

University President Compensation: Evidence from the United States

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Abstract

I examine whether compensation of the university president is a function of university type (i.e., top, research, master's, bachelor's/specialized). Using a panel dataset containing 761 private universities in the United States, I find that (i) the president's pay is linked to the university's performance in the previous period and (ii) the pattern of pay for performance varies across universities of different types. Specifically, top universities' presidents are incentivized to enhance research activities and private contributions; research universities' presidents are incentivized to increase tuition revenue but not enrollment; master's and bachelor's/specialized universities' presidents are incentivized to increase tuition revenue and expand enrollment. I do not find evidence that presidents' pay is linked to relative performance evaluation, measured by the institution's US News & World Report ranking. I obtain these results after using a university-president pair fixed effects model that controls for unobservable university and president characteristics.

Keywords: higher education, president pay, incentive compensation, university type, relative performance

1. Introduction

The compensation of university presidents is an important issue that has profound implications for society. It is tempting to assume that university presidents face low-powered incentive schemes in the form of bureaucratic compensation, because they manage extremely complex organizations that seek to achieve multiple goals simultaneously (Cote, 1985; Ehrenberg, 2003). If provided with incentives linked to certain performance metrics, they might ignore other dimensions that are either not measurable or not being measured and their intrinsic motivation might be crowded out by explicit incentives (Bok, 2002). Further, private universities, like other nonprofit entities, are prohibited by the Internal Revenue Service (IRS) from providing excessive compensation to their executives (Sedatole, Swaney, Yetman, & Yetman, 2012). University presidents' paychecks, however, tell a different story. In 2004, the salaries of five private university presidents in the United States surpassed the million-dollar mark. The number of presidents earning more than \$1 million increased to over forty in 2011. Robert Zimmer at the University of Chicago, the highest paid sitting president in 2011, received \$3.3 million total compensation (Kingkade, 2013). Motivated by these facts, I examine the compensation arrangements of private university presidents in the United States and ask three specific research questions. First, do university presidents have meaningful pay-for-performance incentives? Second, if they have, do the patterns of pay-for-performance incentives vary across universities of different types? Third, is relative performance measure used in president compensation contracts?

The literature examining compensation arrangements for university presidents is sparse. Pfeffer and Ross (1988) find that individual characteristics (e.g., gender, age, whether hired from inside) and institutional characteristics (e.g., size, resources, university type) are related to presidents' pay. Comparing survey data from 1992-93 and 1996-1997, Ehrenberg, Cheslock, and Epifantseva (2001) find that private college university presidents are rewarded for their performance. Using a similar empirical strategy, Sorokina (2003) finds that the tier to which a university belongs is associated with the president's compensation. Bartlett and Sorokina (2005) document several factors associated with presidential pay at national liberal arts institutions. Banker, Plehn-Dujowich, and Xian (2009) suggest that ability, as measured by the stature and enrollment of a president's past university, is associated with his or her compensation. Recently, Huang and Chen (2013) document that presidential salaries are on average approximately one-third as large as those of their corporate CEOs, but their compensation is less volatile than that of CEOs.

Our study extends previous research primarily in two ways. First, university type (i.e., top, research, master's, bachelor's/specialized) is a critical defining element for a university, guiding the university's actions and providing the context within which strategies are formulated and decisions are made. Despite its importance, whether and how university type affects presidents' compensation has not been adequately addressed in the literature. I aim to fill this knowledge gap by examining whether university type plays a role in presidents' compensation. Second, unobserved university and president characteristics are related to both university performance and presidents' compensation. Without controlling for them, it is difficult to make consistent statistical inferences. In this study, I use a university-president pair fixed effects model that links the lagged performance with presidents' compensation. I utilize only within-pair variation in compensation and performance in the analysis, excluding between-pair variation. This fixed effects model provides a powerful tool to control for unobserved university and president heterogeneity and can accurately measure the magnitude of incentive contracts.

2. Research Questions

2.1 Incentive Contract

A private university's constituents include its students, faculty, alumni, private foundations, and federal, state, and local governments (Ehrenberg et al., 2001). The design and implementation of employment contracts with presidents is a key responsibility of a university's board of trustees (Fama & Jensen, 1983). Although incentive compensation can align the interests of presidents with those of trustees so as to mitigate the agency problems, it also entails costs. First, university presidents are often assumed to be socially motivated. In contrast to corporate CEOs, they supposedly care less about monetary income and are more concerned about increasing the well-being of the constituents of the university. A president, therefore, might face significant political cost if he or she is provided with strong monetary incentives that could undermine his or her credibility with the university and cause constituents to question his or her motivation and commitment. As a result, an excessive presidential salary tends to exacerbate tensions that often exist between faculty and administration (Bok, 2002). Second, executive compensation in nonprofits is required to be reasonable, since they do not have residual claimants and thus they are prohibited from distributing any net profits to managers (Sedatole et al., 2012). Third, due to the complex objective functions and hard-to-observe outputs in universities, it is difficult to measure managerial performance or to write meaningful incentive contracts (Brickley & Von Horn, 2002). Finally, the multitasking nature of the president's job makes it detrimental for the president to focus on some tasks at the risk of ignoring others, which is often the result of linking incentives to tangible performance measures. Boards of trustees, therefore, must weigh costs and benefits before determining whether to use incentive contracts with their presidents. Our first research question is whether university presidents receive pay for performance-based incentives.

