking, drilling activity and water quality (No. w30842). National Bureau of Economic Research.

Borusyak, K., Jaravel, X. and Spiess, J., 2024. Revisiting event-study designs: robust and efficient estimation. *Review of Economic Studies*, *91*(6), pp.3253-3285.

Bushman, R., Chen, Q., Engel, E. and Smith, A., 2004. Financial accounting information, organizational complexity and corporate governance systems. *Journal of Accounting and Economics*, *37*(2), pp.167-201.

Callaway, B. and Sant'Anna, P.H., 2021. Difference-in-differences with multiple time periods. *Journal of econometrics*, *225*(2), pp.200-230.

Cengiz, D., Dube, A., Lindner, A. and Zipperer, B., 2019. The effect of minimum wages on low-wage jobs. *The Quarterly Journal of Economics*, *134*(3), pp.1405-1454.

Center for Labor and a Just Economy at Harvard Law School (CLJE) (2024). *Building Worker Power in Cities & States: Government Procurement and Spending Authority*. Available at: Link (Accessed: 3 December 2025).

Chen, H. and Gunny, K., 2015, August. Profitability and cost shifting in government procurement contracts. AAA.

Chen, J. and Roth, J., 2024. Logs with zeros? Some problems and solutions. *The Quarterly Journal of Economics*, *139*(2), pp.891-936.

Cheynel, E. and Levine, C.B., 2020. Public disclosures and information asymmetry: A theory of the mosaic. *The Accounting Review*, *95*(1), pp.79-99.

Christensen, H.B., Floyd, E., Liu, L.Y. and Maffett, M., 2017. The real effects of mandated information on social responsibility in financial reports: Evidence from mine-safety records. *Journal of Accounting and Economics*, *64*(2-3), pp.284-304.

Coase, R.H., 1960. The Problem of Social Cost. *Journal of Law and Economics*, *3*, pp.1-44.

Cohn, J.B., Liu, Z. and Wardlaw, M.I., 2022. Count (and count-like) data in finance. *Journal of Financial Economics*, *146*(2), pp.529-551.

Coviello, D. and Mariniello, M., 2014. Publicity requirements in public procurement: Evidence from a regression discontinuity design. *Journal of Public Economics*, *109*, pp.76-100.

Cuny, C. and Dube, S., 2025. The moderating role of reporting quality. *Contemporary Accounting Research*, *42*(1), pp.94-120.

Dambra, M., Even-Tov, O. and Naughton, J.P., 2023. The economic consequences of GASB financial statement disclosure. *Journal of Accounting and Economics*, *75*(2-3), p.101555.

Dambra, M., Even-Tov, O. and Naughton, J.P., 2023. The economic consequences of GASB financial statement disclosure. *Journal of Accounting and Economics*, *75*(2-3), p.101555.

Davies, S.P., Johnson, L.E. and Lowensohn, S., 2017. Ambient influences on municipal net assets: Evidence from panel data. *Contemporary Accounting Research*, *34*(2), pp.1156-1177.

De Chaisemartin, C. and d'Haultfoeuille, X., 2020. Two-way fixed effects estimators with heterogeneous treatment effects. *American economic review*, *110*(9), pp.2964-2996.

DellaVigna, S., List, J.A. and Malmendier, U., 2012. Testing for altruism and social pressure in charitable giving. *The Quarterly Journal of Economics*, *127*(1), pp.1-56.

Dong, Q., Le, A. and Yoo, S., 2025. Cost Accounting Standards and the Cost Effectiveness of Federal Funds. *Available at SSRN*.

Dranove, D., Kessler, D., McClellan, M. and Satterthwaite, M., 2003. Is more information better? The effects of "report cards" on health care providers. *Journal of Political Economy*, *111*(3), pp.555-588.

Duguay, R., Rauter, T. and Samuels, D., 2023. The impact of open data on public procurement. *Journal of Accounting Research*, *61*(4), pp.1159-1224.

Dye, R.A., 1985. Disclosure of nonproprietary information. *Journal of Accounting Research*, pp.123-145.

Edmans, A., Goldstein, I. and Jiang, W., 2015. Feedback effects, asymmetric trading, and the limits to arbitrage. *American Economic Review*, *105*(12), pp.3766-3797.

Ehrenberg, R.G., 2004. Prospects in the academic labor market for economists. *Journal of Economic Perspectives*, *18*(2), pp.227-238.

Fan, G.H., 2025. Economic consequences of public pension accounting regulation changes: Evidence from housing markets and local economies. *The Accounting Review*, *100*(4), pp.249-275.

Financial Accounting Standards Board (FASB) 1993a, *Accounting for Contributions Received and Contributions Made: Statement of Financial Accounting Standards No. 116*, Financial Accounting Standards Board, Norwalk, CT.

Financial Accounting Standards Board (FASB) 1993b, *Financial Statements of Not-for-Profit Organizations: Statement of Financial Accounting Standards No. 117*, Financial Accounting Standards Board, Norwalk, CT.

Financial Accounting Standards Board (FASB) 1995, *Accounting for Certain Investments Held by Not-for-Profit Organizations: Statement of Financial Accounting Standards No. 124*, Financial Accounting Standards Board, Norwalk, CT.

Friedman, M., 1962. Capitalism and Freedom. *Ethics*, *74*(1)

Goldstein, I., 2023. Information in financial markets and its real effects. *Review of Finance*, *27*(1), pp.1-32.

Goodman-Bacon, A., 2021. Difference-in-differences with variation in treatment timing. *Journal of econometrics*, *225*(2), pp.254-277.

Governmental Accounting Standards Board (GASB) 1999, *Basic Financial Statements—and Management's Discussion and Analysis—for State and Local Governments*, Statement No. 34, Governmental Accounting Standards Board, Norwalk, CT.

Governmental Accounting Standards Board (GASB). (1999). *Statement No. 35: Basic Financial Statements—and Management's Discussion and Analysis—for Public Colleges and Universities*. Norwalk, CT: GASB.

Greenstone, M., Leuz, C. and Breuer, P., 2023. Mandatory disclosure would reveal corporate carbon damages. *Science*, *381*(6660), pp.837-840.

Grossman, S.J. and Stiglitz, J.E., 1980. On the impossibility of informationally efficient markets. *The American Economic Review*, *70*(3), pp.393-408.

He, J., Li, K., Li, N. and Zhang, W., 2024. Proprietary information cost of contracting with the government. *The Accounting Review*, *99*(2), pp.195-227.

Healy, P.M. and Palepu, K.G., 2001. Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics*, *31*(1-3), pp.405-440.

Heutel, G., 2014. Crowding out and crowding in of private donations and government grants. *Public Finance Review*, *42*(2), pp.143-175.

HHS Office of Inspector General (2021). *University of Nevada, Las Vegas agreed to pay $1.4 million for allegedly violating the Civil Monetary Penalties Law by submitting improper claims to NIH and HRSA grants*. Enforcement action. Available at: Link (Accessed: 3 December 2025).

Hirshleifer, D. and Teoh, S.H., 2003. Limited attention, information disclosure, and financial reporting. *Journal of Accounting and Economics*, *36*(1-3), pp.337-386.

Hirst, D.E., Koonce, L. and Venkataraman, S., 2007. How disaggregation enhances the credibility of management earnings forecasts. *Journal of Accounting Research*, *45*(4), pp.811-837.

Holmström, B., 1979. Moral hazard and observability. *The Bell Journal of Economics*, pp.74-91.

Ingram, R.W., 1984. Economic incentives and the choice of state government accounting practices. *Journal of Accounting Research*, pp.126-144.

Jenny, H.H. (1996). *Cost accounting in higher education: Simplified macro- and micro-costing techniques*. ERIC.

Jing, C., Xu, B. and Zuo, L., 2025. Do Financial Disclosures Affect Corporate Sustainability Practices?. *Available at SSRN 4817939*.

Jordan, J. (2012). *Historic savings in contracting - and plans for more*. The White House Blog. Available at: Link (Accessed: 15 December 2025).

Kang, J.K., Loumioti, M. and Wittenberg-Moerman, R., 2021. The harmonization of lending standards within banks through mandated loan-level transparency. *Journal of Accounting and Economics*, *72*(1), p.101386.

Krähmer, D. and Strausz, R., 2011. Optimal procurement contracts with pre-project planning. *The Review of Economic Studies*, *78*(3), pp.1015-1041.

Laffont, J.J. and Martimort, D., 2002. *The theory of incentives: the principal-agent model*. Princeton university press.

Laffont, J.J. and Tirole, J., 1986. Using cost observation to regulate firms. *Journal of Political Economy*, *94*(3, Part 1), pp.614-641.

Laffont, J.J. and Tirole, J., 1993. *A Theory of Incentives in Procurement and Regulation*. MIT press.

Lambert, R.A., 2001. Contracting theory and accounting. *Journal of Accounting and Economics*, *32*(1-3), pp.3-87.

Leuz, C. and Wysocki, P.D., 2008. Economic consequences of financial reporting and disclosure regulation: A review and suggestions for future research. *Available at SSRN 1105398*.

Lewis-Faupel, S., Neggers, Y., Olken, B.A. and Pande, R., 2016. Can electronic procurement improve infrastructure provision? Evidence from public works in India and Indonesia. *American Economic Journal: Economic Policy*, *8*(3), pp.258-283.

Lichtenberg, F.R., 1992. A perspective on accounting for defense contracts. *The Accounting Review*, *67*(4), pp.741-752.

Lu, Y., Tang, T., Xiao, T. and Zuo, L., 2025. Does Disclosure Mandate Affect Firms' Contribution to Poverty Alleviation?. *Available at SSRN 5104746*.

Marks, B.R. and Raman, K.K., 1988. The effect of unfunded accumulated and projected pension obligations on governmental borrowing costs. *Contemporary Accounting Research*, *4*(2), pp.595-608.

McDonough, R.P. and Yan, C.J., 2024. Maintaining maintenance: The real effects of financial reporting for infrastructure. *Contemporary Accounting Research*, *41*(3), pp.1952-1985.

Nathan, B., 2024. Show Your Hand: The Impacts of Fair Pricing Requirements in Procurement Contracting. *Journal of Accounting Research*, *62*(4), pp.1405-1448.

National Institutes of Health (2024). *NIH grants policy statement*. Revised April 2024. Available at: Link (Accessed: 15 December 2025).
Naughton, J., Petacchi, R. and Weber, J., 2015. Public pension accounting rules and economic outcomes. *Journal of Accounting and Economics*, *59*(2-3), pp.221-241.
Office of Inspector General (2005). *Northeastern University DHHS grant costs: CDC No. U17-CCU113278-03*. U.S. Department of Health and Human Services. Available at: Link (Accessed: 3 December 2025).
Office of Inspector General, 2006. *University of Massachusetts Medical School review of NIH Grant No. 5 R01 GM30626-22*. Available at: Link(Accessed: 13 December 2025).
Office of Justice Programs (2020). *Grants 101: Application review process*. Available at: Link (Accessed: 13 December 2025).
Office of Management and Budget (1979). Cost principles for educational institutions. *Federal Register*, 44, pp.12368-12380.
Organisation for Economic Co-operation and Development (OECD) (2025). *Government at a Glance 2025*. Available at: Link (Accessed: 3 December 2025).
Organisation for Economic Co-operation and Development (OECD) (2025). *Integrity in public procurement*. Available at: Link (Accessed: 3 December 2025).
Oster, E., 2019. Unobservable selection and coefficient stability: Theory and evidence. *Journal of Business & Economic Statistics*, *37*(2), pp.187-204.
Plummer, E., Hutchison, P.D. and Patton, T.K., 2007. GASB No. 34's governmental financial reporting model: Evidence on its information relevance. *The Accounting Review*, *82*(1), pp.205-240.
Rambachan, A. and Roth, J., 2023. A more credible approach to parallel trends. *Review of Economic Studies*, *90*(5), pp.2555-2591.
Rauter, T., 2020. The effect of mandatory extraction payment disclosures on corporate payment and investment policies abroad. *Journal of Accounting Research*, *58*(5), pp.1075-1116.
Rogerson, W.P., 1992b. Contractual solutions to the hold-up problem. *The Review of Economic Studies*, *59*(4), pp.777-793.
Rogerson, W.P., 1992a. Overhead allocation and incentives for cost minimization in defense procurement. *Accounting Review*, pp.671-690.
Saito, Y. and Mcintosh, C.S., 2010. The economic value of auditing and its effectiveness in public school operations. *Contemporary Accounting Research*, *27*(2), pp.639-667.
Satyanath, S., Voigtländer, N. and Voth, H.J., 2017. Bowling for fascism: Social capital and the rise of the Nazi Party. *Journal of Political Economy*, *125*(2), pp.478-526.
Stiglitz, J.E., 2000. The contributions of the economics of information to twentieth century economics. *The Quarterly Journal of Economics*, *115*(4), pp.1441-1478.
Sun, L. and Abraham, S., 2021. Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of econometrics*, *225*(2), pp.175-199.
Thomas, J.K. and Tung, S., 1992. Cost manipulation incentives under cost reimbursement: Pension costs for defense contracts. *Accounting Review*, pp.691-711.
Tirole, J., 1994. The internal organization of government. *Oxford Economic Papers*, *46*(1), pp.1-29.
U.S. Department of Education, National Center for Education Statistics (2000) *IPEDS Finance Handbook 2000*. NCES 2000-14. Washington, DC: U.S. Department of Education.
U.S. Department of Justice (2020). *Harvard University agrees to pay over $1.3 million to resolve allegations*

of overcharging NIH grants. United States Attorney's Office press release. Available at: Link (Accessed: 13 December 2025).