RQ1: Do university presidents receive incentive compensation?

2.2 University Type and Incentive Contract

Universities vary in their types (i.e., top, research, master's, bachelor's/specialized), operate in different financial environments, and face different kinds of risks and challenges. Fathiem and Xie (1983) suggest that a performance measure is not helpful if the agent's action on the measure is incongruent with the principal's expected payoff. One set of performance measures desired by a certain type of university might not appeal to other types of university. For example, premier institutions usually have significant endowments and thus are subject to much less financial risk as compared with lower-tier institutions. The boards of trustees of these two groups, therefore, might value different performance objectives and provide different incentives to their presidents. Sedatole et al. (2012) find that the strength of the pay-for-performance relation differs between nonprofits that provide mostly public goods and nonprofits that provide mostly private goods. Our second research question takes this direction one step further and asks whether incentive compensation schemes for university presidents exhibit cross-sectional differences among various university types.

RQ2: Do incentive compensation schemes differ across different types of university?

2.3 Relative Performance Measure

Incentives based on relative performance measures are a common feature of CEO compensation contracts because this practice can insulate CEOs from common uncertainty (Gibbons & Murphy, 1990). The performance outcome of universities is also subject to common uncertainties, such as microeconomic shocks and demographic shifts (Betts, Hartman, & Oxholm, 2009). Because they filter out common uncertainty, relative performance measure-based incentives can be useful for contracting university presidents. Universities, however, are subject to various constraints when using these incentives. First, it is difficult to determine on what

dimension(s) universities should be compared with one another (Bok, 2003). Even ill-known ranking systems, derived from complex metrics, do not include all dimensions of the president's job. There have been substantial objections to the use of any ranking system to determine the performance of presidents (Monks & Ehrenberg, 1999; Ehrenberg, 2005). Second, universities have multiple objectives and constituents. Relative performance runs the risk of shifting presidents' focus to promoting relative performance measures only or even to manipulating them for self-dealing (Ehrenberg, 2003). Considering these costs and benefits, I ask, in the third research question, whether relative performance measures are used in university president contracting.

RQ3: Are university presidents compensated for relative performance?

3. Method

3.1 Sample and Data

I obtain data on presidents' compensation, financial information, and operational records from two sources: the Chronicle of Higher Education and the Delta Program. Private universities in the United States are required to file Form 990 with the IRS and make the forms available to the public upon request. On Form 990, universities report salaries and benefits received by their presidents. In its October issues since 1994, the Chronicle of Higher Education has been compiling and publishing this information for four-year private colleges and universities classified by the Carnegie Foundation for the Advancement of Teaching as research university I and II, doctoral universities I and II, master's (comprehensive) universities and colleges I and II, and baccalaureate (liberal arts colleges I). I obtain the data regarding university financial and operational records from the Delta Cost Project's database, which is maintained by the National Center for Education Statistics (NCES) as part of its Integrated Postsecondary Education Data System (IPEDS). IPEDS conducts annual surveys to gather information from every college, university, and technical and vocational institution that participates in federal student financial aid programs. I merge the two datasets by university name. The final dataset covers an eleven-year period between 1997 and 2007. Since the database from the Chronicle of Higher Education covers a smaller sample as compared with the database from the Delta Cost Project, I delete observations that do not have president compensation information. Our final dataset contains 5,088 observations from 761 post-secondary institutions. In Table 1, Panel A, I present the breakdown of the sample by year.

Table 1. Sample composition

Panel A: By Year

Year	# of Observations	%
1997	392	7.7
1998	384	7.5
1999	378	7.4
2000	482	9.5
2001	486	9.6
2002	509	10.0
2003	499	9.8
2004	517	10.2
2005	608	11.9
2006	492	9.7
2007	341	6.7
Total	5088	100

Panel B: By Type

Type	# of Observations	%
Top	422	8.3
Research	443	8.7
Master's	2305	45.3
Bachelor's/Specialized	1918	37.7
Total	5088	100

The main objective of this study is to examine the cross-sectional difference in compensation of university presidents. I classify the sample into four categories: top, research, master's, and bachelor's/specialized. A university is classified as a top one if it is ranked as one of the top 100 national universities by the U.S. World News and Reports (USWNR), which has published an annual ranking of universities since 1983. Although numerous rankings are published each year to help high school students with college application, the USWNR ranking is considered the most widely used one in the college ranking business and can influence the quantity and quality of applicants to ranked schools (Monk & Ehrenberg, 1999; Ehrenberg, 2003; Bastedo & Bowman 2010). USWNR rates institutions across various dimensions, including academic reputation, student selectivity, faculty resources, graduation and retention rates, financial resources, alumni giving, and graduation rate performance. The universities ranked among the 100 nationally by the USWNR are generally reputable research institutions. Examples are Harvard University and Pepperdine University. I do not include liberal arts colleges because they are not ranked until after 2003.