U.S. Department of Justice (2024). *Raytheon Company to pay over $950M in connection with defective pricing, foreign bribery, and export control schemes*. Available at: Link (Accessed: 5 December 2025).

U.S. Government Accountability Office (2024). *GAOoverview: Understanding waste in federal programs*. Available at: Link (Accessed: 3 December 2025).

Verrecchia, R.E., 1983. Discretionary disclosure. *Journal of Accounting and Economics*, *5*, pp.179-194.

Verrecchia, R.E., 2001. Essays on disclosure. *Journal of Accounting and Economics*, *32*(1-3), pp.97-180.

Weil, D., Graham, M. and Fung, A., 2013. Targeting transparency. *Science*, *340*(6139), pp.1410-1411.

Williamson, O.E., 1971. The vertical integration of production: market failure considerations. *The American economic review*, *61*(2), pp.112-123.

Wing, C., Freedman, S.M. and Hollingsworth, A., 2024. *Stacked difference-in-differences* (No. w32054). National Bureau of Economic Research.

Zuo, L., 2016. The informational feedback effect of stock prices on management forecasts. *Journal of Accounting and Economics*, 61(2-3), pp.391-413.

Appendix A: Stylized Model for Monitoring Mechanism

Model Setup

A risk-neutral principal (e.g., government) procures a project with performance level $q \geq 0$ (e.g., output quantity, quality, productive efficiency) from a risk-neutral agent (e.g., procurement contractor).

The agent's cost parameter:

$$\beta \in \{\beta_L, \beta_H\}, \qquad 0 < \beta_L < \beta_H$$

β is privately known by the agent. The low-cost type β_L is also the high-efficiency type; the high-cost type β_H is the low-efficiency type.

The agent's production cost is linear:

$$C(\beta, q) = \beta q$$

The principal pays government transfer t to the agent, and the agent's utility is:

$$U(\beta) = t - \beta q$$

The outside option is normalized to zero:

$$U(\beta) \geq 0$$

The principal's benefit from performance level q is:

$$S(q), \qquad S'(q) > 0, \qquad S''(q) < 0$$

The prior distribution of types that was known by the principal is:

$$Pr\,(\beta = \beta_L) = \mu, \qquad Pr\,(\beta = \beta_H) = 1 - \mu$$

The principal commits to a direct revelation mechanism specifying, for each reported type $\hat{\beta} \in \{\beta_L, \beta_H\}$, a pair $\left(q(\hat{\beta}), t(\hat{\beta})\right)$, as denoted:

$$(q_L, t_L) := (q(\beta_L), t(\beta_L)), \qquad (q_H, t_H) := (q(\beta_H), t(\beta_H))$$

The principal maximizes expected welfare:

$$W = \mu\,[S(q_L) - t_L] + (1 - \mu)\,[S(q_H) - t_H]$$

A.1 The Incomplete Information Scenario

Under asymmetric information, the principal knows the distribution of the agent's cost parameter $\beta \in \{\beta_L, \beta_H\}$ but cannot observe agent's realized type. Since the principal cannot condition procurement contracts on the agent's true β, any feasible mechanism must ensure that each type prefers to report truthfully (i.e., incentive-compatibility) and that each type is willing to participate (i.e., individual rationality). These informational frictions generate constraints that do not arise under complete information, where the principal can fully observe the agent's type and thus monitor efficiently.

A.1.1 Procurement under Incomplete Information

Under asymmetric information, the mechanism must satisfy the following constraints:

Individual Rationality (IR). Each true type must weakly prefer participating to the outside option:

$$IR_L\colon t_L - \beta_L q_L \geq 0$$
$$IR_H\colon t_H - \beta_H q_H \geq 0$$

Incentive Compatibility (IC). Each type must weakly prefer truthful reporting to misreporting:

$$\mathrm{IC}_L\colon t_L - \beta_L q_L \geq t_H - \beta_L q_H$$
$$\mathrm{IC}_H\colon t_H - \beta_H q_H \geq t_L - \beta_H q_L$$

The principal's problem can be written as

$$\max_{q_L, q_H, t_L, t_H} \quad \mu[S(q_L) - t_L] + (1-\mu)\,[S(q_H) - t_H]$$

A.1.2 Lemmas

To establish the main conclusion in Propositions, I introduce several lemmas that characterize the structure of the optimal mechanism design under asymmetric information. These lemmas identify which constraints bind, determine the agent's information rents, and provide the benchmark for comparing the first-best and second-best allocations. The proof for each lemma is provided in Online Appendix B.

Lemma 1 ($\boldsymbol{IR_H}$ binds). In any optimal solution, the high-cost (low-efficiency) type's participation constraint IR_H binds:

$$t_H = \beta_H q_H$$

Lemma 2 ($\boldsymbol{IC_H}$ is slack). In any optimal solution, the high-cost type's incentive compatibility constraint IC_H is slack.

Lemma 3 (IC_L binds). In any optimal solution, the low-cost type's incentive compatibility constraint IC_L binds:

$$t_L - \beta_L q_L = t_H - \beta_L q_H$$

Lemma 4 (IR_L is slack). In any optimal solution, the participation constraint of the low-cost type is strictly slack:

$$t_L - \beta_L q_L > 0$$

Lemma 5 (Information rents of both types in the second-best mechanism). In the optimal incentive-compatible (second-best) procurement mechanism, the low-cost (high-cost) type earns strictly positive (zero) information rent:

$$U_L^{SB} = t_L - \beta_L q_L = (\beta_H - \beta_L) q_H > 0$$

$$U_H^{SB} = t_H - \beta_H q_H = 0$$

Lemma 6 (Second-best performance under asymmetric information). Under asymmetric information, the optimal (second-best) performance levels satisfy:

$$S'(q_L^{SB}) = \beta_L$$

$$S'(q_H^{SB}) = \beta_H + \frac{\mu}{1-\mu}(\beta_H - \beta_L)$$

A.2 The Complete-information Scenario

Under complete information setting, the principal observes each agent's β directly and can implement the first-best allocation without incentive constraints.

A.2.1 Procurement under Complete Information

Consider now the case where β is observable to the principal. For a given type β, the principal solves

$$\max_{q,t} \quad S(q) - t$$

and the agent's utility is

$$U^{FB}(\beta) = t^{FB}(\beta) - \beta q^{FB}(\beta) = 0$$

for both $\beta_L$and β_H, there is no information rent under complete information. Detailed proof is provided in Online Appendix B.

A.2.2 Lemma

Lemma 7 (First-best performance under complete information). When the cost parameter β is observable to the principal, the optimal (first-best) performance for type $\beta \in \{\beta_L, \beta_H\}$ solves:

$$S'(q^{FB}(\beta)) = \beta$$

Therefore,

$$S'(q_L^{FB}) = \beta_L, \qquad S'(q_H^{FB}) = \beta_H,$$

Since $S'' < 0$ and $\beta_L < \beta_H$, it follows that:

$$q_L^{FB} > q_H^{FB}.$$

A.3 Propositions

In this section, I present two propositions, and the proof of each is provided in Online Appendix B.

A.3.1 Proposition 1: Optimal Performance Level

Proposition 1. Under asymmetric information, the aggregated performance ($Q = q_L + q_H$) is strictly lower than under complete information:

$$Q^{SB} < Q^{FB}.$$

Under asymmetric information, the low-cost (high-efficiency) type receives the same performance as under complete information, while the high-cost type's performance is distorted downward relative to the first-best solution under complete information. The aggregated performance is strictly lower under asymmetric information than under complete information.

A.3.2 Proposition 2: Information Rent

Proposition 2. Under asymmetric information (when β is privately observed by the agent), the optimal incentive-compatible procurement mechanism yields

$$U_L^{SB} = (\beta_H - \beta_L)q_H > 0, \qquad U_H^{SB} = 0.$$

Under complete information (when β is observable), the optimum satisfies

$$U_L^{FB} = U_H^{FB} = 0.$$

Under asymmetric information, the low-cost (high-efficiency) type extracts strictly positive rent, whereas low-cost (high-efficiency) type extracts zero rent under complete information. The high-cost (low-efficiency) type extracts zero rent in any information environment.

Appendix B: Stylized Models for Private Information Signaling Mechanism

Model Setup

The non-government donor (i.e., private individual), who becomes informed through disclosure, contributes $g \geq 0$ to a procurement project of quality α provided by the contractor (i.e., agent). The government (i.e., principal), which is uninformed about α, supplies grant $S \geq 0$. Aggregate provision is

$$G = g + S$$

$v(G; \alpha)$ is utility function of the public good, which is a twice differentiable function mapping total provision G and quality α into social welfare. Preferences follow the separable specification $v(G; \alpha)$ with

$$v_G(G; \alpha) \equiv \frac{\partial v(G; \alpha)}{\partial G} > 0, \qquad v_{GG}(G; \alpha) \equiv \frac{\partial^2 v(G; \alpha)}{\partial G^2} < 0,$$

$$v_\alpha(G; \alpha) \equiv \frac{\partial v(G; \alpha)}{\partial \alpha} > 0, \qquad v_{G\alpha}(G; \alpha) \equiv \frac{\partial^2 v(G; \alpha)}{\partial G \, \partial \alpha} > 0.$$

The donor's utility function is:

$$U_D = \gamma \, v(G; \alpha) - c(g)$$

where $c(g)$ is the donor's cost of giving, and I assume that cost function is increasing and strictly convex, i.e., $c' > 0, c'' > 0$. γ ($\gamma > 0$) is a parameter scaling the donor's valuation of the public good. A larger γ means the donor cares more about the public good. The government's objective function of social welfare is:

$$W = v(G; \alpha) - \kappa S$$

κ ($\kappa \geq 0$) is the marginal social cost of public funds, which can be interpretable as the shadow cost of raising one unit of public revenue (e.g., via taxes or budget constraints).

Quality information. Nature draws α. The donor privately infers α through the disclosure; the government holds a prior. The government observes g but not α.

Timing.

1. Nature draws α.
2. Donor (first mover) infers α and chooses g at time t.
3. Government observes g, updates beliefs $\nu(\alpha; g)$, and chooses S at time $t + 1$.

Equilibrium concept. A Perfect Bayesian Equilibrium (PBE) consists of a donation strategy

$g(\alpha)$, a grant response $S(g)$, and beliefs $\nu(\alpha; g)$ consistent with Bayes' rule wherever possible. I focus on separating equilibria with $g'(\alpha) > 0$, so that $\hat{\alpha} = \alpha(g)$ is well defined.

Next, I will give two Lemmas and one Proposition. The proof for each is provided in Online Appendix C.

B.1 Government's Optimal Grant Response

Lemma 1. Given belief $\hat{\alpha} = \alpha(g)$, the government's optimal grant satisfies

$$S'(g) = -1 - \frac{v_{G\alpha}}{v_{GG}}\, \alpha'(g).$$

The first term (-1) is mechanical substitution effect (holding beliefs fixed, more g reduces needed S); the second term is the private information signaling correction (a higher g raises inferred quality when $\alpha'(g) > 0$, and because $v_{G\alpha} > 0$, the government's optimal S rises).