The second category, research universities, includes institutions that are indicated by the Carnegie Classification as doctoral degree-granting institutions but not ranked among USWNR's 100 top national universities. These institutions offer doctoral programs and are considered research schools. Examples are the University of San Francisco and Biola University. The third category, master's universities, includes institutions indicated by the Carnegie Classification as master's institutions. These schools do not have doctoral programs but grant master's degrees. Examples are Cornerstone University and California Baptist University. The remaining category, bachelor's/specialized, includes mostly bachelor's institutions, such as Dickinson College, and a small number of specialized institutions, such as Rockefeller University and New York School of Interior Design. In sum, the four types of universities have distinct objectives and foci and are likely to design different incentive structures for their presidents. In Table 1, Panel B, I present the breakdown of the sample by type.

3.2 Variable Measurement

3.2.1 Dependent Variables

Salary is the amount of salary paid to an institution's president during an academic year, defined as all salaries, fees, bonuses, and severance payment that each president receives. I measure Salary as III as all other dollar amount variables in 2009 dollars to adjust for inflation. *Benefits* is the amount of welfare benefit plans paid to a president during an academic year. Examples are retirement payouts, expense accounts, health and pension plans, and the use of homes and cars. Universities are also required to include all forms of deferred compensation that are paid or designated in that year. *Total Compensation* is the sum of *Salary* and *Benefits*. It approximates the total amount of compensation received by the president during an academic year. *Faculty Salary* is the average salary for full-time faculty members on 9-month equated contracts.

3.2.2 Independent Variables

Total Revenue, also called total current funds revenues as per the IPEDS, is the total amount of inflow of resources from delivering or producing goods, rendering services, or other activities that constitute the institution's ongoing major operations. It includes revenues from fees and charges, appropriations, auxiliary services, contributions, and other transactions, all net discounts and allowances. *Tuition* is measured as the amount of net tuition directly from students. *Grant* is the sum of revenues from federal appropriations and federal, state, and local grants and contracts. *Grant* is closely correlated with research expenditures (Cohn, Rhine, & Santos, 1989). *Private* refers to the amount of revenues from private donors and contracts, and the estimated dollar amount of contributed services. *Investment* is the amount of revenues derived from the institution's investments, including investments of endowment funds. It may take the form of interest income, dividend income, rental income, or royalty income. *Other* refers to revenues that do not come from tuition, grant, private contributions, or investment. It mainly contains revenues from three resources: (1) affiliated entities, such as

booster clubs, (2) sales and services from educational activities, such as university presses, and (3) auxiliary enterprises, such as food services. It also includes revenues from an institution's teaching hospital, if any, and revenues from independent operations and other resources.

Total enrollment is the number of students enrolled in courses creditable toward a degree or other formal award. It includes those enrolled in vocational programs and off-campus centers, and high school students taking courses for credit. *Undergraduates* is the total number of enrolled undergraduate students. *Graduates* is the total number of enrolled graduate schedules. *Ranking* is the rank declared by the USNWR for the top 100 national universities in an academic year. Institutions not ranked among the top 100 national universities have a missing value for this variable. In other words, observations that have a value for *Ranking* are classified into the top category.

3.3 Empirical Strategy

3.3.1 Basic Model Specification

Compensation of university presidents is influenced by unidentified university and president characteristics or unobserved heterogeneity across universities and presidents. For example, an incoming president receives a higher salary than his predecessor as the board initiates a new contract (Zuefle, 2010). After he proves his outstanding ability and moves to another more reputable university, he is likely to receive an even higher salary. University performance, usually sticky over time, is also a function of unobserved heterogeneity across universities and presidents. Without controlling for unidentified university and president characteristics, which are correlated with both the dependent variable (i.e., presidents' pay) and independent variables (i.e., performance), I may draw erroneous inferences from regression analysis (Wooldridge 2002). To overcome this difficulty, I use a fixed-effects research design similar to that in Hartzell, Parsons, and Yermack (2010). Our specification is

$$Pay_{ij,t} = \alpha + \sum \beta_k Performance_{k,ij,t-1} + \sum \delta_{ij} Pair_{ij} + \sum \gamma_t Year_t + \varepsilon_{ij,t} \quad (1)$$

where i indexes presidents, j , universities. I use a unique intercept to each university-president pair, $Pair_{ij}$, to account for differences in compensation across university-president pairs that do not change over the year. I also include indicator variables, $Year_t$, to control for common changes in compensation for a particular year. The performance measures are lagged in one year, because boards of trustees usually adjust president compensation based on their previous performance. In this university-president pair fixed effects model in which both university and individual characteristics are controlled for, only variations within university-president pairs are used in the estimation, and thus the interpretability and robustness of the pay-for-performance result are improved. I calculate robust standard errors clustered at the university-president pair level to control for possible serial correlation within pairs.

Incentive payments may occur at the end of a president's term, either as a reward for previous performance or as an incentive for early retirement (Cotton, 2003; Ehrenberg et al., 2001). The observations in the last year of a president's term, therefore, might bring noise to the estimation. Since the data does not contain information regarding the reason for a president's departure, I delete the latest observation in each university-president pair. By doing so, I am likely to underestimate the association between performance and pay.

3.3.2 Empirical Model for RQ1 (Incentive Contract)

The first step of the empirical testing is to estimate a basic model, Equation (2), to examine whether presidents' salaries, benefits, and total compensation are sensitive to the two basic performance measures with regard to the scale of operation: total revenue and total enrollment. Sedatole et al. (2012) suggest that the objective of nonprofits is to expand program expenditure. It is difficult, however, to contract on expenditures, and a more feasible performance measure is revenue. Intuitively, the more revenue a university generates, the greater the extent to which it can serve its constituents. Enrollment is another key indicator of output scale for post-secondary institutions (Cohn et al., 1989; De Groot, McMahon, & Volkwein, 1991).

The mechanisms that drive faculty compensation and presidents' compensation are different, although the resources come from the same institution. After I test the basic model for presidents' salaries and benefits, I also use *Faculty Salary* as the dependent variable to examine whether the faculty compensation scheme presents a similar pattern as compared with the presidents' compensation scheme.

$$Pay_{ij,t} = \alpha + \sum \beta_1 TotalRevenue_{ij,t-1} + \sum \beta_2 TotalEnrollment_{ij,t-1} + \sum \delta_{ij} Pair_{ij} + \sum \gamma_t Year_t + \varepsilon_{ij,t} \quad (2)$$

3.3.3 Empirical Model for RQ2 (University Type and Incentive Contract)

Our empirical testing of cross-sectional variation in incentive schemes proceeds in three stages. In the first stage,

I estimate Equation (2) for each of the four types of universities, namely, top, research, master's, and bachelor's/specialized. The estimated coefficients for each type of university represent how much presidents in that group are incentivized for particular performance measures. In the second stage, I split revenue sources into five broad categories: tuition, grant, private contributions, investment, and other. I then study whether presidents' compensation is driven by various sources of revenues by estimating Equation (3) for each type of university. University-president pair fixed effects and year fixed effects are also included in the model.

$$Pay_{ij,t} = \alpha + \sum \beta_2 Grant_{ij,t-1} + \sum \beta_3 Private_{ij,t-1} + \sum \beta_4 Investment_{ij,t-1} + \sum \beta_5 Other_{ij,t-1} + \sum \beta_6 TotalEnrollment_{ij,t-1} + \sum \delta_{ij} Pair_{ij} + \sum \gamma_t Year_t + \varepsilon_{ij,t} \quad (3)$$

In the third stage, I split enrollment into undergraduates and graduates and study whether presidents' compensation is driven by types of enrollment. I estimate Equation (4) within each type of university. The coefficients, β_2 and β_3 , represent the incentive placed on enrollment increase for undergraduate students and graduate students, respectively.

$$Pay_{ij,t} = \alpha + \sum \beta_1 TotalRevenue_{ij,t-1} + \sum \beta_2 Undergraduates_{ij,t-1} + \sum \beta_3 Graduates_{ij,t-1} + \sum \delta_{ij} Pair_{ij} + \sum \gamma_t Year_t + \varepsilon_{ij,t} \quad (4)$$

3.3.4 Empirical Model for RQ3 (Relative Performance Measure)

Finally, I examine whether presidents' compensation is linked with relative performance measures, proxied by the institution's ranking by USNWR. I test this research question using data from top universities only, because the ranking information is not available for other types of universities during the sample period. I estimate Equation (5), which also includes university-president pair fixed effects and year fixed effects. A negative coefficient on β_3 indicates that relative performance measure is used in university president compensation schemes.

$$Pay_{ij,t} = \alpha + \sum \beta_1 TotalRevenue_{ij,t-1} + \sum \beta_2 TotalEnrollment_{ij,t-1} + \sum \beta_3 Ranking_{ij,t-1} + \sum \delta_{ij} Pair_{ij} + \sum \gamma_t Year_t + \varepsilon_{ij,t} \quad (5)$$