B.2 Donor Optimization and Incentive Compatibility

Lemma 2. In any separating equilibrium with $g'(\alpha) > 0$, the donor's contribution satisfies

$$c'(g) = \gamma\, v_G(G; \alpha)\, \frac{v_{G\alpha}}{|\, v_{GG}\, |}\, \alpha'(g).$$

B.3 Proposition

Proposition 1. *In any separating PBE with $g'(\alpha) > 0$, the government's optimal grant increases with the private contribution if and only if*

$$v_{G\alpha}\, \alpha'(g) > |\, v_{GG}\, |. \qquad (1)$$

Equivalently, $S'(g) > 0$.

Under $v_{GG} < 0$, $\alpha'(g) > 0$ (separation), and $v_{G\alpha} > 0$, condition (1) states that the marginal value implied by the quality signal from the private donation exceeds the diminishing marginal benefits of the public good. If and only if this condition holds, the government optimally increases its grant in response to a higher private contribution.

Appendix C: Variable Definition

Variable	Definition
Panel A: Institution Characteristics	
$Multi\_campus$	An indicator variable equals 1 if university i in calendar year t has more than one campus, otherwise 0.
$\#\ campus$	The number of campuses for university i in calendar year t.
$Complexity$	An indicator variable that measures the organizational complexity of a university based on the breadth of its academic offerings. I measure the complexity using the number of academic programs offered at the two-digit CIP level in the academic year 2000/01. The indicator equals one if a university's number of majors in the academic year 2000/01 exceeds the sample median, and zero otherwise.
$Control$	A dummy variable that equals 1 if the university is private not-for-profit, and 0 if public.
$Size$	The categorical variable from IPEDS classification for institution size for university i in academic year t: 1 for size under 1,000 students; 2 for size of 1,000 - 4,999 students; 3 for size of 5,000 - 9,999: 4 for size of 10,000 - 19,999; 5 for size of 20,000 and above.
$Ln(\#\ faculty)$	The natural logarithm of the estimated number of faculty members at university i in academic year t. The number of faculty is estimated using the IPEDS student–faculty ratio and the total number of undergraduate students in each year. For observations where the student–faculty ratio is missing, the university-specific average ratio is used to impute the value.
$GASB$	The treatment indicator equals 1 if public university i adopts GASB 34/35 in academic year t, otherwise 0.
Panel B: Institution Funding	
$\$\ Federal\ grant$	The dollar amount of all revenues from federal agencies under grants and contracts for specific undertakings such as research projects, training programs, and similar activities, received by university i in academic year t. In the IPEDS data, a portion of private not-for-profit universities treat federal student aid grants (e.g., Pell Grants) as student aid expenses when awarded to students. Consequently, the reported federal grants and contracts for these institutions include student aid amounts in addition to research-related revenues. To

	ensure comparability across institutions, we exclude federal student aid grants from this variable for private not-for-profit universities. Information on the treatment of student aid grants is obtained from universities' official statements, and data on federal student aid grants are sourced from IPEDS. Public universities, by contrast, treat federal student aid grants as agency transactions; therefore, these amounts are not included in their reported federal grants and contracts in IPEDS, and no adjustment is needed.
$\$\,Private\ gift$	The dollar amount of all revenues from private (non-governmental) entities under gifts, grants, and contracts for research, training projects, similar activities and all contributions (including contributed services) except those from affiliated entities, received by university i in academic year t.
$\$\,State\ grant$	The dollar amount of all revenues from state agencies under grants and contracts for specific undertakings such as research projects, training programs, and similar activities, received by university i in academic year t. In the IPEDS data, a portion of private not-for-profit universities treat state student aid grants as student aid expenses when awarded to students. Consequently, the reported federal grants and contracts for these institutions include student aid amounts in addition to research-related revenues. To ensure comparability across institutions, we exclude state student aid grants from this variable for private not-for-profit universities. Information on the treatment of student aid grants is obtained from universities' official statements, and data on state student aid grants are sourced from IPEDS. Public universities, by contrast, treat state student aid grants as agency transactions; therefore, these amounts are not included in their reported state grants and contracts in IPEDS, and no adjustment is needed.
$Ln(\$\,Federal\ grant)$	The natural logarithm of $\$\,Federal\ grant$ for university i in academic year t.
$Ln(\$\,Private\ gift)$	The natural logarithm of $\$\,Private\ gift$ for university i in academic year t.
$Ln(\$\,State\ grant)$	The natural logarithm of $\$\,State\ grant$ for university i in academic year t.

Panel C: Academic Output Measures	
$\# \, patent_{grant}$	The number of patents granted to university i in academic year t, including those under the university and its affiliated entities such as university foundations or research institutes.
$\# \, patent_{apply}$	The number of patent applications by university i in academic year t, including those under the university and its affiliated entities such as university foundations or research institutes.
$\# \, publication$	The number of publications by university i in academic year t that are indexed in Elsevier's Scopus database. Publications include journal articles, book chapters, conference papers, case reports, and other indexed outputs.
RE	The dollar amount of total research expenditures of university i in academic year t, including all research-related spending categories: salaries and wages, employee benefits, operation and maintenance of plant, depreciation, interest, and all other research expenses.
$\# \, patent_{grant,t+1}/RE_{million,t}$	The number of patents granted to university i in academic year $t+1$ per million dollars of research expenditure in academic year t.
$\# \, patent_{grant,t+2}/RE_{million,t}$	The number of patents granted to university i in academic year $t+2$ per million dollars of research expenditure in academic year t.
$\# \, patent_{apply,t+1}/RE_{million,t}$	The number of patent applications by university i in academic year $t+1$ per million dollars of research expenditure in academic year t.
$\# \, patent_{apply,t+2}/RE_{million,t}$	The number of patent applications by university i in academic year $t+2$ per million dollars of research expenditure in academic year t.
$Ln(\# \, publication_{t+1}/RE_{million,t})$	The natural logarithm of the number of publications by university i in academic year $t+1$ per million dollars of total research expenditure in academic year t.
$Ln(\# \, publication_{t+2}/RE_{million,t})$	The natural logarithm of the number of publications by university i in academic year $t+2$ per million dollars of total research expenditure in academic year t.
Panel D: Student Grants and Loans	
$\$ \, Federal \; Student \; Grant$	The dollar amount of all student grants from federal agencies for university i in academic year t, mainly including Pell grants and other federal grants. Pell grants include the amount administered by the institution under the Pell grant program. Other federal

	grants include the amount awarded to the institution under other federal student aid programs, such as Supplemental Education Opportunity Grants (SEOG), DHHS training grants (aid portion only), DOD grants, Department of Veterans Affairs grants, and the federal portion of the College Work Study Program (FWS) and State Student Incentive Grants (SSIG).
$Ln(\$\ Federal\ Student\ Grant)$	The natural logarithm of the dollar amount of all student grants from federal agencies, received by university i in academic year t.
$\$\ Federal\ Student\ Loan$	The dollar amount of subsidized federal direct loans (FDL) and subsidized federal family education loans (FFEL) for undergraduates, received by university i in academic year t. These two are the most widely used and most favorable types of federal student loans, as the government pays the interest while the student is in school. Subsidized FDL are issued directly by the U.S. Department of Education, whereas Subsidized FFEL were made by private lenders but guaranteed by the federal government. The FFEL program was discontinued for new loans after 2010, and all new subsidized loans since then have been issued under the FDL program.
$Ln(\$\ Federal\ Student\ Loan)$	The natural logarithm of the dollar amount of subsidized FDL and subsidized FFEL for undergraduates, received by university i in academic year t.
Panel E: Faculty Compensation and Mobility	
$Ln(Avg\ salary)_{position}$	The natural logarithm of the average annual salary for faculty holding a given academic position at university i in academic year t. The average salary is calculated across faculty on nine- or ten-month contracts within each position. The positions considered include tenure-track and tenured faculty on nine- or ten-month contracts—specifically Assistant Professors, Associate Professors, and Full Professors—whose compensation is relatively more sensitive to research activity and the availability of research funding (e.g., merit-based adjustments).
$Mobility_{position}$	The net change in the number of faculty positions at university i between academic years t and $t+1$. Specifically, for mobility in year t, this variable is constructed as the number of faculty holding a given

position in year $t + 1$ minus the number holding that position in year t. This timing follows the structure of academic labor markets, in which promotion, hiring, and separation decisions are typically reviewed and approved during year t but take effect in year $t + 1$. Accordingly, changes in faculty positions observed in year $t + 1$ capture mobility decisions made in response to conditions in year t.

The positions here include tenure-track and tenured faculty on nine- or ten-month contracts, specifically Assistant Professors, Associate Professors, and Full Professors, who are more sensitive to research activity and the availability of research funding.

Figure 1

Costs of Federally Funded Research

This figure illustrates the costs of federally funded research, available from the Association of American Universities. Research facilities on the right hand provide examples of various research costs. These costs are grouped into two main types: direct costs and facilities administrative (F&A) costs. The graph on the left hand zooms in on the research laboratory, providing common examples of direct costs.

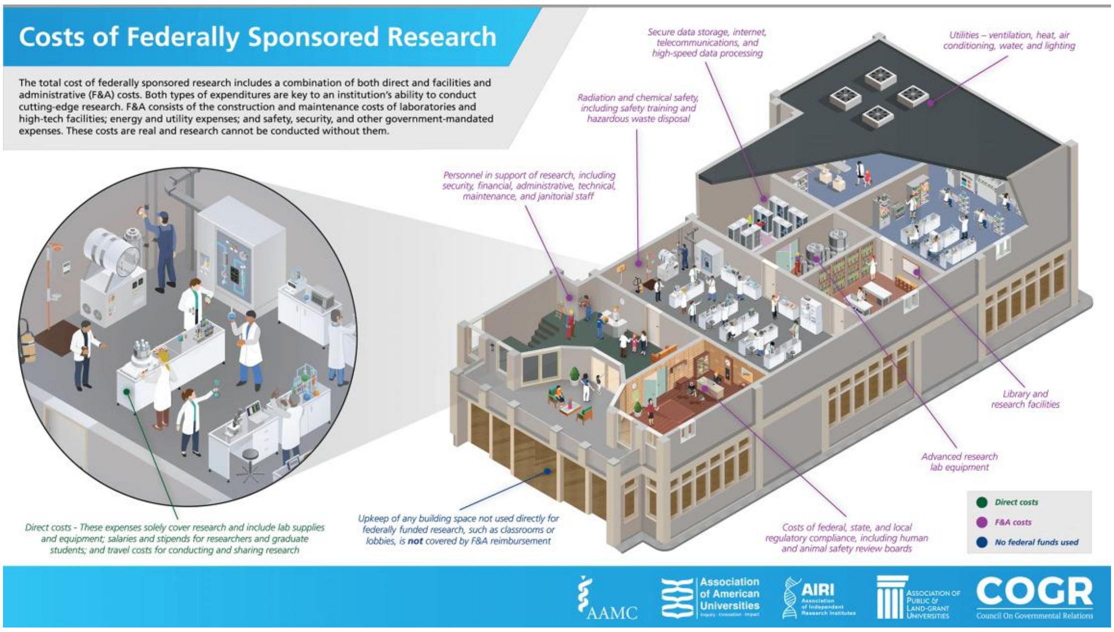


Figure 2

The History of Disclosure Standards across U.S. Colleges

This figure illustrates the history of disclosure standards for U.S. colleges. The "Common Form," also known as the "Old Form," refers to the IPEDS survey format used at that time, during which all colleges and universities followed the fund accounting and reporting standards described in the AICPA's 1973 audit guide. The abbreviation FASB stands for the Financial Accounting Standards Board, and GASB stands for the Governmental Accounting Standards Board. The Aligned Form aims to standardize reporting templates to enhance comparability across FASB and GASB institutions, but without changing the accounting standards *per se*. Years refer to the fall semester of an academic year. For example, 1986 refers to the 1986/87 academic or fiscal year.

	Public	**Private Not-for-profit Colleges**	**Private For-profit Colleges**
1979			
1983			
1984			
1985			
1986			
1987			
1988			
1989		**Common Form**	**Common Form**
1990			
1991	**Common Form**		
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001	**Common Form/GASB**	**FASB**	
2002			
2003			
2004	**GASB**		
2005			
2006			
2007	**GASB/GASB Aligned Form**	**FASB/FASB Aligned Form**	
2008			
2009			**FASB**
2010			
2011			
2012			
2013			
2014			
2015	**GASB Aligned Form**	**FASB Aligned Form**	
2016			
2017			
2018			
2019			
2020			
2021			
2022			

Figure 3

Timeline of Accounting Standards for U.S. Universities

This figure shows the timeline of accounting standards for U.S. universities. Private not-for-profit research universities adopted FASB reporting beginning in academic year 1996/97, replacing the IPEDS Common Form. Public research universities continued to use the Common Form until the phase-in of GASB 34/35 between 2001/02 and 2003/04, with adoption timing determined by total annual revenues. The vertical line denotes the academic year, which refers to the reporting period used by institutions (typically from July 1 of year y to June 30 of year $y + 1$). For example, academic year 2001/02 corresponds to the period from July 1, 2001, to June 30, 2002.

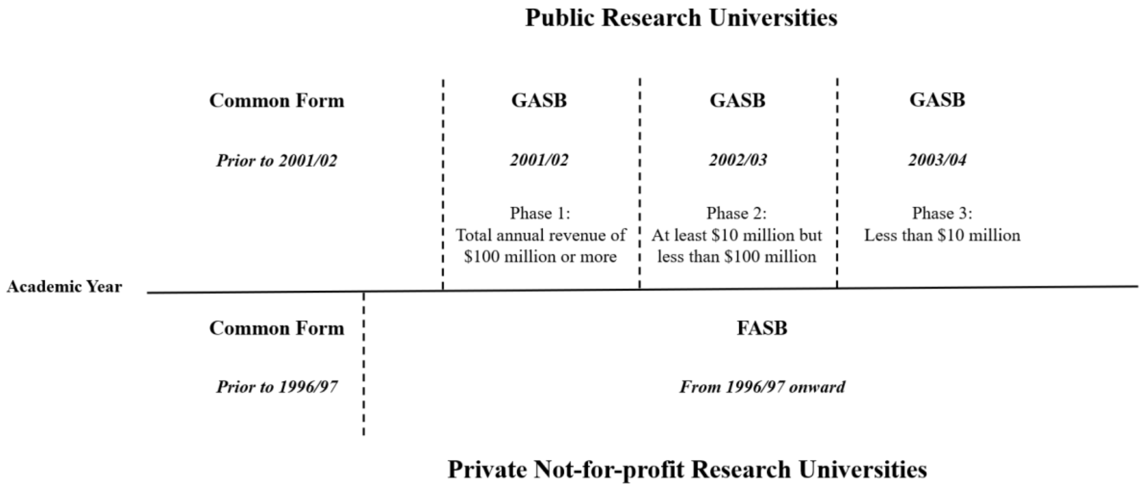


Figure 4

Testing for Diverging Pre-trends and Dynamic Treatment Effects

This figure graphs dynamic diff-in-diffs estimates to examine the parallel trends assumption and dynamic treatment effects. Panel A plots the raw time-series pattern of average federal grants per college for treated public universities and control private not-for-profit universities. Panel B plots event-study estimates from a two-way fixed effects (TWFE) model for federal grants at the college-year level. The treatment group consists of public universities that were classified as Research I (i.e., R1, or previously called "Doctoral/Research Universities-Extensive") or Research II (i.e., R2, or previously called "Doctoral/Research Universities-Intensive") institutions in the 2000/01 Carnegie Classification. The control group comprises private not-for-profit universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. I re-estimate a dynamic event-study of the TWFE model with indicators for distance to/from the implementation of GASB 34/35. Specifically, the regression model is as follows:

$$Outcome = \beta_0 + \sum_{k=-4}^{7} \beta_k D_{k(i,t)} + \gamma \boldsymbol{X}_{i,t} + \alpha_i + \varphi_t + \varepsilon_{i,t}$$

where $Outcome$ is the variable of our interest (federal grants at time t and $t+1$); $D_{k(\text{i,t})}$ is set of indicator variables that equals one if public university i is k academic years away from adopting GASB 34/35 in academic year t (with $k < 0$ denoting k years before adoption and $k > 0$ denoting k years after adoption), and zero otherwise. α_i and φ_t are fixed effects for university and academic year. Heteroscedasticity-consistent standard errors are two-way clustered by the academic year and state level. All specifications are estimated using OLS. The vertical lines represent 95% confidence intervals.

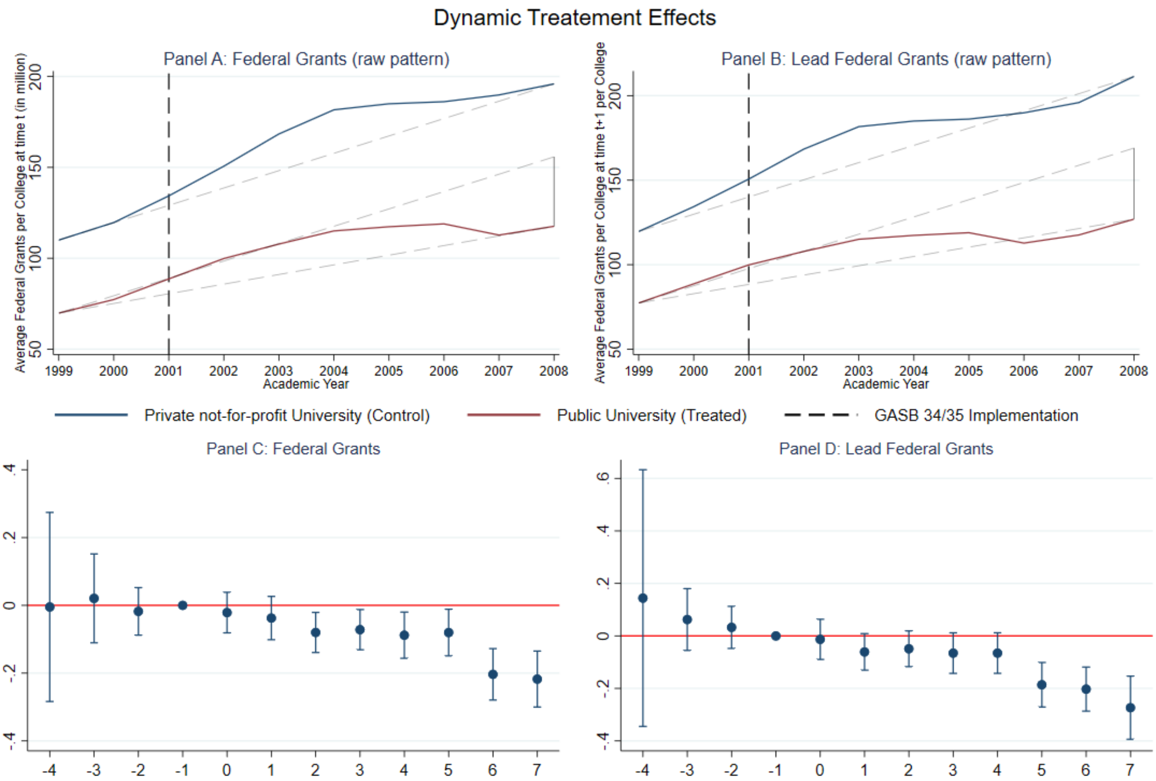


Figure 5

Robustness Test to Violations of the Parallel Trends Assumption: Honest DiD

This figure presents robustness analyses proposed by Rambachan and Roth (2023), which evaluates how sensitive the estimated treatment effects are to potential violations of parallel trends assumption. I test the robust confidence intervals by imposing that the post-treatment violation of parallel trends is no more than certain constant Mbar ($\overline{M}$) larger than the maximum violation of parallel trends in the pre-treatment period. The plots on the left-hand side impose relative magnitudes restrictions, which constrain post-treatment violations of parallel trends to be no larger than a multiple ($\overline{M}$) of the largest pre-treatment deviation. The plots on the right-hand side impose smoothness restrictions, which limit the change in slope between consecutive periods to at most ($\overline{M}$). The red intervals denote the original 95% confidence intervals without restrictions, and the blue intervals show the robust confidence intervals under increasing values of $\overline{M}$. All specifications are based on equation (1), estimated using OLS and include fixed effects for academic year and university. Heteroscedasticity-consistent standard errors are two-way clustered by the academic year and state level. Panel A presents estimates from the specification where the dependent variable is the federal grant at time t. Panel B reports estimate from the specification where the dependent variable is the lead federal grant at $t + 1$.

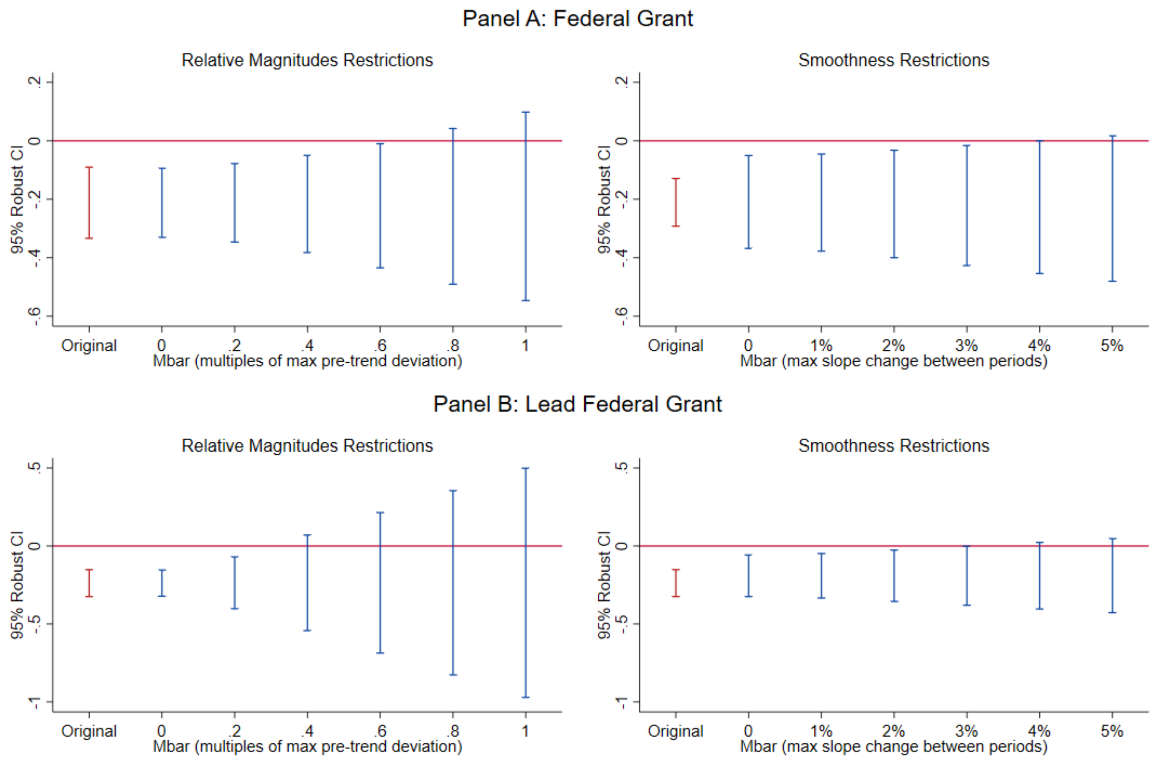


Figure 6

Heterogeneous Treatment Effects

This figure tests the heterogeneous treatment effects based on two-way fixed effects (TWFE) Difference-in-Differences (DiD) estimator. The treatment group consists of public universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. The control group comprises private not-for-profit universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. Panel A shows the Bacon Decomposition of the TWFE DiD estimator. Each marker represents a 2×2 DiD estimate comparing treatment and control groups with different treatment timings. Circles correspond to comparisons between later-treated public universities (treatment) and earlier-treated ones (control); diamonds represent earlier-treated public universities (treatment) versus later-treated ones (control); and crosses indicate comparisons of treated units (public universities) with never-treated units (private not-for-profit universities). The gray dashed horizontal line indicates the overall TWFE DiD estimate. Panel B graphs quantile-regression DiD estimates for treatment effect heterogeneity. The model specifications are estimated using OLS and include fixed effects for academic year and university. Heteroscedasticity-consistent standard errors are two-way clustered by the academic year and state level. The dashed lines represent 95% confidence intervals.