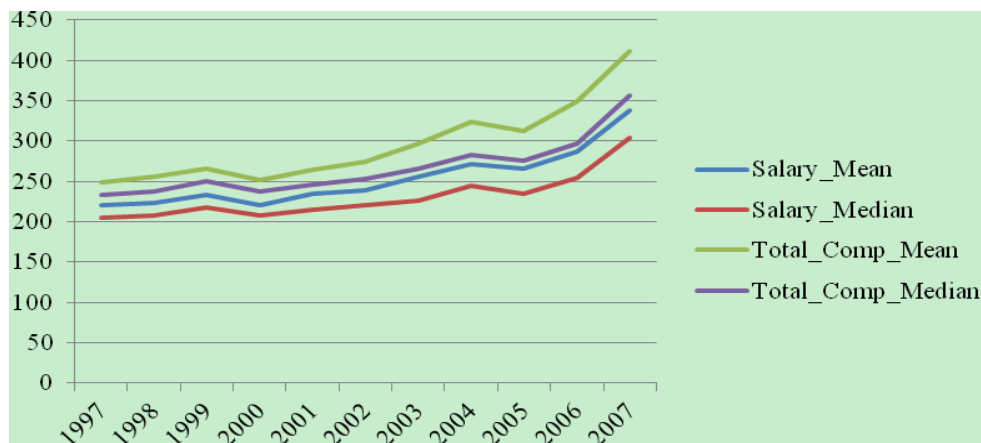
4. Results

4.1 Descriptive Statistics

In Figure 1, Panel A, I present the time trend of university presidents' compensation for the pooled dataset. Mean and median for salary and total compensation increase gradually between 1997 and 2004 and dramatically since 2005. In Panel B, I present the median salary by university type. Top universities' presidents are paid much more than their counterparts from other types of university. Research universities' presidents on average experienced a pay drop in 2005 and had a steep pay increase after 2005.

Panel A: Pooled Dataset

\$ (million)



Panel B: Median Salary by University Type

\$ (million)

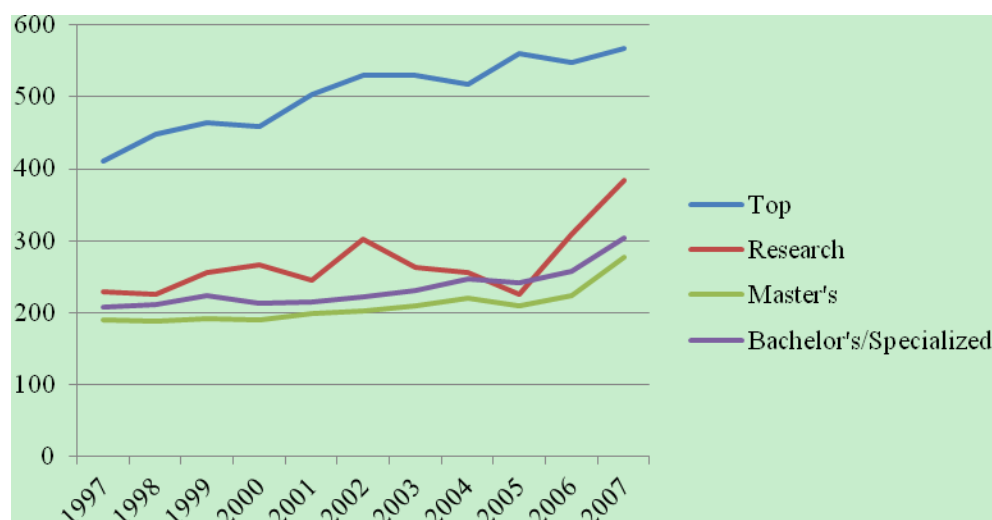


Figure 1. Time trend of university president compensation

In Table 2, I present median values of the salary, benefits, total compensation, and performance measures I use in the empirical tests. Median salary for presidents of top universities, \$0.50 million, is more than twice the median for salaries of presidents of all universities. The median total university revenues are \$871 million for top universities, \$152 million for research universities, and \$51 million for master's and bachelor's/specialized universities. Grant, private, and investment revenues also show significant variations. The enrollment data show that on average top universities have more than 11,000 students, research universities have more than 6,000 students, master's universities around 3,000 students, and bachelor's/specialized universities fewer than 1,500 students.