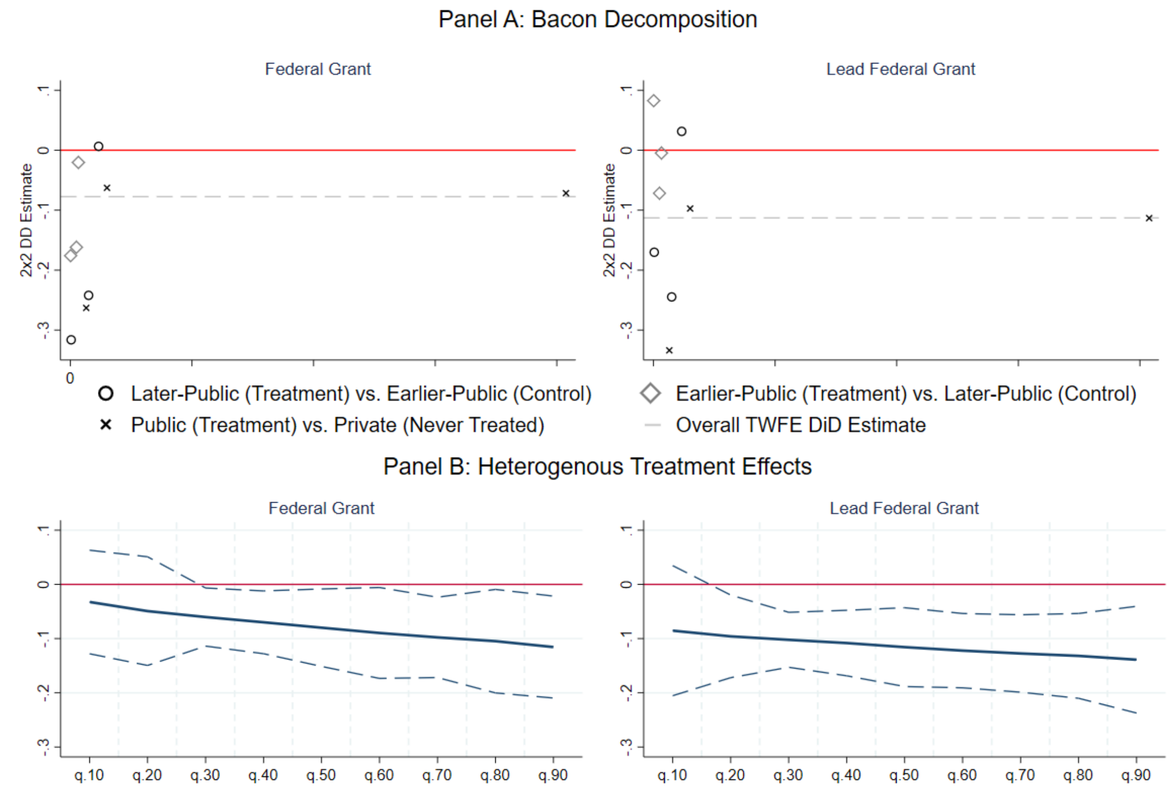


Figure 7

Dynamic Regulatory Learning Effects

This figure plots dynamic regulatory learning effects associated with the private information signaling mechanism. The estimates are obtained from a dynamic event-study using a two-way fixed effects (TWFE) specification for the private information signaling mechanism, as described below:

$$Outcome_{i,t+1} = \beta_0 + \beta_1 I_{i,[-4,-1]} * External\_signal_{i,t} + \beta_2 I_{i,[0,3]} * External\_signal_{i,t} + \beta_3 I_{i,[4,7]} * External\_signal_{i,t} + \beta_4 External\_signal_{i,t} + \sum_{k=-4}^{7} \theta_k D_{k(i,t)} + \gamma \boldsymbol{X}_{i,t} + \alpha_i + \varphi_t + \varepsilon_{i,t}$$

$I_{i,[a,b]}$ is an indicator equal to one if university i is in treated group and academic year t falls between a and b years relative to the implementation of GASB 34/35, and zero otherwise. $D_{k(i,t)}$ is set of indicator variables that equals one if public university i is k academic years away from adopting GASB 34/35 in academic year t (with $k < 0$ denoting k years before adoption and $k > 0$ denoting k years after adoption), and zero otherwise. $Outcome_{i,t+1}$ is $Ln(\$\, Federal\ grant)_{t+1}$, which is the natural logarithm of federal grants received by university i in academic year $t+1$. Federal grants include revenues from federal agencies under grants and contracts for specific purposes, mainly the research projects and academic training programs. I focus on two primary sources of external funding signals ($External\_signal$): private gifts ($Ln(\$\, Private\ gift)_t$) and state grants ($Ln(\$\, State\ grant)_t$). $Ln(\$\, Private\ gift)_t$ is the natural logarithm of private gifts received by university i in academic year t. $Ln(\$\, State\ grant)_t$ is the natural logarithm of state grants received by university i in academic year t. The treated group consists of public universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. The control group comprises private not-for-profit universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. Control variables include the proxy for institutional size and the natural logarithm of faculty number. All specifications are estimated using OLS and include controls and fixed effects for university and academic year. Heteroscedasticity-consistent standard errors are two-way clustered by state and academic year, and t-statistics are shown in parentheses. The vertical lines represent 90% confidence intervals. The definition of each variable is provided in Appendix C.

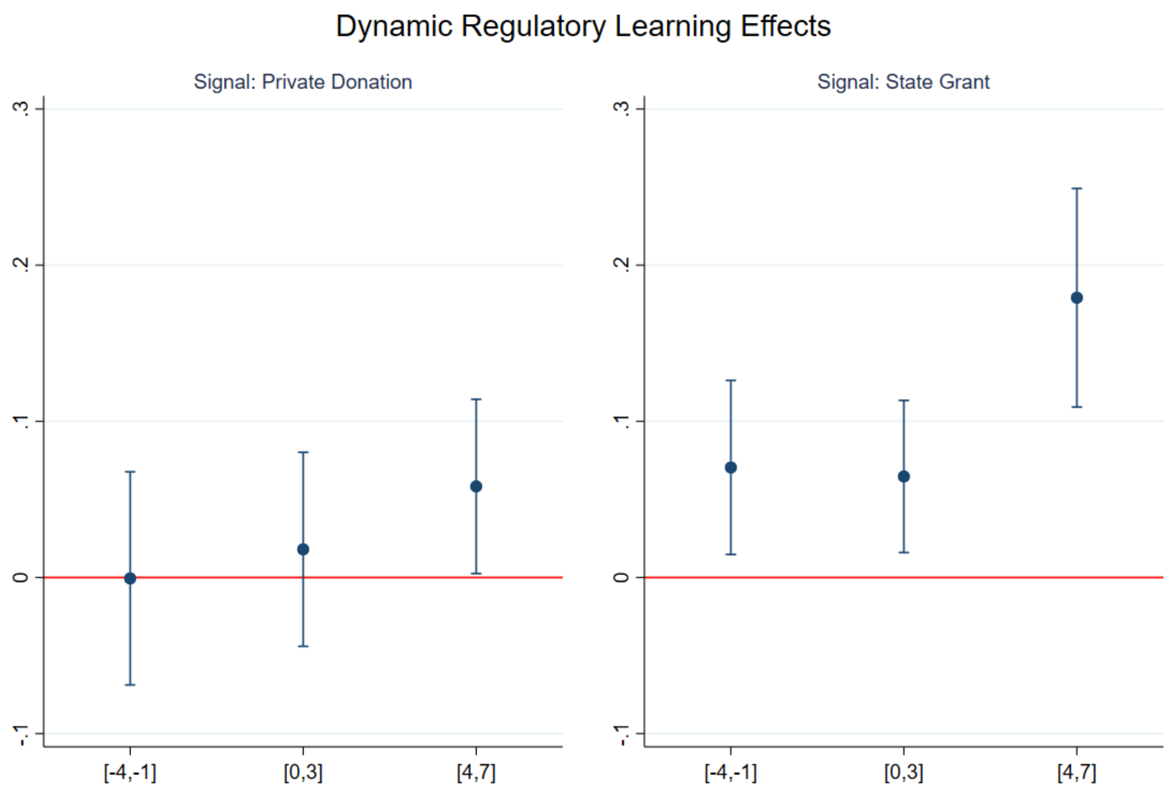


Table 1

Sample Selection

This table presents the sample selection in this study. The research sample is restricted to U.S. research universities classified under the 2000/01 Carnegie Classification (one year prior to the earliest implementation of GASB 34/35) to ensure that sample construction is not contaminated by post-GASB information. The treated group consists of public universities that were classified as Research I (i.e., R1, or previously called "Doctoral/Research Universities-Extensive") or Research II (i.e., R2, or previously called "Doctoral/Research Universities-Intensive") institutions in the 2000/01 Carnegie Classification. The control group comprises private not-for-profit universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. The adoption of GASB 34/35 among public universities was phased in over three waves, corresponding to the implementations in 2001/02, 2002/03, and 2003/04 academic years. For details on the phase-in process of GASB 34/35, see Figure 3.

Carnegie Classification in 2000/01	Accounting Standards	# of unique universities	# of unique universities
Panel A: Public Universities (Treated Group)			
Research I			96
	Adoption of GASB 34/35 in Phase 1	90	
	Adoption of GASB 34/35 in Phase 2	5	
	Adoption of GASB 34/35 in Phase 3	1	
Research II			58
	Adoption of GASB 34/35 in Phase 1	53	
	Adoption of GASB 34/35 in Phase 2	3	
	Adoption of GASB 34/35 in Phase 3	2	
Total			***154***
Panel B: Private Not-for-profit Universities (Control Group)			
Research I	FASB		46
Research II	FASB		16
Total			***62***

Table 2

Descriptive Statistics

This table reports the descriptive statistics for institution characteristics, institution fundings, academic outputs, student grants and loans, and faculty compensation and mobility, respectively. For variable definitions, please refer to Appendix C.

Variable	# obs.	Min	p10	p25	p50	p75	p90	Max	Mean	SD
Panel A: Institution Characteristics										
$Multi\_campus$	2,160	0	0	0	0	0	1	1	0.111	0.314
$\#\ campus$	2,160	1	1	1	1	1	2	8	1.245	0.882
$Complexity$	2,160	0	0	0	1	1	1	1	0.528	0.499
$Control$	2,160	0	0	0	0	1	1	1	0.287	0.452
$Size$	2,160	2	3	4	4	5	5	5	4.235	0.842
$Ln(\#\ faculty)$	2,160	3.296	5.823	6.249	6.641	6.966	7.213	7.894	6.573	0.591
$GASB$	2,160	0	0	0	1	1	1	1	0.564	0.496
Panel B: Institution Funding										
$\$\ Federal\ grant$ *(in million \$)*	2,160	0.711	12.58	25.11	59.38	148.2	302.3	1167	119.6	152.2
$\$\ Private\ gift$ *(in million \$)*	2,160	0	0.638	5.931	20.09	55.92	147.1	937.3	56.55	101.5
$\$\ State\ grant$ *(in million \$)*	2,160	0	1.133	3.144	8.296	17.74	35.02	115.4	14.00	16.72
$Ln(\$\ Federal\ grant)$	2,160	13.47	16.35	17.04	17.90	18.81	19.53	20.88	17.93	1.206
$Ln(\$\ Private\ gift)$	2,011	1.609	14.93	15.90	16.95	17.95	18.86	20.66	16.84	1.678
$Ln(\$\ State\ grant)$	2,100	7.313	14.22	15.04	15.97	16.72	17.39	18.56	15.83	1.322
Panel C: Academic Output										
$\#\ patent_{grant}$	2,160	0	0	0	3	14	34	437	12.99	32.97
$\#\ patent_{apply}$	2,160	0	0	0	4	16	39.50	533	14.77	34.69
$\#\ publication$	2,007	0	20	79	234	613	1214	6276	476.2	675.5
RE *(in million \$)*	2,160	0.165	9.930	20.65	66.45	165.9	331.2	1129	125.7	157.3
$\#\ patent_{grant,t+1}/RE_{million,t}$	2,160	0	0	0	0.0524	0.120	0.202	18.23	0.115	0.651
$\#\ patent_{grant,t+2}/RE_{million,t}$	2,160	0	0	0	0.0568	0.124	0.216	16.93	0.110	0.510
$\#\ patent_{apply,t+1}/RE_{million,t}$	2,160	0	0	0	0.0595	0.140	0.254	11.29	0.118	0.367

$\# \; patent_{apply,t+2}/RE_{million,t}$	2,160	0	0	0	0.0518	0.129	0.241	12.16	0.111	0.366
$Ln(\# \; publication_{t+1}/RE_{million,t})$	1,923	-6.115	0.342	0.929	1.362	1.932	2.974	7.570	1.378	1.523
$Ln(\# \; publication_{t+2}/RE_{million,t})$	1,933	-6.046	0.312	0.976	1.412	1.994	3.013	7.597	1.414	1.549
Panel D: Student Grants and Loans										
$\$ \; Federal \; Student \; Grant$ *(in million \$)*	2,160	0	3.291	6.320	10.48	16.06	22.80	78.51	12.40	9.078
$Ln(\$ \; Federal \; Student \; Grant)$	2,147	13.58	15.04	15.68	16.17	16.59	16.94	18.18	16.09	0.758
$\$ \; Federal \; Student \; Loan$ *(in million \$)*	2,156	0	0	0	16.09	32.22	47.24	174.9	20.03	22.33
$Ln(\$ \; Federal \; Student \; Loan)$	1,582	5.215	12.41	16.40	16.99	17.47	17.76	18.98	16.18	2.506
Panel E: Faculty Compensation and Mobility										
$Ln(Avg \; salaray)_{Assistant \; professor}$	1,925	8.277	10.77	10.85	10.97	11.10	11.22	11.53	10.98	0.184
$Ln(Avg \; salaray)_{Associate \; professor}$	1,925	7.822	10.93	11.02	11.13	11.25	11.37	11.76	11.14	0.186
$Ln(Avg \; salaray)_{Full \; professor}$	1,933	8.299	11.18	11.31	11.45	11.60	11.75	12.24	11.46	0.234
$Mobility_{Assistant \; professor}$	1,924	-79	-14	-4	3	13	24	217	4.650	18.65
$Mobility_{Associate \; professor}$	1,924	-131	-10	-4	2	9	16	205	2.724	14.68
$Mobility_{Full \; professor}$	1,932	-169	-12	-4	1	8	16	487	1.984	19.54

Table 3

The Effects of GASB 34/35 Adoption on the Allocation of Federal Grants

This table reports diff-in-diffs estimates of the effects of GASB 34/35 on the allocation of federal grants. $Ln(\$\,Federal\ grant)_t$ ($Ln(\$\,Federal\ grant)_{t+1}$) is the natural logarithm of federal grants received by university i in academic year t ($t+1$). Federal grants include revenues from federal agencies under grants and contracts for specific purposes, mainly the research projects and academic training programs. The treated group consists of public universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. The control group comprises private not-for-profit universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. Control variables include the proxy for institutional size and the natural logarithm of faculty number. All specifications are estimated using OLS and include controls and fixed effects for university and academic year. Heteroscedasticity-consistent standard errors are two-way clustered by state and academic year, and t-statistics are shown in parentheses. * *p*<0.1; ** *p*<0.05; *** *p*<0.01. The definition of each variable is provided in Appendix C.

	Baseline Results		Robust for Serial Correlation within State	
	(1)	(2)	(3)	(4)
Dep. Variable	$Ln(\$\,Federal\ grant)_t$	$Ln(\$\,Federal\ grant)_{t+1}$	$Ln(\$\,Federal\ grant)_t$	$Ln(\$\,Federal\ grant)_{t+1}$
$GASB$	-0.079***	-0.115***	-0.143***	-0.164***
	(-3.04)	(-4.02)	(-4.46)	(-4.91)
Controls	Y	Y	Y	Y
Academic Year FE	Y	Y	...	...
College FE	Y	Y	Y	Y
State-Academic Year FE	N	N	Y	Y
Dep. Mean without log	119,634,362	126,611,664	119,548,324	126,528,928
Within R-sq	0.011	0.010	0.016	0.013
No. of unique colleges	216	216	208	208
No. of observations	2,160	2,160	2,080	2,080

Table 4

Mechanism: Monitoring

This table examines the monitoring channel behind the effects of GASB 34/35 adoption on the allocation of federal grants. The monitoring mechanism predicts that the reduction in federal grants should be more pronounced for public universities with greater organizational complexity. I estimate the following model specification to test the monitoring mechanism:

$$Outcome_{i,t} = \beta_0 + \beta_1 GASB_{i,t} + \beta_2 Org\_complexity_{i,t} + \beta_3 GASB_{i,t} * Org\_complexity_{i,t} + \gamma \boldsymbol{X}_{i,t} + \alpha_i + \varphi_t + \varepsilon_{i,t}$$

$Outcome_{i,t}$ is $Ln(\$\,Federal\ grant)_t$ or $Ln(\$\,Federal\ grant)_{t+1}$, which is the natural logarithm of federal grants received by university i in academic year t or $t+1$. Federal grants include revenues from federal agencies under grants and contracts for specific purposes, mainly the research projects and academic training programs. Organizational complexity ($Org\_complexity$) is proxied using three alternative measures: a multi-campus indicator ($Multi\_campus$), the number of campuses ($\#\ campus$), and an academic breadth indicator ($Complexity$). $Multi\_campus$ is an indicator equal to one if university i operates more than one campus in academic year t, and zero otherwise. $\#\ campus$ is the number of campuses operated by university i in academic year t. $Complexity$ is an indicator measuring a university's organizational complexity based on the breadth of its academic offerings, which equals one if the number of academic programs offered at the two-digit CIP level by university i in the 2000/01 academic year exceeds the sample median, and zero otherwise. The treated group consists of public universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. The control group comprises private not-for-profit universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. Control variables include the proxy for institutional size and the natural logarithm of faculty number. The coefficients on the organizational complexity proxies ($Org\_complexity$) are not reported because all three measures are time-invariant and are absorbed by the fixed effects. All specifications are estimated using OLS and include controls and fixed effects for university and academic year. Heteroscedasticity-consistent standard errors are two-way clustered by state and academic year, and t-statistics are shown in parentheses. * p<0.1; ** p<0.05; *** p<0.01. The definition of each variable is provided in Appendix C.

	(1)	(2)	(3)
Dep. Variable	$Ln(\$\,Federal\ grant)_t$	$Ln(\$\,Federal\ grant)_t$	$Ln(\$\,Federal\ grant)_t$
$GASB$	-0.068***	-0.057**	-0.037
	(-2.75)	(-2.10)	(-1.12)
$GASB * Multi\_campus$	-0.094**		
	(-2.17)		
$GASB * \#\ campus$		-0.018*	
		(-1.92)	
$GASB * Complexity$			-0.069**
			(-2.04)

Controls	Y	Y	Y
Academic Year FE	Y	Y	Y
College FE	Y	Y	Y
Dep. Mean without log	119,634,362	119,634,362	119,634,362
Within R-sq	0.013	0.011	0.013
No. of unique colleges	216	216	216
No. of observations	2,160	2,160	2,160

Table 5

Mechanism: Private Information Signaling

This table examines the private information signaling channel behind the effects of GASB 34/35 adoption on the allocation of federal grants. The private information signaling mechanism predicts that federal grant allocations should be more responsive to prior private funding signals. I estimate the following model specification to test the private information signaling mechanism:

$$Outcome_{i,t} = \beta_0 + \beta_1 GASB_{i,t} + \beta_2 External\_signal_{i,t} + \beta_3 GASB_{i,t} * External\_signal_{i,t} + \gamma \boldsymbol{X}_{i,t} + \alpha_i + \varphi_t + \varepsilon_{i,t}$$

$Outcome_{i,t}$ is $Ln(\$\,Federal\ grant)_t$ or $Ln(\$\,Federal\ grant)_{t+1}$, which is the natural logarithm of federal grants received by university i in academic year t or $t+1$. Federal grants include revenues from federal agencies under grants and contracts for specific purposes, mainly the research projects and academic training programs. I focus on two primary sources of external funding signals ($External\_signal$): private gifts ($Ln(\$\,Private\ gift)_t$) and state grants ($Ln(\$\,State\ grant)_t$). $Ln(\$\,Private\ gift)_t$ is the natural logarithm of private gifts received by university i in academic year t. Private gifts include revenues from private (non-governmental) entities under gifts, grants, and contracts for research, training projects, and similar activities, as well as all contributions except those from affiliated entities. $Ln(\$\,State\ grant)_t$ is the natural logarithm of state grants received by university i in academic year t. State grants include revenues from state agencies under grants and contracts for specific purposes, such as research projects and training programs. The treated group consists of public universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. The control group comprises private not-for-profit universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. Control variables include the proxy for institutional size and the natural logarithm of faculty number. All specifications are estimated using OLS and include controls and fixed effects for university and academic year. Heteroscedasticity-consistent standard errors are two-way clustered by state and academic year, and t-statistics are shown in parentheses. * p<0.1; ** p<0.05; *** p<0.01. The definition of each variable is provided in Appendix C.

	(1)	(2)
Dep. Variable	$Ln(\$\,Federal\ grant)_{t+1}$	$Ln(\$\,Federal\ grant)_{t+1}$
$GASB$	-0.686***	-1.073***
	(-2.71)	(-3.20)
$Ln(\$\,Private\ gift)_t$	-0.037	
	(-1.62)	
$GASB * Ln(\$\,Private\ gift)_t$	0.033**	
	(2.32)	
$Ln(\$\,State\ grant)_t$		0.079***
		(4.02)
$GASB * Ln(\$\,State\ grant)_t$		0.059***

		(2.94)
Controls	Y	Y
Academic Year FE	Y	Y
College FE	Y	Y
Dep. Mean without log	130,938,871	130,938,871
Within R-sq	0.018	0.054
No. of unique colleges	216	211
No. of observations	2,011	2,100

Table 6

The Effects of GASB 34/35 Adoption on the Efficiency of University Output

This table examines the effects of GASB 34/35 adoption on the efficiency of university output. The efficiency of university output is proxied using three measures. $\# \, patent_{apply,t+1}/RE_{million,t}$ is the number of patents granted to university i in academic year $t+1$ per million dollars of total research expenditure in academic year t. $\# \, patent_{grant,t+1}/RE_{million,t}$ is the number of patent applications by university i in academic year $t+1$ per million dollars of total research expenditure in academic year t. $Ln(\# \, publication_{t+1}/RE_{million,t})$ is the natural logarithm of the number of publications by university i in academic year $t+1$ per million dollars of total research expenditure in academic year t. The treated group consists of public universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. The control group comprises private not-for-profit universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. Control variables include the proxy for institutional size and the natural logarithm of faculty number. All specifications are estimated using OLS and include controls and fixed effects for university and academic year. Heteroscedasticity-consistent standard errors are two-way clustered by state and academic year, and t-statistics are shown in parentheses. * p<0.1; ** p<0.05; *** p<0.01. The definition of each variable is provided in Appendix C.

	(1)	(2)	(3)
Dep. Variable	$\# \, patent_{apply,t+1}/RE_{million,t}$	$\# \, patent_{grant,t+1}/RE_{million,t}$	$Ln(\# \, publication_{t+1}/RE_{million,t})$
$GASB$	0.062***	0.076**	0.123***
	(3.08)	(2.44)	(3.90)
Controls	Y	Y	Y
Academic Year FE	Y	Y	Y
College FE	Y	Y	Y
Dep. Mean without log	0.115	0.118	19.070
Within R-sq	0.002	0.001	0.009
No. of unique colleges	216	216	188
No. of observations	2,160	2,160	1,922

Table 7

GASB 34/35 Adoption and Student-oriented Aid

This table examines the effects of GASB 34/35 adoption on the reallocation of federal funds toward student aid within universities. $Ln(\$\ Federal\ Student\ Grant)$ is the natural logarithm of federal student grants received by university i in academic year t. Federal student grants primarily include Pell Grants and other federal student aid grants administered by the institution. $Ln(\$\ Federal\ Student\ Loan)$ is the natural logarithm of subsidized federal student loans received by university i in academic year t, including subsidized Federal Direct Loans (FDL) and subsidized Federal Family Education Loans (FFEL) for undergraduates. The treated group consists of public universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. The control group comprises private not-for-profit universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. Control variables include the proxy for institutional size and the natural logarithm of faculty number. All specifications are estimated using OLS and include controls and fixed effects for university and academic year. Heteroscedasticity-consistent standard errors are two-way clustered by state and academic year, and t-statistics are shown in parentheses. * p<0.1; ** p<0.05; *** p<0.01. The definition of each variable is provided in Appendix C.