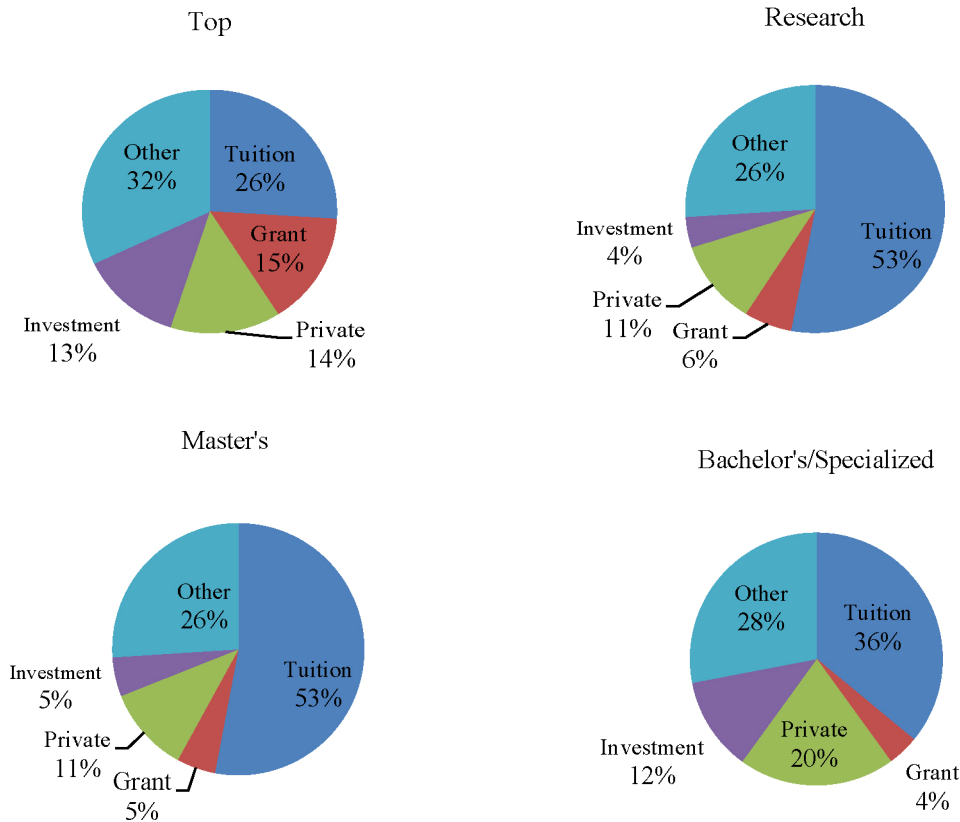
Table 2. Descriptive statistics

	All Median	Top Median	Research Median	Master's Median	Bachelor's/Specialized Median
Salary (\$1,000)	227.83	502.56	255.07	206.47	231.34
Benefits (\$1,000)	27.48	50.22	26.25	23.04	30.58
Total Com(\$1,000)	263.78	570.52	310.05	236.53	267.57
Total Rev (\$ mil.)	59.94	871.73	152.16	50.91	50.94
Tuition (\$ mil.)	27.65	185.23	70.44	26.49	17.72
Grant (\$ mil.)	1.66	130.49	8.45	1.46	1.20
Private (\$ mil.)	7.49	114.90	13.68	4.60	9.01
Investment (\$ mil.)	2.96	99.85	5.12	1.68	4.73
Other (\$ mil.)	10.43	87.42	22.38	8.28	9.93
Total Enrollment	2528	11053	6863	3013	1455
Undergraduates	1986	6004	4059	2177	1395
Graduates ^a	650	3467	2340	646	109

Note. ^a Includes only universities that have graduate students

In Figure 2, Panel A, I use pie charts to demonstrate the composition of revenues across the four types of university. For top universities, other revenue is the largest source, partly because many of these universities have affiliated entities, education activities, and/or medical schools. The second largest revenue source for top universities is tuition, counting for 26% of total revenue. For research universities, the largest source is tuition, counting for more than half of total revenues. Grant revenue is 6% of the total revenues. Master's universities are similar to research universities. For bachelor's/specialized universities, however, the proportion of tuition is only 36%, suggesting that liberal arts colleges and specialized institutions do not depend heavily on private tuitions for funding. As shown in Figure 2, Panel B, the four types of university also present different compositions of undergraduate and graduate students.

Panel A: Revenue Sources



Panel B: Enrollment Information

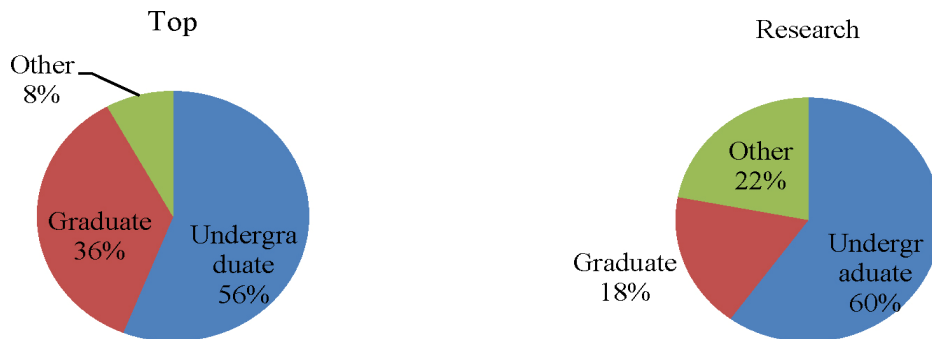




Figure 2. Revenue sources and enrollment information

In the final step of data description, I compare the salary level of university presidents with that of faculty and that of all workers in the United States. For the pooled sample, presidents' salary increases at an annualized rate of 4.4% between 1997 and 2007, and is similar across different types of universities. Faculty salary and pay for all workers in the United States increases at an annualized rate of 1.0%.