	(1)	(2)
Dep. Variable	$Ln(\$\ Federal\ Student\ Grant)$	$Ln(\$\ Federal\ Student\ Loan)$
$GASB$	0.089***	0.311***
	(3.45)	(3.17)
Controls	Y	Y
Academic Year FE	Y	Y
College FE	Y	Y
Dep. Mean without log	12,472,568	27,537,431
Within R-sq	0.037	0.007
No. of unique colleges	213	148
No. of observations	2,147	1,568

Table 8

GASB 34/35 Adoption and Faculty Compensation and Mobility

This table examines the effects of GASB 34/35 adoption on average faculty compensation and mobility. $Ln(Avg\ salary)_{position}$ is the natural logarithm of the average annual salary for faculty holding a given academic position at university i in academic year t. Average salaries are calculated across faculty on nine- or ten-month contracts within each position. $Mobility_{position}$ is the net change in the number of faculty holding a given academic position at university i between academic years t and $t+1$, measured as the number of faculty in year $t+1$ minus the number in year t. The treated group consists of public universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. The control group comprises private not-for-profit universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. Control variables include the proxy for institutional size and the natural logarithm of faculty number. All specifications are estimated using OLS and include controls and fixed effects for university and academic year. Heteroscedasticity-consistent standard errors are two-way clustered by state and academic year, and t-statistics are shown in parentheses. * p<0.1; ** p<0.05; *** p<0.01. The definition of each variable is provided in Appendix C.

Panel A: Faculty Compensation			
	(1)	(2)	(3)
Dep. Variable	$Ln(Avg\ salary)_{Assistant\ prof}$	$Ln(Avg\ salary)_{Associate\ prof}$	$Ln(Avg\ salary)_{Full\ prof}$
$GASB$	-0.020**	-0.031***	-0.028***
	(-2.27)	(-3.68)	(-3.61)
Controls	Y	Y	Y
Academic Year FE	Y	Y	Y
College FE	Y	Y	Y
Dep. Mean without log	59,773	70,014	97,325
Within R-sq	0.003	0.006	0.008
No. of unique colleges	203	203	204
No. of observations	1,924	1,924	1,932
Panel B: Faculty Mobility			
	(1)	(2)	(3)
Dep. Variable	$Mobility_{Assistant\ professor}$	$Mobility_{Associate\ professor}$	$Mobility_{Full\ professor}$

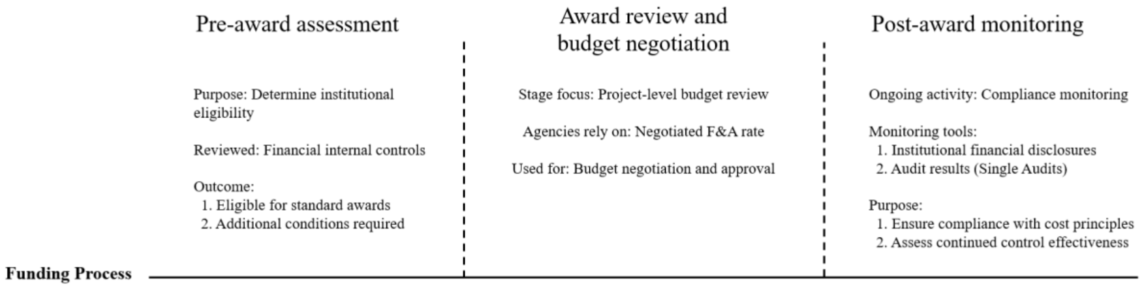
$GASB$	-1.176	2.628	0.644
	(-0.46)	(1.44)	(0.29)
Controls	Y	Y	Y
Academic Year FE	Y	Y	Y
College FE	Y	Y	Y
Dep. Mean	5	3	2
Within R-sq	0.002	0.002	0.001
No. of unique colleges	203	203	204
No. of observations	1,924	1,924	1,932

Online Appendix A

OA-A Figure 1

Stylized Pattern of the Federal Funding Process

This figure presents a stylized overview of the federal research funding process, illustrated through the example of the National Institutes of Health (NIH). The process mainly consists of three stages: pre-award assessment, award review and budget negotiation, and post-award monitoring. Prior to award issuance, federal agencies assess institutional financial management capacity using internal control information, financial reports, and previous audit results, which determine eligibility for standard awards or additional conditions. During award review, federal agencies evaluate project-level budgets, relying on established institution-level financial parameters (e.g., negotiated F&A rates). After awards are made, federal agencies monitor compliance with federal cost principles using ongoing financial reporting, drawdown data, and audit results.



OA-A Table 1

Oster Test for Unobservable Selection and Coefficient Stability

This table shows the Oster test for the main results in Table 3, where all estimates are based on model specification (1). I estimate and report the $\hat{\delta}$ making estimated treatment effects null (i.e., $\beta = 0$) based on the bound $R_{max} = 1$. Oster (2019) suggests that the current estimated coefficient can be considered stable, if it would be driven to 0 only when the importance of unobservable variables exceeds that of observable variables (i.e., $\hat{\delta} > 1$). Satyanath et al. (2017) demonstrate that if the value of $\hat{\delta}$ is less than 0, the bias-adjusted coefficient should be greater than the current estimate, thereby confirming the robustness of current results. All specifications are estimated using OLS and include controls and different sets of fixed effects. Heteroscedasticity-consistent standard errors are two-way clustered by university and academic year. * p<0.1; ** p<0.05; *** p<0.01. The definition of each variable is provided in Appendix C.

	Estimated treatment effects ($\hat{\beta}$)	$\hat{\delta} \mid (R_{max} = 1, \beta = 0)$	Pass Oster test?
Panel A: Fixed effects for university and year			
$Ln(\$\ Federal\ grant)_t$	-0.079***	-4.564	Yes
$Ln(\$\ Federal\ grant)_{t+1}$	-0.115***	-6.480	Yes
Panel B: Fixed effects for university and state-year			
$Ln(\$\ Federal\ grant)_t$	-0.143***	-24.783	Yes
$Ln(\$\ Federal\ grant)_{t+1}$	-0.164***	-30.947	Yes

OA-A Table 2

Robustness to Staggered Treatment Timing: GASB 34/35 and Federal Grant Allocation

To address concerns related to the two-way fixed effects (TWFE) model under staggered treatment timing (Baker et al., 2020), this table restricts the sample by excluding public universities that adopted GASB 34/35 in Phase 2 and Phase 3. The treated group consists of public research universities that adopted GASB 34/35 in academic year 2001/02, i.e., Phase 1. The control group comprises private not-for-profit research universities. Control variables include the proxy for institutional size and the natural logarithm of faculty number. All specifications are estimated using OLS and include controls and fixed effects for university and academic year. Heteroscedasticity-consistent standard errors are two-way clustered by state and academic year, and t-statistics are shown in parentheses. * *p*<0.1; ** *p*<0.05; *** *p*<0.01. The definition of each variable is provided in Appendix C.

	Baseline Results		Robust for Serial Correlation within State	
	(1)	(2)	(3)	(4)
Dep. Variable	$Ln(\$\,Federal\ grant)_t$	$Ln(\$\,Federal\ grant)_{t+1}$	$Ln(\$\,Federal\ grant)_t$	$Ln(\$\,Federal\ grant)_{t+1}$
$GASB$	-0.071**	-0.135***	-0.114***	-0.153***
	(-2.39)	(-3.44)	(-3.53)	(-3.77)
Controls	Y	Y	Y	Y
Academic Year FE	Y	Y	...	...
College FE	Y	Y	Y	Y
State-Academic Year FE	N	N	Y	Y
Dep. Mean without log	122,167,958	122,316,200	129,324,457	129,492,452
Within R-sq	0.013	0.017	0.011	0.011
No. of unique colleges	205	197	205	197
No. of observations	2,050	1,970	2,050	1,970

OA-A Table 3

Robustness Check: The Effects of GASB 34/35 Adoption on the Efficiency of University Output

This table reports robustness tests examining the effects of GASB 34/35 adoption on the efficiency of university research output, measured two years after research expenditures are incurred. The efficiency of university output is proxied using three measures. $\# patent_{apply,t+2}/RE_{million,t}$ is the number of patents granted to university i in academic year $t+2$ per million dollars of total research expenditure in academic year t. $\# patent_{grant,t+2}/RE_{million,t}$ is the number of patent applications by university i in academic year $t+2$ per million dollars of total research expenditure in academic year t. $Ln(\# publication_{t+2}/RE_{million,t})$ is the natural logarithm of the number of publications by university i in academic year $t+2$ per million dollars of total research expenditure in academic year t. The treated group consists of public universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. The control group comprises private not-for-profit universities that were classified as Research I or Research II institutions in the 2000/01 Carnegie Classification. Control variables include the proxy for institutional size and the natural logarithm of faculty number. All specifications are estimated using OLS and include controls and fixed effects for university and academic year. Heteroscedasticity-consistent standard errors are two-way clustered by state and academic year, and t-statistics are shown in parentheses. * p<0.1; ** p<0.05; *** p<0.01. The definition of each variable is provided in Appendix C.

	(1)	(2)	(3)
Dep. Variable	$\# patent_{apply,t+2}/RE_{million,t}$	$\# patent_{grant,t+2}/RE_{million,t}$	$Ln(\# publication_{t+2}/RE_{million,t})$
$GASB$	0.070***	0.061**	0.135***
	(3.54)	(2.31)	(4.40)
Controls	Y	Y	Y
Academic Year FE	Y	Y	Y
College FE	Y	Y	Y
Dep. Mean without log	0.110	0.111	20.155
Within R-sq	0.002	0.001	0.011
No. of unique colleges	216	216	188
No. of observations	2,160	2,160	1,932

Online Appendix B: The Proof for Lemmas and Propositions in Appendix A

OA-B.1 Lemma 1

Lemma 1 (IR_H binds)

In any optimal solution, the high-cost (low-efficiency) type's participation constraint IR_H binds:

$$t_H = \beta_H q_H$$

Proof. Suppose instead that IR_H is slack:

$$t_H - \beta_H q_H > 0$$

Then the principal can decrease t_H by a small amount $\varepsilon > 0$ such that

$$t'_H = t_H - \varepsilon, q'_H = q_H$$

and IR_H remains satisfied:

$$t'_H - \beta_H q_H = t_H - \varepsilon - \beta_H q_H > 0$$

This change strictly increases expected welfare because the transfer to the high-cost type is reduced and no other terms in the objective change. Moreover, IC_L and IC_H are not violated by a sufficiently small reduction in t_H, as both sides of the relevant inequalities move at most by ε. Therefore, a solution with slack IR_H cannot be optimal. Hence in any optimal solution:

$$t_H = \beta_H q_H$$

OA-B.2 Lemma 2

Lemma 2 (IC_H is slack)

In any optimal solution, the high-cost type's incentive compatibility constraint IC_H is slack.

Proof. Given Lemma 1, we have

$$t_H - \beta_H q_H = 0$$

Substituting into IC_H,

$$0 = t_H - \beta_H q_H \geq t_L - \beta_H q_L$$

Thus IC_H requires

$$t_L - \beta_H q_L \leq 0 \qquad (1)$$

On the other hand, IR_L implies

$$t_L - \beta_L q_L \geq 0 \qquad (2)$$

Since $\beta_H > \beta_L$, for any given q_L,

$$t_L - \beta_H q_L = t_L - \beta_L q_L - (\beta_H - \beta_L) q_L$$

If $q_L > 0$, then $(\beta_H - \beta_L) q_L > 0$, so

$$t_L - \beta_H q_L < t_L - \beta_L q_L$$

Combining with (2), we obtain

$$t_L - \beta_H q_L < t_L - \beta_L q_L \; and \; t_L - \beta_L q_L \geq 0$$

For IR_L to hold and $q_L > 0$, it is generically optimal to choose (t_L, q_L) so that

$$t_L - \beta_L q_L > 0$$

which implies

$$t_L - \beta_H q_L > 0$$

for sufficiently small q_L. Then condition (1) would be violated:

$$0 \geq t_L - \beta_H q_L > 0$$

There is a contradiction. Therefore, IC_H cannot be binding at the optimum; it must be slack.

OA-B.3 Lemma 3

Lemma 3 (IC_L binds)

In any optimal solution, the low-cost type's incentive compatibility constraint IC_L binds:

$$t_L - \beta_L q_L = t_H - \beta_L q_H$$

Proof. Suppose instead that IC_L is slack:

$$t_L - \beta_L q_L > t_H - \beta_L q_H$$

Holding (q_L, q_H, t_H) fixed, decrease t_L by a small $\varepsilon > 0$:

$$t'_L = t_L - \varepsilon$$

For sufficiently small ε, both IR_L and IC_L remain satisfied:

$$t_L' - \beta_L q_L = t_L - \varepsilon - \beta_L q_L > t_H - \beta_L q_H - \varepsilon$$

The right-hand side still exceeds $t_H - \beta_L q_H$ for small enough ε. This strictly lowers the expected transfer to the low-cost type and therefore strictly increases expected welfare, contradicting optimality. Hence IC_L must be binding:

$$t_L - \beta_L q_L = t_H - \beta_L q_H.$$

OA-B.4 Lemma 4

Lemma 4 (IR_L is slack)

In any optimal solution, the participation constraint of the low-cost type is strictly slack:

$$t_L - \beta_L q_L > 0.$$

Proof. Given Lemma 1-3,

$$t_L - \beta_L q_L = (\beta_H - \beta_L) q_H.$$

Since $q_H > 0$ and $\beta_H > \beta_L$,

$$t_L - \beta_L q_L > 0.$$

Thus IR_L does not bind.