Table 3. Change in university president compensation 1997-2007

Category	1997	2007	% Change	Annualized
All				
President Salary (mean)	219,994	337,603	153%	4.4%
President Total comp	249,363	411,226	165%	5.1%
Faculty Salary	65,719	72,856	111%	1.0%
Top				
President Salary	399,104	555,318	139%	3.4%
President Total comp	453,950	673,358	148%	4.0%
Faculty Salary	95,095	96,020	101%	0.1%
Research				
President Salary	241,322	336,882	140%	3.4%
President Total comp	266,121	410,457	154%	4.4%
Faculty Salary	71,831	73,250	102%	0.2%
Master's				
President Salary	188,503	277,974	147%	4.0%
President Total comp	210,876	344,799	164%	5.0%
Faculty Salary	58,654	65,593	112%	1.1%
Bachelor's/Specialized				
President Salary	212,543	312,541	147%	3.9%
President Total comp	247,183	372,924	151%	4.2%
Faculty Salary	65,889	71,437	108%	0.8%
Comparison Group				
All U.S. Workers	35,168	40,107	114%	1.0%

4.2 Results for RQ1 (Incentive Contract)

The result for estimating Equation (2) to detect pay for performance is presented in Table 4. A \$1 million

increase in total revenues is associated with an increase of approximately \$32.70 in president salary. One more enrollee is associated with a \$14.74 increase in salary. This result suggests that university president compensation is linked with performance, providing positive support to RQ1. Benefits do not appear to be associated with previous period performance, probably because it is a noisier measure as compared with salary and is more costly to adjust than salary. For this reason, I do not include benefits for future analysis and focus on salary alone. I also look at the link between the basic performance measures and average faculty salary. I find that faculty salary is associated with enrollment. On average, one more enrollee leads to \$0.39 salary increase for faculty.

Table 4. Regression result for basic performance measures (RQ1)

	President Salary	President Benefits	Total Compensation	Average Faculty Salary
Total Revenue (\$1,000,000)	32.70*** (2.70)	15.11 (1.28)	47.89*** (2.73)	0.20 (0.20)
Total Enrollment	14.74*** (3.35)	3.41 (0.95)	18.13*** (3.14)	0.39** (2.35)
Pair Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
N	4,974	4,978	4,977	3,746
# of Pairs	1,122	1,122	1,122	970
R square	0.08	0.03	0.11	0.14

Notes. Estimation results for α and year dummies are not reported. Standard errors, based on two-tailed test, are in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

4.3 Results for RQ2 (University Type and Incentive Contract)

Next, I test RQ2 on whether university type affects executive compensation. I first estimate the basic model, Equation (2), for each type of university and present the result in Table 5. Salary is not related to total revenue or total enrollment for top, research, or bachelor's/specialized universities. For master's universities, however, a \$1 million increase in total revenue is associated with a \$579 increase in presidential salary, as presented in Table 4. Master's university presidents are also provided with a \$13.56 per enrollee incentive for expanding enrollment. This result indicates that master's universities are interested in expanding the scale of their operation and thus incentivize their presidents to perform on these dimensions. Overall, the results shown in Table 4 provide supportive evidence with regard to RQ2.

Table 5. Regression result for president salary by category (RQ2)

	Top	Research	Master's	Bachelor's/Specialized
Total Revenue (\$1,000,000)	14.14 (0.19)	-60.00 (-1.59)	578.58* (1.86)	-2.78 (-0.11)
Total Enrollment	1.10 (0.08)	5.35 (1.15)	13.56** (2.08)	5.69 (0.75)
Pair Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
N	420	441	2300	1813
# of Pairs	94	91	468	492
R square	0.15	0.27	0.06	0.18

Notes. Estimation results for α , the constant, and year dummies are not reported. Standard errors, based on two-tailed test, are in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Next, as shown in Equation (3), I split total revenues by source (i.e., tuition, grant, private contributions, investment, and other) to examine how salary is linked with each source type and whether cross-sectional difference exists among four types of university. For top universities, both grants and private contributions are associated with president compensation, suggesting that promoting research and expanding endowments are the priority for top universities and are thus linked with president incentive schemes. A \$1 million increase in grants is associated with an \$825 increase in top university presidents' salaries. The magnitude of incentive for private contributions is smaller. A \$162 salary increase results from a \$1 million increase for private contributions. Given that the median budget for grants is approximately \$130 million for top universities, a 5% increase in grants on average is related to more than \$5,000 increase in president's salary. The scale of net tuition, however, is not related to top university presidents' compensation, suggesting that top universities do not primarily aim at expanding their size. For other types of universities, tuition income is significantly associated with presidents' salaries. A \$1 million increase in tuition is associated with a \$639, \$2,166, and \$846 increase in salary for presidents at research, master's, and bachelor's/specialized universities, respectively.

Table 6. Regression result for president salary by revenue resource (RQ2)

	Top	Research	Master's	Bachelor's/Specialized
Total Enrollment	-17.68 (-0.79)	-2.07 (-0.33)	-2.41 (-0.30)	17.04 (1.13)
Tuition (\$1,000,000)	-128.50 (-0.24)	639.41* (1.89)	2,165.85** (2.09)	845.85* (1.68)
Grant (\$1,000,000)	824.72** (2.03)	-122.03 (-0.31)	1,779.65 (0.42)	2778.25 (1.56)
Private (\$1,000,000)	162.13* (1.88)	-122.84 (-0.45)	-1,088.83 (-1.57)	141.55 (1.23)
Investment (\$1,000,000)	1.58 (0.11)	-66.28*** (-2.68)	254.56 (0.53)	-20.07 (-0.70)
Other	260.75 (1.24)	-160.38 (-1.14)	978.61 (0.64)	202.19 (1.11)
Pair Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
N	370	401	1900	1432
# of Pairs	89	87	412	387
R square	0.15	0.28	0.06	0.30

Notes. Estimation results for α and year dummies are not reported. Standard errors, based on two-tailed test, are in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

I also examine enrollment across the four types of university, as specified in Equation (4), and report the result in Table 7. Although top and research universities' presidents are not incentivized to expand total enrollment, master's and bachelor's/specialized universities' presidents are, and their incentives are related to enrollment in both undergraduate and graduate programs. One more undergraduate (graduate) enrollee in master's universities is associated with a \$15 (\$20) increase in the president's salary. On average a master's university has 2,177 undergraduate students and 646 graduate students, and thus a 10% increase in both categories leads to almost \$5,000 increase in the president's salary. I find a similar pattern for bachelors'/specialized universities. Overall, the results from Tables 5-7 provide positive support for RQ2 by suggesting that across-sectional difference exists in university presidents' compensation and that incentives are provided in congruence with an institution's type.

Table 7. Regression result for president salary by enrollment type (RQ2)

		Top	Research	Master's	Bachelor's/Specialized
Total Revenue		15.73	-60.57	13.42	415.69***
(\$1,000,000)		(1.36)	(-1.65)	(0.11)	(7.13)
Undergraduate Enrollment		16.61	3.72	15.36***	4.17*
		(0.42)	(0.27)	(4.62)	(1.75)
Graduate Enrollment		-11.82	8.90	19.82***	21.33*
		(-0.42)	(1.58)	(5.26)	(1.88)
Pair Fixed Effect		Yes	Yes	Yes	Yes
Year Fixed Effect		Yes	Yes	Yes	Yes
N		420	432	2291	829
# of Pairs		94	87	465	238
R square		0.15	0.27	0.05	0.09

Notes. Estimation results for α and year dummies are not reported. Standard errors, based on two-tailed test, are in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

4.4 Relative Performance Measure (RQ3)

I estimate Equation (5) for top universities and report the result in Table 8. I do not find evidence that presidents are provided incentives for improving schools' ranking, consistent with the argument that boards of trustees might be reluctant to offer relative performance-based incentive contracts to presidents.

Table 8. Regression result for president salary with university ranking (RQ3)

	Top Universities
Total Revenue (x 1,000,000)	14.33
	(1.34)
Total Enrollment	-2.74
	(-0.17)
Ranking	-4,589.24
	(-0.98)
Pair Fixed Effect	Yes
Year Fixed Effect	Yes
N	420
# of Pairs	90
R square (within)	0.15

Notes. Estimation results for α and year dummies are not reported. Standard errors, based on two-tailed test, are in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

5. Discussion and Conclusion

In this study, I examine compensation arrangements for university presidents in the United States using a university-president fixed-effects specification. I find the following evidence: First, presidents' compensation is responsive to performance. Second, the pattern of pay for performance differs across universities of different types. Specifically, top universities' presidents are incentivized to enhance research activities and private contributions; research universities' presidents are incentivized to increase tuition revenues but not enrollment; master's and bachelor's/specialized universities' presidents are incentivized to increase tuition revenue and expand enrollment. Universities' boards of trustees appear to have different priorities and provide presidents with

incentives that are congruent with these priorities. Finally, I do not find evidence that relative performance measure is used in compensation of presidents of top universities, suggesting that the cost of using relative performance-based incentive contracts might be outweigh the benefit.

Our study is among the first to examine whether and how university type affects president compensation incentives. I find important evidence that incentives are provided in congruence with an institution's type, its focus and strategic priority. The findings expand our understanding of executives' employment contract arrangement in the higher education sector, an area that has profound implication for society but receives relatively little academic attention. Our research design takes into account unobserved university and president characteristics, which enhances the robustness and interpretability of the results.

The limitations of this study have to be taken into consideration when drawing conclusions from the results. First, I assume that unobserved university and president characteristics are constant overtime and thus can be filtered out by using a model with president-university pair fixed effects. Some unobserved characteristics, however, might change over time and cannot be captured by our fixed effects specification. Second, data regarding ranks of universities other than the national top 100 are not available for the sample period, which limits the power of testing whether relative performance is used in presidential compensation. Future studies can utilize more data sources to examine relative performance-based compensation issues. Future studies may also classify universities into more specific types and examine whether presidential compensation is affected by the classification.

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