OA-B.5 Lemma 5

Lemma 5 (Information rents of both types in the second-best mechanism)

In the optimal incentive-compatible (second-best) procurement mechanism:

1. The low-cost (high-efficiency) type earns strictly positive information rent:

$$U_L^{SB} = t_L - \beta_L q_L = (\beta_H - \beta_L) q_H > 0.$$

2. The high-cost (low-efficiency) type earns zero rent:

$$U_H^{SB} = t_H - \beta_H q_H = 0.$$

Proof. From Lemma 4 we know that

$$t_L - \beta_L q_L = (\beta_H - \beta_L) q_H > 0.$$

Thus, the low-cost type receives strictly positive rent:

$$U_L^{SB} = t_L - \beta_L q_L > 0.$$

From Lemma 1, the high-cost type's participation constraint binds:

$$t_H = \beta_H q_H.$$

Therefore, its utility is

$$U_H^{SB} = t_H - \beta_H q_H = 0.$$

Hence, in the second-best allocation, only the low-cost type earns positive information rent, while the high-cost type earns none.

OA-B.6 Lemma 6

Lemma 6 (Second-best performance under asymmetric information)

Under asymmetric information, with the incentive constraints characterized in Lemma 1-4, the optimal (second-best) performance levels satisfy:

$$S'(q_L^{SB}) = \beta_L,$$

$$S'(q_H^{SB}) = \beta_H + \frac{\mu}{1-\mu}(\beta_H - \beta_L).$$

Proof. Lemmas 1-4 imply that IR_H and IC_L bind, and IR_L, IC_H are slack.

Substituting the binding constraints into the principal's welfare yields a reduced-form maximization problem in (q_L, q_H):

$$\max_{q_L, q_H} \ \mu[S(q_L) - \beta_L q_L - (\beta_H - \beta_L) q_H] + (1-\mu)[S(q_H) - \beta_H q_H].$$

FOC with respect to q_L gives:

$$\mu[S'(q_L) - \beta_L] = 0 \Rightarrow S'(q_L^{SB}) = \beta_L.$$

FOC with respect to q_H gives:

$$-\mu(\beta_H - \beta_L) + (1-\mu)[S'(q_H) - \beta_H] = 0,$$

hence:

$$S'(q_H^{SB}) = \beta_H + \frac{\mu}{1-\mu}(\beta_H - \beta_L) > \beta_H.$$

OA-B.7 Lemma 7

Lemma 7 (First-best performance under complete information)

When the cost parameter β is observable to the principal, the optimal (first-best) performance for type $\beta \in \{\beta_L, \beta_H\}$ solves:

$$S'(q^{FB}(\beta)) = \beta$$

Therefore,

$$S'(q_L^{FB}) = \beta_L, \qquad S'(q_H^{FB}) = \beta_H,$$

Since $S'' < 0$ and $\beta_L < \beta_H$, it follows that:

$$q_L^{FB} > q_H^{FB}.$$

Proof. Under complete information the principal solves:

$$\max_q S(q) - \beta q,$$

Which is subject to the participation constraint $t - \beta q \geq 0$. At optimum IR binds: $t = \beta q$. Thus, the principal's problem is unconstrained, and the FOC is:

$$S'(q^{FB}(\beta)) = \beta.$$

Strict concavity of Simplies uniqueness of each solution and $q_L^{FB} > q_H^{FB}$ because $\beta_L < \beta_H$.

OA-B.8 The Agent Utility under Complete Information

Consider now the case where β is observable to the principal. For a given type β, the principal solves

$$\max_{q,t} \quad S(q) - t$$

Subject to participation:

$$t - \beta q \geq 0.$$

At the optimum, IR binds:

$$t = \beta q,$$

So, the principal chooses q to solve:

$$\max_q S(q) - \beta q.$$

The first-order condition is

$$S'(q^{FB}(\beta)) = \beta.$$

Thus, the first-best allocation $(q^{FB}(\beta), t^{FB}(\beta))$ satisfies

$$t^{FB}(\beta) = \beta q^{FB}(\beta),$$

and the agent's utility is

$$U^{FB}(\beta) = t^{FB}(\beta) - \beta q^{FB}(\beta) = 0$$

for both $\beta_L$and β_H, there is no information rent under complete information.

OA-B.9 Proposition 1: Optimal Performance Level

Proposition 1. Under asymmetric information, the low-cost type's performance is undistorted, whereas the high-cost type's performance is distorted downward:

$$q_L^{SB} = q_L^{FB}.$$

$$q_H^{SB} < q_H^{FB}.$$

Under asymmetric information, the aggregated performance $(\mathrm{Q} = \mathrm{q_L} + \mathrm{q_H})$ is strictly lower than under complete information:

$$Q^{SB} = \mu q_L^{SB} + (1-\mu) q_H^{SB} < \mu q_L^{FB} + (1-\mu) q_H^{FB} = Q^{FB}.$$

Thus:

$$Q^{SB} < Q^{FB}.$$

Proof. By Lemma 7, under complete information the first-best performance satisfies

$$S'(q_L^{FB}) = \beta_L, \qquad S'(q_H^{FB}) = \beta_H.$$

By Lemma 6, under asymmetric information the second-best performance satisfies

$$S'(q_L^{SB}) = \beta_L, \qquad S'(q_H^{SB}) = \beta_H + \frac{\mu}{1-\mu}(\beta_H - \beta_L) > \beta_H.$$

Since $S'(\cdot)$ is strictly decreasing (because $S'' < 0$), we obtain:

$$S'(q_L^{SB}) = \beta_L = S'(q_L^{FB}) \Rightarrow q_L^{SB} = q_L^{FB}$$

So, the low-cost type's performance is undistorted.

Similarly,

$$S'(q_H^{SB}) > S'(q_H^{FB})$$

Implies

$$q_H^{SB} < q_H^{FB},$$

So, the high-cost type's performance is distorted downward relative to the first-best.

For the aggregate performance, under the asymmetric information:

$$Q^{SB} = \mu q_L^{SB} + (1-\mu)q_H^{SB} = \mu q_L^{FB} + (1-\mu)q_H^{SB},$$

while under complete information[1]:

$$Q^{FB} = \mu q_L^{FB} + (1-\mu)q_H^{FB}.$$

Because $q_H^{SB} < q_H^{FB}$ and $1-\mu > 0$, it follows that

$$Q^{SB} < Q^{FB}.$$

OA-B.10 Proposition 2: Information Rent

Proposition 2. Under asymmetric information (when β is privately observed by the agent), the optimal incentive-compatible procurement mechanism yields

$$U_L^{SB} = (\beta_H - \beta_L)q_H > 0, \qquad U_H^{SB} = 0.$$

Under complete information (when β is observable), the optimum satisfies

$$U_L^{FB} = U_H^{FB} = 0.$$

Proof. The asymmetric-information utilities follow directly from Lemma 1-5:

$$U_H^{SB} = t_H - \beta_H q_H = 0$$

$$U_L^{SB} = t_L - \beta_L q_L = (\beta_H - \beta_L)q_H > 0$$

Under complete information, the principal observes β and can fully extract the agent's surplus,

[1] Under complete information, the principal conditions the contract directly on the realized type, so the optimization problems for β_L and β_H are fully separable. The probabilities μ and $1-\mu$ appear only in the expression for expected welfare and do not change the first-order conditions determining q_L^{FB} and q_H^{FB}.

which implies

$$U^{FB}(\beta) = 0 \text{ for both } \beta_L, \beta_H$$

Therefore,

$$U_L^{SB} > U_L^{FB}, U_H^{SB} = U_H^{FB}$$

Online Appendix C: The Proof for Lemmas and Proposition in Appendix B

OA-C.1 Lemma 1

Lemma 1. Given belief $\hat{\alpha} = \alpha(g)$, the government's optimal grant satisfies

$$S'(g) = -1 - \frac{v_{G\alpha}}{v_{GG}}\,\alpha'(g).$$

Proof. Given belief $\hat{\alpha} = \alpha(g)$, the government solves

$$\max_{S\geq 0}\;\; v(g+S;\hat{\alpha}) - \kappa S.$$

The first-order condition (FOC):

$$v_G(g+S;\hat{\alpha}) = \kappa. \qquad (1)$$

Taking the total differential of (1) with respect to g and using $\hat{\alpha} = \alpha(g)$ yields

$$v_{GG}(1+S'(g)) + v_{G\alpha}\,\alpha'(g) = 0 \Rightarrow S'(g) = -1 - \frac{v_{G\alpha}}{v_{GG}}\,\alpha'(g). \qquad (2)$$

Thus, the effect of private donations on public funding consists of a mechanical substitution term (-1) and a signaling term $-\frac{v_{G\alpha}}{v_{GG}}\alpha'(g)$.

OA-C.2 Lemma 2

Lemma 2. In any separating equilibrium with $g'(\alpha) > 0$, the donor's contribution satisfies

$$c'(g) = \gamma\, v_G(G;\alpha)\,\frac{v_{G\alpha}}{|\,v_{GG}\,|}\,\alpha'(g).$$

Proof. Anticipating $S(g)$, the donor chooses g to solve

$$\max_{g\geq 0}\;\; -c(g) + \gamma\, v(g+S(g);\alpha).$$

FOC (interior):

$$-c'(g) + \gamma\, v_G(G;\alpha)\,(1+S'(g)) = 0. \qquad (3)$$

To substitute the government's response $S'(g)$ into (3), we first rewrite the term $-\frac{1}{v_{GG}}$ in equation (2). Since public good exhibits diminishing marginal utility,

$$v_{GG} < 0,$$

it follows that

$$-\frac{1}{v_{GG}} = \frac{1}{|\, v_{GG} \,|} \text{ because } |\, v_{GG} \,| = -v_{GG}.$$

Using this identity, equation (2) can be written as

$$1 + S'(g) = \frac{v_{G\alpha}}{|\, v_{GG} \,|} \, \alpha'(g).$$

Substituting this expression into (3) yields the local incentive-compatibility (IC) condition:

$$c'(g) = \gamma \, v_G(G; \alpha) \, \frac{v_{G\alpha}}{|\, v_{GG} \,|} \, \alpha'(g). \qquad (4)$$

Since v_G and $v_{G\alpha}$ are increasing in α, (4) satisfies the single-crossing property; thus, a monotone separating strategy $g'(\alpha) > 0$exists (and beliefs invert $g \mapsto \alpha$).

OA-C.3 Proposition 1

Proposition 1. *In any separating PBE with* $g'(\alpha) > 0$*, the government's optimal grant increases with the private contribution if and only if*

$$v_{G\alpha} \, \alpha'(g) > |\, v_{GG} \,|. \qquad (5)$$

Equivalently, $S'(g) > 0$.

Proof. By Lemma 2, a separating PBE with a strictly increasing contribution strategy $g(\alpha)$ exists. We therefore focus on such equilibria and characterize the government's grant response to g.

From Lemma 1,

$$S'(g) = -1 - \frac{v_{G\alpha}}{v_{GG}} \, \alpha'(g).$$

We seek conditions under which $S'(g) > 0$. Rearranging the inequality:

$$S'(g) > 0 \Leftrightarrow -1 - \frac{v_{G\alpha}}{v_{GG}} \, \alpha'(g) > 0,$$

which is equivalent to

$$-\frac{v_{G\alpha}}{v_{GG}}\,\alpha'(g) > 1.$$

we rewrite the left-hand side as

$$-\frac{v_{G\alpha}}{v_{GG}}\,\alpha'(g) = \frac{v_{G\alpha}}{\mid v_{GG} \mid}\,\alpha'(g).$$

Thus, the inequality becomes

$$\frac{v_{G\alpha}}{\mid v_{GG} \mid}\,\alpha'(g) > 1.$$

Multiplying both sides by $\mid v_{GG} \mid > 0$ yields

$$v_{G\alpha}\,\alpha'(g) > \mid v_{GG} \mid.$$

Therefore,

$$S'(g) > 0 \Leftrightarrow v_{G\alpha}\,\alpha'(g) > \mid v_{GG} \mid.$$